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# A critical review of the literature on generic packaging for cigarettes

**A Report For PMI**

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# Introduction and conclusions

## 1.1 Background

In May 2008, the UK Department of Health ("DH") published a consultation on the future of tobacco control (the "Consultation").[1] According to the Consultation, this is the first step in developing a new national tobacco control strategy that reflects the UK Government's commitment to further reduce smoking rates. The Consultation, which closed on September 8th, sought feedback on four areas:

- reducing the smoking rates and health inequalities caused by smoking;
- protecting children and young people from smoking;
- supporting smokers to quit;
- helping those who cannot quit.

The measures currently being proposed or explored to protect children and young people from smoking include: (i) controlling the display of tobacco in retail environments, (ii) limiting young people's access to tobacco products, (iii) introducing generic packaging, (iv) prohibiting the sale of packs of 10 cigarettes; and (v) reviewing the smoke-free legislation implemented in July 2007.

According to the Consultation, generic packaging, also known as plain packaging, means a standardised package where "the brand name is written in a standard typeface, colour and size and all other trademarks, logos, colour schemes and graphics would be prohibited. The package itself would be required to be plain coloured (such as white or plain cardboard) and to display only the product contents information, consumer information and health warnings required under the law." [2] Throughout this report, we will refer to "generic packaging" and use it as a synonym of plain packaging.

Other countries such as Australia, New Zealand, and Canada are also currently considering generic packaging.

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[1] Consultation on the Future of Tobacco Control, Department of Health, May 2008.
[2] Paragraph 3.64 of the Consultation.

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## 1.2 Instructions

In this context, PMI has asked LECG to review, from a technical perspective, ten studies based on original empirical research on the issue of generic packaging of cigarettes. The selection of papers was based on a thorough review of documents discussing generic packaging as a tobacco control measure carried out by Shook Hardy & Bacon, a law firm commissioned by PMI.

We reviewed the five empirical research-based generic packaging studies cited in the Consultation and five additional widely cited studies, several of which were used in generic packaging proposals in Australia, New Zealand and Canada.

Our review of the studies focuses on two questions.

- Does the empirical evidence support the study's own conclusions?

- Do the studies support the contention that generic packaging would reduce the uptake of youth smoking?

## 1.3 Academic credentials and professional experience

The authors of this review are Dr A. Jorge Padilla and Dr Nadine Watson. Both work in the LECG's European competition policy practice. Dr. Jorge Padilla is the Managing Director of the practice and Dr. Nadine Watson is a Principal. Both of them are highly experienced economists specialized in quantitative methods, consumer research and industrial organization and their application in competition policy and regulatory issues. For further details on LECG and the academic credentials and professional experience of the authors see Annex C.

## 1.4 Executive summary

None of the ten empirical papers reviewed provides evidence that can be used to evaluate whether imposing generic packaging would be an effective method to decrease youth smoking uptake.

None of the papers reviewed the relevant question in the context of the Consultation: how will youth smoking change when all cigarettes are sold in generic packaging. The empirical evidence found in the literature is based on a comparison of generic and branded packaging. These results therefore do not inform on the effects on youth smoking of a policy implementing across the board generic packaging.

Only six of the ten papers reviewed attempted to establish a relationship between generic packaging and smoking by comparing responses of individuals when exposed to generic and branded packages. The other four did not even try to study whether generic packaging will impact smoking behaviour. Moreover, the six papers that approached the relevant question found a very small potential effect of generic packaging on smoking

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despite the strong contrast between the colourful branded packages and the monochromatic generic packages. In the four papers that used direct questioning and focus group discussions to assess the perceived effects of plain packaging on smoking behaviour, over 50% of the respondents said plain packaging would make no difference on smoking behaviour. In the two remaining papers that took a more rigorous approach a similar response was found. Wakefield et al. (2008) found that teenagers report plain packaging would lead to a 3-7 percentage point reduction of smoking prevalence, from 59% to 56%-52%. Goldberg et al. (1995) estimated that teenager say plain packaging would reduce teenager smoking uptake between 5-8 percentage points and would increase the percentage of teenagers quitting smoking by 2-13 percentage points. The evidence provided in these six papers on the link between generic packaging and smoking is neither robust nor statistically significant and does not take into account that smoking decisions, specifically those of adolescents, are driven by multiple factors including family influence, peer influence, prices, unobservable individual characteristics and possibly promotional activities. The conclusions regarding cigarette packaging and youth smoking are therefore bound to be misleading.

All the studies reviewed looked at the relationship between generic packaging and a number of variables such as brand awareness, health warning awareness, and brand image. They did not, however, establish a statistically meaningful link between youth smoking uptake and brand awareness, health warning awareness and brand image.

All but two of the studies were carried in the 1990's. This evidence is outdated and cannot be extrapolated to evaluate current generic packaging proposals. The current regulatory environment is markedly different from that in the last decade and therefore even robust empirical estimates obtained in the 1990's would lack validity today. According to the "Lucas critique", for which Robert Lucas was awarded the Nobel Prize in 1995, any estimated empirical relation based on past data can break down due to changes in policy or other "rules of the game". Policy conclusions based on models estimated in the 1990's are therefore potentially misleading.

From our review of the studies, we conclude that they do not provide a reliable answer on the existence of a causal link between branded cigarette packaging and youth initiation to smoking. The reason is that they have limitations both in terms of the data analysis and data collection methods. These limitations are so fundamental that conclusions concerning the relationship between cigarette packaging and youth smoking are likely to be misleading.

## 1.5 Structure of the report

The remainder of this report is structured as follows. Section 2 provides a survey of the studies and an overall assessment of their validity (which are discussed in more detail in Annex A). Section 3 describes the advantages and limitations of data collection methodologies used when, as in the analysis of the impact of generic packaging, historical data is not available. Section 4 identifies the standards required of any empirical analysis to derive reliable conclusions for policy purposes. Finally, Section 5 concludes analyzing the implications for the current debate on generic packaging.

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# A review of the evidence on the impact of generic packaging on youth smoking

## 2.1 Overview of the studies on generic packaging

One of the main purposes of the Consultation on tobacco control is to find out how to reduce youth smoking initiation. In particular, one of the issues under discussion is whether introducing generic packaging would reduce youth smoking initiation rates. Two requisites are necessary to determine whether the evidence confirms that this is the case or not: high quality data and a careful implementation of the data analysis.

With these two criteria in mind we have reviewed the five research-based papers in the Consultation as well as five additional papers containing original empirical research on generic packaging identified by Shook, Hardy & Bacon.[3] These papers analyze several questions related to generic packaging, and in particular its potential impact on attention to health warnings, brand awareness and appeal and smoking incidence. Table 1 below provides a brief overview of the papers analysed. For each paper, the table describes its objective, the data collection methodology, the sample size and the main conclusions of the study. Note that not all the papers reviewed are based on original survey data. In particular, six of the papers reviewed are based on only three distinct surveys. Each of the following pairs of papers use the same underlying data: Goldberg(1999) and Goldberg(1995), Beede(1992) and Beede(1991), and Rootman at al.(1996) and Northrup and Pollard(1995).

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[3] The five papers cited in the Consultation are Goldberg et al. 1995, Centre for Health Promotion 1993, Beede and Lawson 1992, Goldberg et al. 1999 and Rootman et al 1995.

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**Table 1: Overview of the papers analysed**

| Authors | Objective | Methodology | Sample | Conclusions |
|---|---|---|---|---|
| Wakefield,. Germain and Durkin (2008) | Provide evidence to assist the selection of plain packs designs that would promote the least positive attributes towards smoking. | - Internet online survey | 813 adult Australian smokers, age 18-49 | - Plain packs were rated as significantly less attractive and popular than branded packs. <br> - Smokers of plain packs were rated as significantly less trendy/stylish, sociable/outgoing and mature. <br> - Smokers inferred that cigarettes from plain packs would be less rich in tobacco, less satisfying and of lower quality tobacco. |
| Grant et al. (2007), | Investigate the effects of tobacco marketing communications on brand awareness, brand image, attitude formation and intention to smoke by adolescents. | - Direct questioning <br> - Structural equation modelling | 1,123 respondents, age 11-16 | - Branding activities affect attitudes towards smoking and the intention to smoke. |
| M. Goldberg, et al. (1999) | Evaluate the effects of generic packaging on attention to health warnings | - Visual/recall experiment | 401 teenagers, age 14-17 | - Warnings on generic packages may be more effective to draw attention to health warnings than regular packages but further research is necessary. |
| I. Rootman, et al. (1996) and Northrup et al. (1995)* | Investigate: <br> a) the link between the package and the cigarette brand; <br> b) the impact of generic packaging on health warning recall; <br> c) the impact of price changes on youth smoking. | - Focus groups <br> - Direct questioning | 339 teenagers age 12-17 in the focus groups, 2,132 students in the classroom surveys | - Generic packaging would reduce the positive imagery associated with smoking particular brands. <br> - Generic packaging makes the packages look more serious, and increases the attention to health warnings. <br> - Price reductions have led to an increase in smoking among youth. |
| M. Goldberg, et al. (1995) | (1) Study teenagers opinions regarding smoking, brands, brand image and generic packaging | Direct questioning | 1200 teenagers, age 14-17 | - Teenagers have mixed views on what they believe to be the impact of generic packaging. <br> - Results suggest that the effects of generic packaging on smoking would be marginal. |
| | (2) Study link between a brand and its image. | Direct questioning | | - Generic packaging reduced the link between a brand and its related imagery, especially for vulnerable/naïve consumers. |
| | (3) Study the influence of generic packaging on the ability to recall the presence of health warning messages and their content on packages | Visual experiment | 400 teenagers, age 14-17 <br> This is the same survey used in Goldberg et al. (1999). | - Generic packaging increased the recall rate of only one of three health warnings. The authors suggest that the exposure time was too short and that these results cannot be extrapolated to a more natural long term-setting. |

*Note: *These two papers are analysed together since Rootman at al. (1996) is a summary of the main findings of the same survey described in detail in Northrup and Pollard (1995).*

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| Authors | Objective | Methodology | Sample | Conclusions |
| --- | --- | --- | --- | --- |
| | (4) Estimate the relative utility of different cigarette attributes (brand, price, peer influence) for generic and generic packaging and across brands | Conjoint analysis | 400 teenagers, age 14-17 and 100 adults, age 30-50. | - Price is the most important attribute influencing the uptake or cessation of smoking.<br>- Packaging is generally as important as brand influence and peer influences (except for teenage non-smokers).<br>- Results suggest that plain and generic packaging will, to some "unknown degree, encourage non-smokers not to start smoking and smokers to stop smoking" |
| Centre for Health Promotion (1993) | Study the effects of generic packaging on:<br>a) Images associated with smoking and cigarette packaging;<br>b) Attention to health warning information; and<br>c) Cigarette consumption. | - Direct questioning<br>- Focus groups | 129 smokers and potential smokers in 20 discussion groups, age 12-17. | - Packaging makes the product more attractive, especially for youth contemplating smoking.<br>- This effect is lower for adults and youth that smoke regularly. |
| P. Beede, et al. (1992) | Investigate effects on health warning perceptions of generic packaging | - Focus groups<br>- Visual recognition survey | 568 students, age 13 | - Generic packaging does not heighten recollection of health warnings on familiar brands. |
| Centre for Behavioural Research in Cancer (1992) | Study adolescents' responses to alternative pack modifications related to the presentation of information warnings about the effects of smoking on health. | - Group interviews | 66 individuals age 12-20 in 22 groups of 2-7 participants. | - Bigger health warnings providing more information on health risks than the standard ones would increase awareness. |
| P. Beede and R. Lawson (1991) | Investigate the impact of cigarette packaging on brand image | - Focus groups | 568 secondary school adolescents. Note that this survey is the same as in Beede et al. (1992). | - Brand packs cluster into distinct groups of user profiles.<br>- Generic packs are not associated with any profile.<br>-Brand promotion may enhance adolescents' susceptibility to smoking specific brands. |

As the table shows, these studies rely on:

- individual direct questioning, focus groups and visual recall and recognition experiments involving questions of brand image, attitude toward smoking, intention to smoke, peer influence, etc;

- paired comparison conjoint analysis asking respondents to compare between pairs of alternatives to estimate the relative utility of different cigarette attributes; and

- conjoint rating where respondents are asked to rate or rank several products.

For a detailed description of the applicable data collection methodologies see Section 3.

The conclusions of these studies can be briefly summarized as follows:

- branded packaging makes the product more attractive, especially for the young;

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- health warnings placed on generic packaging may be more effective than on branded packaging in terms of recall and recognition;

- price is the most important attribute influencing the uptake of smoking; and

- packaging is as important as brand and peer influence.[4]

## 2.2 Are the conclusions of these studies reliable?

From our review of the studies, we conclude that they do not provide a reliable answer on the existence of a causal link between branded cigarette packaging and youth initiation to smoking. The reason is that they have limitations both in terms of the data analysis and data collection methods.[5] These limitations are so fundamental that conclusions derived on the relationship between cigarette packaging and youth smoking are likely to be misleading.

In particular, establishing reliable evidentiary support to the claim that cigarette packaging is a "causal factor" of youth smoking would require a carefully applied econometric analysis identifying the causal link between the variables of interest. This requires that:

i. studies employ valid measurements of the outcomes of interest (e.g., the decision whether to smoke or not, the attention paid to health warnings) and the alleged causal factor under investigation (that is, there are no measurement error problems);

ii. samples are representative of the population (that is, there are no sample selection biases);

iii. the analysis demonstrates that other potential causes of smoking, other than the one of interest, have been accounted for (that is, there are no omitted variable biases);

iv. the empirical model is designed to ensure that causality runs in the right direction (from the variable of interest to youth smoking rates, for instance) so that the estimates are not biased; and

v. the statistical validity and robustness of the results are assessed.

All these requisites are not satisfied in the reviewed studies. In fact, their empirical implementation falls short of that required to establish well-founded causal relationships. They do not develop empirical causal models that are theoretically and statistically robust and they do not apply the basic principles of empirical investigation to establish a causal relationship between branded cigarette packaging and youth smoking. In sum, these studies do not meet commonly applied standards, and therefore fail to scientifically prove a causal link between branded or generic packaging and youth smoking.

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[4] Note that most studies were conducted at a time when advertising was still allowed and thus packaging and branding could still be distinguished. In the current environment, where advertising and other promotional activities are prohibited, branding and packaging are difficult to keep as separate and distinct attributes.

[5] For a detailed description of the applicable data collection methods and standards in data analysis see Sections 3 and 4 respectively.

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**Measurement error**

The studies rely on survey data where measurement error is common. This is because many factors can influence the responses in these types of surveys: the clarity of the frame of reference in which the questions are posed to respondents, the influence of scaling on the answers, the social desirability or the speculative nature of many of the questions. For example, to the extent that these factors lead to misreporting and the error is correlated with the observable and unobservable characteristics of the individual, this may severely bias the results unless estimation techniques that correct such problems are used. None of the studies use such corrective estimation techniques or otherwise address the measurement error problem.

**Sample selection biases**

An additional factor that affects the quality of the studies is the fact that the criteria employed to include individuals in the sample may lead to sample selection biases. In Grant (2007), for instance, only adolescents that recognized the brand of a cigarette package were included in the survey. It is plausible that individuals who satisfy this criterion are different from those that are left out of the study in their tobacco use. If this is the case, the results could be severely biased. Similarly, Goldberg et al. (1999) and Goldberg et al. (1995) derive their conclusions from a survey conducted in one mall in Vancouver and the study of the Centre for Behavioural Research in Cancer (1992) is based on a sample of 66 people. In all three cases, the representativeness of the sample is questionable and raises the possibility of sample selection bias.

**Omitted variables**

The studies fail to test against plausible alternative explanations of the observed associations and the researchers present no reliable empirical or theoretical analyses to justify any aspect of model selection. Critically, they do not address whether important variables are omitted.

In particular, the available evidence in the literature on adolescent risky behaviour, including smoking, supports a multi-causal model for youth smoking, as many factors have been empirically linked to youth smoking (cigarette prices, parental influences, risk preferences, peer influences, access, etc). This literature provides a strong empirical basis in support of a causal relationship between many of these factors and youth smoking. Moreover, a further finding that is emerging from recent studies is that many of these features are shaped at early ages and greatly affect overall development and choices to engage in risky behaviour (see Heckman, Stixrud, and Urzua, 2006).

However, the studies reviewed in this report often do not consider any potential determinants of smoking, apart from packaging, and study this factor in isolation. For example, in the Grant (2007) study, the authors only take into consideration one potential determinant of smoking rates at a time (either brand image, brand familiarity or peer influence), and fail to take into account other factors, such as individual characteristics that may influence the attitudes and behaviour toward smoking.

The omission of these relevant variables will cause the estimated parameters of interest to be biased (to the extent they are associated with packaging and brand image). For example, if parental smoking is positively related to perceptions of brand image and

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smoking intentions, the omission of parental smoking in the analysis will bias the estimated effect of brand image on the intention to smoke. The reason is that the estimated parameter would be also capturing the effect of parental smoking on the teenager decision to smoke. The omitted variable bias derived from not taking into account other causal factors makes the results of these studies unreliable.

**Endogeneity**

The studies that use brand related measures such as brand awareness and brand recollection suffer from an additional problem of endogeneity.[6] This means that participants who have greater preferences for smoking might be more aware of brands, even if the brands themselves have no independent causal effect on their desire to smoke. The studies ignore commonly accepted techniques and methods for conducting statistical analyses of human behaviour that would correct for endogeneity, such as the method of instrumental variables, and other modern methods of statistical inference in causal models.

Hence, the correlation between branding measures and smoking patterns does not imply that one can infer a causal relationship between the two variables. The simple correlation between the recognition of a brand on the basis of the current package and future smoking behaviour does not indicate that this type of packaging caused smoking, as this inference does not account for the endogeneity problem. Participants who already are more likely to smoke would be more likely to be classified as having high awareness of cigarettes brands, all else equal. Therefore, observing a correlation between the branding measures and youth smoking is not a reliable evidence of any causal effect.

Note that correlation does not necessarily imply causation. Two variables may be highly correlated even though a causal relationship does not exist between them. For example, ice cream sales are positively correlated with the number of people who drown at the sea. Ice creams, however, do not cause people to drown. The positive correlation between these two variables arises because both are positively correlated with summer. Therefore, simply looking at correlations may lead to serious interpretation errors.

**Statistical validity**

Evaluating the statistical significance of any empirical result is necessary to ensure that findings are not just a chance occurrence. However, only five of the generic packaging studies[7] examined report the statistical significance of the results. The other five studies do not report statistical significance. The margin of error of these results could be sufficiently wide to render the results meaningless.

Similarly, robustness analysis provides assurance that results are unaffected by data or modelling assumptions. None of the studies address the robustness of the results.

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[6] Chaloupka and Warner (2000) highlight that the studies from the noneconomic literature generally do not assess the potential endogeneity between an interest in smoking and behaviour.
[7] Wakefield (2008), Grant (2007), Goldberg (1999), Beade (1992) and Beade (1991).

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# Data collection methodologies: surveys and stated preference techniques

## 3.1 Introduction

Generic packaging legislation has never been implemented in any country. This means that the potential impact of generic packaging cannot be analysed using historical data. Hence, researchers who wish to empirically investigate this matter need to resort to other data collection methods and in particular to direct question surveys, focus groups, visual recall and recognition experiments, ethnographic observations and stated preference methodologies. Each of these methods is designed to answer specific types of questions and/or to be implemented under varying circumstances.

- *Direct question surveys*: these include questionnaires and interviews to collect opinions.

- *Focus groups*: these gather detailed information on a particular topic from group discussions.

- *Visual recall and recognition experiments*: these expose individuals to different pictures or objects and analyse their association, recall or recognition capacity.

- *Ethnographic observations*: these gather information through careful observation of individual behaviours or reactions when exposed to stimuli.

- *Stated preference methodologies*: these are a particular class of survey techniques specifically developed for eliciting consumer preferences. They include contingent valuation methods, conjoint analysis and choice modelling.

The remainder of this section reviews the advantages and limitations of these methodologies. The balance of strengths and weaknesses will depend on the purpose of the research. If the objective is to assess the potential impact of a policy measure, the most robust, representative and unbiased data collection methodology needs to be used.

## 3.2 Direct question surveys

Surveys are administered through questionnaires and interviews with the purpose of collecting opinions or factual information. Individual direct questioning is the most commonly used survey technique. In these surveys, questions are administered by a researcher ("structured interview" or "researcher-administered survey") or by the respondent through questionnaires or self-administered surveys. Interviews are more personal and allow the interviewer the opportunity to probe or ask follow-up questions, but they can be very time consuming and resource intensive. In contrast, questionnaires are relatively inexpensive to administer, but response rates are often very low.

Individual direct questioning has two main advantages.

- First, they are relatively easy to administer and inexpensive, so that they represent an efficient way of collecting information from a large number of respondents and allows for large samples.

- Second, they are often the only means to obtain information on certain issues. They are flexible in the sense that a wide range of information can be collected; they allow the study of attitudes, values, beliefs, and past behaviour, which would otherwise not be possible.

However, this survey method suffers from several limitations.

- First, experiments have shown that *cognitive factors* affect the way people answer survey questions. Simple manipulations affect how people process and interpret questions.[8] The ordering of questions, their wording, or the scales that are presented have been shown to affect the outcome of the survey. For example, whether question A precedes question B or vice versa can substantially affect the answers, because (1) people attempt to provide answers that are consistent with previous ones and (2) prior questions elicit memories or attitudes that influence later answers. In addition, respondents may make very little mental effort in answering the questions, and often do not attempt to recall all relevant information or do not read through the whole set of alternatives.

- Second, the *social desirability* of the responses may have a strong impact on the answers. Respondents want to avoid giving a bad impression to the interviewers and there is a propensity for subjects to give what is perceived to be the "right" response or the response the interviewer is looking for. For example, 25% of non-voters report having voted immediately after an election and many studies document that people are reluctant to report racial prejudice.[9] Similarly, surveys on the use of toxic substances suffer from having low response rates and from under-reporting. This implies that the averages and confidence intervals of usage rates may be seriously underestimated. For example, since individuals who respond typically understate their consumption of toxic substances by up to 56%, the reported mean and variance of the distribution may be significantly lower than their true values.[10]

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[8] See Bertrand and Mullainathan (2001), Sudman et al (1996) and Tanur (1992).
[9] See Bertrand and Mullainathan (2001).
[10] Warner (1978), the most comprehensive cigarette consumption underreporting study to date, found underreporting in the US of 38% to 56% between 1964 and 1975. His estimates are

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- Third, a problem of subjective questions is that in many cases the subjects of the survey do not have coherent opinions on the issues they are being asked about and may be reluctant to admit it. In other cases, they may be wrong about their attitudes, and have problems understanding the reasons for their behaviour.[11]

- Fourth, direct questioning typically focuses the respondent's attention on a single attribute (e.g., generic packaging). However, the omission of other key attributes can bias the estimated value of the attribute being tested. In particular, respondents can over-estimate the value of the attribute in relation to others. This is called the *embedding effect*.[12] For example, a survey might come up with the same willingness-to-pay for either (a) one object or (b) five objects which include the one that was asked about individually. If objects have some value to the respondent, five objects should be worth more than one. An illustration of the embedding effect is the value of housing characteristics. Asked to evaluate a location of a house, a potential home buyer gives a much higher value than if asked to divide his/her willingness to pay for a house into its various attributes (e.g., size, location, view, facilities, etc). This is because the location is also a good indicator of other characteristics such as size and neighbourhood amenities. Unless the home buyer is explicitly asked to value all attributes simultaneously, the value of a single attribute is likely to be overestimated.

- Finally, when using direct questioning it is very hard to provide a frame of reference that is sufficiently clear and meaningful to all respondents so that they all respond with the same framework in mind. Responses made under different frameworks may systematically bias the results. To illustrate, consider the value of having a basement in a house. Someone who has never considered buying a home is likely assign a very different value to the basement than someone who has been actively searching for house simply because they do not have the same information or frame of reference. The literature suggests that this uncertainty can lead to a serious upwards bias in the apparent value of an attribute change (see Li and Mattsson, 1995).

## 3.3 Focus groups

Group interviews or focus groups are structured group processes used to obtain detailed information about a particular topic. People work as a group, listening to each other's comments and answering the questions. Typically, a group facilitator stimulates the discussion and takes notes. People don't complete an interview individually.

Focus group surveys have a number of advantages.

- First, they are relatively easy to undertake and results can be obtained in a short period of time.

- Second, the researcher can probe for clarification and solicit greater detail.

- Third, relative to individual questioning, responses have higher validity due to the clarity of the context and detail of the discussion.

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consistent with other more recent studies carried out in West Virginia and amongst Mexican American smokers. (See West Virginia Health Statistics Center 2000 and Perez-Stable 1990).
[11] See Bertrand and Mullainathan (2001).
[12] See Kahneman and Knetsch, 1992 and Bennett et al., 1998).

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- Fourth, social interaction in the group may produce freer and more complex responses.

Focus groups have some disadvantages in addition to the limitations of direct questioning.[13]

- First, in focus groups, individuals are asked to respond in reaction to comments of other group members.

  - The results obtained might be influenced by the researcher, raising questions of validity. Researchers are not detached observers but always participants (*observer independency*). (See Walvis, 2003).

  - Focus groups attendees often aim to please rather than offer their own opinions or evaluations due to *peer influence.*

- Second, groups can be quite heterogeneous and sometimes it may be difficult for the researcher to clearly and objectively identify all the emerging messages.

- Third, the design of the focus group study (e.g., respondent selection, the questions to be asked, how they are phrased, how they are posed, in what setting, by whom, and so on) can also affect the answers obtained.

- Fourth, generally the number of members of a focus group is not large enough to be a representative sample of a population. Thus, the results obtained may not necessarily be representative of the entire population.

Nonetheless, focus groups are often an important first step in the design of the questionnaire to be used in stated preference methodologies, which we describe below.

## 3.4 Visual recall and recognition experiments

In a visual experiment respondents are exposed to different pictures or objects and the objective is to analyse the individuals' association capacity. Typically, they are used to study how perceived images are associated with different brands. Respondents are asked to associate brands with different types of people (or vice versa).

Recognition experiments expose respondents to brief stimuli in order to analyze their short-term memory capacity. Respondents are not given any prompt to aid recollection. Recall experiments are similar to recognition experiments except that respondents are given a prompt, for example, removing the brand name from a cigarette package and asking respondents to name the brand.

As in direct questioning, these exercises focus the respondent's attention on a single attribute (e.g., generic packaging). Thus, it suffers problems of bias due to the omission of other relevant variables.

In addition, these different techniques give increasingly lower results as fewer prompts are provided. A researcher who shows respondents a cigarette package and asks if they have seen it before will get the highest proportion of positive response, while a

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[13] For a more detailed discussion of focus groups, see Marshall and Rossman (1999).

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researcher who asks to describe a cigarette package sold in the market without showing it at all will get the lowest proportion.[14]

## 3.5 Ethnographic studies

Widely used in anthropology, ethnographic studies gather information through "participant observation" which means that the researcher blends in local daily life and carefully observes everything he/she can about it.[15] Ethnographic research typically arrives at a conclusion only after exploring various source of information: field notes, interviews and site documents. Participant observation is intended to inform about behaviour in action while interviews are meant to provide a chance to learn how people reflect on behaviour and events, amongst others.

## 3.6 Stated preference methodologies

Researchers have developed a range of survey techniques to measure consumer preferences and quantify the individuals' willingness to pay for certain attributes. These techniques are known as "stated preference" techniques in contrast to "revealed preference" techniques. Revealed preference techniques use data are obtained from past behaviour of consumers, whereas stated preference techniques use data obtained by asking respondents to consider several hypothetical options and state or select the most preferred.

A range of techniques has been developed within this general class of methodologies, including (i) contingent valuation, (ii) conjoint experiments and (iii) choice modelling.[16] We describe each of them and discuss their advantages and limitations in the remainder of this section.

**Contingent valuation**

Contingent valuation is a direct survey approach to estimate consumers' preferences. By means of an appropriately designed questionnaire, a hypothetical market is described where the good or service in question can be traded. This contingent market defines the good itself, the context in which it would be provided and the way it would be financed. Respondents are then asked to express their maximum willingness to pay (WTP) for, or their minimum willingness to accept, a hypothetical change in the amount of the good provided. This assumes that stated WTP amounts are related to respondents' underlying preferences in a consistent manner (Hanley et al., 2001). This technique derives its name from the fact that the value estimates are contingent on a hypothetical scenario that is presented to respondents for valuing.

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[14] See Du Plessis (2005) p. 165.
[15] Hall, B. 2001. "How to Do Ethnographic Research: A Simplified Guide." Available at http://www.sas.upenn.edu/anthro/CPIA/methods.html.
[16] See Centre for International Economics (2001).

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The original implementation of contingent valuation techniques is the *open-ended version*, in which respondents are asked to state their WTP for an improvement in the goods they are provided or for a quality change. This method is now rarely used because it is vulnerable to biases. In particular, when the goods are not directly purchased by the public outside the experimental framework, respondents find it difficult to answer open-ended questions on their willingness to pay.

Most contingent valuation studies are now implemented through the *referendum or dichotomous method*, where respondents are asked to choose between two alternatives: pay nothing and maintain the status quo quality level or pay a pre-specified amount in return for improved quality. The quality and bid levels are varied systematically across respondents. The preference data generated using this method are employed to estimate a model that defines the respondents' utility function and is used calculate their WTP.

Despite its advantages relative to open-ended contingent valuation, this method has been found to lead to very high values, possibly because of the phenomenon of "yeah saying", that is, the fact that respondents accept to say "yes" and pay the specified amount to avoid having to say "no".[17] In addition, these methods have some limitations. First, only one attribute or scenario can be presented to the respondents for valuation. Second, it is a poor method for estimating consumer values because respondents are unlikely to provide an accurate response when presented with this simplified a hypothetical scenario with only few alternatives and limited attributes. And third, it may induce some respondents to behave strategically, particularly when public goods are involved. This means that respondents anticipate the impact of their response on the outcome of the study and respond accordingly. For example, respondents may say that they are willing to pay for a free public service, even if not true, because they believe that by doing so the probability that the service will be provided increases.

These limitations have led practitioners to rely on other techniques, and in particular on *multi-attribute valuation* (MAV) *methods*, which include conjoint analysis and choice modelling. These techniques, described below, are suitable for the analysis of several attributes simultaneously and which we describe below.


**Conjoint analysis**

Conjoint analysis is a preference-based approach where respondents are asked to rate or rank several products. There are three main variants according to the measurement scale used to rank the products.

- Conjoint rating asks respondents to evaluate a series of alternatives with a numeric rating scale, one at a time.

- Conjoint ranking asks respondents to rank in order of preference three or more alternatives.

- Paired comparison asks respondents to rate their preference for several different pairs of alternatives.

This method has its origins in the marketing literature and focuses on learning more on consumer preferences, not necessarily on estimating economic values. Given that

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[17] Hanley et al. (2001).

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respondents are not required to commit to select a particular option this method is not appropriate to explain choice behaviour or estimate welfare measures (Adamowicz et al., 1998).

**Choice modelling**

Choice modelling is an approach that asks consumers to select one amongst several alternative products. Its main advantage is that it is based on a realistic task that consumers are familiar with, the task of choosing a product among a group of competing offers.

In a typical choice modelling exercise, respondents are presented a questionnaire with five to eight choice sets. In each choice set, three to five alternatives are presented. The alternatives differ in their attribute levels, which are varied systematically through an experimental design to ensure that a wide range of different options are presented to respondents. The data generated in the choice modelling exercise are used to estimate an econometric model that allows the researcher to obtain measures of the WTP for certain attributes and measure consumer welfare.

## 3.7 Conclusions

Survey techniques, stated preference methodologies and the other techniques described above are often the only means to obtain data to respond to issues of interest to researchers and policy makers. In the case at hand, given that no country has ever introduced generic packaging legislation, any empirical assessment of the impact of this measure requires the use of these data collection methodologies.

These techniques have a number of shortcomings derived from the difficulty in obtaining meaningful answers to subjective questions. There are however ways to solve or, at least, mitigate those problems. Various empirical techniques, which we describe in the following section, have been developed to enhance the reliability of results based on survey data.

The decision on which data collection method to use, and how, depends on the likelihood, size and cost of the prediction errors that may result from using an inappropriate yet simple technique compared to likelihood, size and cost of implementing a more appropriate and complex method. As a result, the choice of method will depend on the goals of the analysis, the potential for errors and their costs. When dealing with major policy proposals intended to modify consumer behaviour, the cost of error is very high and the choice of the method that minimizes the likelihood and the size of prediction errors becomes critical.

In the next section, we describe the issues that a proper empirical analysis must address and the standards of a reliable data analysis.

# Standards in data analysis

## 4.1 Introduction

One of the main purposes of the plain packaging proposal is to reduce youth smoking initiation. In particular, one of the issues under discussion is whether introducing generic packaging would reduce youth smoking initiation rates. In this section, we describe the basic principles of empirical analysis and the features that a study must satisfy to yield reliable conclusions on major policy issues such as the possible introduction of generic packaging for cigarettes. In particular, we discuss the challenges involved in any quantitative policy evaluation and some of the standard issues that arise in practical work, which determine the reliability of the results of an empirical investigation, including possible biases because of omitted variables, measurement error, sample selection and reverse causality problems.

## 4.2 The challenge: Distinguishing correlation and causality

Public policy questions often hinge on understanding relationships among variables and on obtaining quantitative answers to quantitative questions. In these cases, the goal of any data analysis that informs policy making is to *identify and measure causal relationships*, that is, to identify the causal factors that potentially underlie the outcome of interest (youth smoking, for example) and to measure the impact of the former on the latter. This allows the policy makers to predict more accurately the effects of policy interventions.

As explained before, correlation is not the same as causation. Two variables may be highly correlated without a causal relationship existing between them. In the present context, for example, brand awareness may be positively correlated with the intention to smoke even if the brand itself has no causal effect on the desire to smoke. The correlation may arise simply because both variables, brand awareness and smoking intention, are positively correlated with parental or sibling smoking.

The test of whether a given intervention or factor "causes" a given outcome involves considering whether outcomes would be changed if that input — *and that input alone* — varied. Hence, the relevant questions for policy makers involve comparisons of

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counterfactual states of the world: the objective is to know what outcomes would have been observed if a variable were manipulated in some way.

The difficulty is that answering these questions requires comparing two potential outcomes: with and without the intervention, or the observed outcomes and those that would prevail in a counterfactual world. However, learning about differences in counterfactual outcomes is difficult because the outcome of one scenario is all that is ever observed. For example, imagine that the question is whether advertising bans reduce youth smoking. The claim is that a reduction in tobacco advertising would decrease the risk of adolescent smoking. Ideally, testing whether this is the case or not would involve comparing youth smoking at current advertising levels and in a counterfactual world in which advertising was reduced but nothing else changes. This is obviously not possible in practice.

Given this difficulty, how do researchers learn about counterfactual states of the world? Researchers gather relevant data and make comparisons that provide evidence on causal effects by applying econometric techniques that control for observable and unobservable factors that affect the variable of interest, for example, youth smoking. The reliability of the conclusions obtained from these studies hinges on:

i.    properly identifying the causal relations of interest, that is, whether the empirical strategy exploits the information in a way that achieves *identification;*

ii.   using estimation techniques that correct for problems in the quality of the underlying data (i.e., measurement problems or issues in the sample selection process) that may bias the results;

iii.  obtaining statistically significant results that are relatively unaffected by violation of the assumptions under which they have been derived or by a small modifications to the data sample.

## 4.3 Identification strategies

Controlling for confounding factors and dealing with simultaneous relationships are the most important elements that need to be addressed properly to identify a causal relationship.

**Controlling for confounding variables**

Typically, unless the data have been obtained through a randomized experiment, one cannot derive any conclusions about the causal effect of one factor on the outcome of interest by simply comparing the outcomes of those that are affected by the policy and those that are not. In some cases, the reason is that the data is simply not available (the intervention may have never been implemented). In other cases, the comparisons would be misleading because individual responses to different treatments or policies may differ simply because individuals are different. These differences across individual may be either observable, for example differences in age, education, income levels, etc., or unobservable, for example motivation, future prospects, etc.). These observable and unobservable characteristics need to be taken into consideration when analysing

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individual responses. Otherwise, the comparison would be misleading because of what economists know as selection bias or omitted variable bias. An example may help understand the nature of these biases. Some studies suggest that students that take music in high school have better scores in math and English than those who don't. A closer look at these studies, however, indicates that the better test performance is not *caused* by the music courses. Instead, the correlation between testing well and taking music courses may be explained by other factors (the student's innate ability or the overall quality of the school). By omitting these factors, studying music appears to have an effect when in fact it has none.[18]

This example illustrates that precise identification and measurement of causal effects is challenging, as many confounding correlations exist which do not necessarily reflect the structural relations underlying actual outcomes. Observed associations between two parameters may simply reflect individual characteristics and choices, instead of the causal effect of interest. This is what is known as omitted variable bias.

How can one then work out whether an observed association or correlation between two variables indicates the existence of a causal relation between them? In other words, how could we know whether taking music lessons has an effect on scores or not? The most common identification strategy is to reduce the bias in simple comparisons by using regression methods to control for variables that are confounded with the factor of interest.

Well-specified regression models allow the researcher to distinguish among alternative explanations for the same phenomenon. Controlling for other causal factors is indispensable to isolate the effect of the factor being studied. In the example above, regression methods would allow to compare test scores of those taking music courses and those who do not after controlling for measures of ability, family background or school quality.[19]


**Dealing with simultaneous causality**

Often, identifying causality between a given factor and the outcome of interest is complicated by the fact that causality may run both ways, "backwards" and forwards", from X to Y and from Y to X. If there is simultaneous causality, standard regression techniques pick up both effects and do not identify the causal effect of X on Y.

Imagine, for example, that one tried to estimate the impact of reducing class size in schools on the students' test scores. Suppose further that a government initiative subsidized hiring teachers in school districts with poor test scores. If so, causality runs in both directions; for educational reasons, low student-teacher ratios may lead to higher test scores, but because of the government program low test scores lead to low student-teacher ratios. This leads to what is called simultaneous causality bias in standard regression analysis, which has to be ameliorated through the application of advanced estimation techniques (typically, instrumental variables regression).

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[18] Stock and Watson (2003), page 147.
[19] Sometimes, adding an omitted variable to a regression is not an option, because there is no data available. This problem may be circumvented by (1) using data in which the same observational unit is observed in different points in time, like in panel data analysis, or (2) use instrumental variables regression. See Stock and Watson (2003), page 247 and Chapters 8 and 10.

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## 4.4 Data issues

Problems in the quality of underlying data may lead to significantly biased results. However, estimation techniques have been developed to deal with data quality issues. The most commonly encountered data problems are measurement error and selection bias.

**Measurement error**

Errors in the measurement of the variables of interest may lead to biases in the results. Measurement error can arise for several reasons. In survey data, a common source of measurement error is that respondents give faulty answers to the questions posed to them. For example, some respondents may exaggerate their educational attainment or their income to impress the interviewer in socio-demographic surveys, others may shield some of their income if they believe the data could fall into the hands of the tax authority, or may simply forget some of their income or misinterpret the questions, and so on. In other cases, the observed data may suffer from measurement error because it does not correspond to the specific concept that researchers would like to measure. Empirical research confirms that measurement error prevails in most datasets and can have very significant implications on the results of a study.[20]

**Sample selection biases**

Sample selection bias arises when (1) a selection process influences the availability of data and (2) that selection process is related to the outcome of interest. This selection process may introduce biases in the estimates. An example of sample selection arises when estimating the effect of wages of an additional year of education. By definition, only individuals who have a job report wages. Many factors determine whether someone has a job (education, experience, ability, luck, etc). These factors are also very similar to those that determine how much a person earns when employed. Hence, the fact that someone has a job and appears in the dataset is in part determined by factors that also affect the outcome and that may not be observed by the analyst (luck, ability) and may bias the estimates.

## 4.5 Statistical Validity

To evaluate any empirical results, it is necessary to know the rate of error. Any estimate based on a sample is likely to be off the mark, at least by a little, due to random error. The magnitude of this error is measured by the statistical significance of the result which provides a measure of reliability. In addition, the sensitivity of results to modifications to the data analysed and/or methodologies used (i.e., robustness) must also be evaluated. Statistically significant results that are not robust cannot be considered statistically valid.

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[20] For example, in one application, Topel (1991) provides evidence that failure to correct for measurement error in how job tenure is measured greatly affects the estimated returns to tenure in terms of wage increases.

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**Statistical significance**

What is the probability that an empirical relationship between two variables is really just a chance occurrence? Would we find the same relationship between these two variables if we repeated the empirical analysis over many samples obtained from the same population? Or is our finding due only to random chance? To answer these questions it is standard practice to test the statistical significance of all empirical results.

Tests for statistical significance give us the probability that an estimated relationship is a chance occurrence. In other words, statistical significance tests indicate the likelihood of mistakenly asserting that an estimated relationship exists. If an estimate is statistically significant, the estimated relationship is hard to explain as the mere product of random chance.[21]

In empirical work it is standard to judge the statistical significance at the 1%, 5% and 10% level. The test being applied is whether the estimate is significantly different from zero (e.g., at the 5% level, the test being applied is whether the researcher can be 95% confident that the estimated coefficient is in fact statistically different from zero).

**Robust results**

Results are robust when they are not affected much by violation of the assumptions under which they have been derived and they are relatively unaffected by a small modifications to the data sample. Sensitivity or robustness analysis is crucial to make sure that the estimated effect is not merely an artefact of a particular experimental set-up.

Standard robustness tests undertaken in empirical analysis include checks of whether the results are sensitive to changes in (i) the data, (ii) the choice of empirical method, and (iii) the precise modelling assumptions.

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[21] See Federal Judicial Center (2000), "Reference Manual for Scientific Evidence", p. 149.

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# Section 5  Implications for the current debate on generic packaging

None of the reports provide evidence that can be used to evaluate whether imposing generic packaging would be an effective method to decrease youth smoking uptake for the following reasons.

First, relevant evidence would need to establish a causal link between generic packaging and youth smoking initiation. Six of the ten papers reviewed attempt to establish a relationship between generic packaging and smoking uptake but the results are not robust. The other four do not even attempt to study whether generic packaging will impact smoking behaviour. The method used to collect the data in the six papers is unreliable. In each case adolescents where asked to state their opinion on what was likely to happen to youth smoking if generic packaging was introduced. As stated in the Canadian Study by Goldberg et al. (1995), "this influence cannot be validly determined by research that is dependent on asking consumers questions about what they think or what they might do if all cigarettes were sold in the same plain and generic packages".[22] In addition, the data was analysed using methods that do not permit a meaningful causal relationship to be established.

More concretely, as we have seen in Section 4, none of the papers meet commonly applied standards to scientifically establish a causal link between generic packaging and youth smoking. We find four main limitations in the analysis of the relation between youth smoking uptake and generic packaging.

- *Measurement error*: the studies rely on survey data where measurement error is the norm and do not use methodologies designed to correct for quality of data problems. This problem is most acute for responses regarding expectations of future behaviour such as those used in four of the papers reviewed. To the extent that the factors leading to misreporting and errors are correlated with the observable and unobservable characteristics of the individuals surveyed, measurement error may severely bias results.

- *Sample selection bias*: the criteria employed to include individuals in the survey sample may also lead to biased results if the individuals selected systematically differ in some way from those that are left out of the survey. Several of the studies reviewed arbitrarily restrict the sample to adolescents in a few schools or malls in one or two cities. The studies do not even attempt to demonstrate that the sample is representative of the adolescent population in the country of the analysis.

- *Omitted variables*: none of the studies address whether important variables are omitted from their analysis. This is particularly relevant because the available evidence in the literature on adolescent smoking indicates that many factors are

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[22] Goldberg et al. (1995), p.129.

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linked to youth smoking (cigarette prices, parental influences, risk preferences, peer influences, access, etc).

- *Statistical significance and robustness of the results*: only five of the generic packaging studies examined report the statistical significance of the results and none undertake a sensitivity analysis. Evaluating the statistical significance of any empirical result is necessary to ensure that findings are not just a chance occurrence. Similarly, robustness analysis provides assurance that results are unaffected by data or modelling assumptions.

These limitations are so fundamental that conclusions regarding cigarette packaging and youth smoking are bound to be misleading. In particular, establishing reliable evidentiary support to the claim that cigarette packaging is a "causal factor" of youth smoking would require a carefully applied econometric analysis that identifies the causal link between the variables of interest. This requires (i) identifying a valid measure of youth smoking initiation and of all the possible determinants of smoking; (ii) obtaining information for a representative sample of the relevant population; (iii) constructing an econometric model that accounts for all potential causes of smoking including the one of interest; and (iv) testing the statistical validity of the results. None of the studies reviewed satisfy these requirements.

Second*,* all the studies reviewed including the six discussed in the previous paragraphs, looked at the relationship between generic packaging and a number of other variables such as brand awareness, health warning awareness, and brand image. For these papers to be informative on the potential of generic packaging to reduce uptake of smoking among youth, a clear link between each of these variables and smoking initiation needs to be established. No evidence is provided in any of the papers of the existence of the relation between these variables and youth smoking, much less of the quantitative importance of this relation.

As mentioned before, smoking decisions, and specifically those of adolescents, are driven by multiple factors including family influence, peer influence, prices, unobservable individual characteristics and possibly promotional activities. A quantitative assessment of the causal factors of smoking decisions is necessary to assess the relative importance of all major determinants and to avoid over or under estimating the influence of any specific factor on smoking initiation.

In addition, all the studies reviewed face the same sort of methodological problems when analysing the relationship between generic packaging and the other variables as described above. The most conspicuous limitation is the failure to consider alternative explanations for the observed or estimated relationships. All the studies reviewed, even those explicitly recognizing the complexity of smoking decisions (e.g., Goldberg et al. 1995) only analyse relationships between pairs of variables (e.g., generic packaging and health warning awareness). The studies fail to consider whether the observed bi-variate relation is simply a reflection of individual characteristics and choices. For example, a positive relation between brand image and brand awareness need not be evidence of a causal effect. The positive relation can be driven by other factors that explain both, such as family and peer influence. This would be the case if for instance family and peer influence made individuals more aware of cigarette brands and at the same time more positive towards brands smoked by peers and family. At most, therefore, the studies establish correlation between the two variables but not a causal relationship.

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An additional limitation of these studies is that they ignore the possibility of feedback effects between the variables being analysed (endogeneity). This problem is most acute for the branding measures such as brand awareness and brand recollection. For example, teenager recollection of cigarette brands is used as a measure of teen brand awareness ignoring that the participant's knowledge is plausibly related to pre-existing unobserved preferences to smoke. This implies that the estimated correlations between branding measures and smoking patterns cannot be used to draw inferences on the existence of a causal relationship.

Third, all but two of the studies were carried out in the 1990's. This factor implies that the previous evidence cannot be extrapolated to the current debate on generic packaging. The current regulatory environment is markedly different from that in the 1990's. It is questionable therefore whether even robust empirical estimates obtained in the 1990's would still be valid today. This concern is related to the well-known Lucas critique, for which Robert Lucas was awarded the Nobel Prize in 1995, and which basically says that any estimated empirical relation based on past data can break down due to changes in policy or other "rules of the game". Policy conclusions based on those models would therefore potentially be misleading. [23]

Fourth, none of the studies reviewed addresses how individuals would decrease their smoking if they only had access to generic packs which is the relevant question in the context of the current debate on generic packaging. Results derived from the comparison of generic and branded packages, as in these papers, cannot be used to predict what will occur when all cigarettes in the market are sold in generic packages.

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[23] Lucas (1976).

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# Annex A
# A detailed review of empirical studies on generic packaging

**1. Wakefield, M.A., D. Germain and S. J. Durkin, 2008, "How does increasingly plainer cigarette packaging influence adult smokers' perceptions about brand image? An experimental study"**

**Summary**

This article investigates the effects of removing branding design elements from cigarette packs on (i) brand image, (ii) smoking intentions, and (iii) smoker's perceptions of taste, strength and quality of the product.

This study uses a conjoint analysis technique whereby adult Australian smokers are asked to rate cigarette packs with different types of packaging and brands. The authors find that cigarette packages displaying progressively fewer branding design elements are perceived increasingly unfavourably. In addition, they find that smokers of generically packaged cigarettes are rated as less trendy/stylish, less sociable/outgoing and less mature than smokers of the branded packages. Compared to original branded packages, the authors find that smokers perceive generically packaged cigarettes as less rich in tobacco, less satisfying and of lower quality. Overall, the study finds that 59% of the respondents might try or smoke cigarettes in the original pack while 56% to 52% might try or smoke cigarettes in plain packaging (depending on the particular design).

The authors conclude that tobacco control policies should aim to remove as many brand design elements as possible.

**Data collection**

*Description*

A sample of adults aged 18-49 years broadly representative of the Australian adult population in terms of geographic location, income and age were invited to participate in an online survey regarding familiar cigarette brands. Respondents who said they smoked less than weekly or not at all were excluded from further participation in the study. A 22% response rate was obtained with 813 regular smokers completing the survey.

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Eligible respondents were randomly shown one of 12 possible cigarette packages combining one of the three brands most popular Australian brand (Winfield Blue 25s; Peter Jackson Rich 30s; Longbeach Rich 40s) and one of four package designs (original fully branded package and three generic package designs).[24] All packs had the same graphic health warning visible on the top of the face of the pack as required by Australian Government legislation.

Respondents were then asked to rank the package in relation to perceived attributes of the brand, perceived attributes of smokers of the brand, and expected taste/quality of the cigarette. In particular, respondents were asked to rate the characteristics listed in Table 2 according to an 11-point scale, from 0 ('not at all') to 10 ('extremely').[25]

**Table 2 List of characteristics respondents were asked to rate**

| Pack Characteristics | Smokers Characteristics | Sensory Characteristics |
|---|---|---|
| *'This pack is…'* | *'A typical smoker of this pack is…'* | *'These cigarettes would taste…'* |
| Popular brand | Trendy/stylish | Rich in tobacco flavour |
| Attractive looking pack | Young | Low in tar and nicotine |
| Good value for money | Masculine | Cheap tobacco |
| Exclusive/expensive | Lower class | Satisfying |
| You might try/smoke it | Sociable/outgoing | Like a light cigarette |
| | Older/mature | Of the highest quality tobacco |
| | Confident/successful | Harsh on the throat |

*Comments*

The main limitation of this study is that only smokers were included in the sample. Therefore, the results of the analysis cannot be used to analyse the effect of generic packaging on youth smoking uptake.

Furthermore, the online survey approach is flawed due to self selection bias. The low response rate reflects the fact that only a small sample of individuals was motivated by the shopping vouchers offered in exchange for participation. As mentioned above, if the individuals that chose to participate are systematically different from those left out of the study, the results can be severely biased. As the authors acknowledge, this is further exacerbated by the fact that the identity of the respondent of internet surveys cannot be guaranteed as respondents may seek help from others when responding.

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[24] The three generic package designs used were: (i) a generic cardboard brown pack with branded font and same positioning of brand/descriptor as the original; (ii) a generic cardboard brown pack, with brand name in standard font in a prominent position on the pack with descriptor information in standard font at the bottom; and (iii) a generic cardboard brown pack, brand in smaller standard font positioned at the bottom, and the number of cigarettes in larger font in a prominent position on the pack.

[25] Within each of the questions, attributes were presented randomly to avoid order effects.

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**Data analysis**

*Description*

The authors used a logistic regression model[26] to estimate the effect of packaging on pack perceptions. To estimate the logistic regression the authors rescaled the responses as follows: all scores of 5 or above were given a value of one (indicating moderate to high agreement) and all scores below 5 were given a score of zero (indicating disagreement to low agreement).

A preliminary analysis indicated that the effect of packaging on perceptions did not vary according to the cigarette brand. The remainder of the analysis was therefore undertaken for all brands combined.

The results of the bi-variate logistic regression analyses can be summarized as follows:

Plain Pack 1 which preserved the placement and font of brand names was perceived as less attractive than the original branded pack. Smokers of Plain Pack 1 were perceived as less sociable/outgoing and trendy/ stylish than smokers of the original pack. All other dimensions of Plain Pack 1 were rated equally to those of the original branded pack.

Plain Pack 2 which standardised the placement and font of the brand name and relinquished the brand variant at the bottom of the pack was rated as less attractive and popular than the original branded pack. Smokers of Plain Pack 2 were rated as less trendy/stylish, less young and less sociable/outgoing than smokers of the original pack. Compared with those who viewed the original pack, fewer smokers thought the cigarettes would be low in tar, rich in tobacco and of the highest quality tobacco.

Plain Pack 3 where the brand name and variant appeared only in small standard type at the bottom of the pack was perceived as less popular and less attractive than the original branded pack. Smokers of Plain Pack 3 were perceived to be less trendy/stylish, less masculine, less sociable/outgoing and less mature than smokers of the original pack. Compared with those who viewed the original pack, fewer smokers thought the cigarettes would be low in tar, rich in tobacco, satisfying to smoke and of the highest quality tobacco.

*Comments*

Several limitations undermine the results and conclusions drawn from the logistic regression bi-variate analyses.

First, results may suffer from omitted variable bias. The bi-variate analyses undertaken by the authors ignore all other factors that may affect brand perceptions such as individual characteristics.

Second, the authors initially chose an 11-point scale for their analysis that produced an "irregular response distribution". In order to analyse the results the authors had to rescale the data using a binary variable. However, they do not discuss the rationale for using a specific threshold to construct the binary variable nor did they provide a sensitivity analysis to show that alternative rescaling did not affect the results. The authors

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[26] A logistic regression is regression model specifically designed for binary dependent variables where the predicted values have to fall between zero and one.

themselves indicate that future studies should use "a more usual five point Likert scale with named responses".

Third, as the paper recognises, results may have been different if a different background colour other than the cardboard brown had been selected. Inclusion of different coloured packages in the survey design would have been necessary to disentangle the impact on perceptions of colours and the removal of branding design elements.

Fourth, each respondent was asked to rate only one cigarette pack. This means that the reference each respondent had in mind when rating the displayed pack may have been different. As mentioned in Section 3.2, if responses are made under different frameworks, unobserved heterogeneity may systematically bias the results.

Fifth, the authors report the statistical significance of the results but the do not conduct any type of robustness analysis.

**Conclusions**

In our view, the evidence provided in this paper does not reliably establish a link between brand packaging and brand perception, smoking intentions and taste and quality perceptions. Possible measurement error due to an inappropriate rating scale and the likely sample selection problems due to the low response rate may have led to significant biases in the results. In addition, the evidence was drawn from bi-variate analyses that did not take into account other factors affecting brand perceptions, such as individual characteristics.

Moreover, even if results were reliable, this paper does not prove that plain packaging is an effective means to reduce smoking. On the contrary, the evidence in the paper suggests that smoking intentions differ only marginally between the different types of packages. While 59% of the respondents indicated they might try or smoke cigarettes in the original pack, 56% might try or smoke cigarettes in the Plain Pack 1, 53% in Plain Pack 2 and 52% in Plain Pack 3.[27]

## 2. Grant et al. (2007), "The influence of branding on adolescent smoking behaviour: exploring the mediating role of image and attitudes"

**Summary**

This paper investigates the relation between cigarette branding and adolescent attitudes toward smoking and smoking intentions in the UK. The authors consider three factors susceptible of influencing smoking attitudes and intentions amongst adolescents: brand awareness, brand image, and peer influence. The authors analyse the influence of brand awareness, brand image and peer influence on smoking attitudes. They also investigate the direct effect on smoking intentions of smoking attitude, brand awareness, brand image and peer influence.

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[27] Note that these differences may be sensitive to the rescaling of the original responses.

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The authors find that the strongest influence on the intention to smoke amongst adolescents familiar with cigarettes brands is smoking attitude, followed by brand image. The authors conclude that branding practices continue to exert a powerful influence on the attitude towards smoking and future intentions to purchase. The authors argue that their results support the introduction of generic packaging for tobacco.

**Data collection**

*Description*

The data for this study was collected using a direct two-step questioning survey approach. First, 1,123 adolescents were asked to identify cigarette brands they recognised from pictures of cigarette packages. Second, the individuals that recognised a brand (926) were interviewed and asked to fill out a self-completion questionnaire.

To design the questionnaire and interview questions, focus groups and preliminary interviews were conducted. This initial research highlighted the need for an interviewer-administered questionnaire that would allow the interviewer to probe for questions, ensure that questions were responded sequentially and promote honest answers. Interviews were carried out at respondents' homes.

The self completion questionnaire contained questions regarding smoking behaviour, peer influence and the intention to smoke. The observations for the key variables of this study were obtained by asking adolescents to respond to the set of direct questions shown in Table 3. All questions referred to the specific brand that adolescents recognised in the first step of the survey.[28]

**Table 3: Questions used to define the key variables of the study**

| Variable | Question | Response |
|---|---|---|
| Brand awareness | ▪ Is this brand very popular/unpopular with people my age?<br>▪ Do most/few smokers smoke this brand? | 5 point scale |
| Brand image | ▪ Is this an unfashionable/fashionable brand?<br>▪ Is this an attractive/unattractive brand? | 5 point scale |
| Attitude toward smoking | ▪ Does smoking look attractive/unattractive?<br>▪ Are cigarettes worth/not worth spending money on? | 5 point scale |
| Peer influence | ▪ How many 11-year olds do you think smoke at least one cigarette a week?<br>▪ Same question for 15-year olds. | 7 point scale |
| Intention to smoke | ▪ Do you think you will be smoking when you are 18? | 4 point scale |

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[28] It is unclear in the text if all adolescents where shown the same or different cigarette packages.

*Comments*

Several of the limitations of direct questioning surveys (e.g., importance of question wording and ordering of questions and possible lack of effort when answering) are addressed in this study through the initial focus groups and interviews and the interviewer-administered survey. However, many of the limitations mentioned in Section 3 remain unaddressed.

- Unless the interviewer has provided concrete frame of reference for each of the questions, responses may in fact have considerable measurement error. The first question on brand awareness, for example, will be answered differently depending on who respondents think of when considering people their age (i.e., friends, classmates, overall population). The same holds true for the brand image and peer influence questions.

- Furthermore, it is not clear that the answer to the questions posed would provide a reliable proxy for the factor the authors intend to measure. This gives rise to an additional measurement error. For example, the importance of peer influence cannot be quantified simply by adding the number of known smokers. One of the papers cited in the Consultation measures peer influence by asking respondents how many friends they have and how many of these smoke. This allows percentages to be derived that better describe the possible influence of friends that smoke.[29]

- Answers may reflect respondents' perceived "right" responses as they attempt to avoid looking bad in front of the interviewer. This is clearly an issue in the attitude toward smoking and intention to smoke questions.

- Answers may be speculative. Even if respondents' do not have an answer or feel unclear on how to respond, they will provide an answer simply because the interviewer is asking.

There are two additional data collection biases in this study that may affect the quality of the results.

- First, only adolescents that recognized the brand of a cigarette package were included in the survey. This pre-filtering of the sample of adolescents may induce what is typically referred to as sample selection bias. The criteria used to select the survey participants (i.e., familiarity with cigarette brands) may be closely related to individual characteristics associated with tobacco use.[30] In that case, selection process may bias the results of the analysis.[31]

- Second, the use of scales may affect the responses. As illustrated by Bertrand and Mullainathan (2001), respondents appear to infer the "normal" response from the scales used.

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[29] See Pierce et al. (1998), p. 512.
[30] For example parental/sibling attitudes toward and use of drugs may influence smoking intention and smoking attitudes of adolescents (see Heckman et al (2008), p. 40).
[31] See Stock and Watson (2003), p. 250.

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**Data analysis**

*Description*

According to the authors, the objective of this paper is to test how brand familiarity and brand image influence the attitude toward smoking and ultimately the intention to smoke. Six hypotheses are formulated. Three hypotheses relate the intention to smoke with (i) smoking attitude, (ii) brand image and (iii) peer influence. Two hypotheses relate smoking attitude with (i) brand image and (ii) peer influence. The sixth hypothesis relates brand image with brand awareness. A regression model with six equations is estimated to test these hypotheses (i.e., one equation for each hypothesis). In each equation, one dependent variable (either intention to smoke, smoking attitude or brand image) is related with one explanatory variable (smoking attitude, brand image, brand awareness or peer influence). From the estimated size of the estimated coefficient (i.e., the parameter that measures the change in the dependent variable associated with a change in the independent variable), the authors conclude that attitude has the strongest influence on intention to smoke followed by brand image and that peer influence is less important in predicting attitude and intention.

*Comments*

The authors' interpretation of the results is misleading because the data analysis suffers from the following limitations:

- the variables used to estimate the model have serious measurement error;

- the authors did not take into account numerous other factors that affect smoking attitudes and intentions and thus the estimated model has omitted variables;

- the authors made no attempt to distinguish between correlation and causality; and

- the interpretation of the estimated parameters is incorrect.

*Measurement error*

Due to the lack of a well specified reference to be used when answering the questions posed, the influence of scaling on answers, the social nature of the survey and the speculative nature of the questions, the answers provided to the questions in Table 3 are likely to contain considerable measurement error. The reported intention to smoke, for example, will be equal to the true intention to smoke plus an error reflecting adjustments made by adolescents to avoid looking bad in front of the interviewer or subconsciously because they are not objective in their assessment of their own behaviour.[32] The error or adjustment factor is likely to be correlated with observable and unobservable characteristics of the individual. For example, misreporting of intention to smoke may be less amongst adolescents whose parents or siblings smoke.[33] Measurement error that is correlated with individual characteristics will severely bias the results.

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[32] See Warner (1978).
[33] See Heckman, Stixrud, and Urzua (2006).

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*Omitted variables*

In each of the six estimated regression equations, the authors only include one explanatory variable (brand image, brand familiarity or peer influence). Even if each of these were free of measurement error, results are likely to be biased because the authors fail to take into account that other factors, such as individual characteristics, will influence smoking intention and attitude. For example, due to parent or sibling smoking participants may have a higher intention to smoke and also find a brand more attractive because they have seen at home. If parental/sibling smoking is not taken into account, the intention to smoke will appear positively correlated with brand awareness even if the brand itself has no causal effect on the desire to smoke. In that case the observed correlation between brand image and intention to smoke is not reliable evidence of any causal effect. Failure to disentangle the effect of the factor being studied on the outcome in question from other possible influences may severely bias the results.

*Endogeneity*

This paper also ignores the potential endogeneity of the explanatory variables in the empirical implementation. In particular, this occurs because in some of the estimated regression models there is likely to be a feedback between the dependent and the independent variable (two-way causality). For example, in the equation relating brand awareness and brand image, the authors only contemplate the influence of brand awareness on brand image and not the other way around. This set up implies that the popularity of a brand (i.e., brand awareness) makes the brand more attractive (i.e., brand image). It may also be likely, however, that brand image influences brand awareness. Similarly, brand image and awareness may influence the intention to smoke at the same time that the intention to smoke is determining brand awareness and brand image. When feedback between the dependent and explanatory variables is likely to occur, more sophisticated estimation methods are necessary to correctly infer the influence of one variable on the other. None of these corrective measures were used in the study. Failure to account for endogeneity may severely bias the results.

*Incorrect parameter interpretation*

Finally, the authors concluded that peer influence is less important than brand awareness and brand image for smoking attitudes and intentions. However, peer influence is the only variable measured on a 7-point scale while the rest of the variables are measured on 5-point and 4-point scales. Direct comparison of the parameter estimates without rescaling is incorrect as, by construction, the estimated parameter of peer influence will be lower than the estimated parameters of brand awareness and brand image. The peer influence variable needs to be rescaled to a 5-point scale in order to be able to directly compare the influence of brand image, attitude toward smoking and peer influence on the intention to smoke and the influence of brand image and peer influence on the attitude toward smoking.

*Other*

As mentioned before, responses to the answers mentioned above are scaled using different point scales. The software used in the paper (Amos) does not accurately estimate models when the observed variables are categorical. In the presence of

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categorical data, a multi-step method that analyzes the matrix of polychoric correlations rather than covariances is more appropriate. Amos, as opposed to other programs, lacks a means for estimating the polychoric correlation matrix.[34]

**Table 4: Results of the analysis**

| Explanatory variable (variable that may influence the dependent variable) | Dependent variable (variable being explained) | Estimated parameter (impact of unit increase of the explanatory variable on the dependent variable) | Significance level |
|---|---|---|---|
| Brand awareness | Brand image | 0.42 | 1% |
| Brand image | Attitude toward smoking | 0.48 | 1% |
| Attitude toward smoking | Intention to smoke | 0.45 | 1% |
| Brand image | Intention to smoke | 0.21 | 1% |
| Peer Influence | Attitude toward smoking | 0.11 | 5% |
| Peer Influence | Intention to smoke | 0.1 | 5% |

*Source: Grant et al. (2007), Table 2.*

Finally, although the paper tests the statistically significance of the results (see last column of Table 4), it does not prove their robustness.

**Conclusions**

In our view, this paper's findings do not reliably establish a link between brand awareness/brand image and future intentions to smoke of adolescents. Problems of measurement error and sample selection bias derived from how the data was gathered can lead to significant biases in the results. In addition, the paper fails to take into account other factors, such as individual characteristics, that may influence attitudes and intentions to smoke. Furthermore, the finding that peer influence is less important than brand image on smoking intentions and attitudes is based on an incorrect interpretation of the results.

Moreover, even if the paper's results were reliable, the evidence would be insufficient to support the introduction of generic packaging as a tool to reduce youth smoking for two reasons.

▪ First, the evidence does not address how individuals would decrease their smoking rates if they only had access to generic packs which is the relevant question in the context of the current debate on generic packaging. The influence of brand image and brand awareness on smoking intentions or attitudes may be completely different from that estimated in the paper in a situation where all brands are sold in generic packaging.

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[34] For a more detailed analysis of CFA see J. J. Albright notes on Confirmatory Factor Analysis using Amos, LISREL and Mplus, Indiana University, Summer 2007, available at http://www.indiana.edu/~statmath/stat/all/cfa/index.html.

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- Second, regulatory measures have been implemented since the survey was carried out which could render the results obtained in 2006 obsolete. In particular, smoking bans introduced in 2007 in the UK and graphical health warnings which become mandatory in September 2008 may significantly affect the results.

## 3. Marvin E. Goldberg, et al. (1999). "The Effect of Plain Packaging on Response to Health Warnings"

### Summary

This study evaluates the effects of generic packaging on the attention paid to health warnings by comparing recollection rates of warnings on regular and generic packages. The authors find that generic packaging enhances recollection of brief and direct messages but not of longer and vaguer messages. The authors conclude that further research is needed to determine exactly what accounts for these differences in responses.

### Data collection

*Description*

Data was collected using a visual/recall survey. 401 smokers between 14 and 17 years old from Vancouver participated in an exercise designed to measure the effect of generic packaging on health warning recollection. Images of a cigarette package on a table-top surrounded by a can of soda pop, a bottle of headache remedy and a magazine were projected on a computer monitor for 4 seconds. Subjects were randomly assigned to be exposed to 1 of 3 existing health warnings. Half of the members of each group were assigned to see the warning on the regular package, while the others saw the warning on the generic white package.

*Comments*

The survey methodology used by the authors avoids most of the common survey limitations (i.e., importance of question wording, question ordering, response scales, lack of attitude, right answer bias and lack of effort).

The survey, however, was only conducted in one mall in Vancouver. This raises questions of representativeness of the sample and possible sample selection bias (i.e., the characteristics of the individuals may make them more or less susceptible to heath warning labels). An additional limitation of this exercise, as the authors recognize in a previous article,[35] is the short-term setting. A one-time 4-second exposure to the images may not be sufficient to elicit meaningful responses.

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[35] Goldberg (1995).

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**Data analysis**

To assess the effects of generic packaging on individuals' ability to recall health warnings, the authors calculate the percentage of individuals recalling the warning in both generic and regular packages. The results of this analysis, reproduced in Table 5, are summarized below.

- Recall levels for the "Smoking can kill you" warning were 22% for the regular package and 56% for the generic package. The difference in the recall rates is statistically significant at the 5% level.

- Recall levels for the "Cigarettes are addictive" warning were 13% for the regular package and 27% for the generic package. The difference in the recall rates is not statistically significant at the 5% level (i.e., the 95% confidence intervals of the two recall rates overlap at the extremes).

- Recall levels for the "Tobacco smoke causes fatal lung disease in non smokers" warning were 15% for the regular package and 1% for the generic package. The difference in the recall rates is statistically significant at the 5% level.

In sum, the results of the exercise are mixed. One recall level was higher when subjects were exposed to the generic package, one was the same and another was lower.

**Table 5: Health warning recollection results**

| Health warning | Statistic | Regular package | Generic package |
|---|---|---|---|
| Smoking can kill you | Average | 22% | 56% |
| | 95% CI | 14% | 44% |
| | | 34% | 67% |
| Cigarettes are addictive | Average | 13% | 27% |
| | 95% CI | 8% | 18% |
| | | 23% | 39% |
| Tobacco smoke causes fatal lung disease in non smokers | Average | 15% | 1% |
| | 95% CI | 11% | 0% |
| | | 24% | 6% |

*Notes: CI: Confidence Interval.*
*Source: Goldberg et al. (1999).*

**Conclusions**

In our view, the evidence presented in this paper cannot be relied upon to justify the introduction of generic packaging for cigarettes to reduce youth smoking.

First, the results of this paper regarding the effect of generic packaging on health warning recollection are mixed and do not clearly support generic packaging as a means to improve awareness of health warnings. The authors themselves conclude that further research would be needed to reach clear conclusions. Moreover, the study does not establish a link between youth smoking uptake and health warning recollection.

Second, even if we place greater weight on the results showing that generic packaging increased the awareness of health warnings in Canada in 1999, the evidence would be

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insufficient to support the introduction of generic packaging to reduce youth smoking for two reasons.

- First, results comparing the recollection of health warning between branded and generic packages cannot be used to infer the recollection of health warning when all packages are generic;

- Second, results of health warning recollection in 1999 may differ significantly if the study was conducted today. In 1999, Canada had not yet fully implemented pictorial health warnings which gradually took effect beginning in December 2000. Health warnings occupied 25% of the principal display surface and were limited to black and white text.[36] Currently, graphical health warnings are qualitatively different as they occupy as much as 50% of a package face and include extremely graphic colour images.

## 4. Goldberg, M. et al. (1995), "When Packages Can't Speak: Possible Impacts of Plain and Generic Packaging of Tobacco Products"

In 1993, Health Canada commissioned a study to examine the role of generic packaging of tobacco products in marketing, consumer choice, and uptake and cessation of smoking. Acknowledging that in marketing and social research no single study can provide definitive answers to the research question "What will consumers do if?", five different studies where undertaken employing different methodological approaches to address the following objectives:

- assess the potential impact of generic packaging of cigarettes on the likelihood of smoking uptake;

- assess the potential impact of generic packaging of cigarettes on the recognition and recall of health warning messages on cigarette packages;

- assess the potential impact of generic packaging on the likelihood of cessation of smoking; and

- evaluate alternative designs for generic packaging of cigarettes in terms of their potential impact on the uptake or cessation of smoking.

Prior to the study, the Expert Panel responsible of developing the research objectives and submitting the findings of the study to the Minister of Health of Canada carried out a qualitative exploratory study. The panel conducted focus groups to learn about how teenagers talk, think and feel about smoking. The insight derived from this qualitative analysis helped the Panel design the research questions to be addressed by the study.

In the remainder of this section we review the five studies that focus on generic packaging: (i) National Survey, (ii) Word Image Survey, (iii) Visual Image Experiment, (iv)

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[36] WHO Study Group on Tobacco Product Regulation. 2005. "Best practices in tobacco control: regulation of tobacco products : Canada report".

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Recall and Recognition Experiment, and (v) Conjoint Experiment.[37] We analyse each of them in turn. The conclusions derived from these studies are summarized at the end of this section.

**National Survey**

*Summary*

The purpose of the National Survey was to assess the knowledge, attitudes and beliefs held by teenagers (14-17 years) regarding smoking, brands, brand images, generic packaging and perceived impact of such packaging on teenagers. Results of the survey showed that packaging was important for brand identification. Even teens not yet committed to smoking were able to identify the two top teen cigarette brands in Canada solely on the basis of package cues (i.e., without brand names).

The report found that teenagers had mixed views on what they believed to be the impact of generic packaging:

- 62.7% of teens responded that they would not be bothered by generic packaging;

- 45.5% said generic packaging would not change their decision to start smoking;

- 58.% said generic packaging would not affect how much they smoke; and

- 45.2% said generic packaging would not affect their decision to stop smoking.

The authors concluded that these results suggested that the effects of generic packaging would be marginal. The authors highlighted, however, that the categories defined as "vulnerable" and "smoking experimenters" were more likely than frequent smokers to believe that such packaging would have an effect. Finally, the authors acknowledged that survey results only provide information regarding reported perceptions and behaviours which may differ significantly from the actual smoking responses to generic packaging.

*Data collection*

*Description*

A direct question survey was administered to a sample of 1,200 teenagers from across Canada who were vulnerable to starting smoking or who were already smoking. Teens with strong negative anti-smoking attitudes were excluded.[38] The samples chosen in 14 Canadian cities were representative of the Canadian teen population at the time.

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[37] The authors conducted a sixth study to project possible industry responses to generic packaging by examining historical evidence regarding actions of companies in industries characterised by increasing competition.
[38] 6213 contacts were made. Of these 2066 were disqualified because they did not meet the age criterion, 954 were disqualified because they were anti-smokers and 1861 refused the screener. This left 1332 qualified contacts of which 90% (1200) agreed to participate.

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*Comments*

As the authors acknowledge, the survey results only provide information regarding reported perceptions and behaviours. Furthermore, even reported perceptions may not be accurate due to the problems of direct questioning surveys. As described in detail in Section 3, survey results may not be reliable because:

- responses depend on the ordering of questions, their wording, and the scales used;

- respondents may make very little mental effort in answering the questions;

- respondents want to avoid giving a bad impression to the interviewers and therefore may give what is perceived to be the "right" response rather than their actual opinion;

- respondents will provide an answer even if they do not have a clear opinion;

- respondents may have an incorrect appreciation of their own attitudes and reasons for their behaviour; and

- finally, when using direct questioning it is very hard to provide a frame of reference that is sufficiently clear and meaningful to all respondents so that they all respond with the same framework in mind.

### Data analysis

The objective of the survey was simply to provide descriptive statistics on smoking beliefs, patterns and behaviours of teens in Canada. No attempt was made to establish a causal relationship between cigarette packaging and youth smoking.

The survey results show that teenagers do not clearly believe that generic package would be an effective measure to reduce smoking.

- Almost two thirds of respondents said it would not bother them very much if cigarettes were available only in generic packages. Moreover, non-smokers (vulnerable/naïve and experimenters) were the least bothered by having cigarettes available only in generic packages. In fact, they believed that only a few less would start smoking if cigarettes were available only in generic packages.

- In addition, the majority of teens (almost 60%) in the study believed that having cigarettes available only in generic packages would not make any difference to the amount that teenagers smoke. A higher percentage of regular smokers responded that generic packaging would make no difference to the amount that teens would smoke.

- Teenagers interviewed did not believe that making cigarettes available only in generic packages would be the most effective way to help keep young people from smoking. Almost half reported that making cigarette packages less colourful would be the least successful way to help keep young people from smoking.

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**Word Image Survey**

*Summary*

The purposes of this study were to:

- determine whether teenagers see image differences depending on whether a brand is packaged in its current package, a plain white package or a plain white package with a "lungs" symbol; and

- determine whether teenagers see image differences depending on whether a teenager smokes cigarettes of any type, or a particular brand.

The authors found that generic package has a more negative image than the current package. Teenagers who smoke du Maurier or Marinee brands under current packaging have the most positive image while the lungs package has the most negative image. The image related to the generic package lies in between.

*Data collection*

*Description*

The sample of 1,200 teenagers from across Canada who participated in the National Survey was asked to complete the statement, "In general teenagers who smoke cigarettes are …". Respondents were asked to rate characteristics (i.e., insecure/secure; uncool/cool, etc.) on a 9 point scales according to their impressions of teenagers who smoke.

The same question was asked again focusing on the two main teenage cigarette brands in Canada (du Maurier and Matinee) in different package types (generic and current package). Half the sample completed the question for du Maurier and the other half for Matinee. In total, each respondent answered this question three times (once in general irrespective of the type of package, once for cigarettes in generic packages and once for cigarettes in branded packages).

*Comments*

In addition to the limitations mentioned previously regarding the direct questioning approach used in the National Survey, four limitations appear to be particularly relevant to this analysis.

- First, unless the interviewer has provided concrete frame of reference for each of the questions, responses may in fact have considerable measurement error. Answers will differ depending on who respondents think of when thinking of general teenagers who smoke (i.e., friends, classmates, all teenagers they know).

- Second, the use of scales may influence the response if respondents infer from these the "normal" response.

- Third, as the authors acknowledge, a major limitation of this question is that survey respondents make their image judgements from the frame of reference of the current world, where differentiated packages are the norm and familiar to all.

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- Fourth, repetition of the question three times for each respondent may have increased the problem of lack of effort and/or attention.

### *Data analysis*

#### *Description*

The survey results found a significant difference in the images that Canadian teens had of teenagers who smoke (no brand specified) compared with those who smoke either du Maurier or Marinee. Teenagers who smoke du Maurier or Marinee brands under current packaging had the most positive image, while the lungs package had the most negative image. The image related to the generic package fell in between.

#### *Comments*

The results of this survey cannot be used to inform a policy decision regarding implementation of generic packaging. The likely effects of generic packaging can only be inferred from a comparison of the situation before and after the measure. The relevant question therefore is how images for brands differ when they are all in the current package as compared to when they are all in a generic package. The current survey was not designed in this way. Instead, respondents were asked to compare a brand in its current package and in a generic package.

The results of this survey do not rule out the possibility that when generic packaging is applied to all brands relative images will remain unchanged. In fact, the report recognizes that after completing the task for the current package, teens often commented when shown the generic package "Well, it's the same brand, so can I just write down the same answers as for the current package?". Respondents were not asked to respond differently but looking back to previous answers was not allowed.

### Visual Image Experiment

#### *Summary*

The purpose of this exercise was to assess the capacity of generic packaging to reduce differences in the perceived visual images associated with different brands of cigarettes. According to the authors generic packaging may reduce the motivation to use a brand as a badge value and self-definition and this in turn may eliminate one of the motivations of teenage smoking.

The authors found that generic packaging can serve to minimize the unique brand images that have been constructed over time. The authors however caveat that alternative explanations for the results are possible.

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*Data collection*

*Description*

Respondents in the National Survey sample were exposed to pictures of different types of persons. Pictures of different package types for a given brand were placed on these pictures of people, in the lower right-hand corner. Teenagers where then asked to respond to the following question "Consider this (picture). Is (brand name) in this package right or wrong for this (woman/man)". A five point scale was used for response (definitely right to definitely wrong).

The experiment included three brands, six person-types (two for each brand), and three package types (current package, white generic package and white generic package with lungs symbol). Using the information from a previous study, researchers select the three brands for which teens had the greatest convergent images. For each of these brands they identified two person-types. In particular, they selected i) the person-type most often linked to the brand and ii) the person-type least often linked to the brand.

*Comments*

The same limitations listed above for the Word Image Survey apply to this exercise.

*Data analysis*

*Description*

Differences in the response frequencies between the three types of packages were analysed.

The authors found that generic packaging can serve to minimize the unique brand images that have been constructed over time. For all brands, the removal of the brand markings by introducing a generic package led subjects to view the brand as less appropriate for the consistent person/image.

Similarly, the current package was viewed as significantly more appropriate with the consistent person/image than with the inconsistent person/image for all brands. The association of a brand with a particular person image was less consistent with generic packaging.

*Comments*

By selecting only those brands that were more strongly associated with a certain person-type in the national survey, the results of this analysis may have overestimated the actual link between brands and perceived images.

**Recall and recognition experiment**

***Summary***

The objective of this study was to assess differences in the attention teenagers pay to the brand and health warnings of cigarette packages when viewing a current package or

a generic package. The authors found that very few subjects noticed two of the three brands and that generic packaging increased the recall rate of only three of the health warnings.

### *Data collection*

*Summary*

The experiment was conducted in Vancouver with 400 smoker teenagers. Each respondent privately viewed a total of 3 images projected one at a time on a computer monitor. Each image was displayed for 4 seconds and showed a table-top with four items on it: a can of soda pop, a bottle of headache remedy, a magazine, and a cigarette package. For each image a different brand of each product was displayed. In particular, three different cigarette brands were displayed. Half the subjects saw the three cigarettes brands in their current packages. The remaining half saw the three cigarette brands in the generic package.

After each package was displayed the subjects were asked to respond to questions. We list the most relevant questions below.

- Please tell me all the objects you recall seeing.

- What brand did you see?

- What did the health warnings of the cigarette pack say?

Finally, subjects were shown the three packages all at once, with the health messages covered over and asked to indicate which package displayed the three health messages listed on a sheet of paper.

*Comments*

The survey methodology used by the authors avoids most of the limitations of common surveys (i.e., importance of question wording, question ordering, response scales, lack of attitude, right answer bias and lack of effort).

The survey, however, was only conducted in one mall in Vancouver. This raises questions of representativeness of the sample and possible sample selection bias (i.e., the characteristics of the individuals may make them more or less susceptible to heath warning labels).

An additional limitation of this exercise, recognized by the authors, is that a single 4 second exposure to the images may not be sufficient to elicit meaningful responses.

### *Data analysis*

The results of the study do not indicate that health warnings are better recalled when displayed on generic packages.

- Only 44% recalled the warning "Smoking can kill you" which was the one on the most familiar package. 38% of the teens who saw the current package recalled warning. 50% of the teens who saw the generic package recalled the warning. The difference is statistically significant at the 5% significance level.

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- Less than 5% of the teens recalled the other two warnings displayed on the less popular brands.

- For two of the three health warnings/brands, more of those viewing the current packages were able to match warning and package, as compared with those who had seen the generic package.

- Only the "Smoking can kill you" warning was better recalled when it was on the generic package.

## Conjoint experiment

### Summary

Conjoint analysis was used to examine the potential effects of cigarette generic packaging on the decision to smoke in the presence of other product attributes in addition to package type. In particular, individuals were shown alternatives that differed in (i) package type, (ii) brand, (iii) price, and (iv) peer influence (friends smoke/do not smoke).

The authors found that for non-smoking and smoking teens and adults, price was perceived to be the most important attribute influencing the uptake or cessation of smoking. Packaging type (current v. generic) was generally as important as brand influence with respect to the uptake or cessation of smoking and more important than peer influence.

The paper concluded, however, that the extent of the influence of generic packaging on smoking decisions "cannot be validly determined by research that is dependent on asking questions about what they think or what they might do if all cigarettes sold in the same generic packages".[39]

### Data collection

#### Summary

Non-smoking teens were asked to rate pairs of alternatives according to which of them would encourage them the most to start smoking. On the other hand, smoking teens were asked to rate pairs of alternatives according to which would encourage them the most to stop smoking. The experiment was administered to a sample of approximately 400 teenagers (half smokers-half non-smokers) and 100 smoker adults (30-50 years old).

#### Comments

The survey methodology used by the authors avoids the most common survey limitations (i.e., importance of question wording, question ordering, response scales, lack of attitude, right answer bias and lack of effort).

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[39] Goldberg et al. (1995), page 129.

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The survey, however, was only conducted on the same the teenagers that had already participated in the recall and recognition experiment. This may have given them some clues about the purpose of the study and about the aspects of cigarettes in which researchers were particularly interested in. As recognized in the report, the higher the level of respondents awareness about the purpose of the study, the greater the possibilities that the obtained measurements are biased.

### Data analysis

*Description*

The study used a hybrid conjoint analysis which was computer-administered. In an adaptive hybrid approach, respondents were first asked direct questions about attributes and their levels. Their responses to these questions were used to develop a preliminary estimate of respondents' utilities for each attribute and each level of each attribute. Then, a pairwise conjoint stage followed in which the pairs presented to respondents were selected using the prior knowledge of the explicitly measured utilities and were aimed at reducing uncertainty about the respondents' utilities. The process continued and additional pairs were presented until uncertainty about the respondents' utility values reached a statistically acceptable level ($\alpha=0.05$). If respondents were inconsistent in their judgements, additional pairs were presented until a maximum of 30 pairs was reached.

The authors' findings are listed below.

- Amongst non-smoking and smoking teens, and adults, price was perceived to be the most important attribute influencing the uptake or cessation of smoking.

- Packaging type (current v. generic) was generally as important as brand influence with respect to the uptake or cession of smoking and more important than peer influence.

- Amongst teenage non-smokers current packages appeared to encourage smoking more than generic packages. However, there appeared to be a high disagreement between respondents with respect to these attributes. The authors indicated that the importance of generic packaging on the uptake of smoking may have been over – estimated.

- Amongst teenage smokers there was little difference in the utility of the generic package and the current package with respect to the decision to stop smoking.

*Comments*

As the authors indicate, the results of this analysis may not be robust, for the following reasons.

- The analysis does not consider nor correct for possible biases due to endogeneity. The $n^{th}$ question depends upon the answers, and hence the errors, in the first $n-1$ questions which generates a potential for endogeneity bias.

- The variability of the estimated utility values is very high. The standard deviations of the utility values obtained are very large compared with their means. This means that variability in utilities between individuals is very high, and therefore no clear conclusion can be drawn from such results.

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- The analysis does not control for individual specific factors that may condition the decision to start or stop smoking (omitted variable bias).

- In addition, the experiment does not take into account correlations between different attributes. In fact, if we look closer we see that the current package and the peer influence have a similar impact on the perception of which cigarette attributes would encourage people (both teenagers and adults) most to start/stop smoking. We expect these two attributes to be highly correlated (i.e., the current package is the one that peers smoke).

The report concluded that in the case of smokers (both teenagers and adults), "there is little difference in the utility of the plain and generic package versions and the current package with respect to impact on their perceptions of which would encourage them more to stop smoking".


**Conclusions**

The studies commissioned by Health Canada examine the impact of generic packaging of tobacco products on brand image, health warning awareness and uptake and cessation of smoking.


*Brand Image*

The evidence provided suggests that generic packaging has an impact on brand image. The National Survey results showed that packaging was important for brand identification; the World Image Survey results indicated that generic packaging has a more negative image than branded packages; and the Visual Image Experiment results suggested that generic packaging can serve to minimize unique brand images.

In our view, this evidence cannot be used to support the implementation of generic packaging because the results are likely to be biased due to the data collection methods used.

Moreover, even if the results were robust, they cannot be used to inform the generic packaging debate because they were obtained under a significantly different regulatory regime in the early to mid 1990's. In addition, the results are based on a comparison between cigarettes in generic and branded packages. The impact of generic packaging on brand images is likely to differ significantly when all cigarettes are sold under generic packages.

In any event, even if generic packaging has an impact on brand image, this does not support the conclusion that less young people will start smoking.


*Health Warnings*

In our view, results are inconclusive with respect to the relation between packaging and smoking or packaging and recollection of health warnings. The Recall Experiment results showed that generic packaging increased the recall rate of only one of the three health warnings. The authors suggest that the exposure time was too short and that these results cannot be extrapolated to a more natural long term-setting.

This evidence cannot be used to support the implementation of generic packaging as a tool to reduce youth smoking.

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- No attempt is made to establish a link between recollection of health warnings and smoking initiation and, as we have mentioned above, the strength of this link is not obvious, amongst other reasons because individuals may eventually get used to health warning messages and pay limited attention to them, regardless of the type of packaging.[40]

- In addition, results derived from the comparison of health warning on generic and branded packages cannot be used to predict what will occur when all cigarettes in the market are sold in generic packages.

- Results of health warning recollection in 1995 may differ significantly if the study was conducted today. In 1995, Canada had not yet fully implemented pictorial health warnings which gradually took effect beginning in December 2000. Health warnings occupied 25% of the principal display surface and were limited to black and white text.[41] Currently, graphical health warnings are qualitatively different as they occupy as much as 50% of a package face and include extremely graphic colour images.

*Smoking cessation and uptake*

The results regarding the impact of generic packaging on smoking cessation and uptake are not reliable and, according to the authors, further research is required to establish a clear link.

- According to the National Survey results teenagers have mixed views on what they believe to be the impact of generic packaging. The authors correctly conclude that these results suggest that the effects of generic packaging on smoking would be marginal:

  – nearly half of the teens surveyed or more indicated that they would not be bothered by generic packaging; and

  – nearly half of all teens surveyed stated that generic packaging would have no impact on how much they smoke or on their decision to start or stop smoking.

- These results are in line with the preliminary focus group responses where teenagers said they saw "the uptake process as being unaffected by promotions or packaging".[42] Teenagers indicated that "plain packaging would not stop kids from starting or stopping".[43]

- The Conjoint Experiment results suggest that plain and generic packaging will, to some "unknown degree, encourage non-smokers not to start smoking and smokers to stop smoking".[44] However, as the authors indicate "the extent of this influence cannot be validly determined by research that is dependent on asking questions about what they think or what they might do if all cigarettes sold in the same generic packages".

As with the previous results, these results cannot be used to inform the debate on generic packaging even if they were robust and reliable.

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[40] See Rootman et al. (1996).

[41] WHO Study Group on Tobacco Product Regulation. 2005. "Best practices in tobacco control : regulation of tobacco products : Canada report".

[42] See Goldberg (1995), p. 184.

[43] Ibid., p. 185.

[44] Ibid., p. 129.

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- The study does not analyse the impact of generic packaging on smoking uptake when all brands are sold in generic packages.

- Differences in the regulatory environment including smoking bans and large pictorial health warnings, limit the possibility of extrapolating lessons obtained from estimated empirical relations in the early to mid 1990's.[45] According to the well-known Lucas critique, any estimated empirical relation based on past data can break down due to changes in policy or other "rules of the game".

## 5. David Northrup and John Pollard, 1995, "Plain Packaging of Cigarettes, Event Marketing to Advertise Smoking, and Other Tobacco Issues: a Survey of Grade seven and Grade Nine Ontario Students" and Irving Rootman, et al. 1996. "A study on Youth Smoking: Plain Packaging, Health Warnings, Event Marketing, and Price Reductions. Key Findings".

**Summary**

These two papers are analysed jointly because they are both based on the data from a Canadian-American study on tobacco use among youth. The 1995 paper by Northrup and his co-authors focuses on the results from the Canadian data, while the Rootman et al. (1996) paper summarizes the key findings from both the Canadian and American surveys.

The purpose of the study is to examine whether the event advertising tactics employed by tobacco companies in response to the restrictions on the promotion of tobacco products are mistaken for cigarette advertising by the youth. It also examines (1) whether generic cigarette packaging could break the link between such advertising and the brand, (2) whether generic packaging has an impact on recall of health warning information, and (3) the impact of prices on youth smoking rates.

According to the study, the majority of the respondents said generic packaging would make no difference in the amount young smokers would smoke (71%) and that generic packaging would not affect the probability that young non-smokers would start smoking (62%). In addition, the study finds that the recollection of the health warning was not enhanced by using generic packaging.

The authors of these studies conclude that:

- despite advertising bans, many youth misinterpret ads for events sponsored by tobacco companies as cigarette advertising;

- generic cigarette packaging would render this tool ineffective;

- generic packaging makes the package look more serious, which may mean that the health warning on it is taken more seriously;

- students report that price reductions lead to increased smoking among the youth.

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[45] See WHO Study Group on Tobacco Product Regulation (2005).

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**Data collection**

*Description*

Two different data collection methods were used for this study.

- Focus group discussions: a total of 339 adolescents (12-17 years) participated in 52 focus group interviews (40 in Canada and 12 in Chicago) in which brand imagery, attributes of smokers of generic-packaged and regularly-packaged smokers, recall of health warning information, perceived impact of generic packaging on youth smoking and awareness of event sponsorship by tobacco companies were discussed.

- Classroom surveys to 2,132 students (12-14 years) in 71 classrooms in Ontario and 10 in Chicago. The questionnaire was designed to measure awareness of sponsorship of events by tobacco companies, attitudes towards regular and generic packaging, attitudes and behaviours towards smoking, perception of health warnings and estimated impact of price reductions. The Northrup paper focuses on the data from these classroom surveys in Ontario.

These surveys represent a final stage of a larger project in which interviews with experts in marketing and advertising were first carried out to complete a review of past work on the same issues.

*Comments*

The general limitations of focus groups and surveys for this type of analysis have already been discussed in Section 3. For example, the questions are vague and no clear frame of reference is provided to ensure that all respondents have a homogeneous context in mind. Moreover, the answers may reflect the perceived "right" responses or may be speculative, especially given that the proportion of frequent smokers who respond to the questionnaire is very low (only 97 daily smokers and 221 light smokers relative to 1,241 non-smokers in the Ontario surveys).

**Data analysis**

In general, the study relies on simple descriptive statistics of the responses given by the survey respondents. We describe the main results obtained from the questionnaires and comment the reliability of the conclusions below.

*Sponsorship activities of tobacco companies*

To measure students' awareness of the sponsorship of events by tobacco companies, they were showed posters advertising two events in which the words were replaced by nonsense letters to render them unreadable while preserving the font style. Students were asked to write what they thought the poster was about. According to the study, a significant proportion of respondents (53% in one case and 12% in the other) interpreted the posters as advertisements for cigarettes.

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*Generic packaging and youth smoking*

Ontario students were asked what impact they thought generic cigarette packaging would have on youth smoking. Most of them said generic packaging would make no difference in the amount young smokers would smoke (71%) or in the probability that young non-smokers would start smoking (62%). In contrast, one-quarter (25%) said young smokers would smoke less and one-third (35%) said young non-smokers would be less likely to start smoking. Interestingly, 79% of daily smokers and 73% of light smokers believed that introducing generic packaging would have no effect on the rates of youth who start smoking.

In addition, Chicago students were shown the same cigarettes in a generic package, regular package and novel package (new, appealing design), and asked which they would like to take home. Most chose the regular package (80%), 17% chose the novel package and only 3% chose the generic package. In the authors' view, this shows that generic packages hold little appeal to youth.

In our view, the results of this exercise do not support the conclusion that generic packaging influences smoking decisions.

*Health warning recall experiments*

The interviewers held up a poster for the students to see for about one minute. All posters had the same warning, but different classes were randomly shown posters that differed in the brand. For each brand there was a regular package, an off-white generic package and a white generic package. After removing the poster from the student's view, the interviewer asked them to write everything they could remember about the package shown in the poster.

The results show that a very high percentage (83%) of the students in Ontario could remember the health warning, a higher proportion than the brand name (77%). Moreover, for the sample as a whole, recall of the health warning was not enhanced by using generic packaging. Therefore, the evidence indicated that generic packaging would not increase the visibility of health warnings.

In fact, health warnings were remembered by 4 out of 5 Ontario students, regardless of whether they were in generic or regular packaging. An exception was found only for daily smokers. More regular smokers (82%) remembered that health warning when it was shown on a generic package than when it was shown on a regular package (62%). However, the authors recognize that this effect might be temporary. Smokers are very familiar with regular packages and therefore do not pay much attention to the details of the package. In addition, recall of the health warning in American cigarettes, although much lower (6%), was also similar for generic and regular packages.[46]

In view of this evidence, the results of the study suggest that recall of the health warning is not affected by generic packaging. However, the authors argue that generic packaging may enhance the credibility of health warnings. The reason is that 53% of students in Ontario said that generic packaging makes the health warning look more serious, while

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[46] The difference in the Ontario and US findings are probably due to the importance of placement and size of the warning for increasing recall.

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19% said the regular package makes it look more serious. In our view, this conclusion based on the comparison between generic and branded packaging is not relevant to assess the likely impact of generic packaging on health warning recollection when all cigarettes will be sold with the same standardised package.

*Generic packaging and positive imagery*

According to the study, when shown posters with cigarettes in regular and generic packages, 64% of Ontario students said *cool kids* would smoke cigarettes from the regular package and only 5% said *cool kids* would smoke cigarettes from the generic package. Students understood that the product was the same in both styles of packaging but were nevertheless susceptible to the imagery of the branded packages.

Once more, these results are irrelevant in the context of the current debate on generic packaging. The comparison of the imagery projected by regular and generic packaging is meaningless because if generic packaging were introduced the two packaging styles would not coexist.

*Prices*

In February 1994, the Canadian government decreased taxes on cigarettes in an attempt to decrease smuggling. In the questionnaire, students who smoked were asked to report whether the price cut had led them to smoke less, more, or made no difference. One third reported to smoke more as a result of the lower cost, while 3% said they smoked less. These results suggest that cigarette prices are a key element of youth smoking decisions.

**Conclusions**

This study examines the link between generic cigarette packaging and (i) brand images, (ii) health warning recollection and (iii) decisions to smoke or start smoking. It also examines the influence of pricing on smoking decisions.

*Brand image*

Results show that "cool kids" are more likely to smoke cigarettes in branded packages than in generic packages. In addition, very few students chose to take home generic packaged cigarettes over branded cigarettes. The authors conclude that generic packages hold little appeal to youth.

In our view, data collection problems derived from the direct question approach and the structure of the group interviews limit the reliability of these results.

Nevertheless, even if results were reliable, this evidence cannot be used to assess the usefulness of generic packaging as a tool to reduce youth smoking. The comparison between the brand appeal of cigarettes in branded and generic packaging is not the relevant question in the context of the current debate on generic packaging. The relevant question is how brand appeal will be affected when all cigarettes are sold in standardised packages.

*Health warnings*

According to the paper's results, generic packaging does not have an impact on the visibility of health warnings. However, generic packaging may make health warnings looked more serious.

As above, in our view the data collection methods used limit the reliability of these results.

Moreover, the authors do not attempt to establish the link between the seriousness of health warnings and smoking initiation of adolescents. This relative importance of this link is not obvious due to the multitude of factors behind smoking decisions. As a result, the evidence on the impact of generic packaging on visibility and/or seriousness of health warnings cannot be used to support the introduction of generic packaging to reduce youth smoking.

*Decision to smoke*

In our view, the evidence presented suggests that for the majority of the respondents, generic packaging does not seem to influence decisions regarding the amount smoked or the probability of starting to smoke.

These results address the relevant question to evaluate the benefits of introducing generic packaging, however, the study suffers from severe limitations regarding data collection. In addition, these results cannot be extrapolated to the current regulatory environment that restricts tobacco use and advertising much more than in Canada and the US at the time of the survey.[47]

## 6. Centre for Health Promotion, University of Toronto. 1993. "Effects of Plain Packaging on the Image of Tobacco Products Among Youth".

**Summary**

The purpose of this study is to analyse the relationship between positive images associated with smoking and reinforced by cigarette packaging and their contribution to youth smoking. In particular, this report examines the impact of generic packaging on product image and the impact of generic packaging on tobacco use among current smokers and those teenagers contemplating smoking.

The authors find that adolescents support the claim that generic packaging makes the product less attractive and that packaging has a greater influence on youth contemplating smoking than on regular smokers.

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[47] Ibid.

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**Data collection**

*Description*

The authors combine information from several sources:

    i.    interviews with 27 experts in marketing and tobacco research contacted by phone;

    ii.   a literature review on the findings of the research on generic packaging; and

    iii.  20 group interviews comprising 129 teenagers between 12-17 years old in three different locations in Ontario. Separate sessions were conducted for boys and girls and for individuals aged 12-15 and 16-17. In addition, groups were separated into smokers and non-smokers. Participants were reached through consulting directories. Subjects who said they did not smoke and never intended to smoke were disqualified. The purpose of the study was not revealed to participants.

The group interview included individual questionnaires and a focused discussion through which qualitative information was collected. In the questionnaires, participants were asked to report their smoking status and some socio-economic variables. They were presented with a slide presentation of pairs of cigarette packages and had to choose which one they were less likely to be seen with. Next, a package of cigarettes was displayed for 20 seconds, and individuals were asked to draw everything they remembered from the package. In the focused discussion, the facilitators led the discussions. The video tapes were later reviewed and analysed.

*Comments*

The general limitations of surveys and focus groups have already been discussed in Section 3. In this particular case, the results may be biased for several reasons related to the data collection methodology.

First, as the authors recognize, the most serious limitation of this research is the small sample size (129 teenagers), particularly in the non-smokers group (32 teenagers), and the fact that the sample may not be representative. In addition, the fact that participants were reached using professional focus group recruiting firms may reinforce the problem of the sample not being representative, as people who are not very articulate or confident choose not to get involved in this kind of exercises.

Second, although the authors claim the opposite, the purpose of the study could have been easily guessed by participants. In most exercises, participants were asked to compare generic and brand packages. In addition, in some cases parents may have informed their children in advance of the aim of the study (as they were aware of the nature of the study, given that they had to approve their children's participation). In turn, those children probably shared this with other participants. The higher the level of respondent "guessing" (especially correct "guessing") about the intent of the study, the higher the propensity for subjects to give what is perceived to be the "right" response or the response the interviewer is looking for. As a result, the results of the paper are very likely biased.

Third, subjects were offered a choice of products as payment for participating in the research. The choices included a compact disk of choice, four free passes to a movie of

choice or four packages of cigarettes. Half of the participants (16-17 year) were offered cigarettes in generic packages and half were offered cigarettes in brand packages. Interestingly, more males chose the generic packaged cigarettes as their payment option than did males offered brand packaged cigarettes. Females showed no difference in the number who chose cigarettes between the two conditions. Although this was only a pilot study, this exercise is very informative, as adolescents really had to make a choice which actually affects their utility. In other words, this exercise allows learning what adolescents would actually do and not what they say they would do, as in surveys or focus groups. The result indicates that when adolescents faced a real decision, the generic package had the same (or higher) acceptance rate than the brand package. The authors argue that novelty might explain these findings. However, they caveat that the procedure should be repeated including controls for the novelty effect before drawing any conclusions.

**Data analysis**

The analyses are undertaken through a descriptive analysis involving frequencies and cross tabulations of the data, separately by age, gender and smoking status, except when no significant differences across groups are found.

*Impact of generic packaging on product image*

*Description*

First, the study tests the hypothesis that generic packages project less positive imagery of tobacco products as compared to brand packages. In particular, the study includes 5 measures to assess the impact of packaging on the desirability of a product: (i) word lists, (ii) collages, (iii) package preference (brand vs. generic), (iv) package ratings and (v) recall of product brand name.

In the first exercise, interviewers offered a list of possible adjectives and participants had to decide which of them fitted better with a generic or a regular package. The words chosen to describe the buyer or user of a brand package were positive. The words used to describe users of the same cigarettes in generic packages were very different. In particular, two kinds of persons were identified as potential buyers of generic packaged cigarettes: (i) a "loser" that has no idea of what is cool and will smoke anything and (ii) someone who is above peer pressure and would smoke from generic packages to make a statement about how independent they are.

In the second exercise, participants were shown collages of teenagers, younger children, celebrities and cars and were asked to pick out (potential) smokers and non-smokers. More sportive, ecological and committed persons were picked out as non-smokers. In contrast, persons with a cooler image were identified as smokers. This suggests that being cool is associated with the generic behaviour of smoking cigarettes, but not necessarily with brand images or brand packaging. Moreover, for those identified as smokers, participants were asked to distinguish those which would choose a brand package and those that would choose a generic package. Again, the results indicate that only non image-driven individuals would consider smoking cigarettes from a generic package.

In the third exercise, participants were asked to identify which package they would prefer to be seen with: generic or regular. The large majority favoured being seen with brand packages over generic packages.

In the fourth exercise, participants were asked to rate brand and generic packages of the most popular brands in Canada on a scale of 1-5 for different bi-polar adjectives. Brand packages received a better valuation than the generic ones.

Finally, individuals drawings of several packages were shown and coded based on the level of recall of the brand name information. No significant differences in the level of recall between generic and brand packages are found.

*Comments*

The results of the exercises above are not meaningful to assess the impact of the introduction of generic packaging. If generic packaging was introduced, all smokers (unless they quit smoking) would have to smoke cigarettes from generic packages. By implicitly suggesting that the two options (regular and generic) would be available and that smokers could choose between them, the study does not reflect what would actually happen if generic packaging was introduced.

In addition, it is worth noting that generic package looked "cheap" to most participants. This led to questions about whether the cigarettes were also "cheap", "stale" or substandard in some other way. The fact that adolescents perceived cigarettes from generic packages as ones of lower quality may have contributed to the more negative image of generic packages relative to brand packages. The high importance that 16-17 year olds attribute to the quality of the cigarettes reinforces this hypothesis.

Peers' influence may also be behind these results. Peers smoke cigarettes from brand packages. This implies that smoking cigarettes from a different type of package would be associated with a more negative image. Although the study recognizes that other factors, including direct peers' influence, contribute to the images teens have about a particular product, in this case cigarettes, it does attempt to control for these other factors in order to isolate the effect of generic packaging from other factors.

Summing up, the results in the paper are unreliable because of some serious limitations of the analysis. Therefore, they cannot be used as evidence that generic packaging would reduce the linkage between a brand and its related imagery.

*Impact of generic packs on smoking behaviour*

*Description*

The next step in the paper is the analysis of the impact of generic packs on smoking behaviour. The researchers carry out a "willingness to pay" exercise, in which participants were asked to estimate how much they thought people their age would be wiling to pay for generic package of cigarettes if a regular package costs $5.

The results indicate two different patterns. On the one hand, early teens indicated prices lower than the current price for cigarettes in branded packages. On the other hand, older participants and smokers chose a similar price as they felt the product was what mattered, not the package.

Similar results were obtained when participants were asked to report whether more, fewer or the same number of people their age would buy cigarettes if sold in generic packages. Over one-half of participants reported that the same number of young people would buy cigarettes if sold in generic packages. Again, this proportion was higher for older smokers (62%). This indicates that most of the 16-17 years olds who are already regular smokers do not longer see packaging as a vehicle of coolness. They are more interested in taste and freshness of the product itself than in the package.

*Comments*

The simple comparisons in which the authors rely on can lead to misleading conclusions. For example, when asked about their willingness to pay for generic packaging, some respondents explained that they would be willing to pay less for generic than for branded packaging because generic packages would be cheaper to make. Therefore, the *ceteris paribus* condition, which means that all other variables are held constant, is not satisfied. This condition is essential to isolate the effect of the variable of interest. However, in this case participants assume that, in addition to the type of package, the production costs would also change. Therefore, their valuation of generic packages would be reflecting not the actual value they assign to a cigarette generic package but the value of a generic package that is cheaper to produce. Hence, the lower value attributed to this product may simply reflect the lower production cost assumed by participants and not a lower value for generic packages themselves.

In addition, the open-ended contingent valuation method is rarely used because it has been found to be vulnerable to a range of biases (see Centre for International Economics, 2001). There are several reasons for this. First, respondents find contingent valuation exercises difficult to answer. Generally, respondents may have a preference for one alternative over another but they do not know their maximum willingness to pay for a good. Second, by focusing respondents' attention on a single attribute, the values estimated for that attribute may be overestimated if there are other relevant attributes that are not presented to the respondent for valuation (embedding effect). Third, respondents are unlikely to provide an accurate response when presented with a hypothetical scenario. This is particularly problematic when valuing attribute changes that are unfamiliar to respondents. Finally, another potential weakness of this technique is that it may induce participants to behave strategically. As explained above, this means that respondents anticipate the impact of their response on the outcome of the study and respond accordingly.

*Importance of generic packaging relative to others*

In the last section, participants were asked to rank different strategies according to which ones they thought were the most effective to reduce smoking among young people. The cost of tobacco was identified as the most important factor inhibiting onset, followed by making it harder for youth to buy cigarettes. Teenagers found these policies more effective than policies that reduce the attractiveness of packages by making them less colourful. These results indicate a more effective way to reduce tobacco consumption among youth than generic packaging.

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**Conclusions**

The authors of the study reach the following conclusions from their analysis: (1) generic packaging could break the link to other advertising and promotions, as it undermines the positive product images conveyed through other promotional strategies; (2) generic packaging makes the product less attractive; (3) packaging has a greater influence on youth as compared to adults and on youth contemplating smoking onset as compared to youth already smoking regularly; and (4) generic packaging is important as part of a comprehensive strategy to reduce smoking onset among youth, but insufficient on its own.

However, the evidence is not sufficiently robust or reliable to support such conclusions. First, as we have discussed above, the data collection methodology has limitations and likely leads to severe biases, including biases due to sample selection and measurement error. Second, the analysis relies on methodologies like contingent valuation that have been shown to be vulnerable to biases.

The evidence cannot be used to assess the usefulness of generic packaging as a tool to reduce youth smoking. The only exercise related to the question of interest to the generic packaging debate was not properly designed. In it, participants were asked if more, less or the same number of people would buy cigarettes if sold in generic packs. Individuals were simply asked to state their perception on what would happen, and not necessarily what *they* would actually do. In addition, the order in which this exercise was presented to participants (after several exercises in which they were asked about the appeal of branded and generic packs) may have also biased their answers.

The other evidence on the impact of generic packaging on brand appeal and health warning recollection also cannot be used to inform the generic packaging debate, even if it were robust and reliable.

- The authors claim that generic packaging makes the product less attractive (which is reflected in the individuals' different reactions to branded and generic packs and their willingness to pay for generic packs vis-à-vis branded ones). However, this does not necessarily imply that individuals would decrease their smoking rates if they only had access to generic packs, it only provides information on what their decisions might be when deciding between generic and branded packs.

- The authors do not establish a link between health warning recollection and smoking decisions. This strength of this link is not obvious due to the multitude of factors conditioning decisions to smoke.

- The study was undertaken in 1990 in Canada. Similar to other studies reviewed above, the results are probably meaningless for the situation in other countries in 2008. Differences in the regulatory environment render any policy implications from historical data practically meaningless.[48]

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[48] See WHO Study Group on Tobacco Product Regulation (2005).

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## 7. Centre for Behavioural Research in Cancer, 1992, "Health Warnings and Contents Labelling on Tobacco Products"

**Summary**

This study was prepared by the Centre for Behavioural Research in Cancer for the Tobacco Task Force of Ministerial Council on Drug Strategy in Australia. Thirteen papers are included in the study. In this review we discuss the paper entitled "Adolescents' reactions to cigarette packs modified to increase extent and impact of health warnings" as it is the only one that deals with the potential effects of generic packaging.

The paper investigates adolescents' responses to alternative pack modifications related to the presentation of information warnings about the effects of smoking on health. The authors conclude that the inclusion on packs of bigger health warnings and more information on the health risks of smoking than the standard ones are valuable changes, in the sense that they would increase awareness and knowledge especially among youth and they would demonstrate the government's commitment to reduce smoking. Plain packaging, in contrast, was not viewed as an acceptable change by many of the individuals interviewed, who considered that tobacco companies had the right to promote brand image on their own products.

**Data collection**

*Description*

The data used for this study was collected through group interviews in which 66 people between 12 and 20 years participated – 31 of them were male, 35 female and around half of them smokers. Participants were grouped into 22 groups, of between 2 and 7 participants. The individuals were recruited in public places in Melbourne.

These individuals were presented with four pack modifications:

- a *Peter Jackson* pack in which a bigger health warning and expanded information about tar, nicotine and carbon monoxide levels were included relative to the currently available packs (Pack 1);

- three "standardised" or generic packs of *Peter Jackso*n, *Marlboro* and *Hedges*, in which the same changes described above were introduced, but presented in a plain format, devoid of any logos and other identifying information except the brand name and the number of cigarettes written in black type (Packs 2, 3 and 4).

Groups were presented with each of the packs (starting with Pack 1). After recording facial and verbal responses and exclamations, an interview was conducted in which the following issues were raised.

- Were the changes noticed?

- Would they read the new information?

- Do they approve of the changes?

- Why were the changes made?

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- Individuals' reactions on the possibility that the government implements the changes and their perception on how tobacco companies would react.

Finally, information on the participants' age, sex and smoking status was collected.

*Comments*

This study is based on group discussions triggered by the stimulus of the modified packs and led by a field worker. As mentioned in Section 3 of this Report, the results of the interviews may be heavily influenced by how the researcher raises the questions or by peer effects.

Another important feature of the interviews is that the packages were shown in the same order to all groups. First, the reactions to pack 1 were recorded, and then groups were asked about Packs 2, 3 and 4. Field workers always showed the packages in the same sequence. It is therefore plausible that the reactions and answers would have been very different if the order in which the packs were shown had been different. As discussed in detail in Section 3, experiments have shown that cognitive factors (including the order in which the questions are presented) affect the responses obtained in these data collection methods. One way in which the researchers may have ameliorated this concern is by randomly choosing the order in which the packs were shown to each of the groups. This technique, however, was not applied in this case.

In addition, the individuals were recruited in different public locations across Melbourne. This raises the question of whether the sample (which is very small, only 66 individuals) is representative, and to what extent the results are affected by sample selection bias (i.e., the individuals choose to participate in the study or not and their characteristics may make them more or less susceptible to health warning labels than the average in the population). In fact, the question individuals were asked when being recruited already indicated the topic of the questionnaire:

> *"We have made some changes to the packaging of cigarette packs. We would like to know what young people think about them. Do you have five minutes or so to have a look at the packs and tell me what you think?"*

**Data analysis**

*Description*

To assess the responses to the different packages, the authors recorded the participants' reactions and answers to the questions posed by field workers. The information is mostly qualitative, and the conclusions of the study rely on the researchers' assessment of what the overall reactions were. The results can be summarized as follows.

- *Pack 1* – Modified *Peter Jackson* branded package:
  - participants were interested and enthusiastic when first viewing the pack;
  - most participants reported that they noticed the size of the warning, but impressions on the pack were mixed (some were impressed by the amount of information, some thought the pack was not as attractive);
  - most participants reported that they would read the information;

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- most had a positive reaction of the changes, suggesting that they would make people aware of the health risks, which is what most participants believe was the goal of the changes; and

- overall, groups regarded the changes as a potentially positive government measure, but that they believed that tobacco companies would not like them.

- *Packs 2, 3 and 4* – Generic packs:
  - participants reacted with disbelief, surprise and interest when they were shown these packs, and some remarked that they were unattractive,

  - they reported noticing that the warnings were the same as in Pack 1 and that the packs were dull, some commented that they "take away the company look";

  - about a third of the participants approved of the changes, the rest disapproved or were neutral, and interpreted that the changes were meant to discourage smoking or so that "people won't go for the brand name";

  - some smokers reported they would not buy these packs, some said people would get used to them and finally, others said that cigarettes would still be smoked; and

  - the reactions to the possibility that these changes were imposed by law were mixed, some approved and others thought that companies should be allowed to maintain branded packages, but all agreed that tobacco companies would be annoyed if they had to implement these changes.

*Comments*

This study does not carry out any quantitative analysis of the data collected through the group interviews. Instead, the conclusions are based on the qualitative evidence obtained in the course of the discussions by the field workers. The interpretation of the responses and the reliability of the conclusions drawn from them, however, are questionable for several reasons.

First, the sample is heterogeneous, and includes smokers and non-smokers and individuals of different ages (between 12 and 20 years). In some cases, the authors explain that the reactions of smokers and non-smokers are different. For example, the reaction to plain packaging in terms of approval or disapproval seemed to differ across these two groups of individuals: non-smokers tended to be neutral regarding the proposed changes, as they did not find they were relevant for them. This suggests that responses are often related to the individuals' characteristics. To properly measure the average reaction to the modified health warnings and packages, the authors should have taken into account individuals characteristics which influence smoking intention and attitude.

Second, as explained above, the sample of participants was not chosen to be representative and the sample size is small, which may lead to misleading conclusions on the reaction of the average individuals to the changes in the size and content of the health warnings and in the package design.

Finally, the results are not precisely coded and described. The authors refer to "overall responses", "many participants", "several participants", "some participants", etc. These are very vague statements which make the interpretation of the results and checks for

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robustness quite difficult. The information could have been easily codified to enable a quantitative assessment of the different reactions across groups and individuals.

### Conclusions

The purpose of the study is to assess the impact of modified health warnings under two scenarios: branded and generic packs. The results suggest that, both in generic and branded packs, the modified labels increase awareness.

In our view, the study has limitations that reduce the reliability of these conclusions, namely data collection problems derived from the reduced sample size and the fact that the individuals are not necessarily representative of the youth, and possible biases due to the structure of the group interviews. In addition, the lack of a proper data analysis and the reliance on qualitative statements imply that the results are difficult to assess.

In any event, this study does not provide any evidence related to the question of the potential impact of the introduction of plain packaging on youth smoking for the two reasons listed below.

- First, and most important, the purpose of the study is not to assess whether individuals would be more or less likely to take up smoking or quitting if all cigarette packs were generic. This is the relevant question in the context of the current debate on generic packaging which remains unanswered by this study. The issues under investigation in this study, namely how individuals react to bigger or more detailed health warnings and pack design modifications say nothing about the question of interest;

- Second, the authors rely on the results of group interviews conducted in the 1990s in Melbourne. These results are not comparable to the situation in 2008 and in other countries. Smoking regulation is markedly different in the two environments and therefore no meaningful implications can be drawn from the results obtained in one setting in relation to their applicability in other one.

## 8. Beede, P. et al. (1992). "The Effects of Plain Packages on the Perception of Cigarette Health Warnings"

### Summary

This paper investigates the effects of generic packaging on the attention paid to health warnings by comparing recollection rates of warnings on regular and generic packages. The authors find that adolescents in New Zealand pay limited attention to health warnings in comparison to brand information. On the one hand, the unaided recollection results indicated that generic packaging did not have any effect on the recall rates of health warnings presented on New Zealand packs. On the other hand, respondents' recall rates were significantly greater for generic packs as compared to branded packs when New Zealand teenagers where shown US packs. The authors conclude that this finding supports the assumption that, when exposed to unfamiliar product stimuli, generic packaging allows respondents to perceive a greater proportion of information.

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**Data collection**

*Description*

The data used for this study was collected through focus group interviews conducted in eight secondary schools in New Zealand (NZ). Eighty focus group sessions were completed, with a total of 568 students, with an average age of 13. Each interview focused on three cigarettes packs from one of the following groups: NZ brand packs, US brand packs, NZ generic packs and US generic packs. According to the paper, the US packs were introduced to control for the effects of prior learning through advertising and experience concerning the NZ brands.[49]

Students were asked to carry out the following two exercises.

▪ After viewing and discussing the cigarette packs amongst the group, these were withdrawn from view and students were asked to draw as many details about each pack as they could recall. This exercise was completed individually and unaided.

▪ After completing the first exercise, the respondents were provided with a list of 10 health warnings and were asked to indicate any health warnings which they had seen during the experiment. Five of these were fictitious and only four represented warnings from NZ cigarette packs used in the experiment.

*Comments*

This study combines a group discussion with visual recognition survey. Although the latter avoids most of the common survey limitations (i.e., importance of question wording, question ordering, response scales, lack of attitude, right answer bias and lack of effort), the combination with a focus group may affect the quality of the results. Recollection results may be heavily influenced by the previous discussion including how it was led by the researcher and the reactions of other attendees. As mentioned in Section 3, the researcher may not always behave as a detached observer but as a participant and other attendees often aim to please rather than offer their own opinions or evaluations due to peer influence.

In addition, the focus group interviews were conducted in only eight secondary schools in the Dunedin area of NZ. This raises questions of sample representativeness and possible sample selection bias (i.e., the characteristics of the individuals may make them more or less susceptible to heath warning labels). Also, the fact adolescents from the same school participated in the focus group may have heightened the effect of peer influence on the discussion prior to the recollection exercise.

**Data analysis**

To assess the effects of generic packaging on individual abilities to recall health warning and brand names, the authors calculate the percentage of individuals recalling the brand

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[49] The validity of US packs as a control group for this exercise is unclear given that health warnings on US packs are very small. For the purpose of this analysis, a more appropriate control group would be unfamiliar brands with health warning of the same size. A priori, one would expect that the smaller the health warning, the more likely the effect of generic packaging on the warning recollection.

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names and the warning in both generic and regular packages. The results of this analysis, reproduced in Table 6, can be summarized as follows.

- A larger proportion of respondents remembered the brand names of the observed packs compared to the recollection of health warnings.

- No significant difference was observed in the brand recall rates between regular and generic packages. This result holds both for the NZ and US packs.

- No significant difference was observed in the recall rates of health warnings presented in NZ packs. For US packs, however, respondents' recall for the presence of health warnings was significantly greater for generic packs as compared to brand packs.

**Table 6: Percentage brand name and health warning recall rates**

|  | Brand name | Health warning |
|---|---|---|
| NZ brand | 80.1 | 79.4 |
| NZ generic | 83.1 | 82.3 |
| US brand | 69.3 | **45.2** |
| US generic | 71.5 | **65** |

*Notes: Statistically significant differences in the recall rates are indicated in bold.*
*Source: Beede and Lawson (1992), Table 1 and Table 2.*

According to the conclusion presented in the paper's abstract, the health warning achieved a significantly greater recall rate in generic packs than in branded packs. This conclusion, however, is a misleading representation of the results. The correct interpretation of the results is that generic packaging may allow individuals to perceive a greater amount of information in the case of non domestic products with smaller health warnings than the domestic products. However, for domestic products, such as NZ cigarettes in this study, generic packaging has no effect on health warning recollection.

We do not summarize the results of the second exercise, as the authors themselves indicate that their reliability is low.

**Conclusions**

In our view, the evidence presented in this paper cannot be used to support the introduction of generic packaging for cigarettes as a tool to reduce youth smoking.

First, the results of this paper regarding the effect of generic packaging on health warning recollection are mixed. The correct interpretation of the evidence shows that generic packaging does not increase the salience of health warnings on NZ brands but does increase the recollection by NZ adolescents of health warnings on US brands with unfamiliar packaging and very small health warnings. Generic packaging appears to have no effect on brand name recollection, irrespective of the brand.

Second, even if we place greater weight on the results showing that generic packaging increased the recollection of health warnings in New Zealand in the early 1990's, the evidence would be insufficient to support the introduction of generic packaging for the reasons listed below.

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- The comparison of health warning recall rates between branded and generic packages does not address the relevant question: How will recall rates be affected when all cigarettes sold in the market are generically packaged?

- Results of health warning recollection in New Zealand in the 1990's cannot be used to inform current generic packaging discussions because the size and appearance of health warning in New Zealand in the early 1990's differs significantly from those in 2008. At the time of the survey, health warnings in New Zealand occupied 25% of the front of tobacco packets and were limited to black and white text.[50] In many countries, graphical health warnings currently occupy at least 50% of the display surface.

- The recollection of NZ adolescents in the early 1990's of brand names and health warnings may be entirely different to that of adolescents in 2008 due to differences in regulatory environments. At the time of the survey, bans on tobacco sales to minors had not yet been implemented. Advertising was banned only banned from TV, radio, billboards and cinemas. Advertising in printed media was allowed as well as tobacco sponsorship of events. In addition, smoking was allowed in public places with some restrictions.[51]

- The paper does not address nor refer to any evidence on the causal link between youth smoking uptake and health warning recall rates and youth smoking uptake and brand recollection. The strength of the link between health warning and brand recall rates and youth smoking is not obvious as many factors simultaneously determine the decision start smoking.

## 9. Beede, P. and R. Lawson (1991). "Brand image attraction: the promotional impact of cigarette packaging".

**Summary**

This paper investigates the impact of cigarette packaging in promoting brand images. Through focus group discussions, stereotype profiles of cigarette brand smokers were identified and correlated with brands and pack types. The authors find that brand packs cluster into distinct groups each strongly associated with a user profile. Generic packs were found not to be associated with any distinct user-profile. The authors conclude that the promotion of unique brand images may enhance adolescents' susceptibility to smoking specific brands of cigarettes. The policy implications the authors derive from this result is that the reduction of brand image appeal can help increase the effectiveness of health and tobacco campaigns.

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[50] See ASH and Smokefree Coalition (2007), p.22.
[51] Smokefree Coalition, "The history of tobacco control in New Zealand", available at http://www.sfc.org.nz/infohistory.html.

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**Data collection**

*Description*

The data used for this study was collected through focus group interviews conducted in eight secondary schools in New Zealand (NZ). Eighty focus group sessions were completed, with a total of 568 students, averaging age 13. Each interview focused on three cigarettes packs from one of the following groups: NZ brand packs, US brand packs, NZ generic packs and US generic packs. Generic packs were constructed to the same physical specifications of their branded counterparts with the brand name presented in plain typeface on a white surface.

Discussions centred on the stereotype profiles of smokers associated with each brand of cigarette on display. Differences observed among brand packs were compared to user profiles associated with the generic pack.

*Comments*

The data analysed in this study was obtained through focus groups. As discussed in Section 3, focus groups data have the following limitations.

- First, responses may be heavily influenced by how the discussion is led by the researcher.

- Second, responses will depend on the reactions of other attendees, the group dynamics and the pressure of attendees to please or look good amongst peers. This limitation is particularly evident in this case as the focus groups were carried out amongst school class mates.

**Data analysis**

*Description*

Discussion on the descriptive terms which were common across brands or unique to specific brands resulted in the identification of seven composite user profiles.[52] Cigarette packs were clustered into nine distinct groups of images according to the colours and brand name format (e.g., large, plain, fancy).[53] Brand packs clustered into eight distinct groups and all generic packs were placed in a single group, with two exceptions.

Students were then asked to relate stereotype profiles of cigarette brand smokers with the cigarette pack images. The results indicated that user profiles were highly correlated with the cigarette pack images of the branded packs. The group of generic packs were not associated with any distinct user profile. The authors highlight that US brands elicited equally distinct user-profile images as compared to NZ brands despite the unfamiliarity with the foreign brands. The authors conclude from these results that the promotion of unique brand images may enhance adolescents' susceptibility to smoking specific brands of cigarettes. The authors then suggest that in order to increase the effectiveness

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[52] The seven profiles are: young kiwi joker, pensioner, aristócrate, club med, old hippie, loafer, suburbanite.

[53] For example, the physical characteristics of the group containing Benson & Hedges, Rothmans, John Brandon, Sportsman, Peter Jackson and Sterling is: "Variety of rich dark colours. All brand names are printed in a fancy, intricate style".

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of health and tobacco campaigns efforts should be undertaken to reduce the influence of brand image appeal.

At the end of each focus group, participants were asked to give their opinion regarding the likely effect of generic packaging on smoking initiation. Students in general replied that dull and boring packaging would deter curiosity and interest among children and thus decrease smoking initiation.

*Comments*

The main limitations of the data analysis is that (i) it fails to consider other plausible explanations for the results, (ii) it fails to take into account other factors that may influence the association between brand images and stereotypes (i.e., the analysis omitted relevant variables), (iii) it reaches conclusions that cannot be derived from the evidence provided and (iv) results on smoking initiation are derived from opinions of students on the likely effect of generic packaging on smoking initiation.

- The main result of this paper, that generic pack cigarettes elicit vague images of smoker stereotypes as compared to branded packs is not surprising. Since generic pack cigarettes do not actually exist, it is more difficult to associate them with any type of person as compared to brand packs. In addition, the design of the generic packs could influence the association with a stereotype. Other studies have shown that the colour of generic packs has an impact on the stereotype association (see Goldberg et al. 1995).

- In addition, the paper fails to take into account that other factors (i.e., price) can also be influencing the user-profile associated with a particular brand. To the extent that these factors are correlated with the type of package (i.e., most expensive cigarettes are sold in a pack with an aristocratic design), the association between the package design and a particular user-profile could be reflecting a relationship between these other factors and the user-profile (i.e., high-income level people smoke expensive cigarettes). The association between the type of package and the user profile could weaken or disappear once the influence of these other factors is taken into account.

- The conclusion that the effectiveness of anti-smoking campaigns can be increased by reducing the brand image appeal is not supported by the evidence presented in this paper.

- The conclusion that generic packaging would decrease smoking initiation corresponds to the opinions solicited by the researchers at the end of the focus group. In addition to the general limitations of focus groups for this type of analysis discussed in Section 3, these opinions may be severely biased due to peer pressure and student's perceptions of the objective of the focus group by the time this question was posed.

**Conclusions**

The evidence presented does not establish a reliable and robust link between generically packed cigarettes and images of smoker stereotypes.[54]

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[54]. For a more detailed explanation of these reliability and robustness, see Section 4.5.

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Nevertheless, even if a robust link between generically packed cigarettes and smoker stereotypes could be established, the findings are not sufficient to support the introduction of generic packaging for cigarettes to reduce youth smoking.

- First, the comparison of the relation between cigarette pack images and stereotype profiles cannot be used to infer how the generic packages will influence stereotype profiles and pack images when all cigarettes are sold in the market are generically packaged.

- Second, the only results in the paper addressing the relevant question which is the effect of generic packaging on smoking uptake by teenagers are based on a direct question at the end of the focus group regarding teenagers opinions on the likely effect of plain packaging at the end of the exercise. Teenagers predict that smoking initiation will decrease because of the "dull and boring" appearance of the packs. These speculative answers are not backed by evidence showing that generic packaging reduces youth smoking initiation. It is not obvious that "dull and boring" packages will reduce smoking initiation when all cigarettes available on the market are sold in generic packages.

- Third, the regulatory environment in NZ at the time of the study differs considerably from the current regulatory environments. Tobacco use and advertising restrictions are now more stringent and widespread than in NZ at the time of this study. For example, smoking bans in office buildings and in facilities that serve food, including bars and nightclubs had not been implemented in NZ at the time. Similarly, all media advertising, including sponsorship of sporting events had not been prohibited. Now-a-days, packaging cues no longer reinforce images portrayed through advertising and brand images are likely to be much weaker than when advertising was in place.

# Annex B
# References

Adamowicz, W. J. Louviere and J. Swait. 1998. "Introduction to Attribute-Based Stated Choice Methods", Final Report submitted to Resource Valuation branch, Damage Assessment Centre NOAA (US Department of Commerce).

ASH and Smokefree Coalition. 2007. "Tobacco Product Regulation and Policy Frameworks". Research report prepared by Gravitas Research and Strategy Limited. Available at http://www.sfc.org.nz/pdfs/gravitasreport.pdf.

Beede, P. et al. 1992. "The Effects of Plain Packages on the Perception of Cigarette Health Warnings", *Pub. Health,* 106: 315.

Beede, P. and R. W. Lawson. 1991. "Brand Image Attraction: The Promotional Impact of Cigarette Packaging". *New Zealand Family Physician,* 18: 175.

Bennett, J., M. Morrison and R. Blamey. 1998. "Testing the Validity of Responses to Contingent Valuation Questioning", *The Australian Journal of Agricultural and Resource Economics*, 42(2): 131-48.

Bertrand, M. and S. Mullainathan. 2001. "Do People Mean What They Say? Implications for Subjective Survey Data", *American Economic Review*, 91(2): 67-72.

Centre for Behavioural Research in Cancer. 1992. "Health Warnings and Contents Labelling on Tobacco Products".

Centre for Health Promotion, University of Toronto. 1993. "Effects of Plain Packaging on the Image of Tobacco Products Among Youth".

Centre for International Economics. 2001. "Review of Willingness-to-Pay Methodologies." A Report Prepared for Independent Pricing and Regulatory Tribunal of NSW.

Chaloupka, F. J. and K. E. Warner. 2000. " The Economics of Smoking". *Handbook of Health Economics.* A. J. Culyer & J. P. Newhouse (ed.), 1(29): 1539-1627. Elsevier

Diamond, P. A., and J. A. Hausman. 1994. "Contingent Valuation: Is Some Number Better than No Number?." *Journal of Economic Perspectives.* Vol. 8, No 4: 45-64.

Du Plessis, Eric. 2005. *The Advertised Mind.* London: Kogan Page.

Federal Judicial Center. 2000. *Reference Manual on Scientific Evidence.* An electronic version can be downloaded from http://air.f jc.gov/public/f jcweb.nsf/pages/16.

Gillian, A. 2007. "Cigarettes to Carry Graphic Health Warnings", *The Guardian,* August 30, available at http://www.guardian.co.uk/uk/2007/aug/30/health.smoking.

LECG

Grant, I.C., L.M. Hassan, G.B. Hastings, A.M. MacKintosh and D. Eadie. 2007. "The Influence of Branding on Adolescent Smoking Behaviour: Exploring the Mediating Role of Image and Attitudes", *Int. J. Nonprofit Volunt. Sect. Mark*.

Green, P and Y. Wind (eds). 2003. *Market Research and Modelling: Progress and Prospects. A Tribute to Paul E. Green*, International Series in Quantitative Marketing. Springer.

Hall, B. 2001. "How to Do Ethnographic Research: A Simplified Guide." Available at http://www.sas.upenn.edu/anthro/CPIA/methods.html.

Hanley N., S. Mourato and R.E. Wright. 2001. "Choice Modelling Approaches: a Superior Alternative for Environmental Valuation?". *Journal of Economic Surveys*, 15(3).

Heckman, J., F. Flyer and C. Loughlin. 2008. "An Assessment of Causal Inference in Smoking Initiation Research and a Framework for Future Research", *Economic Inquiry*, 46(1):37-44.

Heckman, J., J. Stixrud and S. Urzua. 2006. "The Effects of Cognitive and Noncognitive Abilities on Labor Market Outcomes and Social Behavior". *Journal of Labor Economics*. 24: 411-82.

Kahneman, D., and J. L. Knetsch. 1992. "Valuing Public Goods: The Purchase of Moral Satisfaction." *Journal of Environmental Economics and Management*. 22: 57-70.

Li, C. and L. Mattsson. 1995. "Discrete Choice under Uncertainty: An Improved Structural Model for Contingent Valuation", *Journal of Environmental Economics and Management*, 28: 256-269.

Lucas, R. E. Jr. 1976. "Econometric Policy Evaluation: A Critique", Carnegie Rochester Conference Series on Public Policy. 1: 19-46.

Marshall and Rossman. 1999. *Designing Qualitative Research*. 3rd Ed. London Sage Publications.

Goldberg, M. et al. 1995. "When Packages Can't Speak: Possible Impacts of Plain and Generic Packaging of Tobacco Products". Report for Health Canada.

Goldberg M. et al. 1999. "The Effect of Plain Packaging on Response to Health Warnings", *Amer. J. Pub. Health,* 89: 1434.

Northrup D. and J. Pollard. 1995, "Plain Packaging of Cigarettes, Event Marketing to Advertise Smoking, and Other Tobacco Issues: a Survey of Grade seven and Grade Nine Ontario Students". Institute for Social Research. York University.

Pérez-Stable E. J., B. V. Marín, G. Marín, D. J. Brody, and N. L. Benowitz. 1990. "Apparent Underreporting of Cigarette Consumption among Mexican American Smokers". *American Journal of Public Health*, 80: 1057-1061.

Pierce, J. et al. 1998. "Tobacco Industry Promotion of Cigarettes and Adolescent Smoking". *Journal of the American Medical Association*, 279(7), pp. 511-515.

Rauscher, F., G. Shaw, and K. Ky. 1993. "Music and Spatial Task Performance." *Nature*, *365:* 611.

Rootman, I., et al. 1996. "A study on Youth Smoking: Plain Packaging, Health Warnings, Event Marketing, and Price Reductions. Key Findings".

LeCG

Stock, J. H., and Mark W. Watson. 2003. *Introduction to Econometrics.* Boston, MA: Addison Wesley.

Sudman, S., N. M. Bradburn and N. Schwartz. 1996. *Thinking about Questions: The Application of Cognitive Processes to Survey Methodology.* San Francisco: Jossey-Bass Publishers.

Tanur, J. M. 1992. *Questions about Questions: Inquiries into the Cognitive Biases of Surveys.* New York: Russell Sage Foundation

Topel, R. H. 1991. "Specific Capital, Mobility and wages: Wages Rise with Job Seniority." *Journal of Political Economy*, 99(1): 145-176.

Toubia, O., J.R. Hauser, and D. Simester. 2004. "Polyhedral Methods for Adaptive Choice-based Conjoint Analysis," *Journal of Marketing Research*, 41(1): 116-131.

Walvis, T H. 2003. "Avoiding Advertising Research Disaster: Advertising and the Uncertainty Principle", *Journal of Brand Management*, 10(6): 403-409.

Warner, K. E. 1978. "Possible Increases in the Underreporting of Cigarette Consumption". *Journal of the American Statistical Association.* 73(362): 314-318.

West Virginia Health Statistics Center. 2000. "Estimated Number of Adult Cigarette Smokers and Cigarette Consumption West Virginia, 1990-1999". Available at http://www.wvdhhr.org/bph/oehp/hsc/briefs/three/.

WHO Study Group on Tobacco Product Regulation. 2005. "Best practices in tobacco control : regulation of tobacco products : Canada report".

# Annex C
# Authors' CVs

## Jorge Padilla

Jorge Padilla is the Managing Director of LECG's European competition policy practice.

Dr. Padilla advises clients on a variety of competition policy and intellectual property and consumer choice issues, covering a wide range of industries, including retail electricity, media, telecommunications, entertainment and technology. He has advised on various cases and given expert testimony before the Cypriot, Dutch, French, German, Irish, Italian, Portuguese, Spanish, and UK competition authorities, as well as in cases before the European Commission. Dr. Padilla has also submitted written testimony to the European Court of First Instance and the UK Competition Appeals Tribunal in state aid, cartel, merger control and abuse of dominance cases. He has also given expert testimony in various civil litigation (damages) and international arbitration cases. His work has also involved the application of survey methods, choice modelling techniques and econometrics in wide range of industries to design optimal pricing policies, design tariffs and for valuation of assets.

Dr. Padilla earned M. Phil and D. Phil degrees in economics from the University of Oxford. He is a Research Fellow of the Centre for Economic Policy Research (CEPR, London) and the Centro de Estudios Monetarios y Financieros (CEMFI), and is or has been member of the editorial boards of Competition Policy International, the Review of Economic Studies, the Spanish Economic Review and Investigaciones Económicas (which he directed for more than three years).

Dr. Padilla has written several papers on competition policy and industrial organisation in the Antitrust Bulletin, the Antitrust Law Journal, the Boston University Journal of Science and Technology Law, the Economic Journal, the European Competition Law Review, the European Economic Review, the Fordham International Law Journal, the International Journal of Industrial Organization, the Journal of Competition Law and Economics, the Journal of Economics and Management Strategy, the Journal of Economic Theory, the RAND Journal of Economics, the Review of Financial Studies, the University of Chicago Law Review, and World Competition. He is also co-author of The Law and Economics of Article 82 EC, Hart Publishing, 2006.

**EDUCATION**

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University of Oxford, Nuffield College
D. Phil in Economics, 1992
Thesis title: "Essays on the Economics of Consumer Switching Costs"
Advisor: Dr. Paul D. Klemperer

University of Oxford, St. Antony's College
M. Phil in Economics. (George Webb Medlay Medal for Best Performance in Written
Exams, Prize for Best M. Phil Thesis), 1990

University of Alicante, Spain
B.A. in Economics (with Honours), 1998


## PRESENT POSITION

LECG, Managing Director, March 2004 onwards

Dr. Padilla's project experience in the European Union includes:

- *Abusive behaviour:* analysis and advice to clients on market definition, pricing and non-pricing strategies in connection with abuse of dominant position proceedings before the European Commission and the British, French, Dutch, German, Irish, Italian, Portuguese and Spanish competition authorities*.*

- *Mergers*: economic analysis and advice to clients in connection with merger inquiries by the European Commission and the competition authorities in France, Germany, Ireland, Italy, the Netherlands, Spain and the United Kingdom.

- *State aids:* economic analysis and advice to clients in connection with state aids investigations conducted by the European Commission.

- *Competition policy advice:* author of a study on supply-side substitution for the European Commission (DG Enterprise and DG Competition). Director and principal author of a study on competition policy in the new economy for the Department of Industry of the Catalan Government. Director and author of a study on the competitive implications of switching costs for the Office for Fair Trading.

- *Litigation*:  production of expert economic reports and analyses in connection with a wide range of litigation arising from the application of competition laws and intellectual property laws in various European jurisdictions.

- *Proactive advice:* advice to clients on the competition policy implications of their business strategies, development of codes of conduct, design and implementation of compliance programs.

- *Intellectual property:* valuation of performance and mechanical rights in the entertainment industry. Advice in compulsory licensing cases.

Outside the European Union, Jorge has participated in projects in:

- *United States:* Jorge has contributed to the economic literature on the economic implications of lock in/compatibility and the economics of payment systems in a series of publications in European and U.S. economic journals, such as the RAND Journal of Economics. He has also taught at Boston University as a visiting professor. In the U.S., Jorge has delivered academic seminars at Boston University, MIT-Sloan, New York University, University of Iowa, University of Michigan and the

International Monetary Fund. He has also spoken about competition policy in New York, Santa Fe (NM) and Washington DC before audiences including members of the DoJ (Charles James and Bill Kolasky) and the FTC (Commissioner Thomas Leary).

▪ *Other countries: advice* in antitrust and cartel cases in Argentina, Jamaica and Turkey*.*

## PROFESSIONAL EXPERIENCE

NATIONAL ECONOMIC RESEARCH ASSOCIATES, 1998 – 2004
Director and Managing Director

CENTRE FOR ECONOMIC POLICY RESEARCH (CEPR), LONDON, 1993-onwards
Research Fellow (Industrial Organization)

CENTRO DE ESTUDIOS MONETARIOS Y FINANCIEROS, MADRID, 2003-onwards
Research Fellow

CENTRO DE ESTUDIOS MONETARIOS Y FINANCIEROS, MADRID, 1991-2003

Professor of Economics.

## OTHER PROFESSIONAL ACTIVITIES

Association of Competition Economists, 2003-2006
Member of the Program Committee

Universiteit Nyenrode, Amsterdam, 2003-2004
Member of the Steering Committee of the Nyenrode Institute for Competition.

Review of Economic Studies, 1999-2001
Member of the Editorial Board.

Fundación Empresa Pública, 1997-2000
Editor of the economic journal *Investigaciones Económicas.*
Massachusetts Institute of Technology, Sloan School of Management, 1997
Visiting Professor*.*

Boston University, 1996-1997.
Visiting Professor.

Revista Española de Economía, 1995-1996
Co-editor.

London School of Economics, London, 1995.
Visiting Professor at the Financial Markets Group.

Bocconi University, Milan, 1993.
Visiting Professor at IGIER.

## TEACHING ACTIVITIES

LeCG

Barcelona Graduate School of Economics, "Competition and Market Regulation Master", 2008, Barcelona.

King's College, "Competition Law and Regulated Network Industries course", 2008, London.

The Graduate School in Social, Economic and Political Sciences of the University of Milan, "Summer School In Competition Policy and Market Regulation", 2007- onwards, Milan.

## PUBLICATIONS (in English)

*"Consumer switching costs: a survey",* Investigaciones Económicas, 15, pp. 485-504, 1991.

*"Mixed pricing in oligopoly with consumer switching costs*", International Journal of Industrial Organization, 10, pp. 393-411, 1992.

*"Delegation in international monetary policy games*", joint with Juan J. Dolado and Mark Griffiths, European Economic Review, 38, pp. 1057-1069, 1994.

*"Shared ATM networks and banking competition",* joint with Carmen Matutes, European Economic Review, 38, pp. 1057-1069, 1994.

*"Revisiting dynamic duopoly with consumer switching costs",* Journal of Economic Theory, 67, pp. 520-530, 1995.

*"Product line decisions and the Coase conjecture",* joint with Kai-Uwe Kühn, Rand Journal of Economics, 27.2, pp. 391-414, 1996.

*"Dynamic banking: a reconsideration",* joint with Sudipto Bhattacharya, Review of Financial Studies, 9.3, pp. 1003-1031, 1996.

*"Wage bargaining in industries with market power",* joint with Samuel Bentolila and Juan J. Dolado, Journal of Economics and Management Strategy, 5.4, pp. 535-564, 1996.

*"Endogenous communication among lenders and entrepreneurial incentives",* joint with Marco Pagano, Review of Financial Studies, vol. 10.1, pp. 205-236, 1997.

*"Do firms' product lines include too many varieties?",* joint with Paul Klemperer, Rand Journal of Economics, vol. 28.3, pp. 472-488, 1997.

*"Multilateral Institutions for International Economy Policy Coordination: Bargaining versus Voting*", joint with Antonio Morales, Spanish Economic Review, 1999.

*"Banking (conservatively) with optimists*", joint with Michael Manove, Rand Journal of Economics, vol. 30.2, pp. 726-744, 1999.

*"Financial distress, bank debt restructurings and layoffs",* joint with Alejandro Requejo, Spanish Economic Review, vol. 2(2), pp. 73-103, 2000.

*"Sharing default information as a borrower discipline device",* joint with Marco Pagano, European Economic Review, vol. 44, n. 10, pp. 1951-1980, 2000.

*"The costs and benefits of the strict protection of creditor rights: theory and evidence*", joint with Alejandro Requejo, in Gavin and Pagano (eds.) Institutional Arrangements to

LECG

Ensure Willingness to Repay in Financial Markets, Inter-American Development Bank, 2000.

*"Competition policy in the New Economy: Is European Competition Policy up to the challenge?,* joint with Christian Ahlborn and David S. Evans, European Competition Law Review, vol. 22.5, pp. 156-167, 2001. (in www.lecgcp.com)

*"The complex landscape of oligopolies under EU competition policy. Is collective dominance ripe for guidelines?",* joint with Juan Briones, World Competition, vol. 24, No. 3, pp. 307-318, 2001.(in www.lecgcp.com)

*"The Role of Supply-side Substitution in the Definition of the Relevant Markets in Merger Controls",* Report to the European Commission, 2001.

*"Collateral versus project screening: A model of lazy banks*", joint with Michael Manove and Marco Pagano, RAND Journal of Economics, vol. 32, No. 4, pp. 726-744, 2001.

*"Union Power, Replacement, and Labor Market Dynamics",* joint with Kai-Uwe Kühn, Economic Journal, vol. 112, No 479, pp. 317-343, 2002.

*"Fiscal Policy and the Implementation of the Walsh Contract for Central Bankers",* joint with Haizhou Huang, Annuals of Economics and Finance, vol. 3, pp. 27-42, 2002.

*"Tying in Platform Software: Reasons for a Rule-of-Reason Standard in European Competition Law",* joint with David S. Evans and Michele Polo, vol. 25  No. 4 pp. 509-514, 2002.

*"The Efficiency Offence Doctrine in European Merger Control",* in William Rowley and Michael Reynolds (eds.), International Merger Control: Prescriptions for Convergence, International Bar Association, pp. 117-123, 2002

*"The Antitrust Economics of Tying: A Farewell to Per Se Legality*", joint with Christian Ahlborn and David S. Evans, Antitrust Bulletin, Winter 2003.

*"Demand-Side Efficiencies in Merger Control,*" World Competition, joint with David Evans, Vol. 26, No. 2, Summer 2003.

*"Switching Costs*", joint with Ciara Mc Sorley and Mark Williams, DTI-OFT Discussion Paper No 5, 2003.

*"A Pragmatic Approach to Identifying and Analyzing legitimate Tying Cases",* joint with David S. Evans and Michael S. Salinger*,* European Competition Law Annual: 2003, Hart Publishing, 2006*.*

"*Tying Under Article 82 EC and the Microsoft Decision: A Comment on Dolmans and Graf*", World Competition, David S. Evans, World Competition, December 2004

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"*Excessive Prices: Using Economics to Define Administrable Legal Rules*", joint with David S. Evans, Journal of Competition Law and Economics, 2005.

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*"Rebates as an Abuse of Dominance under Article 82 EC",* joint *with* Donald Slater, GCLC Research papers on Article 82 EC, July 2005.

*"Innovation, Competition and the Lisbon Agenda",* joint with Henri Piffaut*,* The Lisbon Scorecard VII, CER, February 2007.

*"From Fairness to Welfare: Implications for the Assessment of Unilateral Conduct Under EC Competition Law",* joint with Christian Ahlborn, in M. Marquis and C-D. Ehlermann (eds.)*, European Competition Law Annual 2007,* Hart Publishing, forthcoming 2008.

*"Compensation for SGEI: An Economists' Look at the Altmark Test and the Community Framework",* join with Urs Haegler, in J. Derenne and M. Merola (eds.), Economic Analysis of State Aid Rules-Contributions and Limits, Lexxion, 2007.

"*The Economics of High-Tech Antitrust",* joint with Anne Layne-Farrar and James Langenfeld, Global Competition Review, April 2007.

*"Pricing Patents for Licensing in Standard Setting Organisations: Making Sense of FRAND Commitments",* joint with Anne Layne-Farrar and Richard Schmalensee, Antitrust Law Journal, vol 74, Issue 3, 2007.

*"Efficiencies in mergers: Williamson Revisited",* in W. D. Collins (ed.), Issues in Competition Law and Policy, American Bar Association, forthcoming 2008.

*"The Complements Problem within Standard Setting: Assessing the Evidence on Royalty Stacking",* joint with Anne Layne-Farrar and Damien Geradin, forthcoming in the Boston University Journal of Science and Technology Law, 2008


**PUBLICATIONS (Other languages)**

*"Privatizaciones británicas: un comentario",* Moneda y Crédito, 196, pp.123-125, 1993.

*"Los premios Nobel de economía 1994*", joint with Rafael Repullo, Cuadernos de Economía, 1994.

*"Un ensayo sobre la competencia bancaria en el mercado de depósitos",* joint with Carmen Matutes, Cuadernos Económicos ICE, 57, pp. 141-159, 1994.

*"Competencia en el mercado de seguros médicos*", in G. López (ed.) Análisis Económico de la Sanidad, Servei Català de la Salut, Barcelona, pp. 95-115, 1995.

*"Privilegio salarial y reestructuración empresarial: el papel del Fondo de Garantía Salarial",* joint with Alejandro Requejo, Moneda y Crédito, 206, 1998.

*"La ´segunda oportunidad´: el tratamiento legal de la quiebra personal en España y su reforma",* joint with Alejandro Requejo in Mas-Collet and Motta (eds.) Nuevas Fronteras de la Política Económica, 1999.

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*"Comentarios a ´El euro y el futuro de la banca española´* by Jordi Gual in R.Caminal (ed.) El euro y sus repercusiones sobre la economía española, Fundación BBV, 1999.

*"Política de competencia y estrategia empresarial"* joint with Ana Ramos, Harvard Deusto Business Review, November-December, No. 93, pp. 84-93, 1999.

*"Crisis y reorganización empresarial en España: el papel de los bancos*", joint with Alejandro Requejo, Papeles de Economía Española, vol. 84-85, 208-221, 2000.

*"Los Estados Unidos contra Microsoft: innovación, integración tecnológica y derecho de la competencia",* joint with Andrei Hagiu, Gaceta Jurídica, vol. 215, pp. 10-25, 2001.

*"Competencia e Innovación en la Nueva Economía",* joint with Enrique Cañizares, Daniel Domínguez and Ana Ramos, Generalitat de Catalunya, Papers d'Economia Industrial, No 16, 2001.

*"La sustituibilidad de la oferta en el análisis de las concentraciones empresariales",* joint with Inmaculada Gutiérrez, Fundación ICO, Anuario de Competencia 2001, 2002.

*"Economía de la Competencia"*, en *Tratado de Derecho y Economía de la Competencia*, joint with Inmaculada Gutiérrez, Ed. Bosh. 2005.

*"Practicas Unilaterales, Normas de Competencia y Revisión Judicial: Una primera mirada desde la EU",* joint with Christian Ahlborn and David S. Evans, in *El Derecho de la Competencia y los Jueces*, Fundación Rafael del Pino, 2007.

*"Quel bilan de la réforme de la DG Concurrence?"*, joint with David Sevy, Concurrences, nº 2, May 2007.

*"El "mercado" de generación eléctrica en España: estructura, funcionamiento y resultados",* joint with Alejandro Requejo and Luis Agosti, Economía Industrial, nº 364, 2007.


**WORKING PAPERS**

"Royalty Stacking in High Tech Industries: Separating Myth from Reality", joint ith Damien Geradin, Anne Layne-Farrar, December 2006.

"The Reform of Article 82: What we agree, what we are still discussing and what will have to be discussed", July 2007.

"Positive and Normative Implications of the third Anti-Patent Crusade", joint with David J. Teece, October 2007.

"Article 81 Revisited: Deciphering EC Antitrust Goals and Rules", joint with Matthew Bennett. Presented at the Conference "Fifty Years of the Treaty: Assessment and Perspectives of Competition Policy in Europe", Barcelona, November 2007.

"El Papel Disuasorio de las Sanciones: Una reflexión motivada por las nuevas Directrices Comunitarias", joint with Elena Zoido, presented at the Cuarto Seminario de Derecho y Economía de la Competencia de la Fundación Rafael del Pino, November 2007.

"Revisiting Injunctive Relief: Interpreting eBay in High-Tech Industries with Non-Practicing Patent Holders", joint with Anne Layne-Farrar, Vincenzo Denicolò and Damien Geradin, December 2007.

"Standard Setting, Rand Licensing and Ex Ante Auctions: The policy Implications of Asymmetry", joint with Anne Layne-Farrar and Damien Geradin, December 2007.

"Ex-Ante Negotiations in Standard Setting Organizations", joint with Anne Layne-Farrar and Gerard Llobet, February, 2008.


## Nadine Watson

Nadine Watson is a Principal at LECG's European competition policy practice Prior to this, she held positions as a Consultant in the competition policy group at NERA and as a researcher at the Bank of Spain.

Nadine specialises in the application of discrete choice models and other econometric techniques to competition policy and strategic problems. Her work has involved application of choice modelling surveys and techniques to design optimal pricing policies for complex services such as Internet and mobile telephony. She has also successfully applied these and other econometric techniques to evaluate market power, define relevant markets and evaluate the competitive impact of mergers in various industries including music, retail, tobacco and steel. Other projects have included estimation of the scope and duration of cartel infringements and damage calculations in connection with cartel investigations.

Nadine obtained a PhD. in Economics from the University of California at San Diego where she specialised in Applied Econometrics, Monetary and Labour Economics. Prior to joining LECG, she worked as researcher at the Bank of Spain and the Banco de la República of Colombia and as visiting professor at the Universidad Complutense of Madrid.

Prior to joining LECG, she worked in the Competition Policy group at NERA between November 2000 and March 2004.


### EDUCATION

UNIVERSITY OF CALIFORNIA, San Diego
PhD. in Economics, 1996
MA in Economics, 1995

UNIVERSIDAD DE LOS ANDES, Bogotá, Colombia.
MA in Economics, 1990
BA in Economics, 1988


### PROFESSIONAL TRAINING

KING'S COLLEGE, LONDON
EC Competition Law diploma, May 2007

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UNIVERSITY COLLEGE, LONDON
Centre for Microdata Methods and Practice (CEMMAP)
Masterclass "Applied Econometrics of Differentiated Products: Consumer Choice and Competition", Jerry Hausman, 2004

CENTRO DE ESTUDIOS MONETARIOS Y FINANCIEROS (CEMFI),
Diploma in Panel Data Econometrics, Summer School in Economics and Finance, 2003. Tutor: Manuel Arellano

CENTRO DE ESTUDIOS MONETARIOS Y FINANCIEROS (CEMFI),
Diploma in Empirical Industrial Organization, Summer School in Economics and Finance, 2003. Tutor: Eugenio Miravete.

## PRESENT POSITION

LECG, Principal

## PROFESSIONAL EXPERIENCE

NATIONAL ECONOMIC RESEARCH ASSOCIATES, 1998 – 2004
*Consultant, 2001 – 2004*
*Analyst, 1998 – 2000*

BANK OF SPAIN, 1997– 1998
*Postdoctoral Research Fellow*
Conducted research on the transmission of monetary policy through the credit channel and on the elasticity of money demand, both using firm level data

JUNTA MONETARIA, Colombia, 1990-1991
*Research Officer*
Conducted research on various topics presented to the Monetary Board.

BANCO DE LA REPUBLICA, Colombia, 1998-1990
Conducted research on Colombia's financial system including a proposal for the adoption of risk based capital adequacy measures in the Colombian banking system.

## ACADEMIC EXPERIENCE

UNIVERSIDAD COMPLUTENSE DE MADRID
*Visiting Professor*
Taught Macroeconomics and Microeconomics.

UNIVERSITY OF CALIFORNIA, San Diego, 1993-1996
*Teaching Assistant, Department of Economics and Department of Linguistics, U.C. San Diego*
Taught Financial Investments, Microeconomics, Macroeconomics, and Housing Policy.

## WRITTEN TESTIMONY AND CONSULTING REPORTS

*Choice modelling*

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- An empirical investigation of the music recording industry focused on statistically analyzing and quantifying the music business, carefully modeling the various determinants of CD sales, and assessing the likely reaction of music consumers to new, legitimate on-line music services. The final report is entitled "The digital music opportunity" and is available at http://www.emigroup.com/financial.html (EMI Digital music investor day, London, 1 July 2004)".

- For a Spanish mobile telephony operator, design of a strategy to increase market share in the residential and business market.

- For a Spanish telecommunication operator, design of its Internet strategy and estimation of the demand for new services (access, web hosting, web housing and e-commerce) in the Spanish small and medium enterprise market.

- For a European cable TV company, design of the optimal portfolio of TV services taking market segmentation into account.

### *Competition Policy*

- Evaluation of the competitive impact of mergers in the music recording, airline, and tobacco industries.

- Econometric analysis of the effects of cartels in the chemical, fresh foods and air cargo industries.

- Economic assessment of the potential impact of a merger applying econometric techniques of demand estimation and merger simulation in the tobacco industry.

- Empirical analysis of the impact of standardization on royalty rates and other contract terms in the European telecommunications industry in the context of an excessive prices and abuse of dominant position investigation.

- Analysis of competitive effects of a proposed merger in an industrial products industry.

- Definition of relevant market using quantitative methods in a dairy industry in Spain.

- Analysis of the impact of a proposed merger in the book publishing industry using econometric techniques and merger simulation methodologies.

- Evaluation of the competitive impact of a merger in the beer industry focusing on the possible creation of entry barriers and exclusion of competitors.

- Analysis of consumer surveys presented in preliminary injunction to the Court of Second Instance suing for inclusion in the client's timetables on the grounds that these constitute an essential facility.

- For the Office of Fair Trade, review of empirical methods for estimating switching costs using aggregate market data.

- Estimation of residual demand elasticities and cost pass through rates to evaluate the competitiveness of gasoline industry in a cartel investigation launched by the French Competition Authority.

- Evaluation of the competitiveness of the tobacco industry in a case of alleged pricing agreements.

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- Quantitative evaluation of the economic impact of a merger in the Spanish do-it-yourself market.

- Evaluation of the competitive impact of an acquisition in the Spanish auditing business.

- Design of a methodology for market definition and the analysis of effective competition in the electronic communications sector.

- Evaluation of competitiveness in the Philippine cement market using sophisticated econometric analysis.

- Definition of the relevant geographic market in the steel industry using quantitative techniques.

### *Telecommunications*

- For a participant in a UMTS licence contest in Portugal, evaluation of the economic impact of the operator's project using Leontieff's Input-Output methodology.

- For the Secretaría General de Comunicaciones, analysis of the mobile telecommunications sector including forecasts of future trends.

- For a new entrant in the Spanish fixed telephony market, evaluation of its ADSL strategy.

- For a participant in the contest for LMDS licences in Spain, evaluation of the economic impact of the project using linear models.

- Modelling of long run incremental costs of Telefónica's interconnection and access services for a Spanish telecommunications operator.

- Regulatory advice on the regulatory cost accounting principles proposed by the Spanish regulator for a Spanish telecommunications operator.

- Regulatory advice on call termination charges for Internet traffic for a Spanish telecommunications operator.

- Report analysing the definition, quantification and recovery of the access deficit, for a Spanish telecommunications operator.

### PUBLICATIONS

"Evaluación de efectos coordinados en concentraciones", Derecho de la Competencia Europeo y Español, Vol. VIII, 2008.

"Eficiencia judicial y eficiencia económica: el mercado crediticio español", Joint with A. Jorge Padilla, Vanesa Llorens and Soledad Pereiras, Libro marrón, Círculo de Empresarios, ISSN 1133-1771, Nº. 1, 2007.

"Are There Economies of Scale in the Demand for Money by Firms? Some Panel Data Estimates", joint with O. Bover, Journal of Monetary Economics, 52, 2005.

"Review of empirical methods for identifying and measuring switching costs", OFT Economic discussion paper 5 Annexe B, April 2003.

"The Telecommunications Sector in Spain," with J.M Rodriguez, Privatisation

International, Yearbook on Utility Regulation, 1999.

"El canal del crédito bancario: un análisis empírico con datos empresariales," Boletín Económico, Banco de España, May, 1999.

"Bank Lending Channel Evidence at the Firm Level," Working Paper No. 9906, Servicio de Estudios, Banco de España, 1999.

"Migration Effects of Minimum Wage Hikes," Economics in Action, University of California, San Diego, 1997.

"Indicadores de solvencia del sistema bancario: aplicación de la propuesta de Basilea a Colombia," Ensayos sobre Política Económica, No. 16, December, 1989.


## RECENT PRESENTATIONS AND SPEECHES

"Instrumentos empíricos en política de competencia", IX Jornadas sobre Política de la Competencia, Universidad Carlos III de Madrid, April 2008.

"Descripción y Aplicación de Métodos Cuantitativos en Control de Concentraciones", Seminario sobre la Teoría Económica y el Derecho de la Competencia en el XI Curso de Derecho de la Competencia Comunitario y Español, March 2008.

"El análisis económico de sectores de Nueva Economía: Nuevas herramientas conceptuales", Advanced Program in Competition Policy: Economic and Legal Issues, Instituto de Empresa, 2007 and 2008.

"Aspectos Económicos de las Reclamaciones de Daños". Advanced Program in Competition Policy: Economic and Legal Issues, Instituto de Empresa, 2007 and 2008.

"Efectos coordinados en el control de concentraciones: Uso de métodos cuantitativos", Spanish Association of Competition Economics, October 2007.

"Quantitative Techniques for Market Definition", Advanced Program in Competition Policy: Economic and Legal Issues, Instituto de Empresa, February 2006.

"Quantitative Techniques for Market Definition", Course on Spanish and European Competition Policy, Universidad Rey Juan Carlos, February 2005.

 "Vertical Restrictions and Pricing Strategies", Course on Spanish and European Competition Policy, Universidad Rey Juan Carlos, February 2004.

"Market Structure Analysis", on Spanish and European Competition Policy, Universidad Rey Juan Carlos, February 2004.

"Assessment of market competitiveness using quantitative techniques". Presentation for the Comisión del Mercado de las Telecomunicaciones, January 2003.

"Advanced issues in market definition (after markets, bundling, new economy, and quantitative methods". Presentation for the Comisión del Mercado de las Telecomunicaciones, January 2003.

The demand side of a business plan". Presentation at the Workshop *How to successfully bid for a UMTS licence. Valuation and bidding strategies.* Paris 2000.


## HONOURS AND PROFESSIONAL ACTIVITIES

LeCG

Research Fellowship Bank of Spain

Outstanding Teaching Award, University of California, 1996

Tuition and Fee Scholarship, Banco de la República, 1991-1993

**LANGUAGES**

English and Spanish, both fluent.