Science Arena Publications
International journal of Business Management
Available online at www.sciarena.com
2017, Vol, 2 (3): 49-55

The effect of layout of picture and level of threat on evoked fear and smoking cessation intentions

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Abstract: *This article's objective is to investigate the impact of level of threat and layout of the picture on evoked fear and intention to quit smoking. A between-subject full-factorial 2 × 2 experimental design was constructed (level of threat × layout of picture). A total of 316 university students participated. A MANCOVA analysis was used. The intention to quit smoking is positively influenced by perceived severity. Perceived severity and self-efficacy, when the picture is in right and text is in left are more than when the picture is in left and text in right. Evoked- fear is more when the picture is in right and text in left. These findings are interesting as they open the door to create more effective threat-appeal messages by controlling or influencing layout of picture of the threat appeals. The main social implication of this article is for governments and (health) practitioners who are working against health risk among people. When researchers do better works in discovering effectiveness of elements, governments can benefit from this information. This research is focused on impact of elements such as layout of picture on threat appeals. This could be used to create more effective threat appeals.*

Keywords*: intention to quit smoking, threat appeal, background color*

INTRODUCTION

Cigarette smoking is a major cause of early death, tobacco use kills 5.4 million people a year and accounts for 1 in 10 adult deaths worldwide (www.who.int), while within the European Union it accounts for over half a million deaths each year. Since 2003, the World Health Organization has proposed the Framework Convention on Tobacco Control (FCTC) in order to decrease the number of smokers worldwide. The FCTC aims to help and guide countries in developing effective tools for tobacco control policies. In order to improve the effectiveness of tobacco prevention campaigns, the FCTC encourages use of graphic warnings on tobacco packs. More than 20 countries have introduced them: Canada, 2000; Brazil, 2002; Thailand, 2005; Belgium, 2006; UK, 2008 etc. Studies have been conducted to assess the impact of these visual warnings (Gallopel-Morvan et al., 2011).

Fear is a negatively-valenced emotion, accompanied by a high level of arousal, and is elicited by a threat that is perceived to be significant and personally relevant (Lang, 1984). Fear may be expressed physiologically (as arousal), through language behavior (verbal self-reports), or through overt acts (facial expressions) (Lang, 1984). Threat is an external stimulus variable (e.g., an environmental or message cue) that exists whether a person knows it or not. If an individual holds acognition that a threat exists, then he or she perceives a threat. Message characterizations of threat focus on the severity of the threat (e.g., "AIDS leads to death") and on the targeted population's susceptibility to the threat (e.g., "You're at-risk for AIDS because you share needles while using intravenous drugs") (Witte, 1992).

Fear appeals often are used in social marketing campaigns to inform people about a health risk and convencing them to do the recommended behavior or to take Preventive measures (Dillard & Anderson, 2004,). Changing background colors of messages or using different font colors is easy and often without extra cost. Colors with negative-valence on cigarette packages have been shown to lead to negative associations (Gallopel-Morvan et al., 2013).

Message framing is a theoretically-grounded persuasive communication strategy aimed at motivating behavior through presentation of equivalent appeals framed in terms of either gains or losses. Because people are relatively open to taking risks when faced with potential losses, loss-framed appeals should be most effective in promoting behaviors thought to involve potential risk or uncertainty (e.g., being screened for a life-threatening disease). In contrast, because people tend to avoid risks in the face of potential gains, gain-framed appeals should be most effective in promoting behaviors associated with safety and certainty (e.g., exercising) (Gerend & Sias, 2009). Yet effects of message framing may also depend on threat cues that are incidental to the behavior targeted in the message (Gerend & Sias, 2009).

Packaging has a key role in customers' purchase decisions (Hanzaee & Sheikhi, 2010). Packaging is like a silent salesman, and most of the customers purchase just by looking at the front of the package (Otterbring et al., 2013). Package designes are similar in a category so selecting specific product may depend on if it takes the customer's attention and transport the right message within a very limited time (Judd et al., 1989).

Text and pictures are important package features. Researchers often categorize these into separate classifications, such as verbal and visual (Rettie & Brewer, 2000), or informational and visual package elements (Silayoi & Speece, 2007). Pictorial elements are central for capturing and retaining customers' attention, and textual elements have a large impact on consumers' choices (Otterbring et al., 2013). Words, more than pictures, generally enhance comprehension of new products.

Research about product warnings started in the eighties and most studies focus on the impact of textual and rational warnings (Argo & Main, 2004). The first scientific publication on pictorial tobacco warnings appeared in 2003 (Hammond et al.) and was followed by other studies, mainly by public health researchers. Studies show graphic warnings are more effective than textual labels on cognitive and emotional reactions as well as behavioral intentions (Gallopel-Morvan et al., 2011). Regarding cognitive reactions, graphic warnings are more visible, easier to understand and increase awareness and knowledge of the health hazards of smoking (Trasher et al., 2007). As for emotional reactions, graphic labels activate responses that have an impact on behavior. According to behavioral intentions, graphic labels are more effective than texts in motivating smokers to quit, to help former smokers keep without smoking and to prevent non-smokers from starting to smoke, (Gallopel-Morvan et al., 2011).

To receive the most direct attention, textual elements should be on the left-hand side of a package, whereas pictorial elements should be on the right-hand side. This is inconsistent with previous design directions (based on recall), suggesting the opposite element organisation.

The processing of textual and pictorial information in the human brain should be cnsidered. The functional of the brain's hemispheres is asymmetric (Witelson & Pallie, 1973). On the basis of this asymmetry, the human brain is lateralised, which means that information processing is handled differently in the two hemispheres. There is substantial evidence that the left hemisphere (LH) specialises in semantic categorisation and comprehension, processing, and recognition of verbal information; whereas the right hemisphere (RH) specialises in imagery, visuo-spatial skills, and comprehension of pictorial material (Otterbring et al., 2013). Because of the cross-connection between the hemispheres and the visual fields, information from the left visual field (LVF) is processed in the RH, and information from the right visual field (RVF) is processed in the LH in normal subjects (Otterbring et al., 2013).

The LH processes textual information and the RH processes pictorial information. There are two theories: recall and preference. In the recall view, RVF recalls better for verbal package elements and a LVF better recalls for pictorial elements. This could be explained by brain laterality, linguistic information is processed mainly in the LH, and visuo-spatial functions primarily located in the RH (Rettie & Brewer, 2000). In the preference view, studies recommend background should have the opposite layout (textual elements on the left and pictorial elements on the right). Since such a design has a positive impact on preference and overall product evaluation (Otterbring et al., 2013).

Research Hypotheses

H1. Investigating differences between (a) perceived severity, (b) perceived susceptibility, (c) response efficacy, (d) selfefficacy, (e) evoked fear, and (f) smoking cessation intention when picture is in right and text in left and the picture is in left and text in right.

H2. Investigating differences between (a) evoked fear, and (b) smoking cessation in different threat levels and layout of picture.

METHODOLOGY

Design and Stimuli

A between-subject full-factorial 2 × 2 experimental design was constructed (level of threat × layout of picture). Two threat-appeal messages were designed to promote smoking cessation, differing in the level of threat presented (level of threat: low/high) and displayed against different layout of picture (picture in right, text in left vs. picture in left, text in right). The health risk chosen for the threat message was Laryngeal cancer which was the most unpleasant risk of smoking. The baseline of the message read "Are you smoking?" with a text affirming the self-efficacy and response efficacy and the recommendation was formulated in the slogan "quit smoking". A distinction was made between two levels of threat. For the high-threat condition, 4 pictures of throat with Laryngeal cancer were displayed and under the picture "Smoking results in Laryngeal cancer" was written. For the low-threat a picture of throat with a little redness was displayed and under the picture "Smoking may be result in Laryngeal cancer" was written. It stated the following: "smoking is unhealthy and is bad for you and result in cancer. If you are smoking, may be you will be the next! The chance of Laryngeal cancer is one out of 50 for smokers. Quit smoking and become healthy."

The low fear–evoking message contained the text: "smoking is unhealthy and is bad for you and result in cancer. If you are smoking, may be you will be the next! The chance of Laryngeal cancer is one out of 500 for smokers. Quit smoking and become healthy."

Table1. Measures

No.	Variable	Item	scale	resource
1	perceived susceptibility	3	5-point Likert scales	RBDS; Witte, McKeon, Cameron, & Berkowitz, 1995
2	perceived severity	3	5-point Likert scales	RBDS; Witte, McKeon, Cameron, & Berkowitz, 1995
3	self-efficacy	3	5-point Likert scales	RBDS; Witte, McKeon, Cameron, & Berkowitz, 1995
4	response	3	5-point Likert	RBDS; Witte,

	efficacy		scales	McKeon, Cameron, & Berkowitz, 1995
5	evoked fear	4	semantic differential	Keller and Block [1996]
6	The intention to quit smoking	1	5-point Likert scales	Ajzen and Fishbein 1980

Participants and Procedure

A convenience sample includes 316 respondents (168 females, 53.2%, 148 males, 46.8%). Respondents were from different levels at university (65% undergraduated, 25% master, 9% PH.D, 1% Associate Degree). According to a number picked by the respondents (1–4), they either saw the low/highthreat level with either a picture in right, text in left/ picture in left, text in right. After seeing these stimuli, the respondents were asked to fill in the questionnaire.

RESULTS

A MANCOVA analysis was performed with level of threat and layout of picture as fixed factors and gender, student of university level and age as a covariate. After seeing a threat appeal with different layout of picture, the respondents reported different perceived severity ($f=46.29$, $Sig=0.001<0.05$, $Mean_{\text{picture right-text left}}=2.751$) is more than ($Mean_{\text{picture left-text right}}=1.669$) so H1a is confirmed. Self effiency was different too ($f=283.629$, $Sig=0.001<0.05$, $Mean_{\text{picture right-text left}}=4.166$) is more than ($Mean_{\text{picture left-text right}}=2.665$) confirming H1d. Respondants reported different evoked $f=22.012$, $Sig=0.001<0.05$, $Mean_{\text{picture right-text left}}=2.906$) is less than ($Mean_{\text{picture left-text right}}=3.375$) so H1e is confirmed.

A significant interaction effect indicates that the ad layout of picture affect intention to quit smoking ($f=41.121$, $Sig=0.001<0.05$) (See figure1).

Table2. Demographic variables

%	frequency		
53.2	168	female	gender
46.8	148	male	
100.0	316	total	
1.3	4	Associate Degree	Student of …
64.6	204	undergraduated	
25.3	80	master	
8.9	28	PH.D	
100.0	316	Total	
68.4	216	<25	age
17.7	56	25-30	
7.6	24	30-40	
6.3	20	>40	
100.0	316	total	

Table3. Cronbach's alpha

Cronbach's alpha	variables
0.872	Perceived Severity
0778	Perceived Susceptibility
0.881	Response Efficacy
0783	Self-Efficacy
0.779	Evoked Fear
0.734	The Intention to Quit Smoking
0.892	Total

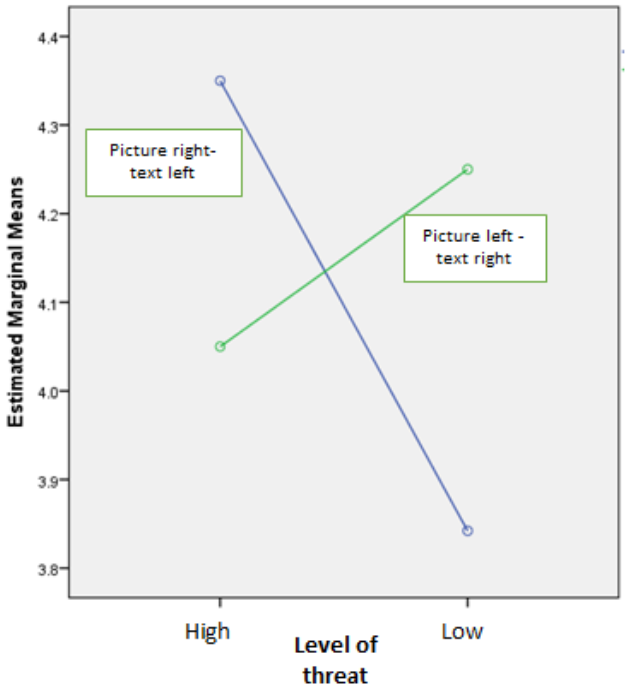

Figure1. Interaction effect of threat level and layout of picture on smoking cessation intentions

Table4. Mancova Results

Effect size	Significant level	F	Mean Square	Degrees of freedom	Sum of squares		
48%	.000	46.290	29.951	1	29.951	Perceived severity	intergroup
10%	.228	1.467	.700	1	.700	Perceived Susceptibility	
5%	.513	.430	.413	1	.413	Response effiency	
80%	.000	283.629	57.678	1	57.678	Self effiency	
35%	.000	22.012	5.625	1	5.625	Evoked fear	
11%	.149	2.107	1.600	1	1.600	smoking cessation	

						intentions	
			.647	158	102.230	Perceived severity	Inside group
			.477	158	75.369	Perceived Susceptibility	
			.961	158	151.771	Response effiency	
			.203	158	32.131	Self effiency	
			.256	158	40.375	Evoked fear	
			.759	158	120.000	smoking cessation intentions	
				159	132.181	Perceived severity	total
				159	76.068	Perceived Susceptibility	
				159	152.184	Response effiency	
				159	89.809	Self effiency	
				159	46.000	Evoked fear	
				159	121.600	smoking cessation intentions	

Discussions & Conclusion

The main objective of this research was to find out whether the use of a picture in right- text in left vs. a picture in left- text in right in a threat appeal impacts the intention. The results show positive effects of the picture in right-text in left, versus to the the picture in left- text in right on perceived severity, displaying a higher perceived severity when it is shown against a picture in right- text in left order. In picture in right-text in left self effiency is higher than a picture in left- text in right order. Evoked fear was different and in a picture in right- text in left was lower than picture in left- text in right order.

RVF better recalls verbal package elements and a LVF better recalls pictorial elements. This could be explained by brain laterality, linguistic information is processed mainly in the LH, and visuo-spatial functions primarily located in the RH (Rettie & Brewer, 2000). So it is better to put picture in right and text in left, in this case the perceived severity is higher.

An interaction appeared with attention to intention to quit smoking. In case of high-threat appeal, picture in right- text in left was higher but in low-threat appeal the result is different and picture in left- text in right is higher.

This article looks at the possible effects of layout of picture on the influence of threat appeals. Governments can use this information to make better threat messages and campagines to prevent people from risk or make them do recommended behavior. A picture in right- text in left order in the threat appeal apparently helps to present the message better by increasing perceived severity. In order to receive the most direct attention, textual elements should be on the left-hand side of a package, whereas pictorial elements should be on the right-hand side (Otterbring et al., 2013). Under such conditions, simple heuristic cues such as picture layout are important. These findings can be used to create more effective threat-appeal messages by changing the picture and text layout of the threat appeals.

This research was in a country with Arabic writing wich is right to left. Some of researches show that the writing is important and when it is from right to left or right to left can have different impacts.

The social implication of this article is for governments and (health) practitioners who fight any kind of (health) risk among people. When researchers describe how threat appeals work and which elements influence their effectiveness (e.g., picture layout), practitioners and governments benefit from this knowledge and are able to create better threat appeals.

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