

Multimodal Efficacy of Health Warnings on UK Cigarette Packages: A Cognitive-Semiotic Analysis

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Abstract

This study investigates the impact of health warnings on cigarette packages in the UK. The common health warnings, their specific communicative functions and their effectiveness in influencing consumer behaviour and perception remain underexplored. This study aims to fill this gap by employing a qualitative multimodal social semiotic analysis to understand how textual and pictorial warnings function to communicate health-related messages effectively. The theoretical frameworks guiding this analysis are Kress's approach (2010) Multimodal Social Semiotic and Forceville's model (2020) of Visual and Multimodal Communication. Methodologically, the study focuses on a purposive sample of seven UK cigarette packages, analysing the warnings for their semiotic effectiveness and pragmatic functions. The study reveals effective health warnings on UK cigarette packages that integrate textual, visual, and design elements. The findings also highlight the importance of cognitive relevance, showing that warnings which balance cognitive effort with substantial rewards—like emotional impact—more effectively influence behaviour change. The study suggests that more effective health warnings on cigarette packages should use a strategic integration of text, imagery, and design. It also recommends regular updates to warning designs based on ongoing audience research and enhanced public engagement in the design process to ensure that warnings remain relevant and impactful.

Keywords: Health warnings, cigarette packaging, multimodal communication, cognitive relevance, public health policy

Introduction

Worldwide, tobacco consumption is a significant challenge to public health due to its association with many diseases and early deaths (Schluger & Koppaka, 2014). In the United Kingdom, the use of textual and pictorial warnings in cigarette packs has been an integral part of tobacco control policies (Harris et al., 2006). Health warnings aim to prevent smoking by informing both smokers and the general population about the risks involved. Health warnings are commonplace but their specific communicative functions especially in terms of influencing consumer behaviour and perception are hardly understood (Noar et al., 2016).

Therefore, the study analyses the pragmatic functions that these warnings perform as well as how such practical functions stem from the text-image dynamics within health communication. Verbal and pictorial warnings have cognitive and emotional effects on individuals which may induce them to change their behaviour (Dhani et al., 2021). Nonetheless, this area has not been properly explored on how far health warnings serve their intended communicative purposes, especially within the multimodal framework. This gap in research presents a critical area of inquiry, as the effectiveness of health warnings directly influences public health outcomes and policy efficacy. Such a focus by this study on the UK context becomes significant because stringent regulations on tobacco packaging have been put in place besides innovative approaches being used in this region. The UK has taken a leading role globally in implementing comprehensive tobacco control measures that include among others some of the most graphic direct warnings found on cigarette packages. Consequently, this environment offers an excellent opportunity for examining various elements of warnings that contribute to their overall pragmatic function.

The Multimodal Social Semiotic approach by Kress (2010) adopted here examines how texts come into play with images providing insight into how these modes work together towards conveying health risks. It is especially appropriate for studying how meaning gets constructed or interpreted when dealing with health communications. Besides, Forceville's model (2020) also offers a nuanced framework for understanding how

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visual and multimodal elements effectively convey messages by adhering to principles of cognitive relevance. This study focuses on what different multimodal signs present as advising, deterring, warning etc.

It is expected that the findings of this study reveal pragmatic roles played by health warnings in communicating health hazards thus adding to a wider literature on public health strategies as well as tobacco control. The study, therefore, seeks to enlighten policymakers and health communicators by giving a detailed examination of verbal and pictorial warnings on packages of cigarettes in the UK which have been adopted as a tool for improving tobacco control measures. Finally, this study is aimed at enhancing the effectiveness of health warnings thereby resulting into improved health outcomes and informed consumer choice.

Problem Statement

Tobacco use remains one of the most preventable causes of diseases and deaths worldwide meaning that effective methods to control it should be prioritized by public health authorities (Perez-Warnisher et al., 2019). In many countries including the United Kingdom, textual and pictorial warnings on cigarette packages are among the major strategies used to deal with this tobacco epidemic (Brewer et al., 2016). Health warnings are intended to inform consumers about the risks of smoking, discourage tobacco use, and ultimately reduce the incidence of smoking-related diseases. However, despite their widespread adoption, significant difficulties still exist in assessing their effectiveness or ensuring they work properly (Damalas & Eleftherohorinos, 2011).

The effect of health warnings on smoking behaviour is not as plain, and many things influence it including cultural differences, psychological factors, individual differences and the like (Hammond, 2011). Studies (e.g. LaVoie et al., 2017) reveal variation in reactions to health warnings among individuals showing that all warnings may not be effective equally across different demographic groups. It is also difficult to say what kind of designs or content would best achieve the intended health impacts.

Furthermore, there is a lack of knowledge about how these multimodal elements (text and images) function in communication terms for warning sections. While there are several types of research conducted on the general effects of health warning labels on cigarette packs, very few have attempted to find out the resultant effects that they have – this means their risk conveying capability, reflection prompting nature, emotional reactions caused by them and persuasive capacity towards smoker behavioural change. To make matters worse, this knowledge gap has made policymakers unable to develop more robust warnings.

Again, an ever-changing field of tobacco products and marketing strategies requires that continuous evaluations be done on the importance and performance of current cautionary inscriptions. This implies that tobacco control policies need a sound understanding of how existing warnings work amidst broader consumer interactions and media influences as the industry keeps changing its tactics. The current study, therefore, aims to fill these gaps through the application of the Multimodal Social Semiotic approach (Kress, 2010) which could specifically analyse pragmatically verbal-pictorial warnings found on UK cigarette packages. These include understanding how such information warns smokers about dangers involved or affects perception leading to change either positively or negatively; something essential in shaping apt public health messages thus improving the overall strategy of UK tobacco control plus beyond.

Objectives of the Study

- 1- To investigate the pragmatic functions of textual and pictorial warnings on UK cigarette packages,
- 2- to examine the between textual and pictorial elements on UK cigarette packages; and
- 3- to evaluate the effectiveness of warning designs on UK cigarette packages.

Theoretical Framework

The present study uses two models for data analysis, namely, Kress's model (2010) as well as Forceville's model (2020) of Visual and Multimodal Communication. These two models are explained below:

Kress's Model (2010)

In the context of analysing health warnings on cigarette packages, the multimodal social semiotic approach (Kress, 2010) facilitates a detailed examination of how textual, visual, and design elements collectively convey health-related messages. This model considers each semiotic resource as part of a broader communicative goal within specific cultural and regulatory environments.

1. ***Textual Analysis:*** This component of the model examines the language used in health warnings. The analysis focuses on the clarity, directness, and persuasiveness of the text. It involves scrutinizing the lexical choices, syntax, and overall discourse structure. Researchers assess how effectively the text communicates the health risks of smoking and whether it is framed in a way that is likely to influence behaviour.
2. ***Visual Analysis:*** Imagery plays a critical role in health communication. This model analyses the types of images used, such as graphic depictions of disease, symbolic representations, or abstract designs. The evaluation looks at how these images interact with the viewer's emotions and cognition, how they support or contradict the textual message, and their compliance with cultural sensitivities.
3. ***Colour Usage:*** The use of colour is analysed not just for aesthetic appeal but for its psychological impact and its effectiveness in drawing attention. Different colours can evoke different emotions or convey universal symbols (e.g., red for danger). The model examines how colour schemes are used to enhance the visibility and urgency of the message.
4. ***Layout and Design:*** This involves the spatial arrangement of textual and visual elements. The model assesses the composition of these elements on the package, focusing on how they guide the viewer's gaze and how effectively they use space to prioritize information. It also considers the hierarchy of information, determining which messages are given prominence and how this influences perception.
5. ***Integration of Modes:*** Central to Kress's approach (2010) is the integration of different semiotic modes. This involves analysing how text, images, colour, and layout work together to create a cohesive message. The coherence and synergy between these modes are critical for the overall effectiveness of the health warnings.
6. ***Cultural and Contextual Sensitivity:*** The model requires an analysis of how well the semiotic resources are tailored to the cultural and regulatory contexts of different countries. This includes studying how cultural norms and legal requirements influence the design and messaging of health warnings.

Forceville's Model (2020) Visual and Multimodal Communication

Forceville's approach offers a nuanced framework for understanding how visual and multimodal elements convey messages effectively by adhering to principles of cognitive relevance. This model, rooted in Relevance Theory, posits that effective communication balances the cognitive effort required to process information with the rewards or benefits derived from this process.

In the context of analysing health warnings on UK cigarette packaging, Forceville's model (2020) can be instrumental. Cigarette packs often use stark, impactful visuals alongside text to warn against the dangers of smoking. These visuals can include images of diseased lungs, decaying teeth, or suffering individuals, which are intended to elicit strong emotional reactions. According to Forceville's model (2020), the effectiveness of these images can be gauged by how relevant they are perceived by the target audience—the smokers.

Applying Forceville's model (2020) involves examining several aspects:

1. ***Cognitive Effort:*** This entails looking at how easily the target audience can process the information presented on the packaging. Simple yet striking images combined with clear, concise text could reduce cognitive strain while effectively conveying the health risks associated with smoking.

2. **Cognitive Rewards:** These are the insights or valuable information the viewer gains from interpreting the images and text. In the case of cigarette packaging, the reward could be a deeper understanding of the personal health risks of smoking or the emotional impact of seeing potential long-term effects, which might motivate a decision to quit smoking.
3. **Contextual Sensitivity:** The model also considers the context in which the communication occurs. For cigarette packaging, this means considering where the products are typically sold and used, and tailoring the imagery and text to be most impactful within those environments.
4. **Viewer Engagement:** Forceville's model (2020) encourages an assessment of how different demographic groups perceive and react to the warnings. This is crucial as age, cultural background, and even past smoking experience might influence how a person interprets the relevance and severity of the visual warnings.

By applying Forceville's (2020) Relevance Principle to the visual and textual elements of cigarette packaging, researchers and public health officials can better design warnings that not only capture attention but also deliver powerful, persuasive messages that are cognitively engaging. This approach ensures that the warnings are not just seen but are impactful enough to encourage behaviour change, leveraging both the shock value of images and the informative nature of text to achieve public health goals.

Literature Review

The existing literature on tobacco control underscores the pivotal role of graphic and pictorial health warnings in influencing public behaviour towards smoking cessation. Research consistently shows that these warnings, especially when graphic, are more effective than text-only messages in conveying the severe health risks associated with smoking. For instance, studies like Mudey et al. (2023) highlight the regulatory emphasis in India on graphic health warnings to enhance comprehension among populations with limited literacy. Similarly, Elton-Marshall et al. (2015) demonstrate that pictorial warnings in Malaysia significantly boost awareness and motivate behavioural change more effectively than text-only warnings in China, emphasizing the role of robust regulatory frameworks.

Further insights come from Walter (2022) and Netemeyer et al. (2016), who delve into how health warnings are processed cognitively and emotionally. Walter's research reveals age-dependent differences in how adolescents process health warnings, with variations in their responses to the severity and immediacy of the conveyed health risks. Netemeyer et al. focus on the emotional responses elicited by graphic warnings, noting that emotions such as fear, guilt, and disgust are crucial in deterring adolescents from smoking. This emotional engagement is key to the warnings' effectiveness, necessitating designs that can evoke such strong reactions.

The cultural context also plays a significant role in the effectiveness of health warnings. For instance, Xing et al. (2023) analyse the cultural appeals in Chinese cigarette packs, finding that cultural symbols are often employed to promote tobacco products, whereas Qadir (2022) examines how warnings are perceived among Kurdish EFL students, stressing the importance of aligning warning messages with cultural norms and politeness strategies.

Additionally, studies like McCool et al. (2012) and White et al. (2008) focus specifically on adolescents, demonstrating that graphic warnings on plain packaging not only capture attention but also diminish the social appeal of smoking among this demographic. The effectiveness of such strategies in preventing smoking initiation highlights the importance of targeted interventions.

In the broader scope of tobacco control, comprehensive reviews by Hammond (2011) and Noar et al. (2016) affirm the superior efficacy of larger, pictorial warnings over smaller, text-only versions in promoting smoking cessation and enhancing health knowledge. These reviews provide a solid foundation for advocating larger and more visually impactful warnings as a public health strategy.

However, despite the extensive research, there remains a gap in studies that integrate multimodal strategies and pragmatic functions within a comprehensive framework, especially across the UK. The proposed study addresses this gap by employing a multimodal social semiotic approach, focusing on how textual and pictorial elements on cigarette packages interact to perform specific communicative functions such as warning, advising, and persuading.

Methodology

Study Design

In this study, a qualitative approach was used, focusing on multimodal social semiotic analysis to examine the pragmatic functions of UK cigarette packs. This method was selected because of its ability to capture health warnings' depth and complexity in sending out messages that are communicated and perceived. Qualitative analysis helps in understanding subtler ways these components work together to influence consumer behaviour rather than just simple statistical relationships found in data, and also helps us understand what health warnings mean for different people.

A qualitative framework allows for a wider range of contextual factors to be involved in the inquiry. It includes cultural and social factors which contribute significantly towards understanding why different groups exhibit varied reception and effectiveness towards health warnings. Also, the qualitative approach is well-suited since it can deal with a wide range of rich semiotic elements found in the warnings; including text, images as well as layout among others that combine into comprehensive messages about health risks.

This type of study is exploratory which best suits this study. In other words, it supports the exploration of new patterns, and themes insights into how warnings affect thoughts or actions more meaningfully—areas often overlooked by quantitative studies. Additionally, as opposed to survey questionnaires or experiments, this approach may involve direct feedback from those being affected such as smokers or potential smokers through interviews or focus groups. These perspectives develop data revealing direct experiences regarding the personal impact and interpretation variations associated with these notifications. In conclusion, the use of the qualitative technique ensures a thorough examination into how UK cigarette packages use communication techniques which can better shape public health messaging strategies as well as tobacco control measures being put in place.

Corpus and Sample of the Study

The corpus consisted of 24 picture warning labels taken from UK cigarette packs where purposive sampling was used to select only 7 pictures based on desired demographic characteristics: gender (males/females) and age (children, youth and elderly). The reason behind this particular selection is to ensure that the analysis is not skewed towards one segment of the population without fairly considering others.

Gender representation has been taken care of in this case by selecting pictorial warnings that are gender balanced; three pictures each male and female. Such a split enables investigation into possible variations regarding the impact and interpretation of health warnings on different sexes. This kind of analysis is necessary as previous studies have identified differences in response between genders due to diverse women's and men's socialization processes, health beliefs, and attitudes toward smoking.

The age range also accounted for two pictures for each of the three age groups namely children, youth and elderly. The division is important since it helps to examine to what extent various age groups respond to these warnings. On one hand, young populations such as children and youths may be more affected by visual aspects because they are still developing hence their vulnerability could be used against them through media marketing approaches while older persons may see them in line with their own old wisdom about health issues.

This is because it ensures that the analysis is comprehensive rather than being biased towards any demographic, which enhances generalizability of findings. Secondly, the insights provided are important for designing culturally and socially sensitive public health messages and tobacco control policies, thus increasing their effectiveness throughout the population. Thus, this diverse sample was selected to provide an in-depth understanding of diverse effects of pictorial warnings that can be used to guide more effective health communication strategies against tobacco use.

Methods of Data Analysis

The data analysis in this study is structured around the Multimodal Social Semiotic approach developed by Kress (2010), which is highly pertinent for analysing the complex interactions among textual, visual, and design elements in health warnings on cigarette packages. This approach is particularly adept at uncovering how these elements function collectively to communicate health-related messages within specific cultural and regulatory contexts. Here's a detailed breakdown of how each component of this framework is applied in the analysis:

a) Textual Analysis

This involves a thorough examination of the language used in health warnings. The analysis is focused on the clarity, directness, and persuasiveness of the textual content. Key aspects such as lexical choices, syntax, and overall discourse structure are scrutinized to assess how effectively the text communicates the health risks associated with smoking. This includes evaluating whether the language used is likely to influence behaviour, considering factors like command language, the immediacy of language, and the use of fear appeals. The goal is to determine the efficacy of text in making the health risks salient and motivating behavioural change.

b) Visual Analysis

The imagery on cigarette packages is critically analysed for its role in health communication. This involves studying the types of images used—whether they are graphic depictions of health effects, symbolic representations, or abstract designs. The analysis considers how these images interact with viewers' emotions and cognition, supporting or contradicting the textual messages. Factors such as the shock value of graphic images, the interpretability of symbolic images, and the appropriateness of abstract designs are evaluated to see how they influence the overall message's impact.

c) Colour Usage

Colours are analysed not only for their aesthetic appeal but also for their psychological impacts and effectiveness in drawing attention. The analysis looks at how different colours are used to evoke specific emotions or convey meanings (e.g., red as a symbol of danger). The study assesses whether the chosen colour palettes enhance the visibility and urgency of the warnings, potentially affecting the viewer's emotional response and attention retention.

d) Layout and Design

This component assesses the spatial arrangement of textual and visual elements on the cigarette packages. It includes an examination of how these elements are composed to guide the viewer's gaze and prioritize information. The layout is analysed for its effectiveness in creating a clear hierarchy of messages, determining which aspects of the warning are most prominent and how this influences the viewer's perception and interpretation.

e) Integration of Modes

A critical aspect of Kress's approach is the integration of different semiotic modes—text, images, colour, and layout. This analysis involves examining how these modes work together to create a cohesive and effective

message. The coherence and synergy between these modes are evaluated to assess the overall impact of the health warnings, looking at how well they blend to form a unified communicative goal.

f) Cultural and Contextual Sensitivity

The analysis extends to how well the semiotic resources are adapted to the cultural and regulatory contexts of the UK. This involves studying how cultural norms and legal requirements influence the design and messaging of health warnings, ensuring that they are appropriately tailored to resonate with the local population and comply with regulatory standards. By employing this detailed, multimodal analysis, the study engages in a qualitative content analysis that not only dissects individual elements but also synthesizes them to evaluate the overall effectiveness and appropriateness of health warnings on UK cigarette packages. This comprehensive approach allows for a deeper understanding of how multimodal health communications function to impact public health behaviours and perceptions.

Data analysis based on Forceville's model (2020)

The data analysis in the current study is conducted using Forceville's model (2020) of Visual and Multimodal Communication. By employing this model, the present study engages in a qualitative content analysis that not only dissects individual elements but also synthesizes them to assess the health warning effectiveness and appropriateness of UK cigarette packages. This comprehensive model contributes to a deeper understanding of how multimodal health communications function to influence public health behaviours and perceptions.

The employed Forceville's model (2020) presents a sophisticated framework for analysing health warnings on UK cigarette packaging by applying the Relevance Theory. The emphasis of this theory is on how much cognitive effort put into communication influences its success in delivering the message. In the case of tobacco packaging, the idea is to convey the extremely high health risks connected with smoking in a manner that strongly strikes smokers, thereby making them think twice or discouraging potential smokers.

1. Cognitive Effort

This model also examines how easily smokers can process information provided on the packaging. This involves assessing the simplicity/complexity of both text and images. Examples include unambiguous textual warnings combined with stark images of medical conditions such as throat tumours, and lung cancer among others are analysed for ease of comprehensibility. The intention is to make these messages clear enough to be quickly understood, thus reducing cognitive burden while conveying effectively health hazards involved in such actions.

2. Cognitive Rewards

The analysis of the data of the current study is focused on what smokers acquire or feel after processing the warnings. The cognitive rewards could include a heightened understanding of particular health hazards or an emotional response to images of health decay as a result of smoking. These are immensely significant due to their contribution to the overall message impact, which may affect a smoker's decision to quit and/or that of non-smokers not to start at all. The data analysis examines the extent to which information and emotion elicited by the warnings are enough to motivate changed behaviour.

3. Contextual Sensitivity

Forceville's model (2020) also accounts for the context in which cigarette packages are seen or purchased. This involves analysing how warning design and placement on the packaging are geared towards making an optimal visual impact in various retail settings. It evaluates factors such as warnings' visibility in display settings, and

cultural subtleties that could influence perceptions about them, to ensure that there is proper customization of these warnings for maximum utility.

4. Viewer Engagement

The model eventually encourages an in-depth evaluation of how different demography responds to warnings. These include age, culture and former smoking experience including other things that can affect how these groups perceive the significance and severity of the warnings. By comprehending these dynamics, health communicators can refine warnings for more efficient targeting of specific populations making the health messages more effective at large.

With Forceville's model (2020), however, this technique enables researchers as well as public health officers to create cigarette packet warning labels that are not only noticeable but also profound in their impact. This focus on balancing cognitive effort with cognitive rewards ensures that the warnings are both accessible and compelling, thereby achieving significant public health benefits through effective communication strategies aimed at reducing smoking rates among others. Thus, this technique is a comprehensive instrument used for evaluating and improving the design and content of health warnings to bring about desired behavioural changes.

Findings

Analysis of data based on Kress's Model (2010)

This section provides the analysis of data based on Kress's model (2010) as follows:



Figure 1. UK Health Warning on Rothmans Brand

The warning on the cigarette package (Figure 1) uses simple and forceful wording: “Smoking can kill your unborn child”. This choice of terms is meant to be clear and strong, using the word “kill” to leave no doubt about the dangers associated with smoking during pregnancy. The words chosen are intended to have an impact on the reader's actions by creating a sense of urgency and danger that might affect decision-making regarding smoking.

This textual warning has been accompanied by a powerful picture which shows an unborn child with congenital deformities being supported through oxygen. This image is created to make viewers feel very emotional. By visually showing that the unborn child is at risk, the message in print is further emphasized. The statement

explains how cigarette smoke affects unborn babies' lives dramatically, hence it evokes stronger emotions than ever before.

Notably, the way colours are used in the picture of the child as red and pale contributes to how the visual message is more impactful. The colour red bears connotations of danger and warning often used to catch attention or warn others. On the other hand, paleness may represent sickness or weakness, which underscores that smoking can have severe medical consequences on a child's health. These colours work elementarily together to enhance the visual urgency of the message, making it more noticeable and emotionally engaging.

The package design also probably has a prominent layout, ensuring texts and images are immediately noticeable. This strategy facilitates instant visual connection between words and graphics, thus promoting overall understanding and retention of information. Hence, these features are focused on by the design to maximize their effect while directing viewers' eyes to ensure that the seriousness of its contents is well conveyed.

In general, a combination of clear text, emotional and mental charm in the imagery, strategic colour application, and careful design layout is an example of multimodal health warnings. This consistent use of semiotic resources such as text, imagery, colour and layout constitute a compelling health warning that complies with cultural sensitivity and regulatory standards. It is these elements working together within its specific cultural/legal context that aims to maximize the effectiveness of this warning while illuminating how pragmatic functions are used in UK cigarette packs to influence public health behaviour.



Figure 2. UK Health Warning on Benson & Hedges Gold Brand

The warnings on Benson & Hedges Gold cigarette packs (Figure 2) combine texts with pictures all conveying child exposure risks to second-hand smoking. 'Don't let children breathe your smoke' is a direct command through which the smoker is implored to shield their children from breathing in smoke. Such unambiguous language attempts to influence smokers by appealing to them directly about their obligations towards children.

It is noticed that the package is visually presented with an image of a small girl in hospital, who is suffering from breathing problems and requires oxygen assistance. In addition, this picture acts as a symbol by itself; it personifies health threats rendered through the text and stirs the viewer's emotions by displaying a child's susceptibility to second-hand smoke. A visual representation of children in pain serves as an excellent means for arousing sympathy while allowing smokers to think twice before smoking around kids. In this picture, the colour palette employed especially in the paleness of the girl reinforces the theme concerning disease and vulnerability. Pale colours often symbolize weakness and can provoke a motherly instinct among spectators.

The application of such colour here was intentional as it emphasizes the seriousness of the visual message, thus highlighting its severe effects on children exposed to second-hand smoke.

This warning's layout and design must have been done this way so that both image and text are prominent enough for an immediate visual-cognitive connection between them. This style makes sure that this advice does not only attract attention but also engages emotionally and cognitively. To sum up, the warning on a package of Benson & Hedges Gold (Figure 2), it is an effective expression of multimodal social semiotics that informs children about the dangers of passive smoking. By combining direct written messages with images that evoke emotions, strategic use of colour and well thought out design, this technique unifies its strengths to drive home a powerful health message. This approach is in line with the objective of the current study which has shown how pragmatic functions serve as tools for making health warnings on cigarette packages more effective.



Figure 3. UK Health Warning on Pall Mall Brand

The text on the package (Figure 3): “Smoking causes strokes and disability,” uses plain and straightforward words to convey the very serious consequences of smoking. The words used such as “strokes” and “disability” not only show major illnesses but also demonstrate the long-term weakening effects caused by smoking. This definite and true statement aims at educating smokers on their behaviours by associating them directly with critical health risks.

The warning's accompanying imagery is of an old man in a hospital, lifeless and debilitated by a stroke resulting in a coma. This man also has breathing disorders that necessitate the need for oxygen support. This graphic element is a powerful way of expressing the significant consequences of smoking through a human story that anyone can relate to. This is because this picture pierces our emotions by targeting one's feelings on seeing an old person who is so weak due to smoking. The use of light and dark shades in the image's depiction enhances the effect of its visual message. In other words, his skin might be pale because he is ill or feels weak, while red colour may stand for distressing or critical health-related matters. These colours are effective in communicating the urgency and severity of the health risks associated with smoking. Furthermore, these colours do not only draw attention but also connect emotionally with viewers, hence increasing the memorability of such health warnings.

An important thing to be noticed in the spatial arrangement of the text and image is that both elements are prominent and reinforcing. This design probably directs the viewer's sight to join together the written warning with a visual representation, thereby improving the overall impact of the message. The layout is crafted to ensure that the warning is not only viewed but is impactful, fostering a deeper understanding and emotional response from the viewer. The Pall Mall cigarette package (Figure 3) represents an integration of textual, visual,

and colour elements that exemplify Kress's multimodal social semiotic approach. By combining stark warnings in texts with poignant visuals, a single powerful communication for the health risks of smoking is developed. A blend of these semiotic resources ensures that the warning has some effect on individuals through emotions as well as reason.

In addition, this warning considers cultural and contextual issues by concentrating on widely acknowledged health and disability themes. It is portrayed sensitively but frankly to ensure that it applies to a large number of people and conforms to the standards of public health messaging. This review highlights how the Pall Mall cigarette package employs various modes of communication to convey a strong health warning. The direct text, powerful image, strategic use of colours, and thoughtful design provide an effective manner through which the risks involved in smoking are communicated.



Figure 4. UK Health Warning on Rothmans Brand

The package for Rothmans (Figure 4) has the following written text: “Smoking raises the risk of blindness.” This health warning is very clear and powerful in its statement. This phrase directly associates smoking with an ultimate health outcome, blindness, which is less popularly known as a smoking hazard. Such specificity and severity of the problem under consideration aim at informing smokers about other serious risks that are little or not known to many people. The accompanying picture featuring a youthful lady whose face is covered by cigarette smoke while specifically reaching to her eyes graphically illustrates the above-mentioned warning message. This image effectively uses the fume as a symbol of potential sight loss showing how ‘smoke’ may blur one’s vision physically or metaphorically. By targeting young women who are commonly marketed by tobacco corporations, this young woman’s photograph becomes especially poignant for younger smokers—driving home the point that they too can suffer from such harmful medical conditions, just like any adult person.

The photograph shows a woman whose face and eyes are covered with grey smoke, which sends a strong message. Normally, grey is associated with dullness, vagueness and loss; all of these can be used to symbolize blindness. The choice of the colour in this case confirms the warning on health as it portrays the smoke as a blinding element that makes danger more apparent to those who see it. The design probably situates the text warning adjacent to this picture so that both aspects get interwoven into one unit. This arrangement allows for an instant connection between textual content and visual representation, enabling better understanding and evoking empathy from viewers. By deliberately positioning its components, the health risk communication becomes not only accessible but also impactful.

The discussion of a Rothmans package shows how combining text, imagery, and colour uses multiple semiotic resources to convey a health warning. Combining direct writing with metaphorical images tells the story that smoking is not only harmful in obvious ways such as cancer or heart disease but can also cause blindness. In this way of picture representation, people are forced somehow to memorize the negative part of smoking because this is where it turns out to be more persuasive by making the same statement in media. Consequently, the drawing is culturally relevant since it deploys cross-culturally ubiquitous symbols about risks and health among others. The message, therefore, deals with an essential human fear like blindness; thus, heightening its relevance and impact to various audiences. This analysis shows how the Rothmans cigarette packet (Figure 4) employs a multimodal social semiotic approach in sending out a powerful health warning by examining pragmatic functions performed by verbal and pictorial elements while communicating health risks on cigarette packets.



Figure 5. UK Health Warning on Marlboro Brand

The warning text on the package of Marlboro Red (Figure 5), “Smoking causes throat cancer,” communicates a serious health problem brought about by smoking. On one hand, the use of the word ‘causes’ in making a direct causal bond between smoking and cases of throat cancer is a strong persuasion strategy that highlights how substantial these risks are. Smoking’s severe consequences are powerfully depicted in an image showing an elderly man during a surgical procedure on his throat where there is an open hole as well as an oxygen pipe for breathing purposes. This graphic portrayal may elicit strong emotions such as fear and empathy from viewers, who would have been too sympathetic upon seeing it for the first time. It provides smokers with a harsh reminder about what happens physically when they get any disease related to tobacco use; hence, providing vivid information that makes ignoring or neglecting health risks so hard.

The face’s colours of red and pale show the message sent by the illustration. While inflammation, suffering or misery may be symbolized by reddening, on the other hand, paleness might represent illness and lack of strength. Together these two shades let us see how sick a person with throat cancer caused by smoking can look. The colour used here is calculated to stir up emotions that emphasize on urgency and gravity of this warning. It is apparent that in designing this warning, the spatial arrangement emphasizes the text-image relationship such that both elements are readily noticeable and mutually reinforcing each other. This layout technique is necessary for effective health warning delivery as it enables viewers to link written details with visual evidence, instantly leading to comprehension and emotional appeal of the information. In terms of

conveying health warnings, this packaging displays an example of multimodal resources being effectively utilized. Simple informative text integrated with a graphic image loaded with emotion makes a powerful story about the dangers associated with smoking.

In sum, through a combination of words and pictures alongside strategic colour choice, smoking's negative effects are portrayed strongly in one voice. The warning covers the cultural and regulatory context by illustrating a health problem that universally connects with people. Although it respects cultural sensitivities, the realistic portrayal of throat cancer treatment makes its point starkly and effectively to meet public health standards and maximize impact across diverse audiences. This analysis demonstrates how the Marlboro Red cigarette package employs a multimodal approach to successfully communicate the dangers of smoking. By integrating text, imagery and colour cohesively, the health risks associated with smoking can be fully understood.

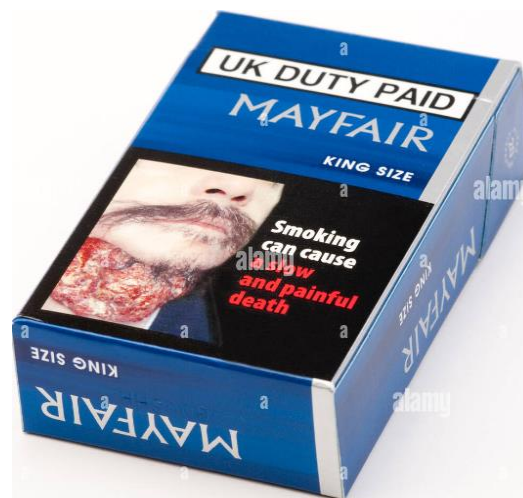


Figure 6. UK Health Warning on Mayfair Brand

The textual warning on the Mayfair package (Figure 6) states, “Smoking can cause slow and painful death”. This textual warning uses forceful language to demonstrate one serious outcome of smoking. The words ‘slow’ and ‘painful’ give a visceral dimension to the statement, thereby heightening the fear as well as seriousness related to risks for smokers’ health. It is a kind of language that provokes strong emotional responses in an attempt to get smokers who have seen it immediately to think deeply about their habits. This is because they use very vivid images of what could happen if they continue smoking or do not stop at all.

The image in this warning portrays a throat cancer patient, whose picture with a big tumour on the neck/throat is quite visually striking when paired with the written message. The tumour is presented vividly in red and white colours, thereby stressing the visual representation of the disease. Targeting young men, the demographic group that often overlooks the long-term health effects of smoking helps to extend the audience reach of such a message. The colours red and white on the tumour have some significance. The red colour brings out danger signals which are also painful, leading to severe conditions as pictured here. White suggests rareness or singularity about its growth, portending harshness or seriousness. These combinations enhance graphical illustration and depict harder truths about cancer to support this cautionary message.

The arrangement of the text and image in the layout appears to be such that both elements are immediately noticeable and connected. In this strategic placement, a dire warning can, therefore, be easily linked with a graphic visual to make an improved message. The design saves for the health risk communication clarity, hence using space to maximize on impact of texts and visuals as warnings. This packaging is multimodal because it

combines words and pictures to give a forceful health cautionary note. This informative analysis shows how the use of semiotic resources—texts, images and colours—in this cigarette package creates a meaningful portrayal of the dangers of smoking cigarettes. Therefore, integration is crucial in making sure that not only does it catch attention but also leaves a permanent impact on the viewer’s mind.

The cultural suitability of the rendering not only reflects a health problem that concerns everyone and appreciates the fact that such photos may have diverse impacts. The image itself is graphically violent, but it must be able to communicate effectively under the provisions of public health ensuring that its message remains legal and ethical. In general, a Mayfair cigarette package analysis shows how a multimodal social semiotics approach can efficiently communicate severe health hazards caused by smoking as per the goals of this study illustrating the pragmatic functions of health warnings on cigarette packets. It has managed to make use of its semiotic resources very well to caution people against slow painful deaths resulting from smoking making it very effective and memorable in creating impact.



Figure 7. UK Health Warning on Sovereign Brand

The text on the Sovereign package states, “Smokers’ children are more likely to start smoking” (Figure 7). In a frank and informative manner, this message highlights how parents engage in smoking. It is, therefore, a particularly emotionally charged subject matter – parental responsibility and child health. The message tries to persuade smokers to stop smoking on their kids by showing them that the chances of their kids developing smoking habits are higher. This may be useful in reducing second-hand smoke exposure and preventing its normalization among future generations.

This picture (Figure 7) shows a young mother who is smoking while her baby tries to take it from her hands. This strong image is, therefore, an exact representation of what has been stated in the text. This act of the child attempting to reach for the cigarette stands as a symbolical representation of danger indicated by warning texts about how actions shown by parents could directly affect their children. By showing the dangers associated with their smoking habits through visuals, this scene elicits strong emotions, particularly among viewers who are also parents.

The warning on this package links a message with an image, showing the risks of smoking not only to the smoker but also to their families. The direct text and strong visual story create a powerful behavioural red flag that amplifies the impact of the health warning. Personalizing the communication by using a mother and her baby, also makes it more relatable to a wider range of people who smoke and are parents as well. This design likely ensures high visibility for all components: both texts and graphics are placed in noticeable positions, thus

establishing an immediate visual link between them. This approach also increases how quickly viewers understand as well as feel about what they see since it can easily resonate with their emotions, hence making this alert stronger and unforgettable at large.

The scenario described is culturally sensitive as well as a typical social situation making the message resonate with the readers. It addresses the issue of children's welfare, which is an important concern to all societies and it is consistent with cultural values of child protection. Because of this significance, not lost in these exchanges could be a broader audience appeal. In general, the Sovereign cigarette pack (Figure 7) employs textual and visual means to communicate how smoking by parents affects their children's behaviour. The multimodal resources used effectively enhance the persuasive power of the message, thereby attempting to change smoking behaviours among parents for the sake of their kids' good health.

The data analysis shows that strategic use of cigarette packs with age and sex (male/female) based warnings is designed to maximize health message relevance, and impact for a broader demographic. Warnings should be viewed by as many different people as possible as this enables them to visualize themselves in those images or someone, they know so that smoking becomes more real and personal. Additionally, the varied demographics show how smoking poses a general risk to the public, but also specific health concerns pertinent to each group, such as the vulnerability of children for second-hand smoke exposure, initiation of long-term effects during young adulthood, and accumulation of health problems associated with ageing. Targeting gender increases attention to male or female-dominated illnesses that may increase message relevance while also enhancing cultural acceptability and conforming with regulatory requirements. Moreover, this approach promotes inclusiveness which ensures that no population segment is left behind when it comes to public health campaigns, thereby increasing their effectiveness. Each picture is selected not only because of its direct meaning but also for the reason that it can elicit particular emotions like protectiveness, compassion or fear; in this regard, they are used to strengthen the anti-smoking story and motivate a change in conduct.

Analysis of data based on Forceville's model (2020)

Applying Forceville's model, researchers can examine the effectiveness of health warnings on cigarette packages. The visual elements and textual information combine to maximize cognitive relevance, balancing the cognitive effort involved in processing information with cognitive rewards such as emotional impact and informativeness. For instance,

Rothmans (Figure 1) features the text "Smoking may kill your unborn child" accompanied by a picture of an unborn baby having congenital defects and an oxygen support system. This is aimed at pregnant women or prospective parents with a lot of emotional impact to emphasize the great risks associated with smoking while carrying a fetus. In this case, there is moderate cognitive effort due to explicit and disturbing visuals but the significant cognitive reward is more awareness about the dangers of pregnancy smoking. Both exhibited features worked together to elicit intense feelings for behavioural change purposes.

Moreover, Benson and Hedges Gold (Figure 2) present the warning "Do not let children breathe your smoke" and an image of a child in a hospital room. It appeals directly to parents and carers based on the natural desire to safeguard children. This means that the text and pictures are understandable and uncomplicated, so minimal cognitive effort is needed to interpret the message. However, the emotionally motivating imagery of an innocent child made this package worth the cognitive load associated with smoking in front of kids. In Figure 3, Pall Mall also cautions that "Smoking causes strokes and disability" with an accompanying picture of an old man having a stroke in a hospital bed. This package focuses on the long-term consequences of smoking, using the image of an aged person to portray danger for older people who smoke or those thinking about what happens sometime later due to their addiction. Thus, graphic representation demands medium cognitive efforts but

holds high cognitive rewards as it reveals the serious effects of strokes like disability graphically, hence making this information more relevant or useful.

The image in Rothmans (Figure 4) has a text that reads “Smoking increases the risk of blindness.” The cigarette package uses an image that captures a woman’s eyes being concealed by grey smoke, which is a symbolic representation. This visual metaphor calls for some cognitive effort to fully comprehend it but is a powerful illustration of the relationship between smoking and blindness. This cognitive payoff comes from holding onto an evocative image that connects smoking directly with blindness, another less well-known risk factor that might resonate with audiences.

Besides, Marlboro Red (Figure 5) presents a text that reads “Smoking causes throat cancer” with a hard-hitting picture of an old man who has undergone a tracheotomy. This visual is extremely graphic showing how harsh throat cancer can be and it demands high-level thinking to face it up. However, on the other hand, there is a great cognitive reward as it starkly shows the potential need for extreme medical intervention which acts as a strong deterrent. Mayfair (Figure 6), on the other hand, presents “Smoking can cause slow and painful death,” along with a photograph of an adolescent boy with a big tumour in his neck. This message and image together provide an intense warning about smoking-related cancer that hurts so much. The cognitive effort here is moderate, balanced by a high emotional and informative reward, making the consequences of smoking vividly clear.

With the caption ‘Smokers’ children are more likely to start smoking,’ is illustrated with a picture of a young mother smoking while her child tries to take a cigarette (Figure 7). This package invokes parental responsibility directly and has a low cognitive load and high emotional rewards. The image uses parents’ concern about negatively influencing their child’s behaviour as a result of certain actions and enhances its effectiveness by engaging them emotionally. To conclude, each cigarette package is made to optimize the impact of health warnings by balancing cognitive effort with reward. According to Forceville’s model (2020), the significance of relevance is highlighted regarding visual communication as it explains that the most effective warnings are those which resonate deeply with their target audiences in terms of emotional involvement, direct information or even stark visuals illustrating hazardous smoke consequences.

Discussion of Findings

Using Kress’s (2010) Multimodal Social Semiotic approach and Forceville’s model (2020) Visual and Multimodal Communication for analysing health warnings on UK cigarette packages has provided insights into how these warnings function and affect their audience. Both theoretical frameworks offer different perspectives but complement each other regarding the efficiency of visual and textual features used in cigarette packaging. For instance, Kress’s model (2010) highlighted the synergy between textual, visual, colour, and layout elements within the packaging. Thus, the analysis showed that health warnings are more effective when they are integrated and connected. This is where strategic use of colours and layouts directs the attention of the viewer, leading to a better overall message uptake. Furthermore, cultural and contextual sensitivity was found to be important as the data analysis shows that tailored warnings for particular demographic groups tend to be more effective. This demonstrates how communication in health warnings is complex since every semiotic resource serves different purposes for the communicative purpose.

According to Forceville’s model (2020), the Relevance Principle has been put forward as a better way of understanding how cognitive effort and rewards shape the processing and impacts of health warnings. The findings reveal that such warnings are more likely to influence behaviour if they offset the weight on the mind with large cognitive rewards, such as emotional impact and informational value. This model particularly highlighted how the relevance of these warnings to individuals’ lives—such as depicting diseases specific to

demographic risk factors—enhances their persuasive power. The data analysis also points out the need for contextual adaptation of messages to optimally be positioned within environments where smoking decisions are made.

While the model by Kress (2010) examines different ways of communication in detail, Forceville's model (2020) looks at cognitive dimensions for understanding message uptake. The comparative analysis suggests that visual shock value, emphasized in Kress's model (2010), can be used to grab attention and leave a lasting impression while cognitive engagement and relevance, emphasized in Forceville's model (2020), contribute to the sustenance of impact and behavioural change. Besides, from an examination of these two models, it is apparent that the most effective health warnings are those which are multimodally abundant as well as deeply contextually meaningful for their receivers.

It is shown that using these two models, it is possible to understand how best to construct public health messages on cigarette packs. The second one points out that health information should be lively and directly communicative as well as having the ability to reach people on a personal level by reflecting their unique wellness problems and physical environments. As a result, policymakers and marketers could create more effective anti-smoking campaigns through the understanding of these two important things; therefore, they become both eye-catching and personally meaningful to customers. It can be concluded that the application of Kress's (2010) and Forceville's (2020) models provides a deeper perspective of the multimodal and cognitive processes involved in health communication. This may contribute to the more strategic placement of health warnings which might enhance the effects of anti-smoking efforts in public health.

Conclusion

This study has effectively utilized the models of Kress (2010) and Forceville (2020) to examine UK cigarette packets' health warnings. The results show that these warnings are more effective where there is a strategic combination of textual, visual, colour and layout elements that work together to communicate the health dangers posed by smoking. While Kress's (2010) model emphasized a uniform multimodal approach, Forceville's (2020) cognitive relevance focused on how the balance between cognitive effort and rewards affects the impacts of such messages. Consequently, it established that by including these components in their layouts, they not only became better at attracting attention but also tried to evoke emotional reactions in people who see them so as to affect their thoughts about smoking. In addition, the detailed understanding of how those elements relate to the broader cultural framework further enhances our understanding of effective health communication processes.

One of the outcomes that can be drawn from the present study involves using models of Kress (2010) and Forceville (2020) several recommendations can be made to improve health warnings on UK cigarette packets based on this study. First, cigarette packaging designs in future should still have multi-model elements which are integrated strategically, such as text, visuality or imagery, colour and layout. It is a collaboration of these aspects that makes it possible for designers to create a unified message on health. Designers and policymakers should make every element outstanding in its way and at the same time blend harmoniously with others to come up with an attractive narrative which is also informative. Furthermore, cognitive relevance is a must in designing health warnings. Designers need to craft words that could hit home among people in terms of demographics and cultural backgrounds. This could involve changing the pictures and languages used within the cautions to reflect various user groups' experiences and concerns, thereby personalizing them even more effectively than they already do now.

In addition to improving design aspects, it is suggested that health warnings be regularly changed on cigarette packets. This is to keep them current and efficient by reflecting the latest medical information, innovations in

graphic design, and shifts in public health regulations. Frequent updating might foster public interest as well as responsiveness towards these warnings. In addition, there is a major advantage of carrying out continuous audience research. Such studies should seek to discover how different age groups understand and react to different types of health warning labels. Such insights are crucial for fine-tuning future warnings' effectiveness and can be acquired using qualitative methods that examine the emotional and cognitive effects of such warnings.

Additionally, increasing public participation in the development process of health warnings might help. Policymakers would be able to get the reality on the ground by engaging the public through consultations or interactive social media campaigns. In light of this, it can be stated that such an approach could make these warnings more acceptable and thus effective. Lastly, technology could be used to create more interactive and appealing warnings which might raise the level of awareness and knowledge base about health risks associated with smoking. The introduction of digital additives like QR codes on packs would enable consumers to access more educational materials explaining further about hazards linked with smoking.

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