

# Promoting change in meat consumption among the elderly: Factual and prefactual framing of health and well-being

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## ABSTRACT

Messages aimed at changing eating habits of the elderly are often not persuasive. In two studies, we tested the hypothesis that the persuasiveness of messages regarding the effects of meat consumption on health versus well-being would depend on their factual versus prefactual ('if ... then ...') framing. Different groups of elderly participants were presented with different versions of a message describing the possible negative effects of excessive meat consumption. Results of a preliminary study showed that messages about the effects of meat consumption on health and well-being induced a different regulatory concern in recipients, safety and growth concerns respectively. Results of the two main studies then showed that messages about health/safety had stronger effects on participants' involvement, attitudes, and intentions to change eating behaviour when framed in factual rather than prefactual terms. Conversely, messages about well-being/growth had stronger effects when framed in prefactual rather than factual terms. Discussion focuses on how the appropriate framing of messages about meat consumption can effectively promote changes in eating habits of elderly people.

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## 1. Introduction

Health authorities around the world have invested substantial resources in public campaigns (Hornik, 2002) informing citizens about the potentially undesirable effects of certain foods and the importance of following a good diet. Widespread conditions such as coronary artery disease, myocardial infarction, stroke, hypertension, etc., can be effectively prevented by reducing dietary intake of certain nutrients, such as cholesterol, triglycerides, salt and sugars (Franco, Cooper, Bilal, & Fuster, 2011; WHO, 2014). Furthermore, consumption of red and processed meat has been found to significantly increase the risk of developing several types of cancer (Bouvard et al., 2015).

Due to the high prevalence of chronic and degenerative diseases in the later stages of life, older individuals are frequently the target of nutritional campaigns (Hornik, 2002). However, the effects of these campaigns are often limited (Dodson, Baker, & Brownson, 2010; Snyder, 2007; Wakefield, Loken, & Hornik, 2010), for reasons that have yet to be fully understood.

In two experimental studies, we investigated some of the

conditions under which a message can effectively motivate older individuals to change their habits regarding meat consumption. We expected that the persuasiveness of the message would depend on two related factors, namely the concern raised by the message and its factual/prefactual framing.

Regarding the concern raised by the message, we made a distinction between messages focused on *health* and messages focused on *well-being*. The majority of the messages employed in public campaigns point to health conditions we may wish to avoid, for example: "An unbalanced diet increases your chances of suffering a heart attack or stroke" (Wakefield et al., 2010). However, maintaining and improving one's well-being is another powerful motivation that often leads people to change their eating habits (Block et al., 2011). We therefore aimed to test the persuasiveness of messages focused on health against the persuasiveness of messages focussed on well-being, for example: "An unbalanced diet strains your metabolism and reduces your psychophysical well-being".

A message regarding the effects of nutrition on health or well-being can be also framed in several alternative ways (Brug, Ruiters, & Van Assema, 2003; Wilson, 2007). In our research, we made a distinction between *factual* messages and *prefactual* messages. In the two examples above, messages were formulated in a *factual* form, that is, they described the causal relation between an unbalanced diet and certain outcomes. However, the same messages

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can also be formulated in a *prefactual* form, presenting an hypothetical future outcome as the consequence of an hypothetical present behaviour (Sanna, 1996). Messages may therefore also be formulated in this way: “If you follow an unbalanced diet, your chances of suffering a heart attack will increase”, and “If you follow an unbalanced diet, you will strain your metabolism and reduce your psychophysical well-being”.

Research on message framing indicates that the persuasiveness of communication promoting change in attitudes and behaviours depends on whether the formulation of a message fits with recipients' *growth* versus *safety* concern in terms of self-regulation (Cesario & Higgins, 2008; Cesario, Higgins, & Scholer, 2008; Freitas & Higgins, 2002). In our research, we assumed that messages focused on well-being are connected with a growth concern, because they put an emphasis on the progressive pursuit of a good quality of life (Cesario, Corker, & Jelinek, 2013). Conversely, messages focused on health are connected with a safety concern, because they put an emphasis on the avoidance of punctual and well-defined outcomes, such as specific diseases (Lee & Aaker, 2004). We hypothesised that messages focused on well-being (and therefore inducing a growth concern) would differently affect participants' motivation, attitudes, and intentions to reduce meat consumption when framed in *prefactual* rather than in *factual* terms, while messages focused on health (and therefore inducing a safety concern) would be more persuasive when framed in *factual* rather than in *prefactual* terms.

In the following paragraphs, we first briefly review past research on the focus on health versus well-being when communicating with the elderly. Then we discuss these two nutrition-related concerns as specific instances of the two basic concerns that regulate individual behaviour (Higgins, 1997, 2000), namely the fulfilment of safety needs, on the one hand, and the fulfilment of growth needs on the other. Finally, we speculate on why *prefactual* formulation better fits with a well-being/growth concern, while *factual* formulation better fits with a safety/healthy concern.

### 1.1. Health vs. well-being in communication with the elderly

As individuals age, they are often urged to reduce or even cease their consumption of certain types of food, in order to treat diagnosed conditions (such as diabetes, hypertension, hyperlipidemia, and hypercholesterolemia; see Gariballa, 2004; Janssen, De Gucht, Dusseldorp, & Maes, 2012; Willett & Stampfer, 2013), or to prevent them (see Boeing et al., 2012 for a review). Neither nutritional advice given by personal physicians, nor public calls by authorities to adopt an appropriate dietary regime are always effective, however (Dodson et al., 2010).

The limitations of nutritional counselling delivered by primary care professionals to older patients (Ryan & Butler, 1996; Sparks & Nussbaum, 2008) include, among other practical aspects such as lack of time and resources, a lack of specific training in nutrition-related matters and in counselling techniques (Kushner, 1995). Furthermore, research on doctor-patient communication (Baltes & Wahl, 1996) highlighted physicians' tendency to focus communication on the aspects of elder patients' life that imply dependence, for example, compliance with medication or coping with disability, rather than on those characterised by autonomy and resilience, for example, physical activity, social interactions, and the preparation of daily meals. More recent research also investigated age as a moderating factor in the effectiveness of public health-promotion campaigns (Southwell, 2010). Age-related changes in cognitive functioning affect the way older adults process information (Koutstaal, 2003), including medical and nutritional guidelines.

Older individuals may therefore be less likely to understand and retain information provided by these campaigns.

In addition to cognitive factors, motivational factors may play a role. The elderly may perceive messages promoting changes in eating habits as irrelevant or not sufficiently engaging, as concerns different than health may drive their eating behaviour. Some indication in this sense comes from a study on the motivations of individuals following some form of diet to reduce their weight (Bish et al., 2005). This study, which was conducted using a representative sample of Americans, showed that the percentage of people undertaking efforts to reduce their weight was highest (80.8%) among those who had received medical advice about losing weight, but it was considerably high (40.6%) also among those who had *not* received any medical advice. Several motivations account for these spontaneous attempts to change eating habits, including a desire to improve physical fitness and psychophysical well-being (Block et al., 2011; Hayes & Ross, 1987; McCabe & Ricciardelli, 2004).

There is an increasing interest in non-health related motivations underlying the decision to change eating habits (Fleury, 1996; Fleury & Sedikides, 2007), reflecting a general shift from a strict biomedical perspective, which considers health as the mere absence of disease, to a broader, holistic perspective, which considers health and well-being as equally important components of individual welfare (McMahon & Fleury, 2012). This is the case across the whole lifecycle, including later stages of life. For example, research on the subjective experience of ageing has shown that despite the high prevalence of chronic and degenerative diseases among the elderly, maintaining a good quality of life remains an important goal even in this stage of life (Gabriel & Bowling, 2004). Therefore, it is possible that most communication advocating dietary change addresses only one concern of the elderly, that is, maintaining health, leaving another relevant one, that is, well-being, unaddressed.

### 1.2. Health and well-being as safety and growth concerns

The notions of *health* as the absence of disease and *well-being* as the presence of a positive quality of life (Amarantos, Martinez, & Dwyer, 2001) are consistent with the distinction between the two fundamental concerns of *safety* and *growth* which regulate individual behaviour, according to social psychological research (Higgins, 1997, 1998). Safety concern encompasses the fulfilment of security needs, such as maintaining satisfying life conditions, keeping one's job, and complying with social duties and obligations. Growth concern encompasses the fulfilment of nurturance needs, such as enjoying one's life, advancing one's career, or attaining one's hopes and aspirations. Past research showed that a prevailing safety concern is associated with greater sensitivity to potential loss and a preference for risk-avoidance strategies (Freitas & Higgins, 2002; Higgins, 2000). Conversely, a prevailing growth concern is associated with greater sensitivity to potential gains and a preference for proactive approach strategies.

Persuasive messages can activate growth or safety concerns in recipients (Cesario et al., 2013; Cheng, Yen, Chuang, & Chang, 2013), inducing a “*regulatory fit*” (Cesario et al., 2008; Freitas & Higgins, 2002; Higgins, 2000) between an individual's self-regulatory concern and the way a message is framed. Some research has shown that regulatory fit can be triggered not only by explicitly framing messages in terms of safety or growth, but also by more subtle aspects of message presentation, such as the body language of the person delivering the message (Cesario & Higgins, 2008). In the present research, we started from this and hypothesised that the effectiveness of messages focused on health (i.e., a safety concern) versus well-being (i.e., a growth concern) can be

enhanced by framing the message in factual versus prefactual terms, respectively.

### 1.3. Framing messages on health versus well-being in factual versus prefactual terms

Prefactual thinking is the mental simulation of the possible future outcomes resulting from hypothetical behaviours and decisions (Bakker, Buunk, & Manstead, 1997). While a factual statement (e.g., “Eating vegetables improves your health”) provides a simple causal connection between an antecedent (eating vegetables) and a consequence (improving one's health), a prefactual statement (e.g., “If you eat vegetables, your health will improve”) presents the consequence as an hypothetical event that depends upon the realisation of the antecedent. Prefactual thinking has been found to affect expectations and intentions to act in the future (Petrocelli, Seta, & Seta, 2012), and to improve actual performance in prefactually anticipated behaviours (Sanna, 1996). Individuals engaging in prefactual thinking estimate the subjective likelihood of both the antecedent and the consequence (Petrocelli et al., 2012), regardless of the contingencies that restrain one's actual behaviour. This allows them to mentally simulate how changing one's present choices can lead to different future outcomes, thus increasing their perceived control of reality.

Prefactual thinking has been used successfully in cognitive-behavioural interventions, such as mental contrasting and implementation intentions (Stadler, Oettingen, & Gollwitzer, 2009, 2010). In mental contrasting, individuals first indicate the goal they wish to achieve by changing a certain behaviour, and then they are asked to imagine the most positive outcome of successfully changing their behaviour, and the most critical obstacle they could encounter during the process (Oettingen, Pak, & Schnetter, 2001). By generating implementation intentions, individuals are asked to anticipate the steps leading to a desired outcome by framing them in the if-then prefactual format (Gollwitzer & Sheeran, 2006). Both behavioural strategies have proven to be effective in increasing physical activity, because anticipating possible obstacles and difficulties improves goal commitment and makes possible solutions more readily available. Similarly, Bagozzi, Moore, and Leone (2004) found that the attitudes towards different prefactual scenarios regarding a diet predicted the intention to actually implement such diet. In particular, negative attitudes towards the prefactual failure scenario (“Imagine you're following a diet and not achieving weight loss”) were associated with a strong intention to undertake weight control behaviours.

Findings from previous research therefore suggest that prefactual thinking (either spontaneous or induced) is effective in making the connection between one's behaviour and its future consequences salient. This enhances the perception of control, resulting in a stronger intention to engage in the proposed behaviour.

In the present research, we assumed that the above mentioned properties of prefactual formulation make it particularly suitable to frame messages about the effects of nutrition on well-being. This would be the case because the negative outcomes of nutrition related to well-being, such as being out of shape or having a poor quality of life, are usually experienced as deviations from the progressive pursuit of self-improvement (Wrosch, Scheier, Miller, Schulz, & Carver, 2003), thus making the prefactually-framed proposed behaviour a particularly fitting solution to this type of problems.

In contrast, negative health-related outcomes are usually seen as sudden and hardly controllable events that interrupt a state of healthiness (Balog, 2005). Therefore, the idea of progressively adjusting one's behaviour, which is implicit in prefactual

formulation, may not be perceived as fully consistent with health as avoidance of diseases, making a prefactual formulation less suitable than a factual formulation for messages about health.

### 1.4. Research overview

In the present research, we analysed the effectiveness of different persuasive messages about the negative effects of excessive meat consumption on health or well-being. We chose to analyse the effects of this kind of messages because the frequent consumption of meat products, in particular red meat (veal, beef, pork, etc.) has been recognised as having a significant negative impact on consumers' health and well-being (Bouvard et al., 2015; Micha, Wallace, & Mozaffarian, 2010). Despite evidence of the several downsides of meat consumption, consumers remain ambivalent on the prospect of reducing it, as shown by several studies on consumer attitudes and behaviours (Berndsen & van der Pligt, 2005; Graça, Calheiros, & Oliveira, 2015).

The sample of our studies was made of elderly participants (above 60 years old). This part of the population is targeted by an increasing number of campaigns regarding the negative effects of nutrition on health (Houston, Nicklas, & Zizza, 2009; Millen, Fada, Ohls, Ponza, & McCool, 2002), but it is also the object of an increasing attention (Edwards & Chapman, 2004) to the notion of active or successful ageing, intended as “a period of opportunity and well-being, with retention, or development, of the psychological resources to cope with life's challenges” (Bowling & Iliffe, 2011). In light of this particular attention to the elderly population, the City of Milan decided to support this research project.

In a Pilot Study, we tested whether messages focused on health or well-being would indeed, as we assumed, activate different concerns among elderly individuals – a safety concern in the case of health and a growth concern in the case of well-being. In Studies 1 and 2, we tested our main hypothesis, namely, that messages focused on well-being (but not messages focused on health) would be more effective when framed prefactually than when framed factually. They would lead to a better evaluation of the message and more negative attitudes towards meat consumption (Study 1), as well as lower intention to consume meat (Study 2). We expected that this would be the case because, as discussed in the previous section, prefactual statements would best address the growth regulatory concern related to well-being, but not safety concern related to health.

## 2. Pilot study

Before testing our main hypothesis, we assessed whether a message describing the effects of meat consumption on health would indeed raise a safety concern in participants, whereas a message describing the effects of meat consumption on well-being would raise a growth concern. We presented two groups of elderly participants with two versions of a fictitious article describing the negative effects of excessive meat consumption. One version of the article described the effects of consumption on health, while the other described the effects of consumption on well-being. We expected participants reading the message about health to have a heightened preoccupation for the effects of nutrition on the fulfilment of personal duties and obligations, indicating the relative salience of a safety concern. Conversely, we expected participants reading the message about well-being to have a heightened preoccupation for the effects of meat consumption on the fulfilment of personal goals and aspirations, indicating the salience of a growth concern.

## 2.1. Method

### 2.1.1. Participants and procedure

The study was conducted with the support of the City of Milan in some socio-recreational centres for the elderly, including Centres of Multifunctional Aggregation (CAM), Socio-Cultural and Recreational Centres (CSRC), and occupational workshops. A total of 59 volunteers (71.9% women, mean age = 73.70, *SD* = 7.02) participated in this study. Most participants reported being retired (76.3%), or homemakers (6.8%). Only one participant (1.7%) reported being actively employed, whereas nine (15.3%) did not respond the question. Almost half the participants (44.1%) were married, 27.1% were widowed, 15.3% were single or separated. Eight participants (13.6%) did not report their relationship status.

Participants were welcomed and had the purpose of the research briefly explained. Then they were asked to complete the questionnaire individually. The average time to complete the questionnaire was 15 min. They were subsequently debriefed by one of the researchers and participated in a group discussion on the topic of nutrition.

### 2.1.2. Message manipulation

Participants were asked to read a short text (approximately 125 words) about the effects of meat consumption on health or well-being. The text was allegedly published in a newspaper article reporting the results of several studies conducted by the World Health Organisation (WHO). The content of the article described the negative effects of excessive consumption of meat on either health or well-being, depending on whether participants were assigned to the health message experimental condition ( $n = 30$ ) or the well-being message condition ( $n = 29$ ). The full text of the two versions of the article is presented in [Table 1](#) (upper panel).

### 2.1.3. Measures

**2.1.3.1. Manipulation check.** The effectiveness of the manipulation was measured with one item: “In your opinion, does the article mainly deal with the effects of meat consumption on health (e.g.,

risk of illness and disease prevention) or the effects of meat consumption on the psycho-physical well-being (e.g., physical fitness and quality of life)?” Participants answered the question on a 7-point scale ranging from 1 (“Effects of meat consumption on health”) to 7 (“Effects of meat consumption on psychophysical well-being”).

**2.1.3.2. Regulatory concern.** The induction of a safety or growth regulatory concern in participants was measured in two ways. The first one, adapted from [Cesario et al. \(2013, Study 1\)](#), consisted in two questions asking participants to indicate to what extent they believed that the negative consequences of meat consumption described in the article would interfere with the fulfilment of their goals and aspirations (growth concern) and with the compliance with their duties and obligations (safety concern), using 7-point scales ranging from 1 (“Not at all”) to 7 (“Very much”). The second measure was based on the thought-listing technique ([Cacioppo & Petty, 1981](#); [Cacioppo, Von Hippel, & Ernst, 1997](#)) commonly used in studies on persuasion and communication. Participants were asked to reflect on the motivations underlying changes in eating habits and to list up to five factors that may make people feel the *obligation* to change these habits, and up to five factors that may make people feel the *desire* to change these habits. Responses were screened for invalid or irrelevant answers (e.g., “I don’t know”, “No”). Once a small number of invalid responses were excluded ( $N = 4$ ), all the remaining ones were in line with the required task. Responses regarding the motivations that make people feel obliged to change their habits included statements such as “to avoid health problems”, “in case of disease” and “to avoid cholesterol and triglycerides”. Responses regarding the motivations that make people desire changing their eating habits included statements such as “to change one’s physical appearance”, “to improve digestion”, and “to try new tastes”.

The number of motivations generated by each participant (ranging from 0 to 5) was computed as an index of the strength of safety and growth regulatory concerns, respectively. The two concurrent measures of growth concern showed moderate correlation,

**Table 1**  
Different versions of the fictional newspaper article on excessive meat consumption.

Health content	Well-being content
<p>The World Health Organisation states that “a diet with a high content of meat is bad for your health.” Epidemiological studies have shown that life expectancy is significantly shorter for those who consume a large amount of meat. In particular,</p> <p>the spokesman for the World Health Organisation says that eating a lot of meat significantly increases the risk of serious diseases, such as cardiovascular disorder, diabetes, obesity and cancer. A recent study presented by the World Health Organisation has shown that eating a lot of meat increases the risk of developing type-2 diabetes and raises your chances of suffering a heart attack and stroke. Other studies have also found that a diet with plenty of animal protein and fat predisposes you to cancers of the digestive system.</p> <p>The World Health Organization states that “if you follow a diet with a high content of meat, your health will worsen.” Epidemiological studies have shown that if you consume a large amount of meat, life expectancy is significantly shorter. In particular, the spokesman for the World Health Organization says that if you eat a lot of meat, the risk of serious diseases, such as cardiovascular disorder, diabetes, obesity and cancer, is significantly increased. A recent study presented by the World Health Organization has shown that if you eat a lot of meat the risk of developing type two diabetes, and suffering a heart attack and stroke increases. Other studies have also found that if you follow a diet with plenty of animal protein and fat, you are predisposed to cancers of the digestive system.</p>	<p><i>Factual frame</i></p> <p>The World Health Organisation states that “a diet with a high content of meat is bad for your psychophysical well-being.” Epidemiological studies have shown that quality of life is significantly worse for those who consume a large amount of meat. In particular, the spokesman for the World Health Organisation says that eating a lot of meat significantly undermines well-being by making digestion more difficult and impairing bowel regularity and physical fitness. A recent study presented by the World Health Organisation has shown that eating a lot of meat slows down metabolism, thus reducing the rate at which you burn your body fat. Other studies have also found that a diet with plenty of animal protein and fat has a negative impact on your mood and psychological well-being.</p> <p><i>Prefactual frame</i></p> <p>The World Health Organization states that “if you follow a diet with a high content of meat, your psychophysical well-being decreases”. Epidemiological studies have shown that if you consume a large amount of meat, life quality is significantly worse. In particular, the spokesman for the World Health Organization says that if you eat a lot of meat, this significantly hinders your well-being, making digestion more difficult and worsening bowel regularity and physical fitness. A recent study presented by the World Health Organization has shown that if you eat a lot of meat, your metabolism slows down, thus reducing the rate at which you burn your body fat. Other studies have also found that if you follow a diet with plenty of animal protein and fats, this has a negative impact on your mood and psychological well-being.</p>

$r(46) = .505, p < .001$ . The two concurrent measures of safety concern showed similar, albeit slightly lower, correlation,  $r(46) = .385, p = .007$ .

## 2.2. Results

### 2.2.1. Manipulation check

Participants in the health message condition indicated that the content of the article regarded the effects of meat consumption on health more than its effects on well-being ( $M = 2.61, SD = 1.66$ ), whereas participants in the well-being message condition indicated that the article concerned the effects of meat consumption on well-being more than its effects on health ( $M = 3.75, SD = 1.69$ ),  $t(54) = 2.55, p = .014$ . Therefore, the health vs. well-being manipulation was successful.

### 2.2.2. Effects of the message on participants' regulatory concern

We performed a repeated-measures ANOVA on participants' ratings of the consequences of excessive meat consumption, with goal-interference (safety vs. growth) as a within-subject factor, and message content (health vs. well-being) and question order (safety-related questions first vs. growth-related questions first) as between-subject factors in the analysis. The latter variable was included to control for possible order effects, particularly in the statement generation task. Some participants ( $N = 5$  in the health message condition,  $N = 6$  in the well-being message condition) did not respond to the two items and were therefore excluded from analyses.

An interaction effect was found between message content and goal-interference,  $F(1,42) = 6.94, p = .011, \eta^2 = .14$ . Follow-up ANOVAs for each goal-interference measure were performed. Results showed that participants rated the consequences of excessive meat consumption as interfering more with their duties and obligations in the health message condition ( $M = 4.58, SD = 2.13$ ) than in the well-being message condition ( $M = 3.14, SD = 2.46$ ),  $F(1,44) = 5.86, p = .020, \eta^2 = .12$ . Conversely, participants rated the consequences of excessive meat consumption as interfering more with their hopes and aspirations in the well-being message condition ( $M = 4.02, SD = 2.32$ ) than in the health message condition ( $M = 3.88, SD = 2.22$ ), although this difference was not statistically significant,  $F(1,44) = .75, p = .37, \eta^2 = .02$ . No other significant effects were found for either goal-interference measure,  $F_s < 2.88, p > .10$ .

The same repeated-measures ANOVA was performed on the number of statements generated by participants regarding duties and desires motivating dietary change, which was the within-subject factor. First of all, the results showed that participants generated more statements regarding the motivations for which people might *desire* to change their eating habits ( $M = .73, SD = .93$ ) than statements regarding the motivations for which people might *feel obliged* to change their eating habits ( $M = .49, SD = .63$ ),  $F(1,55) = 4.63, p = .036, \eta^2 = .08$ .

We found the expected interaction effect between message content and the number of growth-related (*desires*) vs. safety-related (*duties*) sentences that were generated by participants,  $F(1,55) = 4.63, p = .036, \eta^2 = .08$ . Subsequent ANOVAs showed that whereas participants generated a similar number of safety-related sentences in the health message condition ( $M = .55, SD = .69$ ) and the well-being message condition ( $M = .43, SD = .57$ ),  $F(1,55) = .54, p = .47, \eta^2 = .01$ , they generated significantly more growth-related sentences in the well-being condition ( $M = 1.03, SD = 1.05$ ) than in the health condition ( $M = .43, SD = .68$ ),  $F(1,55) = 6.61, p = .013, \eta^2 = .11$ .

In sum, the results of Study 1 confirmed our hypothesis that messages describing the effects of nutrition on health would raise a

safety concern in participants, as shown by higher perceived interference with duties and obligations, but not perceived interference with hopes and aspirations. Conversely, messages describing the effects of nutrition on well-being raised a growth concern, as shown by the higher number of sentences about motivations linked to the desire to change one's eating habits, but not about motivations linked to the perceived duty to change one's eating habits.

## 3. Study 1

In Study 1, we presented different groups of elderly participants with the same fictitious articles on the negative effects of meat consumption on health or well-being that were used in the Pilot Study. The manipulation of the text was altered to provide different groups of participants with either a factual or prefactual framing of the messages regarding health or well-being. We expected that the message about health would be more effective when framed factually than prefactly, whereas the message about well-being would be more effective when framed prefactly than factually.

### 3.1. Methods

#### 3.1.1. Participants and procedure

The questionnaire was administered in socio-recreational centres for the elderly, as in Study 1. A total of 84 volunteers (44 women and 40 men) aged between 58 and 92 years ( $M = 74.90, SD = 8.41$ ) participated in this study. The majority of participants (88.5%) were retired. Half the participants (51.2%) were married, 37.8% were widowed, and the remaining 10.9% were single or separated/divorced.

#### 3.1.2. Message manipulation

Participants were asked to read the same short text used in Study 1, adapted into four different versions: a factually framed health message, a factually framed well-being message, a prefactly framed health message, and a prefactly framed well-being message. The first two versions contained the same factual statements used in Study 1. The latter two versions consisted of the same antecedents and consequents reformulated as "if clauses". For example, the factually framed statement "... a diet with a high content of meat *is bad* for your health" was rephrased to become "... *if you follow* a diet with a high content of meat your health *will worsen*". The full text of the two prefactual versions of the article is reported in [Table 1](#) (lower panel).

#### 3.1.3. Measures

**3.1.3.1. Manipulation check.** The effectiveness of the health vs. well-being message manipulation was measured using the same item used in Study 1.

**3.1.3.2. Message evaluation.** Participants indicated how convincing and credible the message was, using two 7-point Likert scales ranging from 1 ("Not at all") to 7 ("Very much"). As the two measures were highly correlated,  $r(75) = .80, p < .001$ , a single message evaluation index was computed.

**3.1.3.3. Source credibility.** Participants were asked to indicate on a 7-point scale ranging from 1 ("Not at all") to 7 ("Very much") their agreement with three statements regarding the alleged source of the information reported in the article (the World Health Organisation): "I trust the WHO", "I deem the WHO sincere and reliable", "The WHO claims are supported by sound scientific evidence". As the three source credibility ratings were strongly correlated,  $r_s(77) \geq .624, p < .001$ , a single index was computed (Cronbach's

$\alpha = .81$ ).

**3.1.3.4. Engagement.** Participants' engagement (see Lee & Aaker, 2004) was measured by asking them to rate how interested, involved, and motivated they were after reading the article, again using a 7-point scale ranging from 1 ("Not at all") to 7 ("Very much"). The three items were used to compute a single engagement index (Chronbach's  $\alpha = .89$ ).

**3.1.3.5. Liking of meat.** Positive disposition towards meat consumption was measured by the extent to which the participants agreed with the statement: "I like meat", measured by a 7-point scale from 1 ("Strongly disagree") to 7 ("Strongly agree").

**3.1.3.6. Socio-demographic information.** Finally, socio-demographic information (i.e., gender, age, marital status, and employment status) was collected.

## 3.2. Results

### 3.2.1. Manipulation check

As expected, participants rated messages about well-being as describing the effects of meat consumption on well-being rather than on health ( $M = 4.49$ ,  $SD = 2.26$ ). Conversely, they rated messages about health as describing the effects of meat on health rather than on well-being, ( $M = 2.88$ ,  $SD = 2.00$ ),  $F(1,74) = 9.23$ ,  $p < .001$ ,  $\eta^2 = .11$ . No other main effect or interaction effect was significant,  $F(1,74) = 2.62$ ,  $p > .11$ ,  $\eta^2 < .03$ .

### 3.2.2. Effects of message content and frame on participants' evaluation of the message

We performed a 2 (message content: well-being vs. health)  $\times$  2 (message framing: factual vs. prefactual) ANOVA with the evaluation of the message (i.e., the extent to which the message was considered convincing and credible) as the dependent variable. No main effects of message content,  $F(1,75) = .20$ ,  $p = .88$ ,  $\eta^2 < .01$ , or message framing,  $F(1,75) = .28$ ,  $p = .60$ ,  $\eta^2 < .01$  emerged from the analysis. An interaction effect between the two variables emerged,  $F(1,75) = 6.42$ ,  $p = .013$ ,  $\eta^2 = .08$ . Bonferroni post-hoc  $t$ -tests showed that messages about well-being tended to be evaluated more positively when framed in prefactual ( $M = 5.53$ ,  $SD = 1.88$ ) than in factual terms ( $M = 4.78$ ,  $SD = 1.32$ ),  $t(36) = 1.45$ ,  $p = .15$ . Conversely, messages about health were evaluated more positively when framed in factual ( $M = 5.78$ ,  $SD = 1.14$ ) than in prefactual terms ( $M = 4.64$ ,  $SD = 2.21$ ),  $t(39) = 2.14$ ,  $p = .039$ . No difference between the evaluation of the prefactual well-being message and the evaluation of the factual health message emerged,  $t(39) = .26$ ,  $p = .80$ .

We then performed an ANOVA on the evaluation of the message source, which yielded similar results. We found no main effect of message content,  $F(1,75) = .54$ ,  $p = .47$ ,  $\eta^2 < .01$ , or framing,  $F(1,75) = .01$ ,  $p = .98$ ,  $\eta^2 < .01$ , but the interaction of message content and framing was significant,  $F(1,75) = 8.34$ ,  $p = .005$ ,  $\eta^2 = .10$ . Subsequent  $t$ -tests again showed that the source of the message was evaluated more positively when participants read a message about well-being presented in prefactual terms ( $M = 6.04$ ,  $SD = 1.16$ ) than in factual terms ( $M = 5.04$ ,  $SD = 1.39$ ),  $t(36) = 2.31$ ,  $p = .027$ . However, the source of the message was evaluated more positively when participants read a factually framed message on health ( $M = 5.80$ ,  $SD = 1.53$ ) than when they read a prefactly framed one ( $M = 4.78$ ,  $SD = 1.72$ ),  $t(39) = 1.90$ ,  $p = .066$ . Again, no difference between the evaluation of the prefactual well-being message and the evaluation of the factual health message was found,  $t(39) = .51$ ,  $p = .61$ .

### 3.2.3. Effects of message content and frame on participants' engagement and liking of meat

We performed a 2 (message content: well-being vs. health)  $\times$  2 (message frame: factual vs. prefactual) ANOVA on participants' engagement (i.e., to what extent they were interested, involved, and motivated by the message) as the dependent variable. The results revealed a main effect of message content,  $F(1,75) = 7.03$ ,  $p = .006$ ,  $\eta^2 = .09$ , with participants being more engaged by messages about well-being ( $M = 5.73$ ,  $SD = 1.23$ ) than by messages about health ( $M = 5.02$ ,  $SD = 1.88$ ). Furthermore, an interaction effect was found,  $F(1,75) = 13.51$ ,  $p < .001$ ,  $\eta^2 = .15$ . Bonferroni post-hoc  $t$ -tests showed that participants were more engaged by a message about well-being that was framed prefactly ( $M = 6.29$ ,  $SD = .92$ ) rather than factually ( $M = 5.36$ ,  $SD = 1.29$ ),  $t(36) = 2.40$ ,  $p = .022$ , and that they were more engaged by a message about health that was framed factually ( $M = 5.71$ ,  $SD = 1.26$ ) rather than prefactly ( $M = 4.13$ ,  $SD = 2.20$ ),  $t(25.51) = 2.71$ ,  $p = .006$ .

Finally, we tested the effect of message content and framing on participants' self-reported liking of meat. We found no main effect of message content,  $F(1,75) = .07$ ,  $p = .79$ ,  $\eta^2 < .01$ , or framing,  $F(1,75) = .82$ ,  $p = .37$ ,  $\eta^2 < .01$ , but we found the predicted interaction effect,  $F(1,75) = 7.89$ ,  $p = .006$ ,  $\eta^2 = .09$ . Follow-up  $t$ -tests showed that participants reported liking meat less after reading prefactly framed well-being messages ( $M = 2.88$ ,  $SD = 1.67$ ) than after reading factually framed well-being messages ( $M = 4.38$ ,  $SD = 1.66$ ),  $t(38) = 2.79$ ,  $p = .008$ , whereas the opposite was true in the case of health messages ( $M = 3.35$ ,  $SD = 1.56$  and  $M = 4.12$ ,  $SD = 2.26$  for factually and prefactly framed messages, respectively), although this difference was not significant,  $t(38) = 1.28$ ,  $p = .21$  (Fig. 1). Participants tended to report liking meat less after exposure to a prefactly framed well-being message than after exposure to a factually framed health message, but the difference between these two conditions did not reach significance,  $t(38) = .92$ ,  $p = .36$ .

The results of Study 1 therefore confirmed our hypotheses. Prefactly framed messages about well-being and factually framed messages about health were more positively evaluated than prefactly framed health messages and factually framed well-being messages, and they also more easily engaged receivers. In addition, participants who read prefactly framed well-being messages and factually framed health messages reported liking meat less than participants in the other conditions, indicating that

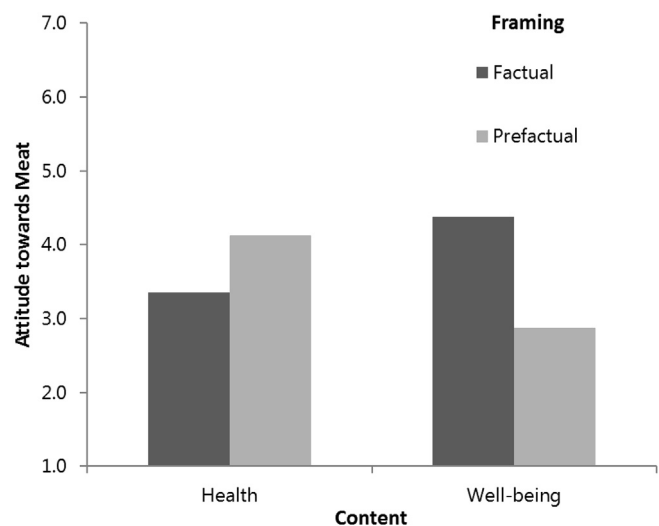


Fig. 1. Effects of message content and framing on participants' liking of meat (Study 1).

these messages were more persuasive than the other messages. Overall, these results indicate that the growth concern evoked by messages describing the effects of food on well-being is better addressed by prefactual framing, that focuses on how present behaviours can affect future outcomes, than by factual framing. Conversely, the safety concern evoked by messages describing the effects of food on health seem to be better addressed by factual framing, that focuses on direct and explicit causal relationships between food consumption and health conditions, than by prefactual framing.

## 4. Study 2

In Study 2, we investigated the effects of message content (health vs. well-being) and frame (factual vs. prefactual) on behavioural intentions. We expected that participants' intentions to decrease meat consumption and increase vegetable consumption would be higher after reading prefactually framed well-being messages than after reading factually framed well-being messages, whereas the opposite would be true for messages about health.

### 4.1. Method

#### 4.1.1. Participants and procedures

The study was conducted with the support of the City of Milan in socio-recreational centres for the elderly not previously involved in the previous studies. A total of 97 volunteers between the ages of 60 and 95 years ( $M = 73.59$ ,  $SD = 7.34$ ), 75.5% of which were women, participated in the study. As in the previous studies, the most frequent relationship statuses were married (46.4%) or widowed (39.2%). Of the remaining participants, 8.3% were single or separated, and 3.1% did not report their relationship status. The majority of participants were pensioners (86.6%), whereas the rest were homemakers (5.2%) or actively employed (3.2%), or they did not report their current work status (5.2%). The manipulated stimuli from Study 1 were used, with only minor adjustments to the text based on feedback from the participants of previous studies (e.g., in Study 2 the negative effects of meat consumption were specified to be "long-term effects").

#### 4.1.2. Measures

**4.1.2.1. Current eating habits.** To assess baseline levels of food consumption, participants were first asked to indicate their current consumption of different types of food (red meat, white meat, cured meat, fresh vegetables, cooked vegetables, legumes, potatoes, and fresh fruit), on a 7-point scale (1 = never, 2 = less than once per week, 3 = 1–2 times per week, 4 = 3–4 times per week, 5 = 5–6 times per week, 6 = once per day, and 7 = several times a day).

**4.1.2.2. Engagement.** Participants' engagement was measured using the same three items used in Study 1 (Chronbach's  $\alpha = .87$ ).

**4.1.2.3. Behavioural intentions.** Participants' intention to change their consumption of red and cured meat, and fresh and cooked vegetables in the following month were measured using of a 7-point scale, ranging from 1 ("much less than before") to 7 ("much more than before").

**4.1.2.4. Restaurant menu food-choice task.** In addition to the self-reported behavioural intention scales, we measured participants' intention to comply with the suggested behaviour (i.e., reducing meat consumption) using a food-choice task to test the effectiveness of the manipulated texts in a familiar, albeit simulated, situation (see [Bucher, van der Horst, & Siegrist, 2012](#) for a similar

measure of behavioural compliance). We asked them to imagine that they had won a voucher for a complimentary meal in a well-reviewed restaurant. We then presented them the menu of the hypothetical restaurant, asking them to choose the dishes they preferred, with the limit of one choice per course. The menu consisted of three courses, each containing three options, including two meat-based dishes. Participants could choose an appetizer of either mixed grilled vegetables, meat stuffed olives, or a mixed charcuterie plate, and an entrée of either vegetable soup, lasagna, or tortellini (meat-stuffed pasta). Finally, the main course options were steak with fries, fish with salad, or aubergine parmigiana. Three dessert options were also provided, but were not considered in our analyses. We computed an index of the number of meat-based servings chosen by the participants in the restaurant choice task, ranging from 0 (no meat-based choices) to 3 (all meat-based choices). Therefore, lower scores indicated a stronger intention to reduce meat consumption, whereas higher scores indicated a weaker intention to reduce meat consumption.

### 4.2. Results

#### 4.2.1. Manipulation checks

The content manipulation was successful, with participants recognizing well-being messages as describing the effects of food on well-being rather than health ( $M = 4.33$ ,  $SD = 1.87$ ), and health messages as describing the effects of food on health rather than well-being ( $M = 3.53$ ,  $SD = 1.97$ ),  $F(1,91) = 4.02$ ,  $p = .048$ ,  $\eta^2 = .04$ . No other main or interaction effects of the manipulated variables were found,  $F(1,91) < .20$ ,  $p > .73$ ,  $\eta^2 < .01$ .

#### 4.2.2. Effects of message content and frame on participants' engagement

As in Study 1, we performed a 2 (message content: health vs. well-being)  $\times$  2 (message frame: factual vs. prefactual) ANOVA on participants' engagement (i.e., to what extent they were interested, involved, and motivated by the message) as the dependent variable. The analysis showed no main effects of either variable,  $F_s(1,91) < 2.32$ ,  $p > .13$ ,  $\eta^2 < .03$  while, as expected, the two-way interaction was significant,  $F(1,91) = 8.01$ ,  $p = .006$ ,  $\eta^2 = .08$ . Bonferroni post-hoc  $t$ -tests showed, as found in Study 1, that the factually framed health message ( $M = 5.75$ ,  $DS = 1.27$ ) was significantly more effective than the prefactually framed health message ( $M = 4.47$ ,  $DS = 1.61$ ),  $t(45) = 3.02$ ,  $p = .004$ , and that the prefactually framed well-being message ( $M = 5.75$ ,  $DS = 1.26$ ) was more effective than the factually framed well-being message ( $M = 5.36$ ,  $DS = 1.56$ ),  $t(46) = 1.94$ ,  $p = .05$ . No difference in the engagement following exposure to the factually framed health message versus the prefactually framed well-being message was found,  $t(43) = .28$ ,  $p = .78$ .

#### 4.2.3. Effects of message content and frame on participants' eating intentions

Ratings of participants' intention to eat red and cured meat were positively correlated,  $r(92) = .433$ ,  $p < .001$ , as were ratings of eating intention for fresh and cooked vegetables,  $r(93) = .632$ ,  $p < .001$ . No other significant correlations emerged,  $r_s \leq -.137$ ,  $p \geq .19$ .

To assess the effects of message content and frame on participants' intentions to eat red meat, cured meat, fresh vegetables, and cooked vegetables, we performed a series of ANCOVAs with the two manipulated variables as between-subject factors and self-reported current consumption of each food as covariates. A main effect of the covariate was found regarding the intention to eat red meat,  $F(1,90) = 4.51$ ,  $p = .012$ ,  $\eta^2 = .05$ , indicating that the current consumption of red meat was significantly associated with the intention to eat it in the future. No significant main effects of either

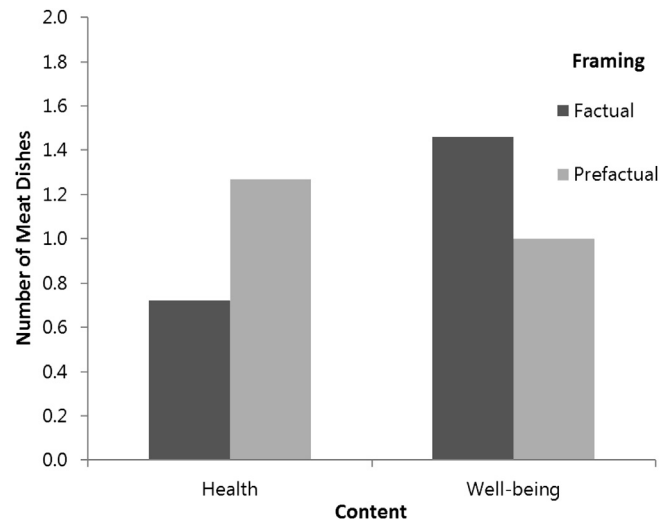
message content or frame were found,  $F_s(1,90) < .30$ ,  $p > .58$ ,  $\eta^2 < .01$ , but there was a significant interaction effect,  $F(1,90) = 7.65$ ,  $p = .007$ ,  $\eta^2 = .08$ . Participants reported being less inclined to eat red meat when they read the prefactly framed message about well-being ( $M = 2.08$ ,  $SD = 1.15$ ) than when they read the factually framed message about well-being ( $M = 3.00$ ,  $SD = 1.90$ ),  $t(45) = 2.05$ ,  $p = .046$ . Conversely, they were less inclined to eat red meat when they read the factually framed message about health ( $M = 2.24$ ,  $SD = 1.17$ ) than when they read the prefactly framed message about health ( $M = 2.87$ ,  $SD = 1.18$ ),  $t(46) = 1.86$ ,  $p = .07$ . The intention to eat red meat did not differ significantly after exposure to the prefactly framed well-being message versus the factually framed health message,  $t(43) = .28$ ,  $p = .78$ .

A main effect of current consumption of cured meat was found on the intention to eat cured meat,  $F(1,90) = 13.28$ ,  $p < .001$ ,  $\eta^2 = .14$ . No significant main effects were found,  $F_s(1,90) < .68$ ,  $p > .40$ ,  $\eta^2 < .01$ , but a significant interaction effect did emerge,  $F(1,90) = 6.76$ ,  $p = .011$ ,  $\eta^2 = .08$ . Again, participants had a lower intention to eat cured meat after reading the prefactly framed well-being message ( $M = 2.44$ ,  $SD = 1.29$ ) than after reading the factually framed well-being message ( $M = 3.36$ ,  $SD = 1.25$ ),  $t(45) = 2.17$ ,  $p = .035$ . Conversely, they had a lower intention to eat cured meat after reading the factually framed health message ( $M = 2.21$ ,  $SD = 1.29$ ) than after reading the prefactly framed health message ( $M = 2.87$ ,  $SD = 1.42$ ),  $t(46) = 1.69$ ,  $p = .10$ . Again, the difference between the two most effective messages (the prefactly framed well-being message and the factually framed health message) was not significant,  $t(43) = 1.09$ ,  $p = .28$ .

Participants' intention to eat fresh vegetables showed a strong effect of the covariate,  $F(1,90) = 41.50$ ,  $p < .001$ ,  $\eta^2 = .35$ , indicating that the intention to eat fresh vegetables was largely related to their current level of fresh vegetables consumption. Again, no main effects of message content or frame were found,  $F_s(1,90) < .05$ ,  $p > .83$ ,  $\eta^2 < .01$ , while a significant interaction was found,  $F(1,90) = 5.96$ ,  $p = .017$ ,  $\eta^2 = .04$ . Consistent with our expectation, the prefactly framed well-being message resulted in a stronger intention to eat vegetables ( $M = 5.76$ ,  $SD = 1.62$ ) than the factually framed well-being message ( $M = 4.91$ ,  $SD = 2.00$ ), although this difference did not reach significance,  $t(45) = 1.61$ ,  $p = .11$ . Conversely, the factually framed health message ( $M = 6.08$ ,  $SD = 1.35$ ) resulted in a stronger intention to eat vegetables than the prefactly framed health message ( $M = 4.70$ ,  $SD = 1.89$ ),  $t(46) = 2.93$ ,  $p = .005$ . No difference between the two most effective messages (the prefactly framed well-being message and the factually framed health message) emerged,  $t(43) = .37$ ,  $p = .78$ .

Participants' intention to eat cooked vegetables was similarly affected by current consumption,  $F(1,90) = 20.17$ ,  $p < .001$ ,  $\eta^2 = .19$ , and by the interaction between message content and frame,  $F(1,90) = 6.73$ ,  $p = .011$ ,  $\eta^2 = .07$ . Again, a significant difference was found,  $t(46) = 3.03$ ,  $p = .004$ , between the factually framed health message ( $M = 6.12$ ,  $SD = 1.30$ ) and the prefactly framed health message ( $M = 4.70$ ,  $SD = 1.91$ ). The difference between the prefactly framed well-being message ( $M = 5.68$ ,  $SD = 1.82$ ) and the factually framed well-being message ( $M = 5.23$ ,  $SD = 1.60$ ) was in the expected direction, but did not reach significance,  $t(45) = .91$ ,  $p = .37$ . No other significant effects were found,  $F_s(1,90) < 1.29$ ,  $p > .26$ ,  $\eta^2 < .02$ .

We computed an index of the number of meat-based servings chosen by participants in the restaurant choice-task to further test the persuasiveness of the different messages. A small number of participants ( $N = 3$ ) failed to complete the food-choice task correctly, either by selecting more than one choice on the menu or by not selecting any choices. These participants were excluded from the analyses. The index was positively correlated with the self-reported intention to eat red meat,  $r(90) = .304$ ,  $p = .003$ , and



**Fig. 2.** Effects of message content and framing on the number of meat dishes chosen by participants in the food-choice task (Study 2).

cured meat,  $r(89) = .369$ ,  $p < .001$ , and negatively correlated, albeit non-significantly, with the self-reported intention to eat fresh,  $r(90) = -.144$ ,  $p = .17$ , and cooked vegetables,  $r(90) = -.181$ ,  $p = .084$ , respectively.

A  $2 \times 2$  ANOVA performed on the food-choice task index showed no significant main effects,  $F(1,90) < 1.81$ ,  $p > .18$ ,  $\eta^2 < .02$ , but the analysis found the predicted interaction between message content and frame,  $F(1,90) = 8.51$ ,  $p = .004$ ,  $\eta^2 = .09$  (Fig. 2). Participants who read the prefactly framed well-being message ( $M = 1.00$ ,  $DS = .80$ ) chose fewer meat-based dishes than those who read the factually framed well-being message ( $M = 1.46$ ,  $DS = 1.02$ ),  $t(45) = 1.71$ ,  $p = .089$ . Conversely, participants who read the factually framed health message ( $M = .72$ ,  $DS = .61$ ) chose fewer meat-based dishes than those who read the prefactly framed health message ( $M = 1.27$ ,  $DS = .88$ ),  $t(45) = 2.52$ ,  $p = .015$ . Such findings, although significant, should be taken with some caution, due to the limitations of the food-choice task measure. In particular, the simulated setting of the food-choice task deviated to some extent from the common everyday situations where actual nutritional choices are made. Once considered these potential limitations, results supported our hypotheses.

In sum, the results of Study 2 showed that the effects of message content and frame on recipients' intentions to comply with the persuasive message were consistent with the effects observed in Study 1 for message evaluation, engagement, and attitudes, extending not only to self-reported intention to reduce the consumption of meat products (red and cured meat), but also, at least in part, to the intention to eat more vegetables, and to choose vegetable-based dishes in a simulated food-choice task.

## 5. General discussion

Our research investigated the possibility of broadening the scope of communication about nutrition aimed at the elderly population, by focussing messages not only on health, but also on well-being (Amarantos et al., 2001). Results indicate that older adults' attitudes, intentions, and choices regarding meat consumption can be influenced by both types of appeal, depending on their framing. We found that messages focussing on the effects of food on well-being are more convincing when framed prefactly ("if ... then") than factually, whereas messages focussing on the effects of meat consumption on health are more convincing when



framed factually than prefactly.

These results advance our understanding of the factors influencing the persuasiveness of nutritional recommendations aimed at the elderly, a research field that has received only limited attention so far (Southwell, 2010).

First, our research shows that messages about the effects of nutrition with the elderly can effectively focus on the pursuit of well-being. According to a growing body of research on active or successful ageing, many people continue to attribute great value to the pursuit of a good quality of life throughout the later stages of life (Amarantos et al., 2001; Bowling, 2008). Presenting dietary change as a way to improve one's well-being therefore can be beneficial. It addresses a regulatory concern, namely the growth concern, which is present in varying degrees throughout lifetime (Higgins, 1997), and which in some cases can acquire more importance than the safety concern commonly addressed by health-related appeals. The data of our pilot study confirmed that when elderly individuals read a message about the potential risks deriving from excessive meat consumption (e.g. cardiovascular diseases and cancer), they were more likely to think about dietary change as a duty, or something they were obliged to do, showing a safety regulatory concern. Conversely, when they read a message about the effects on well-being, they were more likely to think about dietary change as a way to foster self-improvement aspirations, showing a prevalent growth regulatory concern. Addressing complementary concerns in nutrition communication may provide an advantage in terms of compliance with nutritional recommendations, particularly in the case of the reduction of meat consumption. For example, research on individuals following a vegetarian diet (Hoffman, Stallings, Bessinger, & Brooks, 2013) found that those with a primarily health-related motivation reported lower conviction and a shorter period of adherence to their diet, compared to individuals with other motivations.

Second, our research contributes to clarify the conditions under which communication focused on well-being can be effective in promoting dietary change, suggesting that a recourse to prefactual (i.e. "if ... then") statements can increase the effectiveness of this kind of communication. Although several past studies have demonstrated that *prefactual thinking* enhances the perception of control over one's behaviour and the intention to engage in behavioural change (Petrocelli et al., 2012), the effects of *prefactual communication* have not been systematically explored so far. Our results indicate that the conditionality and intentionality (Bagozzi et al., 2004; Stadler et al., 2009, 2010) implied by a prefactual statement is consistent with a growth/well-being regulatory concern, which is associated with the desire to actively improve one's present condition. Conversely, the prefactual frame is less consistent with the safety/health concern, which is associated with the desire to avoid and prevent undesirable outcomes. These results suggest that the factual versus prefactual formulation of a message can be included among the message features that influence the perception of "fit" between the message and the recipient's regulatory concern. As previous research has clearly shown (Cesario et al., 2008, 2013; Lee & Aaker, 2004; Tam, Bagozzi, & Spanjol, 2010), such fit promotes a recipient's involvement in communication, which in turn can lead to changes in attitudes and behaviours.

A more in-depth understanding of the mechanisms underlying the differences in the effectiveness of factual and prefactual messages about health and well-being is certainly needed and might be reached by future research on this topic. For example, an exam of the emotional reactions elicited by prefactual messages might contribute to further understanding of their rather limited effectiveness when they are focused on health. Prefactual

messages suggesting that individuals play an active role in their future health conditions might trigger negative cognitive and emotional responses, such as self-blame and anticipated regret (Zeelenberg, Beattie, Van der Pligt, & de Vries, 1996), and therefore reduce rather than increase motivation to engage in preventive behaviour.

Future research might also contribute to overcome the limitations of the present one regarding sample composition. The relatively small number of participants, the way they were recruited, and their gender distribution may have limited the external validity of our results. As women tend to eat less red meat than men (Kiefer, Rathmann, & Kunze, 2005), and to be more risk-averse (although such difference decreases with age, see Byrnes, Miller, & Schafer, 1999) our participants might have been more sensitive than average to messages describing the negative effects of meat consumption. Furthermore, as participants attended the activities of socio-recreational structures, they were generally in good physical and mental conditions.

A comparison between older and younger participants might be another interesting development for future research. These two groups are likely to differ in their chronic regulatory focus (Higgins, 1997), that is, individuals' stable tendency to be driven by growth concerns or safety concerns. Younger individuals, in particular, may be less likely persuaded by health/safety-related messages than older individuals. Previous research indicates that motivations other than health, including those related to well-being, often drive young consumers' nutritional choices (Backman, Haddad, Lee, Johnston, & Hodgkin, 2002; Fitzgerald, Heary, Kelly, Nixon, & Shevlin, 2013; O'Dea, 2003; Puggelli & Bertolotti, 2014).

Individual factors influencing the persuasiveness of factual and prefactual messages about health and well-being should also be investigated. For example, experiments could be designed to investigate whether safety and growth concerns activated by an unrelated task (rather than by the message itself, as in our studies) interfere with the recipient's sensitivity to messages about health or well-being, as suggested by previous research on the regulatory fit phenomenon (Cesario, Grant, & Higgins, 2004; Lee & Aaker, 2004).

Finally, individual differences in temporal orientation (Joireman, Shaffer, Balliet, & Strathman, 2012) may moderate the persuasive effects of growth versus safety regulatory concern on one hand, and of factual versus prefactual framing on the other. Future-oriented individuals might be more concerned with the long-term effects of nutrition on both health and well-being than present-oriented individuals, thus making prefactual communication generally more persuasive in their case.

In sum, our research contributes to a better understanding of the conditions under which nutritional communication addressed to the elderly can be effective. Our results indicate that the content and the framing of persuasive messages should be taken in consideration jointly when designing communication campaigns. Messages focussing on the consequences of nutrition on health and on well-being can both be effective, provided that they are formulated in a way that is consistent with the different concerns evoked in recipients. Considering the growing social and economic costs of healthcare, effective communication aimed at improving the quality of nutrition can be seen as a starting point to provide a powerful and relatively inexpensive tool to improve the health and well-being of the ageing population.

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## References

- Amarantos, E., Martinez, A., & Dwyer, J. (2001). Nutrition and quality of life in older adults. *The Journals of Gerontology, Series A*, 56(Suppl. 2), 54–64. [http://dx.doi.org/10.1093/gerona/56.suppl\\_2.54](http://dx.doi.org/10.1093/gerona/56.suppl_2.54).
- Backman, D. R., Haddad, E. H., Lee, J. W., Johnston, P. K., & Hodgkin, G. E. (2002). Psychosocial predictors of healthful dietary behavior in adolescents. *Journal of Nutrition Education and Behavior*, 34(4), 184–193. [http://dx.doi.org/10.1016/S1499-4046\(06\)60092-4](http://dx.doi.org/10.1016/S1499-4046(06)60092-4).
- Bagozzi, R. P., Moore, D. J., & Leone, L. (2004). Self-control and the self-regulation of dieting decisions: the role of prefallacious attitudes, subjective norms, and resistance to temptation. *Basic and Applied Social Psychology*, 26(2&3), 199–213. <http://dx.doi.org/10.1080/01973533.2004.9646405>.
- Bakker, A. A., Buunk, B. P., & Manstead, A. S. R. (1997). The moderating role of self-efficacy beliefs in the relationship between anticipated feelings of regret and condom use. *Journal of Applied Social Psychology*, 27(22), 2001–2014. <http://dx.doi.org/10.1111/j.1559-1816.1997.tb01637.x>.
- Balog, J. E. (2005). The meaning of health. *American Journal of Health Education*, 36(5), 266–273. <http://dx.doi.org/10.1080/19325037.2005.10608195>.
- Baltes, M. M., & Wahl, H. W. (1996). Patterns of communication in old age: the dependence-support and independence-ignore script. *Health Communication*, 8(3), 217–231. [http://dx.doi.org/10.1207/s15327027hc0803\\_3](http://dx.doi.org/10.1207/s15327027hc0803_3).
- Berndsen, M., & van der Pligt, J. (2005). Risks of meat: the relative impact of cognitive, affective and moral concerns. *Appetite*, 44(2), 195–205. <http://dx.doi.org/10.1016/j.appet.2004.10.003>.
- Bish, C. L., Blanck, H. M., Serdula, M. K., Marcus, M., Kohl, H. W., & Khan, L. K. (2005). Diet and physical activity behaviors among Americans trying to lose weight: 2000 behavioral risk factor surveillance system. *Obesity Research*, 13(3), 596–607. <http://dx.doi.org/10.1038/oby.2005.64>.
- Block, L. G., Grier, S. A., Childers, T. L., Davis, B., Ebert, J. E. J., Kumanyika, S., et al. (2011). From nutrients to nurturance: a conceptual introduction to food well-being. *Journal of Public Policy & Marketing*, 30(1), 5–13. <http://dx.doi.org/10.1509/jppm.30.1.5>.
- Boeing, H., Bechthold, A., Bub, A., Ellinger, S., Haller, D., Kroke, A., et al. (2012). Critical review: vegetables and fruit in the prevention of chronic diseases. *European Journal of Nutrition*, 51(6), 637–663. <http://dx.doi.org/10.1007/s00394-012-0380-y>.
- Bouvard, V., Loomis, D., Guyton, K. Z., Grosse, Y., Ghissassi, F. E., Benbrahim-Tallaa, L., et al. (2015). Carcinogenicity of consumption of red and processed meat. *The Lancet Oncology*, 16(16), 1599–1600. [http://dx.doi.org/10.1016/S1470-2045\(15\)00444-1](http://dx.doi.org/10.1016/S1470-2045(15)00444-1).
- Bowling, A. (2008). Enhancing later life: how older people perceive active ageing? *Ageing and Mental Health*, 12(3), 293–301. <http://dx.doi.org/10.1080/13607860802120979>.
- Bowling, A., & Iliffe, S. (2011). Psychological approach to successful ageing predicts future quality of life in older adults. *Health and Quality of Life Outcomes*, 9(1), 13. <http://dx.doi.org/10.1186/1477-7525-9-13>.
- Brug, J., Ruiters, R. A., & Van Assema, P. (2003). The (ir) relevance of framing nutrition education messages. *Nutrition and Health*, 17(1), 9–20. <http://dx.doi.org/10.1177/026010600301700102>.
- Bucher, T., van der Horst, K., & Siegrist, M. (2012). The fake food buffet. A new method in nutrition behaviour research. *British Journal of Nutrition*, 107(10), 1553–1560. <http://dx.doi.org/10.1017/S000711451100465X>.
- Byrnes, J. P., Miller, D. C., & Schafer, W. D. (1999). Gender differences in risk taking: a meta-analysis. *Psychological Bulletin*, 125(3), 367–383. <http://dx.doi.org/10.1037/0033-2909.125.3.367>.
- Cacioppo, J. T., & Petty, R. E. (1981). Social psychological procedures for cognitive response assessment: the thought-listing technique. In T. V. Merluzzi, C. R. Glass, & M. Genest (Eds.), *Cognitive assessment* (pp. 309–342). New York: Guilford Press.
- Cacioppo, J. T., Von Hippel, W., & Ernst, J. M. (1997). Mapping cognitive structures and processes through verbal content: the thought-listing technique. *Journal of Consulting and Clinical Psychology*, 65(6), 928–940. <http://dx.doi.org/10.1037/0022-006X.65.6.928>.
- Cesario, J., Corker, K. S., & Jelinek, S. (2013). A self-regulatory framework for message framing. *Journal of Experimental Social Psychology*, 49(2), 238–249. <http://dx.doi.org/10.1016/j.jesp.2012.10.014>.
- Cesario, J., Grant, H., & Higgins, E. T. (2004). Regulatory fit and persuasion: Transfer from “feeling right”. *Journal of Personality and Social Psychology*, 86(3), 388–404. <http://dx.doi.org/10.1037/0022-3514.86.3.388>.
- Cesario, J., & Higgins, E. T. (2008). Making message recipients “feel right” How nonverbal cues can increase persuasion. *Psychological Science*, 19(5), 415–420. <http://dx.doi.org/10.1111/j.1467-9280.2008.02102.x>.
- Cesario, J., Higgins, E. T., & Scholer, A. A. (2008). Regulatory fit and persuasion: basic principles and remaining questions. *Social and Personality Psychology Compass*, 2(1), 444–463. <http://dx.doi.org/10.1111/j.1751-9004.2007.00055.x>.
- Cheng, Y. H., Yen, H. R., Chuang, S. C., & Chang, C. J. (2013). Product option framing under the influence of a promotion versus prevention focus. *Journal of Economic Psychology*, 39, 402–413. <http://dx.doi.org/10.1016/j.joep.2013.06.003>.
- Dodson, E. A., Baker, E. A., & Brownson, R. C. (2010). Use of evidence-based interventions in state health departments: a qualitative assessment of barriers and solutions. *Journal of Public Health Management and Practice*, 16(6), E9–E15. <http://dx.doi.org/10.1097/PHH.0b013e3181d1f1e2>.
- Edwards, H. E., & Chapman, H. M. (2004). Contemplating, caring, coping, conversing: a model for promoting mental wellness in later life. *Journal of Gerontological Nursing*, 30(5), 16–21. <http://dx.doi.org/10.3928/0098-9134-20040501-06>.
- Fitzgerald, A., Heary, C., Kelly, C., Nixon, E., & Shevlin, M. (2013). Self-efficacy for healthy eating and peer support for unhealthy eating are associated with adolescents’ food intake patterns. *Appetite*, 63, 48–58. <http://dx.doi.org/10.1016/j.appet.2012.12.011>.
- Fleury, J. (1996). Wellness motivation theory: an exploration of theoretical relevance. *Nursing Research*, 45(5), 277–283. <http://dx.doi.org/10.1097/00006199-199609000-00005>.
- Fleury, J., & Sedikides, C. (2007). Wellness motivation in cardiac rehabilitation: the role of self-knowledge in cardiovascular risk modification. *Research in Nursing & Health*, 30(4), 373–384. <http://dx.doi.org/10.1002/nur.20225>.
- Franco, M., Cooper, R. S., Bilal, U., & Fuster, V. (2011). Challenges and opportunities for cardiovascular disease prevention. *The American Journal of Medicine*, 124(2), 95–102. <http://dx.doi.org/10.1016/j.amjmed.2010.08.015>.
- Freitas, A. L., & Higgins, T. E. (2002). Enjoying goal-directed action: the role of regulatory fit. *Psychological Science*, 13(1), 1–6. <http://dx.doi.org/10.1111/1467-9280.00401>.
- Gabriel, Z., & Bowling, A. (2004). Quality of life from the perspectives of older people. *Ageing and Society*, 24(5), 675–691. <http://dx.doi.org/10.1017/S0144686X03001582>.
- Gariballa, S. (2004). Nutrition and older people: special considerations relating to nutrition and ageing. *Clinical Medicine*, 4(5), 411–414. <http://dx.doi.org/10.7861/clinmedicine.4-5-411>.
- Gollwitzer, P. M., & Sheeran, P. (2006). Implementation intentions and goal achievement: a meta-analysis of effects and processes. *Advances in Experimental Social Psychology*, 38, 69–119. [http://dx.doi.org/10.1016/S0065-2601\(06\)38002-1](http://dx.doi.org/10.1016/S0065-2601(06)38002-1).
- Graça, J., Calheiros, M. M., & Oliveira, A. (2015). Attached to meat? (Un) Willingness and intentions to adopt a more plant-based diet. *Appetite*, 95, 113–125. <http://dx.doi.org/10.1016/j.appet.2015.06.024>.
- Hayes, D., & Ross, C. E. (1987). Concern with appearance, health beliefs and eating habits. *Journal of Health and Social Behavior*, 28(2), 120–130. <http://dx.doi.org/10.2307/2137126>.
- Higgins, E. T. (1997). Beyond pleasure and pain. *American Psychologist*, 52, 1280–1300. <http://dx.doi.org/10.1037/0003-066X.52.12.1280>.
- Higgins, E. T. (1998). Promotion and prevention: regulatory focus as a motivational principle. *Advances in Experimental Social Psychology*, 46, 1–46. [http://dx.doi.org/10.1016/S0065-2601\(08\)60381-0](http://dx.doi.org/10.1016/S0065-2601(08)60381-0).
- Higgins, E. T. (2000). Making a good decision: value from fit. *American Psychologist*, 55(11), 1217. <http://dx.doi.org/10.1037/0003-066X.55.11.1217>.
- Hoffman, S. R., Stallings, S. F., Bessinger, R. C., & Brooks, G. T. (2013). Differences between health and ethical vegetarians. Strength of conviction, nutrition knowledge, dietary restriction, and duration of adherence. *Appetite*, 65, 139–144. <http://dx.doi.org/10.1016/j.appet.2013.02.009>.
- Hornik, R. (2002). *Public health communication: Evidence for behavior change*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Houston, D. K., Nicklas, B. J., & Zizza, C. A. (2009). Weighty concerns: the growing prevalence of obesity among older adults. *Journal of the American Dietetic Association*, 109(11), 1886–1895. <http://dx.doi.org/10.1016/j.jada.2009.08.014>.
- Janssen, V., De Gucht, V., Dusseldorp, E., & Maes, S. (2012). Lifestyle modification programmes for patients with coronary heart disease: a systematic review and meta-analysis of randomized controlled trials. *European Journal of Preventive Cardiology*, 20(4), 620–640. <http://dx.doi.org/10.1177/2047487312462824>.
- Joireman, J., Shaffer, M. J., Balliet, D., & Strathman, A. (2012). Promotion orientation explains why future-oriented people exercise and eat healthy evidence from the two-factor consideration of future consequences-14 scale. *Personality and Social Psychology Bulletin*, 38(10), 1272–1287. <http://dx.doi.org/10.1177/0146167212449362>.
- Kiefer, I., Rathmann, T., & Kunze, M. (2005). Eating and dieting differences in men and women. *Journal of Men's Health and Gender*, 2(2), 194–201. <http://dx.doi.org/10.1016/j.jmhg.2005.04.010>.
- Koutstaal, W. (2003). Older adults encode—but do not always use—perceptual details intentional versus unintentional effects of detail on memory judgments. *Psychological Science*, 14(2), 189–193. <http://dx.doi.org/10.1111/1467-9280.01441>.
- Kushner, R. F. (1995). Barriers to providing nutrition counseling by physicians: a survey of primary care practitioners. *Preventive Medicine*, 24(6), 546–552. <http://dx.doi.org/10.1006/pmed.1995.1087>.
- Lee, A. Y., & Aaker, J. L. (2004). Bringing the frame into focus: the influence of regulatory fit on processing fluency and persuasion. *Journal of Personality and Social Psychology*, 86(2), 205–218. <http://dx.doi.org/10.1037/0022-3514.86.2.205>.
- McCabe, M. P., & Ricciardelli, L. A. (2004). Weight and shape concerns of boys and men. In J. Kevin Thompson (Ed.), *Handbook of eating disorders and obesity* (pp. 606–634). Hoboken, NJ, US: John Wiley & Sons.
- McMahon, S., & Fleury, J. (2012). Wellness in older adults: a concept analysis. *Nursing Forum*, 47(1), 39–51. <http://dx.doi.org/10.1111/j.1744-6198.2011.00254.x>.
- Micha, R., Wallace, S. K., & Mozaffarian, D. (2010). Red and processed meat

- consumption and risk of incident coronary heart disease, stroke, and diabetes mellitus: a systematic review and meta-analysis. *Circulation*, 121(21), 2271–2283. <http://dx.doi.org/10.1161/CIR.0b013e3181df95cb>.
- Millen, B. E., Ohls, J. C., Ponza, M., & McCool, A. C. (2002). The elderly nutrition program: an effective national framework for preventive nutrition interventions. *Journal of the American Dietetic Association*, 102(2), 234–240. [http://dx.doi.org/10.1016/S0002-8223\(02\)90055-6](http://dx.doi.org/10.1016/S0002-8223(02)90055-6).
- O'Dea, J. A. (2003). Why do kids eat healthful food? Perceived benefits of and barriers to healthful eating and physical activity among children and adolescents. *Journal of the American Dietetic Association*, 103(4), 497–501. [http://dx.doi.org/10.1016/S0002-8223\(03\)00013-0](http://dx.doi.org/10.1016/S0002-8223(03)00013-0).
- Oettingen, G., Pak, H. J., & Schnetter, K. (2001). Self-regulation of goal-setting: turning free fantasies about the future into binding goals. *Journal of Personality and Social Psychology*, 80(5), 736. <http://dx.doi.org/10.1037/0022-3514.80.5.736>.
- Petrocelli, J. V., Seta, C. E., & Seta, J. J. (2012). Prefactual potency: the perceived likelihood of alternatives to anticipated realities. *Personality and Social Psychology Bulletin*, 38(11), 1467–1479. <http://dx.doi.org/10.1177/0146167212453747>.
- Puggelli, F. R., & Bertolotti, M. (2014). Healthy and unhealthy food in Italian television ads for adults and children. *Young Consumers*, 15(1), 58–67. <http://dx.doi.org/10.1108/YC-03-2013-00364>.
- Ryan, E. B., & Butler, R. N. (1996). Communication, aging, and health: toward understanding health provider relationships with older clients. *Health Communication*, 8(3), 191–197. [http://dx.doi.org/10.1207/s15327027hc0803\\_1](http://dx.doi.org/10.1207/s15327027hc0803_1).
- Sanna, L. J. (1996). Defensive pessimism, optimism, and simulating alternatives: Some ups and downs of prefactual and counterfactual thinking. *Journal of Personality and Social Psychology*, 71, 1020–1036. <http://dx.doi.org/10.1037/0022-3514.71.5.1020>.
- Snyder, L. B. (2007). Health communication campaigns and their impact on behavior. *Journal of Nutrition Education and Behavior*, 39(2), S32–S40. <http://dx.doi.org/10.1016/j.jneb.2006.09.004>.
- Southwell, B. G. (2010). On the need for a life-span approach to health campaign evaluation. *Health Communication*, 25(6–7), 525–528. <http://dx.doi.org/10.1080/10410236.2010.496701>.
- Sparks, L., & Nussbaum, J. F. (2008). Health literacy and cancer communication with older adults. *Patient Education and Counseling*, 71(3), 345–350. <http://dx.doi.org/10.1016/j.pec.2008.02.007>.
- Stadler, G., Oettingen, G., & Gollwitzer, P. M. (2009). Physical activity in women: effects of a self-regulation intervention. *American Journal of Preventive Medicine*, 36(1), 29–34. <http://dx.doi.org/10.1016/j.amepre.2008.09.021>.
- Stadler, G., Oettingen, G., & Gollwitzer, P. M. (2010). Intervention effects of information and self-regulation on eating fruits and vegetables over two years. *Health Psychology*, 29(3), 274–283. <http://dx.doi.org/10.1037/a0018644>.
- Tam, L., Bagozzi, R. P., & Spanjol, J. (2010). When planning is not enough: the self-regulatory effect of implementation intentions on changing snacking habits. *Health Psychology*, 29(3), 284–292. <http://dx.doi.org/10.1037/a0019071>.
- Wakefield, M. A., Loken, B., & Hornik, R. C. (2010). Use of mass media campaigns to change health behaviour. *The Lancet*, 376(9748), 1261–1271. [http://dx.doi.org/10.1016/S0140-6736\(10\)60809-4](http://dx.doi.org/10.1016/S0140-6736(10)60809-4).
- WHO (World Health Organization). (2014). *Global status report on noncommunicable diseases*. Geneva, Switzerland: WHO Press.
- Willett, W. C., & Stampfer, M. J. (2013). Current evidence on healthy eating. *Annual Review of Public Health*, 34(1), 77–95. <http://dx.doi.org/10.1146/annurev-publhealth-031811-124646>.
- Wilson, B. J. (2007). Designing media messages about health and nutrition: what strategies are most effective? *Journal of Nutrition Education and Behavior*, 39(2), S13–S19. <http://dx.doi.org/10.1016/j.jneb.2006.09.001>.
- Wrosch, C., Scheier, M. F., Miller, G. E., Schulz, R., & Carver, C. S. (2003). Adaptive self-regulation of unattainable goals: goal disengagement, goal reengagement, and subjective well-being. *Personality and Social Psychology Bulletin*, 29(12), 1494–1508. <http://dx.doi.org/10.1177/0146167203256921>.
- Zeelenberg, M., Beattie, J., Van der Pligt, J., & de Vries, N. K. (1996). Consequences of regret aversion: Effects of expected feedback on risky decision making. *Organizational Behavior and Human Decision Processes*, 65(2), 148–158. <http://dx.doi.org/10.1006/obhd.1996.0013>.