

UNIVERSITE DE DROIT, D'ECONOMIE ET DES SCIENCES D'AIX MARSEILLE
AIX MARSEILLE UNIVERSITE
INSTITUT D'ADMINISTRATION DES ENTREPRISES

CENTRE D'ETUDES ET DE RECHERCHE
EN GESTION D'AIX MARSEILLE

**ADAPTING COMMUNICATION MESSAGES
TO REWARD AND PUNISHMENT SENSITIVITY
OF TARGETED AUDIENCES IN
FIGHTING OBESITY**

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W.P. n° 943

June 2014

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Adapting communication messages to reward and punishment sensitivity of targeted audiences in fighting obesity

Abstract

Fear is a strategy that public authorities favor in their campaign against obesity. Its effectiveness needs to be considered in light of the regulatory fit. If messages based on fear are more efficient for people sensitive to punishment, messages based on pleasure are more efficient for people sensitive to reward.

Keywords

Consumer behavior, food, communication, electrodermal activity, regulatory fit.

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Introduction

Communicating about a strong threat to health together with recommending changes in habits easy to implement is often presented in the literature as an effective strategy to convince individuals to switch to healthier behaviors (Witte and Allen 2000). However, the effectiveness of this strategy depends on the goal pursued (e.g. change in behavior, detection of sickness; Rothman and Salovey, 1997) and consumers' attitude towards risks.

Individual variables such as reward and punishment sensitivity (Gray, 1981) or promotion/prevention orientation (Higgins, 2000) appear to be good predictors of risky behaviors. A substantial body of scientific literature has revealed the strong association between reward sensitivity and (over-)consumption of alcohol (Franken, 2002), cigarette (O'Connor, Stewart and Watt, 2009), drugs (Dawe, Gullo and Loxton, 2004) and junk food (Davis, Patte, Levitan, Reid, Tweed and Curtis, 2007).

However, depending on differential sensitivity to reward or punishment, each individual reacts in various ways to the same information (Cesario, Grant and Higgins, 2004 ; Chernev, 2004). Promoting a diet with a positive message (e.g. *"If you eat the right amount of fruit and vegetable, you can keep yourself safe from illness and maintain an overall good health"*) is more persuasive for people sensitive to reward. Promoting a diet with a negative message (e.g. *"If you do not eat the right amount of fruit and vegetable, you are more likely to be overweight and to have heart conditions"*) is a more persuasive strategy when targeting people sensitive to punishment (Cesario et al., 2004). The congruence between strategic individual information and the promotion or prevention orientation is known as *regulatory fit* and has a beneficial effect on persuasion and behavioral change.

However it is important to take into account the attributes of the products. People sensitive to reward pay more attention to hedonic attributes (e.g. the taste of an ice-cream), whereas utilitarian attributes (e.g. the calorie content of an ice-cream) will be valued by people sensitive to punishment (Chernev, 2004).

Hence, in the context of food consumption, we propose that valuating positive hedonic attributes of healthy food has a positive effect on people sensitive to reward in a strategy directed at helping them adopting a healthier lifestyle. This is known as the first condition of *regulatory fit*. Conversely, emphasizing negative utilitarian attributes of junk food has a positive effect for persuasion strategies aimed at people sensitive to punishment. This is the second condition of *regulatory fit*.

Research methods

Participants (N=24 right-handed undergraduate students; 12 female, 12 male; age: M=21.4±2.2) received a monetary compensation (10 euros) for volunteering in the experiment that received all local, regional and national ethics authorization as required by the French Bioethics laws. They were informed that they were participating in a study on nutritional habits and health promotion. Similar to many studies on food consumption, all were asked to fast during the 4 hours preceding the experiment in order to increase the value placed on food consumption. To test the effect of valence (positive vs negative) and attribute (hedonic vs utilitarian) on persuasion depending on sensitivity to reward and punishment, four categories of public health promotion ads –combining text and images- were designed. We built templates of ads used by the French authorities in anti-obesity campaigns to guarantee familiarity with the lay-out, the logos and the wording seen on billboards and magazines:

1. *Health Benefits* linked to eating fruit and vegetable (positive utilitarian);
2. *Health Risks* linked to eating junk food (negative utilitarian);
3. *Pleasure* of eating fruit and vegetable (positive hedonic);
4. *Disgust* of junk food (negative hedonic).

Each participant evaluated each message category in a counterbalanced order. Upon arrival, participants were presented with 10 food pictures (among which 5 junk food items) and asked to rate their intention to eat junk food and healthy food on a 9-point Likert scale. They had to sit in front of a computer screen onto which the ads were displayed. Sensors were placed on two of their left fingers to assess their level of arousal based on the computation of the percentage of change in their electrodermal activity compared to a baseline measured prior to the experiment. Within each category of messages, 10 different messages were presented

successively in a block design (due to the relaxation time constraints of recording electrodermal activity). To measure persuasion, participants evaluated the response efficacy and their self-efficacy. Ten pictures of food were then presented for which they self-reported their intention to eat. At the end of the experiment a questionnaire was used to assess sensitivity to reward and punishment: the 24-item Behavioral Inhibition System/Behavioral Activation System (BIS/BAS; Carver & White, 1994).

Results and discussion

Results reveal that sensitivity to reward is positively correlated with prior intention to eat junk food ($r = 0.412, p < 0.05$), which confirms that sensitivity to reward is positively correlated with eating behaviors that imply a risk for health. Sensitivity to punishment exhibits no correlation with prior intention to eat healthy or junk food.

To test for the effect of regulatory fit between the type of message employed and the participants' sensitivity to reward or to punishment, multiple regression analyses were used. For each category of messages and each dependent variable (response efficacy, self-efficacy, arousal and healthy consumption intention of junk and healthy food), we tested both the effect of reward and punishment sensitivity and their prior intention to eat junk food, using a backward approach to select the most appropriate model.

We found significant effects of sensitivity to reward and prior intention to eat junk food in the *no regulatory fit* conditions (positive utilitarian, negative utilitarian and negative hedonic). Prior intention to eat junk food impacts response efficacy when positive and utilitarian messages are presented ($R^2 = 0.318, p < 0.05$). Sensitivity to reward has a significant effect on response efficacy ($R^2 = 0.286, p < 0.05$) and self-efficacy ($R^2 = 0.195, p < 0.05$) when messages are negative and hedonic. Sensitivity to reward also has a positive effect on response efficacy ($R^2 = 0.222, p < 0.05$) and on the percentage of change in electrodermal activity when messages are negative and utilitarian ($R^2 = 0.191, p < 0.01$). When messages are negative and utilitarian, a higher level of electrodermal activity and response efficacy - without any significant increase in self-efficacy and intention to eat healthy food after exposure to ads- suggests that individuals perceive the threat to be strong but too difficult to overcome (Witte and Allen, 2000). Instead, increased response efficacy in both partial fit

conditions (positive and utilitarian, negative and hedonic conditions) without any significant increase in electrodermal activity and intention to eat healthy food after exposure to messages suggests that the recommendation is considered feasible but not engaging enough.

In *regulatory fit* conditions (positive and hedonic messages), sensitivity to reward and prior intention to eat junk food have a positive effect on all dependent variables. They have a positive effect on response efficacy ($R^2 = 0.403$, $p < 0.001$), self-efficacy ($R^2 = 0.246$, $p < 0.05$), percentage of electrodermal activity change ($R^2 = 0.521$, $p < 0.001$) and also on intention to eat healthy food after exposure to the ads ($R^2 = 0.298$, $p < 0.05$). It is only under *regulatory fit* conditions (negative and utilitarian messages) that sensitivity to punishment has a positive impact on response efficacy ($R^2 = 0.217$, $p < 0.05$).

Therefore, our findings confirm those of Cesario et al. (2004) and Chernev (2004), highlighting the importance of taking into account regulatory fit when dealing with the valence and the attributes of the message, and the necessity of adapting public health strategies to the target audience.

Our results also reveal a limitation of the current public health communication strategies. Individuals with high sensitivity to reward and high prior intention to eat junk food develop an intention to eat healthy food after exposure to positive and hedonic messages. However, there is no negative effect on intention to eat junk food is found, whatever the condition.

Conclusions and implications for theory and practice

This study challenges the well-accepted idea that fear-appeal messages are most efficient at convincing people to change eating behaviors. Promoting the taste of healthy food and, more generally, emphasizing the pleasure and benefits of adopting healthy food behaviors is more effective especially for people prone to taking risks for their health. Using physiological measures to complement more classical self-reported declarative measures to assess the effectiveness of communication messages in public health turned to be greatly beneficial.

Our findings highlight the relationship between sensitivity to reward and intention to eat junk food. We show that individuals with high sensitivity to reward and high intentions to eat junk food are more likely to be persuaded by positive and hedonic health messages while negative

and utilitarian content seem to be more efficient for individuals with high sensitivity to punishment.

A clear theoretical implication of our work is the need to integrate the concepts of reward and punishment as moderators in models dealing with appeal to fear sensitivity (see Witte and Allen, 2000 for early suggestions). It also requires taking into account regulatory fit - including both valence (positive vs. negative) and attribute types (hedonic vs. utilitarian)- in theoretical approaches (Higgins, 2000).

Our results also reveal a current limitation of health messages. Whereas promoting healthy eating habits increases intentions to consume healthy food, reducing the consumption of unhealthy food is not easy since no significant decrease in the intention to eat junk food was observed, even under regulatory fit conditions.

Finally, from a managerial perspective, our findings highlight the importance of considering a differential approach (i.e. not a one-size-fits-all) when targeting population(s) and developing public health messages (Oullier, 2013; Petit et al., 2011). People prone to taking health risks might be easier to persuade to adopt the recommended healthy behavior when exposed to positive messages promoting food hedonic attributes. The next step is methodological with a combination of self-reported and (neuro)physiological measures to evaluate the effectiveness of communication messages in fighting obesity or other public health threats (Oullier & Sauneron, 2010).

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