

Lethal versus reproductive disease appeals in preventive health ads: The moderating effects of life history strategy and message framing

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Abstract:

In this paper, we rely on evolutionary psychology to examine how the use of lethal (threatening survival) versus reproductive (threatening reproduction) disease appeals affects smoking intention among consumers with different life history strategies. The results of two experimental studies indicate that smoking intention varies as a function of the type of appeal and the life history strategy adopted by the consumer: slow strategists' smoking intention is lower when a reproductive disease appeal is used, while fast strategists' smoking intention is lower when a lethal disease appeal is used. The interactive effect is moderated by message framing and appears only for negative framed messages, but not for positively framed messages. These results contribute to advertising research by providing an evolutionary explanation for the effects of disease appeals in preventive health communication.

Keywords: health communication, evolutionary psychology, advertising effectiveness

Track: Advertising & Marketing Communications

1. Introduction

The costs resulting from consumers engaging in harmful health behaviors are remarkable. For example, tobacco use causes 650,000 deaths per year in Europe, resulting in €544 billion in direct medical costs and lost productivity – equivalent to about 4.6% of the EU's GDP (European Respiratory Society, 2018). Although only 15% of the world's population live in Europe, one third of the burden of tobacco-related diseases occurs in Europe. In an attempt to reduce harmful behavior by consumers and to improve consumer well-being, policy makers invest considerable funds in preventive health advertising campaigns. These campaigns often utilize disease appeals (e.g., heart disease, cancer, diseased liver). Disease appeals are a type of fear appeals featuring a medical condition resulting from consumers' engagement in a harmful health behavior (Kleinot & Rogers, 1982; Manyiwa & Brennan, 2012).

The limited evidence on the effectiveness of disease appeals, however, suggests that they are oftentimes ineffective in influencing consumer behavior (Michaelidou, Dibb, and Ali, 2008; Pechmann, Zhao, Goldberg, and Reibling, 2003; Smith & Stutts, 1999). In the current study, we provide an explanation for the effectiveness of different disease appeals across different consumer groups. We draw on evolutionary psychology to distinguish between *lethal* diseases threatening survival (e.g., heart disease) and *reproductive* diseases threatening reproduction (e.g., infertility) (Kenrick, Griskevicius, Neuberg, and Schaller, 2010). Relying on life history strategy (LHS), we further differentiate between *slow strategists* that are consumers invested in somatic resources aiding survival (e.g., obtaining embodied capital such as knowledge and skills) and *fast strategists* that are consumers invested in mating resources aiding reproduction (e.g., obtaining a sexual partner) (Figueredo et al., 2014). Across two experiments using anti-smoking advertisements, we demonstrate how disease appeal type interacts with life history strategy to affect consumers' intention to smoke.

The study contributes to preventive health advertising research by suggesting that despite prior literature advocating mostly against the use of disease appeals, these can also be utilized effectively to reduce harmful behavior. It further undergirds the usefulness of an evolutionary lens when explaining the effect of disease appeals related to distinct challenges from our evolutionary past (e.g., survival, reproduction). The key

practical implication of the paper is that policy makers and advertisers need to consider different types of deep-seated disease-related appeals. It further demonstrates how life history strategy can be used for segmenting the target audience to maximize the communication effect of preventive health advertising campaigns.

2. Theoretical Background

2.1 Lethal versus reproductive disease appeals and life history strategy

Preventive health advertising campaigns widely adopt disease appeals to deter consumers from engaging in harmful behaviors. In a content analysis of anti-smoking television advertisements, Pechmann et al. (2003) indicated that the “Disease and Death” and “Selling Disease and Death” appeals were the most frequently used appeals among seven different appeal categories. However, results of the follow-up experiment by the same authors exposed no effect of disease appeals on intention to smoke. Yet, intention to smoke was successfully decreased when other appeals were used. For that reason, Pechmann et al. (2003) advised for the neglect of disease appeals in favor of appeals stressing that smoking: endangers others; is an impediment in achieving higher-order aspirational goals; is viewed as unappealing and resisted by an attractive role model. In another anti-smoking advertising study, Michaelidou et al. (2008) compared the effectiveness of long-term disease-related information and short-term cosmetic information (e.g., yellow teeth and fingernails and smelly clothes). The authors concluded that cosmetic appeals have a greater impact than disease appeals.

The literature on disease appeals in preventive health ads reveals two aspects. First, the field appears to be quite united around the conclusion that the effectiveness of disease appeals is limited and these should, thus, be rather avoided. Second, when manipulating disease appeals the literature exclusively relies on the use of lethal diseases that threaten survival (Manyiwa & Brennan, 2012). This leads to the neglect of the existence and importance of other distinct challenges that consumers face. From an evolutionary psychology perspective (Kenrick et al., 2010), primary evolutionary goals that can be deterred by a disease are survival (staying healthy) and reproduction (having an offspring). Anti-smoking advertising is a particularly appropriate application domain

for studying the effects of appeals related to both goals, for smoking can lead to both lethal diseases (e.g., heart disease, cancer) and to reproductive diseases (e.g., impotence), allowing campaigns to be framed around each appeal.

Life history strategy (Figueredo et al., 2014) is the dominant framework used to model individual's resource allocation between survival and reproductive goals. According to this theory, the simultaneous achievement of these two goals suggests a resource allocation problem leading to the implicit competition between the goals. The theory distinguishes between slow strategists invested in somatic resources (aiding survival) and fast strategists invested in mating resources (aiding reproduction) (Olderbak, Gladden, Wolf, and Figueredo, 2014). Griskevicius, Tybur, Delton, and Robertson (2011) hinted at the possible manners in which the two types of strategists assess threats to their resource allocations. According to the authors, since the two strategist types ultimately aim to achieve both goals and since the two resource types are non-substitutable, each strategist type is more afraid of threats to their scarcer resource: slow (survival-oriented) strategists – of threats to reproduction; fast (reproduction-oriented) strategists – of threats to survival. If an organism delays reproduction to invest in somatic resources, it risks not reproducing at all. Conversely, if an organism reproduces too quickly without investing in somatic effort, it may die before its full reproductive potential can be met. Given these arguments, we hypothesize that:

H1: Disease appeal and life history strategy interact to affect smoking intention such that a) for slow (survival-oriented) strategists, smoking intention is lower when reproductive disease appeals are used compared to lethal disease appeals, and b) for fast (reproduction-oriented) strategists, smoking intention is lower when lethal disease appeals are used compared to reproductive disease appeals.

2.2 Message framing as a moderator of the effect of disease appeals

According to framing theory, consumers respond differently to objectively equivalent messages depending on whether they contain negative outcomes (negative-framed) or positive outcomes (positive-framed). While such an apparent inconsistency in decision processes is traditionally viewed as a design flaw in the human mind, evolutionary psychology purports that this bias may instead reflect a design feature that

helped humans solve recurrent evolutionary challenges (Griskevicius & Kenrick, 2013). In particular, the theory suggest that negative information has greater implications across a broad range of psychological phenomena including survival and reproduction (Baumeister, Bratslavsky, Finkenauer, and Vohs, 2001; Rozin & Royzman, 2001; Taylor, 1991). Hence, consumers might be only responsive to negative-framed messages containing evolutionarily relevant cues, but not to positive-framed messages (Saad, 2017). Therefore, we hypothesize that:

H2: The interactive effect of disease appeal and life history strategy on smoking intention is moderated by message framing such that a) for negative-framed messages, the effect appears, and b) for positive-framed messages, the effect does not appear.

3. Research Method

3.1 Study 1

Study 1 follows a two-factor between-subject experimental research design with disease appeal (lethal vs. reproductive) as a manipulated factor and life history strategy (a continuous variable) as a measured factor. Disease appeal was manipulated through the use of two anti-smoking advertisements, containing the same image of a smoked cigarette and differing only in the advertising message (see Figure 1).



Figure 1. Experimental Stimuli (Study 1)

Smoking intention was measured with a three-item, seven-point scale ($\alpha = .95$), borrowed from Pechmann et al. (2003). Life history strategy was assessed with the twenty-item, seven point Mini-K scale ($\alpha = .86$) from Figueredo et al. (2014). For

example, participants indicated their level of agreement with the statement “I would rather have one than several sexual relationships at a time”. A higher mean of agreement on the LHS scale is indicative of a slow strategy, while a lower mean implies a fast strategy.

A total of 141 non-smoking US participants (48% female, mean age of 39.74 years) were recruited through Amazon’s MTurk platform and were randomly assigned to one of the two experimental conditions. A non-smoking sample was chosen to ensure results’ comparability with prior studies on preventive health communication aiming to deter non-smokers from starting to smoke (Pechmann et al., 2003).

To test hypothesis 1, participants’ responses to the advertisements were analyzed using a moderated regression model with disease appeal (D), life history strategy (LHS), and their interaction as independent variables. Smoking intention served as a dependent variable. The analysis revealed main effects of disease appeal and life history strategy that are qualified by the predicted interaction of the two factors on smoking intention (see Table 1 and Figure 2). A spotlight analysis demonstrated that: for slow strategists (+1SD), smoking intention is lower when reproductive disease appeals are used compared to lethal disease appeals ($M_{\text{lethal}} = 2.44$; $M_{\text{reproductive}} = 1.66$; $t = -1.67$, $p < .10$); and for fast strategists (-1SD), smoking intention is lower when lethal disease appeals are used compared to reproductive disease appeals ($M_{\text{lethal}} = 1.99$; $M_{\text{reproductive}} = 2.78$; $t = 1.68$, $p < .10$). Thus, hypothesis 1 is supported.

Independent variables	Smoking intention				
	Unstandardized coefficient	Standard error	t	LLCI	ULCI
Constant	-3.38	3.02	-1.12	-9.36	2.60
Disease appeal (D)	4.34	1.87	2.32*	.65	8.04
Life history strategy (LHS)	1.12	.59	1.90 ⁺	-.05	2.28
D x LHS	-.87	.37	-2.36*	-1.59	-.14

⁺ $p < .1$; * $p < .05$; ** $p < .01$; LLCI/ULCI=lower and upper levels of confidence interval

Table 1. Tests of Moderation

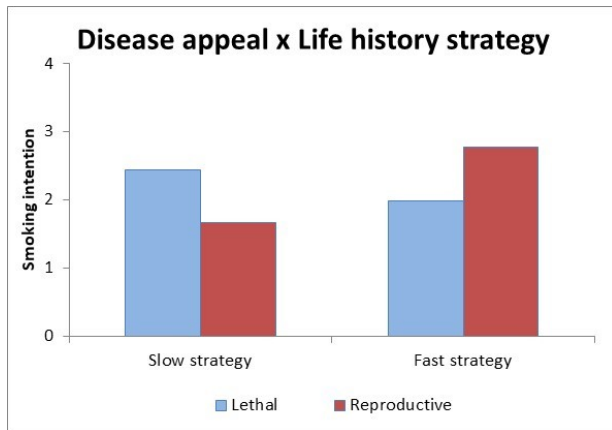


Figure 2. Interaction Effect of Disease Appeal and Life History Strategy

3.2 Study 2

Study 2 follows a three-factor between-subject experimental research design with disease appeal (lethal vs. reproductive) and message framing (negative vs. positive) as a manipulated factors, and life history strategy (a continuous variable) as a measured factor. The stimuli used were adapted from study 1 and contained an image of a smoked cigarette and different advertising messages: for the lethal disease / negative framing condition – “A diseased heart can end your life. Smoking worsens heart health.”; for the reproductive disease / negative framing condition – “Low potency can be the end of your genes. Smoking worsens potency.”; for the lethal disease / positive framing condition – “A healthy heart can extend your life. Not smoking improves heart health.”; for the reproductive disease / positive framing condition – “High potency can help you spread your genes. Not smoking improves potency.” The same scales for smoking intention ($\alpha = .96$) and life history strategy ($\alpha = .81$) were employed.

A total of 386 non-smoking US participants (56% female, mean age of 43.10 years) were recruited through MTurk and were randomly assigned to one of the four experimental conditions.

To test hypothesis 2, participants’ responses to the advertisements were analyzed using a moderated regression model with disease appeal (D), message framing (F), life history strategy (LHS), and their interactions as independent variables. Smoking intention served as a dependent variable. The analysis revealed the predicted interaction of the three factors on smoking intention ($R^2 = .04$, $p = .05$; $b = -1.39$, $se = .58$, $p = .02$, $LLCI = -2.53$, $ULCI = -.26$;

see Figure 3). A spotlight analysis demonstrated that a) for negative-framed messages, for slow strategists (+1SD), smoking intention is lower when reproductive disease appeals are used compared to lethal disease appeals ($M_{\text{lethal}} = 2.83$; $M_{\text{reproductive}} = 1.83$; $t = 2.11$, $p = .04$); and for fast strategists (-1SD), smoking intention is lower when lethal disease appeals are used compared to reproductive disease appeals ($M_{\text{lethal}} = 2.09$; $M_{\text{reproductive}} = 3.31$; $t = -2.82$, $p = .01$); and b) for positive-framed messages, smoking intention did not differ for either disease appeal among both slow ($M_{\text{lethal}} = 2.37$; $M_{\text{reproductive}} = 2.58$; $t = -.52$, $p = .61$) and fast strategists ($M_{\text{lethal}} = 2.45$; $M_{\text{reproductive}} = 2.76$; $t = -.73$, $p = .47$). The results replicate the findings of study 1 (negative framing) and support hypothesis 2.

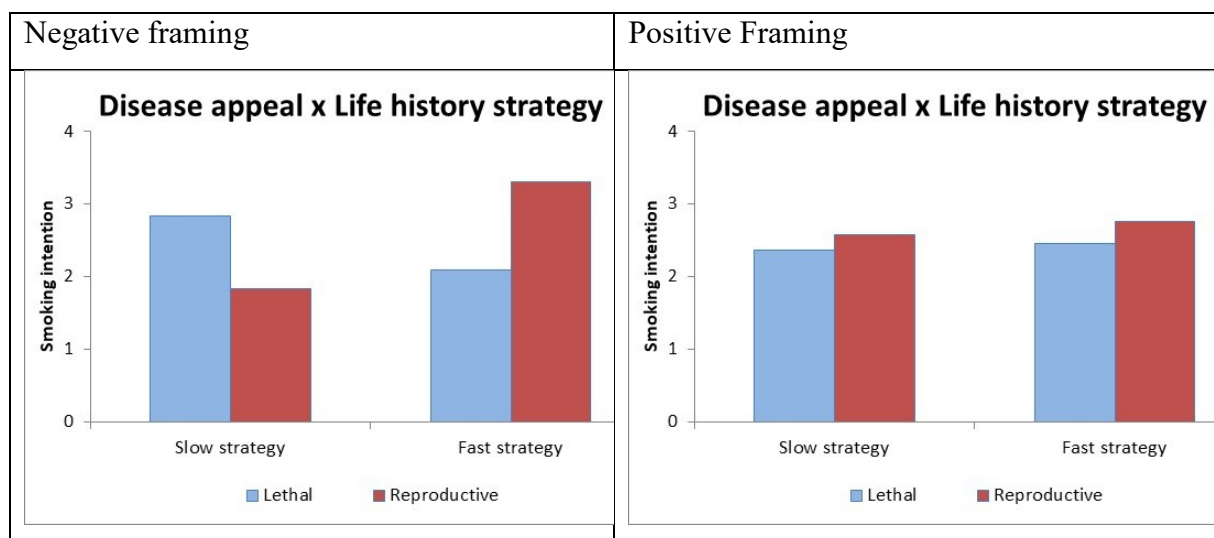


Figure 3. Interaction Effect of Disease Appeal, Life History Strategy, and Message Framing

4. Discussion

The current paper provides contributions to both academic research and to advertising practice. The study introduces and explains the role of appeal type as a moderating factor for the effects of disease appeals in preventive health advertising. The extant literature mainly condemns the use of disease appeals as a means of influencing consumer behavior. Furthermore, by operating at the proximate level of explanation, prior research fails to elucidate the ultimate Darwinian *why* – why under certain conditions disease appeals do not elicit changes in behavior or in intention? By adopting an evolutionary lens, the current paper demonstrates that behavioral intention varies as a function of disease appeal type, consumers' life history strategy, and message framing.

These findings can help explain why prior experimental research reports no effects of disease appeals, despite the existence of qualitative studies in which consumers indicate decreased intention to engage in harmful behaviors that can lead to a lethal end – “The fact that you can die from it is a turn-off.” (Peracchio & Luna, 1998, p. 51). Perhaps, these studies did not account for consumers’ life history strategy that we highlight as an important moderator. The current paper further contributes to framing theory by demonstrating that consumers are only responsive to negative-framed messages containing evolutionarily relevant cues.

Policy makers and advertisers are advised to consider different types of deep-seated disease-related appeals as well as message framing, and to use life history strategy for segmenting the target audience. Beside the psychometric assessment of life history strategy, advertisers might also use socioeconomic status indicators to draw inferences about consumers’ life history strategy. For example, consumers that grew up in a relatively resource-scarce environment might be more likely to adopt a faster strategy, while consumers that grew up in a relatively resource-plentiful environment might be more likely to adopt a slower strategy (Griskevicius et al., 2011).

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