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Research report

Promoting the avoidance of high-calorie snacks. The role of temporal message framing and eating self-efficacy

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ABSTRACT

Background: Message framing outcomes of healthy behaviours as occurring 'every day' vs. 'every year' can influence the temporal proximity and perceived likelihood of these outcomes. However, it is not known how pre-existing beliefs such as confidence in one's ability to perform health-related behaviour interact with such messages. *Objective:* The purpose of this research was to investigate whether eating self-efficacy moderates the effect of temporal framing (day-frame vs. year-frame) on snacking behaviour. *Methods:* Participants ($N = 95$) completed the short form of the Weight Efficacy Lifestyle Questionnaire (WEL-SF) and read either a day-framed or year-framed message about the health benefits associated with avoiding snacking. Consumption of snacks was reported 7 days later. *Findings:* For those with low levels of eating self-efficacy (WEL-SF score < 4.3 on a 7-point response scale), the year-framed message was associated with lower levels of snacking than the day-framed message. *Discussion:* The current research identifies a key role for eating self-efficacy in shaping recipients' responses to temporally framed messages about the health benefits associated with the avoidance of snacking.

Introduction

The role of diet in excessive weight gain, obesity, and chronic diseases such as cardiovascular disease, diabetes, and some forms of cancer, is well documented (Boffetta et al., 2010; Brannon & Feist, 2009; Forslund, Torgerson, Sjöström, & Lindroos, 2005; Gandini, Merzenich, Robertson, & Boyle, 2000; Hooper et al., 2001; Joshipura et al., 2001; Kopelman, 2007; Liu, 2003; Lobstein, Rigby, & Leach, 2005; Ness & Powles, 1997; Wiseman, 2008), with a high frequency of snacking recognised as a significant contributor to the obesity epidemic (Miller, Benelam, Stanner, & Buttriss, 2013). There has been widespread dissemination of messages about the benefits of healthy diet. However, the current prevalence of eating-related problems (Tabassum, 2009) suggests that there is more to be done to develop effective health communication in this area.

The current study focuses on a simple manipulation of the way in which the benefits of healthy diet are framed. More specifically, in this investigation we turn to the conceptual rationale based on temporal framing (Chandran & Menon, 2004; Lo, Smith, Taylor, Good, & von Wagner, 2012) and explore the effects of day-framed and year-framed messages encouraging the avoidance of snacking. Extending current knowledge, we explore the potential moderating role of eating self-efficacy in this context.

Temporal framing

There are a number of approaches available to guide health educators in the development of persuasive communications (Chaiken & Eagly, 1989; Chaiken & Maheswaran, 1994; Kahneman & Tversky, 1979; Levin, Schneider, & Gaeth, 1998; Petty & Cacioppo, 1986; Rothman, Bartels, Wlaschin, & Salovey, 2006; Rothman & Salovey, 1997; Rothman, Wlaschin, Bartels, Latimer, & Salovey, 2008; Tversky & Kahneman, 1981). One promising strategy, drawing on Construal Level Theory (Trope & Liberman, 2000, 2003, 2010), concerns temporal framing (Chandran & Menon, 2004). Temporal framing is the application of a time frame to a particular outcome such as 'many people dying from heart disease'. For example, comparisons can be made between messages containing the sentence "**every day** a significant number of people suffer the consequences of heart disease" and "**every year** a significant number of people suffer the consequences of heart disease". While objectively, the time frame does not convey information about the temporal distance of the events they describe (heart disease), it has been argued that the day and year frames 'trigger disparate subjective temporal perceptions that systematically affect judgments of risk', with day frames

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associated with events that are closer in time (more proximal), and thus more concrete and probable than those associated with a year frame (Chandran & Menon, 2004; p. 376).

Chandran and Menon (2004) propose that day frames will be more effective within negative-valence messages because the threats to health appear more concrete and imminent. In contrast, year frames are expected to be more effective within positive-valence messages where avoidance of a health threat seems a distant prospect, heightening the perception of risk to health in the immediate future and increasing individuals' motivation to act. While the research in this area is limited, the findings have supported these assertions (Chandran & Menon, 2004; Kees, 2011; Lo et al., 2012). It appears that temporal framing may be a simple and effective technique for enhancing the persuasive impact of health messages. However, many questions remain about whether individual differences moderate these effects. It is possible that individuals' level of self-efficacy prior to exposure to health communications is influential. In particular, it may be more challenging to manipulate perceptions of whether health threats can be avoided amongst those who are confident in their ability to perform the targeted behaviour. The effects of temporal framing within gain-framed messages depend on manipulating the proximity and concreteness of avoiding a threat, and consequently, self-efficacy is likely to play an important moderating role.

The moderating role of self-efficacy

In both correlational and experimental studies, confidence in one's ability to engage in recommended behaviour has been shown to be a strong predictor of whether this behaviour is achieved (Bandura, 1977, 1986, 1997, 2001; Bandura & Locke, 2003; Guillaumie, Godin, & Vézina-Im, 2010; Povey, Conner, Sparks, James, & Shepherd, 2000; Salovey, Rothman, & Rodin, 1998; Schwarzer, 2008; van 't Riet, Ruiter, Werrij, & de Vries, 2009, 2010; Werrij, Ruiter, van 't Riet, & de Vries, 2011).

Self-efficacy is an important moderator of the effects of interventions that target healthy lifestyles (Saksvig et al., 2005; Wangberg, 2008); and in the context of dietary behaviour, research has shown that individuals reporting higher levels of self-efficacy are less likely to snack (Masalu & Åstrøm, 2001), more likely to act on their intentions to eat healthy foods (Gutiérrez-Doña, Lippke, Renner, Kwon, & Schwarzer, 2009; Richert et al., 2010; Schwarzer, 2008), and more successful in achieving weight loss (Brownell & Cohen, 1995; Byrne, 2002; Strecher, DeVellis, Becker, & Rosenstock, 1986; Wadden & Letizia, 1992). Novel approaches are thus required to promote behaviour change amongst those lower in self-efficacy.

The current study

The current study is the first to test the moderating effect of self-efficacy on temporally framed (day-framed vs. year-framed) messages emphasising the health benefits associated with the avoidance of snacking at work[1]. Chandran and Menon (2004) argue that when an outcome is framed positively, year-framed messages make the health hazard appear more of a threat than day-frame messages. Hence, we hypothesised that for participants reporting low levels of eating self-efficacy there would be an effect of temporal framing on the avoidance of snacking, with those reading the year-framed messages about the benefits of reduced snacking reporting less snacking behaviour than those reading the day-framed messages. In contrast, we expected to find that if message recipients are confident that they are capable of exerting control over eating behaviour (high eating self-efficacy), then health communications about the consequences of adopting or not adopting a healthy diet will be equally beneficial in both day- and year-frame conditions. Those reporting high self-efficacy should be less susceptible to manipulations that are intended to alter perception of whether avoidance of risk is proximal and concrete or distant and abstract.

Method

Participants

One hundred forty-six participants completed the Time 1 measures, 51 failed to respond at Time 2, representing an attrition rate of 35%. Participants were staff at a university in the South of England (74 female) aged 22–66 ($M = 42.44$; $SD = 11.07$). Body mass index (BMI) ranged from 17.92 to 37.28, with an average at the higher end of the 21–25 normal BMI category ($M = 24.37$; $SD = 3.77$).

Design and procedure

The study employed a randomised prospective design, involving two waves of data collection[2]. University staff responded to an email inviting them to participate in an on-line survey about work-based eating behaviour, with the offer of a free lunch-time salad as incentive. At Time 1, participants were randomly assigned to receive either a day-framed or year-framed message about the benefits of avoiding eating high-calorie snacks. The use of these time frames is in keeping with previous studies in this area (e.g. Chandran & Menon, 2004; Lo et al., 2012). Allocation was based on a computer-generated numbers list. Participants completed Time 2 measures 7 days later.

Measures and manipulations

Demographic information

Participants were asked to indicate their age, gender, weight, and height. Body mass index (BMI) was calculated for each participant: BMI = weight (kg)/height (m) [3].

Baseline snacking behaviour

Following Luszczynska, Tryburcy, and Schwarzer (2007), baseline snacking behavior was measured with a single item 'In the last 7 days at work, how many high-calorie snacks did you eat?' Participants were provided with examples of snack foods (e.g. chocolate, crisps, salted nuts), and participants were given an open text box in which to respond.

[1] The use of a positive-valenced message following a statement about the health consequences associated with unhealthy diet is in keeping with messages typically used to encourage healthy dietary choices. For example, in the UK, the NHS Choices website states that 'eating a healthy, balanced diet is an important part of maintaining good health, and can help you feel your best'. Previous research also indicates that the effectiveness of gain-framed health messages when encouraging 'safe' behaviours that are characterised typically by little 'risk' (e.g. dietary behaviour, exercise, dental flossing) and which are likely to result in a healthy outcome (see Rothman et al., 2006). Loss-framed messages (vs. gain-framed messages) are typically more persuasive when encouraging behaviours that may be construed as 'risky' to perform (e.g. mammography, HIV screening) given their potential to detect the presence of a serious health problem (Rothman et al., 2006; Rothman & Salovey, 1997).

[2] Participants were invited to complete a second follow-up questionnaire, one month after completion of the initial follow up; receiving the offer of a free lunch-time salad as incentive to participate. The number of participants completing this survey was too small to conduct any further meaningful analyses.

[3] It should be noted that subjective (self-reported) measures assessing height and weight were used to calculate body mass index (BMI).