

COGNITIVE PROCESSING AND ASSESSMENT OF ANTI-SMOKING COMBINED WARNING LABELS PROPOSED BY THE EUROPEAN COMMISSION: AN EMPIRICAL STUDY WITH A SPANISH SAMPLE

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Smoking is a major public health problem in the European Union. The presentation of health warnings on cigarette packets is a common strategy for alerting consumers to the adverse effects of smoking. The main aim of this study was to assess the level of emotional activation and the potential utility of the new combined warning labels (both text and photo) that the European Commission has proposed for use on cigarette packets. By means of a Likert-type scale, 106 participants assessed the emotional activation each image caused in them, as well as its usefulness for an anti-smoking campaign. Results showed that the combined warnings could be arranged according to their emotional activation level and their usefulness. Further analyses showed that the scores given to some warnings were strongly influenced by the presence/absence of the corresponding text message, the smoking habit (smokers vs. non-smokers), and participant's gender. Finally, a positive relationship was found between emotional activation and utility. By and large, our research has some significant implications for the development of tobacco control policies.

Keywords: Smoking warning label, Tobacco control, Cognitive processing, Emotional activation.

El tabaquismo es uno de los principales problemas de salud pública en la Unión Europea. La presencia de mensajes de advertencia en el empaquetado es una estrategia habitual para alertar sobre los riesgos asociados al consumo de tabaco. El objetivo de este trabajo fue valorar el nivel de activación emocional y la potencial utilidad de las nuevas advertencias antitabaco combinadas (texto y foto) que la Comisión Europea ha propuesto para ser incluidas en los paquetes de tabaco. 106 participantes valoraron mediante una escala Likert el nivel de activación que les generaba cada una de las advertencias, así como su posible utilidad en una campaña antitabaco. Los datos obtenidos han permitido realizar una ordenación de las advertencias según los niveles de activación y de utilidad. Además, los resultados indicaron que las puntuaciones obtenidas por algunas advertencias estuvieron influenciadas por ciertos factores, tales como la presencia/ausencia del mensaje de texto que le acompaña, el hábito de fumar (fumadores vs. no fumadores) y el sexo de los participantes. Finalmente, se descubrió una relación positiva entre activación emocional y utilidad. Tomados en conjunto, estos resultados pueden ayudar a elaborar directivas sanitarias más eficaces para la prevención del tabaquismo.

Palabras clave: Advertencia sanitaria antitabaco, Prevención tabaquismo, Procesamiento cognitivo, Activación emocional.

Smoking has been associated with a large number of pathologies resulting in substantial morbidity and mortality. In the European Union, over half a million citizens die per year as a direct and indirect result of tobacco addiction; the corresponding figure for Spain is estimated by the health authorities at 50,000 people. Among the objectives of Spain's anti-smoking health legislation (*Ley de Medidas Sanitarias frente al*

Tabaquismo) is the progressive reduction of the number of smokers (Ministerio de Sanidad y Consumo, 2005).

One of the decisive international landmarks in the campaign against smoking has been the implementation, by the World Health Organization (WHO), of the Framework Convention on Tobacco Control (FCTC). On the basis of this convention it is attempted to coordinate worldwide policies, with the aim of reducing and avoiding smoking (World Health Organization, 2003). The FCTC obliges the countries that have ratified it –among them Spain– to follow certain guidelines in the campaign against smoking. Among the measures adopted (increased taxes, prohibition of advertising, restrictions on smoking in public places), it is important to note that one of them refers to the provision of

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information to citizens about the risks associated with smoking.

Traditionally, one of the most widely used means of notifying people about these risks has been the use of health warnings printed on advertising and on packets of cigarettes themselves. Such warnings represent a low-cost way for the health authorities to inform citizens of the potential harm. But although various studies have shown that the spread of information among the population about the risks of tobacco has a positive influence on the reduction of smoking (Abernethy & Teel, 1986; Townsend, Roderick & Cooper, 1994), empirical results obtained in relation to its effectiveness are often contradictory (Gutman & Peleg, 2003; Strahan et al., 2002). From a perceptual point of view, the current forms of warning consisting purely of text may go totally unnoticed. For example, it has been shown experimentally that just 37% of people look at the warning sufficiently to read the message and process it (Fischer et al., 1989). Also, studies using sophisticated *eye-tracking* techniques have reported that modification of the messages with the aim of increasing their impact (in the style of *smoking kills*) does not lead to their capture the attention more effectively compared to the more classic type (*the health authorities warn that smoking is harmful to health*, for example) (Crespo et al., 2007). Likewise, modification of the text warnings with the aim of increasing their novelty does not appear to increase the level of attention paid to them or improve their recall, compared to the more classic approach (Krugman et al., 1994). In conclusion, and as some authors have argued, anti-smoking messages should be the first thing that is perceived, though unfortunately they are often totally *invisible* (Kaiserman, 1993).

Today, as an alternative to using warning messages consisting solely of text in large black-and-white letters, more and more anti-smoking campaigns are turning to the use of images or photographs. In this way it is proposed to transmit the message about the health risks of smoking more effectively. In the year 2000, Canada was the first country to begin using warnings combining text and photographs on packs of cigarettes (Hammond, Fong, McDonald, Cameron & Brown, 2003). Following their example, Brazil and Australia introduced similar strategies; the United Kingdom is about to follow suit using realistic photographs (Department of Health, UK, 2006). Aware of the enormous public health problem

smoking represents, in 2003 the European Commission proposed a set of regulations about the use of colour photographs on packs for informing the public about the pernicious effects of tobacco (Commission of the European Union, 2003). In October 2004 it made public the new warnings from which the member States must choose if they decide to use them on cigarette packs (see Note 1 to view them all). Each one consists of a full-colour photograph and a descriptive text message about the risks of smoking.

Given their limited introduction so far, scientific analysis of the effectiveness of these new types of warning is still scarce. Hammond's group studied the impact of the graphic warnings in Canada (Hammond et al., 2003, 2004), their results showing that the negative emotional reactions generated were associated with greater disposition to give up the habit. Specifically, smokers who reported more fear in relation to the images were more likely, after three months, to have given up smoking, tried to give up or reduced the amount they smoked. More recently, Thrasher and cols. carried out an exploratory study to determine the impact of graphic warnings on cigarette packets among Mexican smokers, selecting those which most effectively made participants think about giving up smoking (Thrasher et al., 2006). The conclusions of their study highlight the need to incorporate these warnings as appropriate forms of information that can contribute efficiently to reducing smoking rates.

Pending the adoption of the new European regulations in Spain, and given that we know of no previous studies of this nature in our country within the field of psychology and smoking prevention, we decided to embark on the present research project. The current social context –which coincides with the coming into force of the new anti-smoking legislation in Spain (*Ley Antitabaco*)– not only presents the opportunity, but also accentuates the need to undertake a study of this nature. In this work we decided to analyze the impact on observers of this new type of combined health warning. Impact was analyzed from a dual perspective: the emotional activation generated and the perceived utility of the warning for an anti-smoking campaign. In assessing the emotion, two dimensions can be considered: affective valence, with a range from pleasant to unpleasant, and activation, which ranges from calm to excitement (Moltó et al., 1999; Vila et al., 2001). In our

study, following the line of previous work, we assessed only the latter dimension, which refers to the intensity of the emotion and seems to be related to duration of free visual exploration of the images and to their recall (Bradley, Greenwald, Petry & Lang, 1992; Cuthbert, Bradley & Lang, 1996; Lang, Greenwald, Bradley & Hamm, 1993; Patrick & Lavoro, 1997). Likewise, our research focused on the utility value participants assigned to each warning, on the assumption that it would be used in preventive campaigns. In conclusion, the specific goals pursued were as follows: (1) To classify the new warnings proposed by the EU according to the level of emotional activation they generate in the observer, and according to their potential utility for campaigns to dissuade smoking. (2) To explore the influence of the text message accompanying the image. (3) To analyze possible differences in the ratings of activation and utility according to gender and condition (smoker or non-smoker). (4) To determine the relationship between level of activation generated and level of utility assigned. The results obtained may be of considerable help in the design of risk information and smoking control policies by health authorities who decide to use these new combined warnings on cigarette packets.

METHOD

Participants

Participants were 106 university students (40 males and 66 females), aged 18 to 24 ($M = 21.6$; $SD = 1.27$). In the sample there were 31 smokers and 75 non-smokers, 9 of whom were ex-smokers.

Stimuli

We used the original document published by the European Commission, which includes the full library of new health warnings (also adapted for Spanish readers). This document is public: see Note 1 for how it can be accessed through the European Commission's URL. For descriptive purposes, the numbering of the warnings corresponds to the order of the original document from the Commission. Given that the aim of this study was to assess the new combined warnings, of the total 42 warnings we used only 36. Specifically, we analyzed those made up of photograph plus text. We discarded for the present work, therefore, 6 warnings that use only a text message in red and white on a black background (numbers 1, 4, 13, 37, 38 and 40).

Procedure

The study was carried out in group sessions, in each of which between 10 and 20 participants took part. All sessions took place at the same time of day, in the same room and in the same lighting conditions. Each of the warnings was projected individually onto a screen, generating an image size of 140 cm x 180 cm, by means of an NEC VT 560 projector connected to a laptop computer. Participants remained seated at a distance from the screen of 3 to 5 m. Prior to viewing the warnings they filled out a questionnaire on their habits, in which, in covert form, they were asked about their smoking. In the next stage, all participants performed two successive tasks that were counterbalanced. In one of them they were asked to rate the emotional activation generated in them by each warning viewed (they were instructed to do this according to how much of an impression it made on them). With the aim of analyzing the influence of the text message accompanying each photograph, during the rating of activation the participants were divided at random into two groups: Group 1 saw the photographs in isolation (the text was removed by means of a digital photo-retouching program) and Group 2 saw them complete with the warning message, as they were originally designed. Exposure time to each image was 8 seconds, so as to guarantee adequate visual processing. As each picture disappeared, participants gave a score, on response protocols, to the activation it had produced in them, in accordance with the following scale: (0) none, (1) low, (2) moderate, (3) high, and (4) very high. In the other task, participants rated each warning according to its potential utility for a hypothetical anti-smoking campaign, also on a 0-4 scale. In this second task, all participants always saw the images with their corresponding text message. Exposure time to the warnings was also 8 seconds. Between tasks there was a rest period of 3 minutes, and each task took approximately 30 minutes.

RESULTS

Activation

Mean level of emotional activation assigned to each warning is shown in Appendix I (AL). On the basis of these data we calculated the mean scores corresponding to percentile 85 (P_{85}) and percentile 15 (P_{15}),

classifying as high-activation warnings those with scores of over P_{85} (>2.59) and as low-activation, those with scores of under P_{15} (<0.98) (see Figures 1A and 1B). The warning that generated most activation was that corresponding to the photograph showing a person's neck with a large tumoural mass, and this was followed by the picture of the mouth with diseased teeth and gums and that which compared a healthy lung with one damaged by the effects of smoking; high scores in activation level were also obtained by the photo of a man in hospital wearing an oxygen mask and that showing a heart operation. On the other hand, the warnings that generated least activation were that showing a couple in bed, that of a man emerging from a tunnel, the pictogram showing a person throwing a packet of cigarettes in the bin, that of the doctor taking a patient's blood pressure and that of a man doing a resistance test.

With the aim of analyzing the possible influence of the text message, of the participant's condition (smoker or non-smoker) and of gender on level of emotional activation generated for each of the warnings, we carried out a set of ANOVAs. As regards the influence of the warning text message on rating of activation level, the results indicate significant differences for six of the photographs (see Figure 2), which caused greater activation when they were presented accompanied by the text message (Group 2) than when they were shown in isolation (Group 1). Likewise, the fact of being a smoker resulted in significant differences for three warnings (Figure 3). Two showed radiodiagnostic clinical tests (Images 7 and 16), and obtained a higher score in the smokers' group, whilst the photo of the heart surgery (Image 6) was rated with a higher activation level by the non-smokers. Finally, differences were also found between males and females in the activation level generated by 8 images, for all of which women's activation score was higher than men's. These images were number 17 [neck tumour, $F(1, 104) = 5.691$, $p < 0.05$], number 29 [mouth with lesions, $F(1, 104) = 9.387$, $p < 0.01$] and number 8 [healthy and diseased lungs, $F(1, 104) = 4.423$, $p < 0.05$], from Figure 1, together with the five images shown in Figure 4 (Images 2, 5, 31, 33 and 39).

In the rest of the warnings no significant differences were found in activation level for any of the variables analyzed.

Utility

For the rating of utility, all the warnings were viewed in combined form, i.e., the photograph together with the text message accompanying it. Appendix I indicates the mean utility level (UL) estimated for each of them, on the assumption that it would be used in an anti-smoking campaign. In the same way as for the case of emotional activation, classification of the warnings as being of low or high utility was made on the basis of mean scores under P_{15} or over P_{85} , respectively. Thus, those warnings which obtained scores under P_{15} (<1.43) were classified as low-utility, whilst scores above percentile P_{85} (>2.80) were selected as high-utility images. Four of the warnings rated as high-activation (see Figure 1: Images 8, 9, 17 and 29) were also rated as high-utility for use in an anti-smoking campaign. Together with these, the warning in Figure 5.A (Image 35) –showing the face of a child wearing an oxygen mask and bearing the text *Protect children: don't make them breathe your smoke*– was rated highly in terms of utility. On the other hand, some of the warnings rated as being of lesser utility were those rated as low-activation (see Figure 1.B: Images 14, 39 and 42); these were joined by the two warnings shown in Figure 5.B, showing a scan of a throat tumour and old, wrinkled hands, respectively.

As in the case of activation, we analyzed separately the influence of being a smoker and participant's gender. Once again, significant differences emerged for two of the warnings, depending on whether the rating was made by a smoker or a non-smoker. Thus, the warning showing a man emerging from a tunnel and bearing the text: *Get help to stop smoking: 0803 0000 00* (Figure 1B: Image 42), was considered of more utility by the non-smokers [$F(1, 104) = 4.857$, $p < 0.05$], whilst the

Table 1
Warnings for which there were differences between males and females in level of utility. Females gave higher scores in all cases

Image No.	Description	F(1,104)	p
2	Corpse	5.273	<0.05
17	Man with large tumoural mass on neck	5.265	<0.05
20	Old, wrinkled hands	5.952	<0.05
21	Woman with face pack next to skull	6.047	<0.05
22	Artificially fertilized ovum	7.233	<0.01
25	Pathological arteriogram	4.031	<0.05
29	Mouth with diseased teeth and gums	5.636	<0.05
30	Intubated unconscious man	4.127	<0.05
36	Girl looking at a heart shape formed by cigarette smoke	8.080	<0.01
41	Clasped hands	9.742	<0.01

Figure 1

(A) shows the five warnings that generated high emotional activation, whilst (B) shows those that generated low emotional activation

A



Img. 17



Img. 29



Img. 8



Img. 9



Img. 6

B



Img. 26



Img. 42



Img. 39



Img. 15



Img. 14

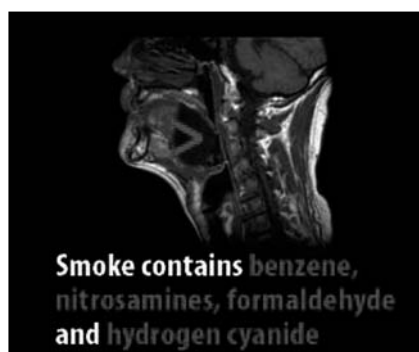
image of a tomogram showing a lung tumour and with the text *Smoking causes fatal lung cancer* (Figure 3: Image 7) obtained a higher score in the case of smokers [$F(1,104) = 10.160, p < 0.01$]. As regards observer's gender, ten of the warnings showed differences in utility rating according to this variable, the ratings in all these cases being higher from females than from males (see description and corresponding F values in Table 1).

For the rest of the warnings there were no significant differences in utility level for any of the variables analyzed.

Relation between activation and utility

Finally, we analyzed the relationship between activation level generated by each image and level of utility assigned. With this purpose we calculated the Pearson correlation ($\sigma = 0.94$). This high level of correlation suggested that the warnings which scored high in emotional activation level were also considered as the most useful (highest utility), and vice versa. Thus, the four warnings rated by participants as most useful coincided

Figure 2
Warnings that provoked higher activation level on being presented together with the corresponding text message than in when the photo was presented in isolation, without text.



Img. 28 $F(1,104)=4.793, p<0.05$



Img. 24 $F(1,104)=4.348, p<0.01$



Img. 11 $F(1,104)=5.521, p<0.05$



Img. 23 $F(1,104)=10.501, p<0.01$



Img. 19 $F(1,104)=6.136, p<0.05$



Img. 42 $F(1,104)=4.282, p<0.05$

Figure 3
Warnings that generated different activation level depending on whether the observer was a smoker or a non-smoker. Numbers 7 and 16 generated higher activation level in smokers, and number 6 in non-smokers.



Img. 7 $F(1,104)=4.573, p<0.05$



Img. 16 $F(1,104)=5.027, p<0.05$



Img. 6 $F(1,104)=5.245, p<0.01$

Figure 4
The five warnings shown, together with 8, 17 and 29 from Figure 1A, provoked higher emotional activation in females than in males



Img. 2 $F(1,104)=5.145, p<0.05$



Img. 5 $F(1,104)=5.570, p<0.05$



Img. 33 $F(1,104)=4.332, p<0.05$



Img. 31 $F(1,104)=5.368, p<0.05$



Img. 39 $F(1,104)=5.231, p<0.05$

Figure 5. (A)

Warning classified as high-utility. Together with this warning, also classified as high-utility were numbers 8, 9, 17 and 29, shown in Figure 1A.

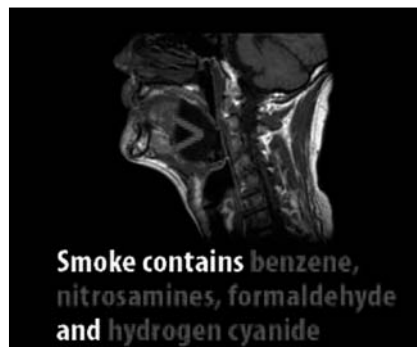
(B). Warnings classified as low-utility. Also classified as low-utility were numbers 14, 39 and 42, shown in Figure 1B.

A



Img. 35

B



Img. 28



Img. 20

with those that had obtained the highest scores in emotional activation (see Figure 1.A: Images 8, 9, 17 and 29). As regards the images classified as being of lowest utility, three of them (see Figure 1.B: Images 14, 39 and 42) were also selected as generating low emotional activation.

DISCUSSION

The goal of the present study was to assess the new combined anti-smoking warnings proposed by the European Commission in a Spanish sample, according to the level of emotional activation they generated in the observer and to their potential utility in an anti-smoking public health campaign. Furthermore, we analyzed the possible influence of some modulatory factors –such as presence of the text message that accompanies the warning, being a smoker or a non-smoker, and participant's gender– on the way the warnings were rated.

Appendix I shows, for all the warnings analyzed, the mean ratings obtained, with regard to both activation and utility. The image that generated most emotional activation and the one most highly rated as useful for an anti-smoking campaign was that which shows a tumoural mass on a man's neck; this is followed by the warning showing a mouth with diseased teeth and gums, and by the image of a healthy lung and a diseased one (see Figure 1A). These three warnings were also those selected as having most impact in the work by Thrasher et al. (2006), and by respondents to a survey carried out in the United Kingdom to choose the most effective images (Department of Health, UK, 2006).

Our study also highlights how diverse factors can exercise their influence on the rating of certain images. First of all, the presence of the descriptive text message corresponding to the photograph was strongly decisive in some cases. Thus, the rating of activation level differed for 6 of the images (those shown in Figure 2), which obtained a lower score when the photograph was shown in isolation than when it was shown together with its corresponding text message. This effect may be due to the fact that these photographs are somewhat ambiguous, and only acquire a clear meaning when they are shown with the corresponding message. Consequently, anti-smoking control policies must avoid any type of vagueness about the meaning of the image, bearing in mind throughout the design process that it

should always be accompanied by descriptive text; if an image is to be used alone, it should be clearly self-explanatory, so that its meaning cannot become confused or masked by other elements of the context in which it is displayed.

Secondly, some warnings were processed and categorized differently by smokers and by non-smokers, this differential condition appearing to affect the emotional response and the utility rating. Thus, the warnings that included thoracic tomograms or x-rays showing serious pulmonary damage (Warnings 7 and 16) were rated as generating higher levels of activation and as being more useful by smokers than by non-smokers. This result partly coincides with those obtained in a European study on cigarette packet labelling, coordinated by *Cancer Research UK* and the *Centre for Tobacco Control Research* at the University of Strathclyde, in Glasgow (European Health Research Partnership and Centre for Tobacco Control Research, 2002). That study suggested that the most appropriate photographs for use in anti-smoking warnings would be medico-scientific ones related to specific lesions resulting from smoking (Tuyá, 2003). Alternatively, non-smokers tend to consider as more useful those warnings that propose or suggest sources of direct support (e.g., a telephone number) for kicking the habit, of the type *Get help to stop smoking: 0803 00 00 00*.

Finally, activation levels for some warnings were modulated by the observer's gender. In our study, 8 images obtained significantly higher scores in activation in the case of females than in that of males. Among these were the three images that overall provoked the highest emotional activation (Images 8, 17 and 29); this concurs with the findings of research on the rating of emotion, in which females tend to give higher activation scores to highly unpleasant scenes (Moltó et al., 1999; Vila et al., 2001). Greater activation was also generated in females than in males by the images associated with fertility and protection of the child during pregnancy, such as the photograph of a baby in hospital and the ultrasound scan of a foetus. Surprisingly, the images related to male infertility or sexual impotence did not provoke greater activation in males than in females, though this finding indeed also coincides with those from the study by Thrasher et al. (2006). With regard to the utility of the warnings, females tend, once more, to consider more useful for anti-smoking campaigns those warnings

related to infertility (artificially fertilized ovum) and to the protection of children (girl looking at a heart shape formed by cigarette smoke), or those referring to ageing (old, wrinkled hands, woman with face pack next to a skull).

An aspect that should be highlighted in our study is the close relationship between activation level and utility level for the warnings. In general, the warnings that provoked most activation were also those rated as most useful for inclusion in anti-smoking campaigns. This result is in line with the data contributed by some researchers, who have shown how messages that provoke high levels of negative emotion are also rated as the most effective (Biener, Ji, Gilpin & Albers, 2004; Hammond et al., 2004). It also coincides with the findings of a study carried out in Brazil after the introduction of graphic warnings on cigarette packets, in which 79% of respondents thought the photographs should be more impactful to be useful (ANVISA, 2003). Moreover, in this regard, data from the field of visual attention studies using sophisticated *eye-tracking* techniques confirm that high-activation photographs receive more attention during visual exploration, and consequently are better recalled, than those of a low-activation nature (Crespo, Cabestrero & Barrio, 2005).

In conclusion, it can be stated that health warnings continue to be a useful means of informing people of the risks associated with smoking. In contrast to the classic black-and-white text messages, in the new era of public health campaigns there is an insistence on the use of photographs or pictograms that transmit much more directly and effectively the message about the high risks involved in this addictive behaviour. Our study is a pioneering one in Spain, and the results obtained constitute a starting point for subsequent work in this line, linked to the transmission of information about the risks of smoking. Therefore, this research may serve as a useful frame of reference for health authorities in the design and application of smoking control policies, which redound to the benefit of citizens' health. Future work will need to analyze whether the classic *wear-out effects* due to repeated exposure are smaller than they are for the current warnings based exclusively on text messages –an issue widely discussed in the literature on smoking– and how they might affect the effectiveness of these new types of warning.

NOTE 1 (as referred to on pp. 27 and 28)

The complete set of 42 warnings can be downloaded at the following address (European Commission):

http://ec.europa.eu/health/ph_determinants/life_style/Tobacco/ev_20041022_en.htm#1

Given that the principal interest in the present work was in the analysis of the combined warnings (text and image) –which are the most novel–, warnings 1, 4, 13, 37, 38 and 40 were excluded from the analysis, on being constituted exclusively of a text message.

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Appendix 1 Full set of 42 warnings proposed by the European Commission. See Note 1 to access the file in which they can be viewed. For each warning the following are indicated: the order in the original document; what the image shows; the text message; the activation level (AL); and the utility level (UL)				
No.	PHOTOGRAPH	TEXT MESSAGE	AL	UL
1 2 3	– Corpse Foot of corpse	“Smokers die younger”	– 2.51 1.91	– 2.75 2.34
4 5 6	– Cardio-pulmonary reanimation Heart surgery	“Smoking clogs the arteries and causes heart attacks and strokes”	– 2.58 2.61	– 2.74 2.74
7 8 9	Computerized Axial Tomogram showing lung tumour Macroscopic aspect of healthy and diseases lungs Hospital patient with oxygen mask	“Smoking causes fatal lung cancer”	2.03 3.15 2.78	2.07 3.55 2.92
10 11 12	Hospital patient smoking Syringe with a cigarette inside Man behind bars; the bars are cigarettes	“Smoking is highly addictive: don’t start”	2.20 2.01 2.02	2.19 2.50 2.39
13 14 15	– Pictogram representing a person throwing a packet of cigarettes in the bin Man doing a resistance test	“Stopping smoking reduces the risk of fatal heart and lung diseases”	– 0.75 0.97	– 1.23 1.46
16 17 18	Thoracic x-ray showing serious pulmonary damage Man with large tumoural mass on neck Patient wired up to monitors	“Smoking can cause a slow and painful death”	2.40 3.62 1.99	2.30 3.60 2.47
19 20 21	Wizened apple Old, wrinkled hands Woman with face pack next to skull	“Smoking causes ageing of the skin”	1.02 1.32 1.43	1.44 1.42 1.62
22 23 24	Artificially fertilized ovum Spermatozoids seen through electronic microscope Woman with empty baby buggy	“Smoking can damage the sperm and decreases fertility”	1.26 0.99 1.11	1.44 1.44 1.85
25 26 27	Pathological arteriogram Couple in bed Drooping cigarette	“Smoking may reduce the blood flow and causes impotence”	1.09 0.74 1.15	1.57 1.64 1.97
28 29 30	Scan showing a throat tumour Mouth with diseased teeth and gums Intubated unconscious man	“Smoke contains benzene, nitrosamines, formaldehyde and hydrogen cyanide”	1.06 3.43 2.48	1.30 3.46 2.41
31 32 33	Ultrasound of a foetus Photograph of a foetus Baby in hospital	“Smoking when pregnant harms your baby”	1.72 1.81 2.17	2.12 2.31 2.78
34 35 36	Child breathing cigarette smoke Child wearing oxygen mask Girl looking at a heart shape formed by cigarette smoke	“Protect children: don’t make them breathe your smoke”	1.88 2.23 1.50	2.66 2.84 2.25
37 38 39	– – Doctor taking a patient’s blood pressure	“Your doctor or your pharmacist can help you stop smoking”	– – 0.79	– – 1.27
40 41 42	– Clasped hands Man emerging from a tunnel	“Get help to stop smoking: 0803 00 00 00	– 1.16 0.75	– 1.74 1.23