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Reading Story, Eating Healthy?

The Effects of the Narrative Versus Informational Nutritional Message on Dietary Intentions and Self-efficacy of Low Socioeconomic Status Groups.

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Abstract

Narratives appear to be a promising alternative to informational health communication, that might help reduce health disparities. Characters in stories provide models of health-enhancing behaviours. This way, narratives might increase diet-related self-efficacy and so support healthy eating of socioeconomically deprived populations that are vulnerable to an unhealthy diet. However, little empirical evidence exists on the use of narratives in such a context. This research investigates the effects of narrative versus informational message about healthy nutrition on behavioural intentions to eat healthy. It was hypothesised that the narrative message would have a positive effect on intentions to eat healthy. The effect was expected to be moderated by subjective socioeconomic status, such that lower the status, larger the effect of narrative on intentions would be. Moreover, it was hypothesised that the narrative effect would be mediated by self-efficacy. A two-condition randomized online experiment with low-income participants ($N = 268$) showed that there was no overall difference between the effects of two messages on behavioural intentions and no mediating effect of self-efficacy. However, the narrative message appeared to have a small but significant positive effect on intentions for participants with low subjective socioeconomic status, $d = 0.16$, $p = .033$. Therefore, this study supports the notion that narratives might offer an effective tool for informational health promotion to socioeconomically deprived groups. Nonetheless, the successful application of narratives in health communication practice warrants a deeper understanding of how narratives are processed, which should be subject to further research.

Keywords: narratives, health communication, health promotion, healthy diet, low socioeconomic status, health disparities

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Introduction

One might say that health disparities begin on the plate. People of low socioeconomic status (SES) tend to eat less healthy than the average population. Consequently, they develop more non-communicable diseases (NCDs) and live shorter (Allen et al., 2017). Socioeconomic health inequalities could be tackled via health promotion interventions that would address their structural causes, but also empower deprived individuals to make healthier choices, especially in nutrition (World Health Organization [WHO], 2013). Research indicates that health communication that employs storytelling or narratives might be an effective health promotion tool to address this issue (Davis et al., 2017; Kreuter et al., 2007; Murphy et al., 2013). Deprived environments lower one's self-efficacy, a key determinant of risky dietary patterns (Sheehy-Skeffington, 2019). Characters in narratives that model optimal dietary habits might increase the self-efficacy of disadvantaged groups and so foster healthy eating behaviours (Hinyard & Kreuter, 2007; Moyer-Gusé, 2008).

However, the empirical evidence of the narrative effects in health promotion is currently inconclusive. Despite promising findings, the research area suffers inconsistencies due to many moderators and mediators of narrative effects (Braddock & Dillard, 2016; De Graaf et al., 2016; Perrier & Martin Ginis, 2018; Shen et al., 2015; Zebregs et al., 2015). Only limited empirical evidence supports the notion that narratives have positive effects on behavioural intentions to eat healthy (Ranjit et al., 2015; Unger et al., 2009). Apart from encouraging evidence of positive narrative effects on various deprived groups (Campbell, 1999; Garza et al., 2005; Kreuter et al., 2010; Larkey et al., 2015; Moran et al., 2016; van Leeuwen et al., 2013), little is known about the relationship between low SES and narrative effects. Finally, there is not enough evidence of the role of self-efficacy in narrative processing (Ranjit et al., 2015). To my best knowledge, no

study has yet compared the effects of narrative versus informational message on dietary intentions and self-efficacy among low SES population. This research aims to examine the narratives within this context and so provide empirical support for the effects of narratives in diet-related health communication to socioeconomically deprived groups. Moreover, it might help uncover mechanisms of narrative processing and contribute to the effective use of narratives in health communication in the future.

It was be hypothesised that in comparison with the informational message, the narrative dietary message would have a positive effect on intentions to eat healthy. The effect was expected to be moderated by low subjective socioeconomic status (SSES) so that participants with the lowest SSES would experience the largest narrative effect on intentions; and mediated by self-efficacy. In a between-subject randomized experiment, participants were exposed to either narrative or informational dietary message. Participants' intentions to eat healthy, self-efficacy related to a healthy diet and additional control variables were measured to estimate the impact of the message on named behavioural indicators. Results showed no overall effect of narrative on intentions. However, there was a significant positive interaction between narrative and low SSES predicting intentions. Finally, self-efficacy did not moderate the narrative effect on intentions.

Literature Review

Health Promotion to Fight Disparities

The state of public health across the globe displays major inequalities. SES is directly linked to the prevalence of NCDs, currently leading death cause (Allen et al., 2017). As your position in the society decreases, the likelihood that you will suffer from cardiovascular diseases, cancer, chronic respiratory diseases, or diabetes, and die younger increases (Nettleton, 2013;

Pepper & Nettle, 2014; Rowlingson, 2011). The crucial risk factor behind the development of the NCDs is an unhealthy lifestyle (Wanless et al., 2002; WHO, 2018). As a major contributor to NCDs mortality, suboptimal diet alone killed at least 11 million people globally in 2017 (Afshin et al., 2019). The high prevalence of poor nutrition among low SES population (Adler & Rehkopf, 2008; Pampel et al., 2010) thus deepens health disparities in the world.

The WHO strategy to tackle NCDs focuses on the prevention of risk factors and promotion of protective behaviours (WHO, 2013). Apart from the creation of health-enhancing environments providing enough resources and opportunities for a healthy life (Marmot et al., 2013; Pampel et al., 2010), the strategy also points to the role of health promotion. Health communication can effectively promote health by educating, increasing health literacy, and empowering individuals to make health-enhancing choices (Nutbeam, 2000). Therefore, health communication can improve the public health and help address socioeconomic health disparities. In these regards, health communication research in the past two decades has shown an increased interest in narratives. Stories might overperform traditional, informational types of health messages in a number of induced health-related behavioural outcomes (Braddock & Dillard, 2016; De Graaf et al., 2016; Perrier & Martin Ginis, 2018; Shen et al., 2015; Zebregs et al., 2015). Narrative health communication might, thus, contribute to the reduction of health inequities (Davis et al., 2017; Kreuter et al., 2007; Murphy et al., 2013). However, empirical evidence to support this claim is limited. This research will thus investigate the effects of narratives in the promotion of healthy diet to low SES groups.

Narratives: Promising Tool to Address Health Disparities?

Under the term narrative, scholars refer to stories, anecdotes, and testimonials that mostly cover “at least one character who experiences at least one event” (Bal, 1997; Green, 2006;

Kreuter et al., 2007; McDonald, 2014; Rimmon-Kenan, 2003 in De Graaf et al., 2016, p. 90). The character of the narrative is an agent, who intentionally acts towards certain goals and delivers information about a topic. The event of the narrative is built around a chronological, causal transition between the two states and situated in a spatiotemporal framework (Bal, 1997; Green, 2006; Herman, 2009; McDonald, 2014; Perrier & Martin Ginis, 2018; Rimmon-Kenan, 2003; Ryan, 2007; Shen et al., 2015). Narratives are usually focused on particular characters, events, and experiences, whereas informational messages tend to be more general, providing factual information about reasons and ways to accomplish goals, often in argumentative form. Contrarily to openly persuasive informational messages that address the topic explicitly, the persuasive intent of narratives might be less evident, and the topic just implicit (Bilandzic & Busselle, 2013; Kreuter et al., 2007; Shen et al., 2015).

The research suggests that the mental and emotional responses to stories might exert effects on health behaviours. In some cases, narrative persuasive power might exceed the power of informational health messages (Green & Brock, 2000; Moyer-Gusé, 2008). The metanalyses have shown positive relationships between exposure to narratives and a number of message-consistent behavioural indicators, such as attitudes, beliefs, behavioural intentions, or behaviours (Braddock & Dillard, 2016; De Graaf et al., 2016; Perrier & Martin Ginis, 2018; Shen et al., 2015; Zebregs et al., 2015). Narratives seem to raise credibility and acceptance of the message (Deighton et al., 1989; Green, 2004; Green & Brock, 2000; Kreuter et al., 2007) and reduce counterarguing and criticism (Green & Brock, 2000; Knowles & Linn, 2004; Slater et al., 2003; Slater & Rouner, 2002; Winterbottom et al., 2008). Health communication using storytelling has additional benefits like adaptability to a context relevant for the target audience (Ranjit et al., 2015), or low requirements for literacy or education to be understood (Kreuter et al., 2007).

These are some of the reasons why narratives are regarded as a potential tool of health promotion towards disadvantaged populations. However, narrative effects vary depending on the type of target behaviour (Perrier & Martin Ginis, 2018; Shen et al., 2015). Previous evidence of effective use of narratives in low SES context refers mostly to screening behaviours (Borrayo et al., 2017; Garza et al., 2005; Kreuter et al., 2010; Larkey et al., 2015) and cervical cancer prevention (Moran et al., 2016; Murphy et al., 2013). The research on narratives addressing nutrition is limited. Two studies that investigated diet-related narratives in low SES context report positive effects on intentions - however, without a comparison to a non-narrative alternative (Ranjit et al., 2015; Unger et al., 2009). Although those findings are encouraging, more research is needed to determine whether the narratives the healthy nutrition promotion to low SES groups can have positive effects on intentions to eat healthy, especially compared to the informational message.

Moreover, the target population appears to be a moderator of narrative effects (Perrier & Ginis, 2018). Previous research found significant positive narrative effects on populations that display characteristics of low SES in terms of education or income (Galobardes et al., 2006a, 2006b). Narratives performed well for people with lower levels of education or literacy (Kreuter et al., 2010; Moran et al., 2016; van Leeuwen et al., 2013), or disadvantaged ethnic sub-populations (Borrayo et al., 2017; Murphy et al., 2013; Wilkin & Ball-Rokeach, 2006). Some studies suggest that narratives can induce healthy behaviours among low-income groups (Campbell, 1999; Garza et al., 2005; Kreuter et al., 2010; Larkey et al., 2015). However, to my best knowledge, no study has yet evaluated the relationship between narratives and low SES as such.

Unknown Mechanisms of Narrative Persuasion

However, besides the promising results, metanalyses also report studies with little, or no significant narrative effect on behavioural indicators (Braddock & Dillard, 2016; De Graaf et al., 2016; Perrier & Martin Ginis, 2018; Shen et al., 2015; Zebregs et al., 2015). The great variation of reported effects across the field is due to many known and unknown moderators and mediators of narrative effects. This issue within the field might be addressed by further investigation of mechanisms behind narrative processing. The literature outlines various possible mediators of narrative effects on behaviour, which do not necessarily exclude one another (Perrier & Martin Ginis, 2018). The power of narratives is often associated with emotional engagement triggered by a vivid story (Green, 2006; Kreuter et al., 2007; Shen et al., 2015; Winterbottom et al., 2008) or comprehensibility of narratives (Hinyard & Kreuter, 2007). Nonetheless, other possible mediators of narrative effects remain without sufficient empirical evidence (Braddock & Dillard, 2016).

I Can Do That Too! Observational Learning and Self-efficacy

One of the relatively unexplored ways how narratives might affect behaviour is self-efficacy. According to Bandura (1977), self-efficacy, as a personal conviction that an individual can successfully execute given behaviour, is a necessary precondition to perform a behaviour. One of the sources providing the self-efficacy is a vicarious experience - an exposure to the example of someone else's success in the same behaviour. In other words, it might be possible to learn to believe in one's own capacities to perform a given behaviour from observing others as models. This way, self-efficacy can be a subject to observational learning. Apart from knowledge, values, skills, or styles of behaviour, models might thus transmit and reinforce also self-efficacy (Bandura, 1977, 1986, 2004). The positive influence of models on self-efficacy has

been supported by empirical studies on children and students (Schunk, 1986; Schunk & Hanson, 1985, 1989).

Self-efficacy learned from observation of character might be the way of how narratives influence behavioural outcomes (Hinyard & Kreuter, 2007). A character of the story can model self-efficacy for an observer. Merely by engaging with the character in a story, the observer's perception of her own capabilities to engage in health-enhancing behaviour can increase (Moyer-Gusé, 2008). Simply put - if the character of the story can do that, I can do that too. This is in line with the finding that narratives that show healthy behaviours seem to be more persuasive than those that show negative examples (De Graaf et al., 2016). Raising the self-efficacy means raising the chances that a behaviour will be successfully executed (Ajzen, 2002), especially when it comes to nutritional habits of low SES groups (Sheehy-Skeffington, 2019).

Powerlessness and Unhealthy Diet

The observational learning of control can be the key mechanism that makes narratives suitable for low SES groups. This way, narratives might help to overcome one of the greatest barriers to a healthy diet that originates in a deprived environment: low self-efficacy. From the perspective of socioecological psychology, the environment shapes human cognition and behaviour. Risky behaviours of low SES individuals are viewed as an adaptive response to their situation of poverty (Nettle et al., 2013; Oishi, 2014; Üskül & Oishi, 2018). Low SES environment triggers three psychologically important cues. First, experiencing low SES is associated with a constant feeling of not having enough resources. Second, living in poverty means living in an unpredictable context. Third, the subjective perception of one's low relative social position is interpreted as doing worse than others (Sheehy-Skeffington, 2018; 2019; 2020; Sheehy-Skeffington & Rea, 2017; Sheehy-Skeffington & Haushofer, 2014).

In response to these socioecological cues, the cognition of low SES individuals undergoes a major psychological shift. The deprived environment triggers the development of a sense of powerlessness over one's life (Seeman, 2008). Scarcity, instability, and low status all decrease one's confidence that her future will evolve in line with her plans (Anderson & Galinsky, 2006). The context of low SES population reinforces the belief that life events are mostly driven by external forces and so completely out of one's control (Rotter, 1966). As a result, the environment of poverty significantly decreases self-efficacy. Importantly, the lack of personal control is strongly associated with health-damaging behavioural patterns (Sheehy-Skeffington, 2018; 2019; 2020; Sheehy-Skeffington & Rea, 2017; Sheehy-Skeffington & Haushofer, 2014).

Self-efficacy is an important determinant of human behaviour (Ajzen, 2002) and one of the key psychosocial mediators between SES and health (Seeman, 2008). Perceived personal control influences whether and how humans cope with different situations, how much effort they sacrifice, and how long they persist (Bandura, 1999). Low self-efficacy contributes to risky health-related decisions, such as eating an unbalanced diet (Sheehy-Skeffington, 2018; 2020). The powerlessness resulting from existential struggles, for instance, long-term unemployment, transfers to all domains of life, including eating habits. Consequently, an individual does not feel competent enough to cut off fast-food or to resist fizzy drinks (Schwarzer & Renner, 2000). On the other hand, high levels of self-efficacy are associated with lower chances to return to previous unhealthy diet (Bagozzi & Edwards, 1998; Fuhrmann & Kuhl, 1998; Gollwitzer & Oettingen, 1998).

Research Question and Hypotheses

These findings imply that narratives might address the underlying psychological mechanisms of low SES groups that shape their eating patterns. By fostering the individual sense of control over one's eating decisions, narratives might overperform traditional, informational dietary messages in health promotion to low SES populations. Therefore, it can be assumed that self-efficacy mediates narrative effects on intentions, whereas the effect is moderated by the subjective experience of low SES. However, to my best knowledge, there is not sufficient empirical basis to support this claim.

There is evidence of an increased individual sense of self-efficacy by a narrative that led to positive changes in various health-related behaviours not only within low SES populations (Appalasamy et al., 2018; Borrayo et al., 2017; Campbell, 1999; Falzon et al., 2015; Makalela, 2015) but the research in the nutritional domain is limited and inconclusive (Ranjit et al., 2015; Slater et al., 2003). Ranjit and colleagues (2015) reported that a storybook on healthy lifestyle increased self-efficacy and intentions to engage in a healthy diet among low SES readers. However, a non-narrative message alternative was not included in the study and the study design did not allow to infer causality. Contrarily, an experimental study by Slater and colleagues (2003) that compared effects of narrative and informational message on healthy diet found no narrative effect on self-efficacy. Importantly, the latter study did not involve low SES population, what might have affected the results (Perrier & Martin Ginis, 2018).

Given the interplay of possible moderators and mediators of narrative effects, the literature within the field recommends a segmented approach to investigate particular contexts when narratives can bring the greatest advantage (Braddock & Dillard, 2016; Perrier & Martin Ginis, 2018). Based on the literature and previous evidence of narrative effects, this research will

experimentally investigate the relationship between narratives, self-efficacy, and intentions to engage in a healthy diet on low SES population and so address the current gap in the literature. A narrative study embedded in this context might contribute to more effective promotion of healthy diet within socioeconomically deprived settings, that can help to tackle health disparities (Davis et al., 2017; Kreuter et al., 2007; Murphy et al., 2013). This research would also contribute to the endeavours to uncover the mechanisms behind the narrative processing and so determine conditions for the optimal narrative use in health promotion (Perrier & Martin Ginis, 2018).

To address the issue, the following research question was proposed:

What are the effects of narrative versus informational message about healthy nutrition on dietary intentions and self-efficacy of low SES groups?

Following hypotheses were stated:

Hypothesis 1: The narrative form of the message on a healthy diet will have a positive effect on intentions to eat healthy.

Hypothesis 2: The positive effect of the narrative message on intentions will be moderated by subjective socioeconomic status, such that the effect will be the largest for those with the lowest subjective socioeconomic status.

Hypothesis 3: The positive effect of the narrative message on intentions will be mediated by self-efficacy.

Methodology

Research Design

To study the effects of narrative message about healthy diet on behavioural intentions and self-efficacy, I chose a mixed-methods approach with an emphasis on quantitative methods. Given that the research investigates the causal effects of narratives, I adopted a between-group

experimental design with two conditions (Charness et al., 2012; Field & Hole, 2003). Participants were randomly assigned to the narrative or informational group and exposed to one message type accordingly. To ensure that the randomisation yielded two equivalent groups, sample characteristics in both groups were checked and compared (Field & Hole, 2003). Statistical tests showed that the two groups were balanced (Appendix A). Then, participants filled a questionnaire that measured variables of study interest. The qualitative part of the research was based on the explanatory sequential design (Creswell & Plano Clark, 2017) that builds on quantitative research. Including an open-ended question into the post-treatment questionnaire allowed me to gain a better understanding of the quantitative data. Moreover, quantitative characteristics of the data served as a basis for purposeful sampling in the qualitative analysis that distinguished between narrative and informational condition (Creswell et al., 2003).

Participants and Recruitment

Sample Size

A priori power analysis in software G*Power was used to determine sample size based on the desired power level, significance, and population effect size (Cohen, 1988; Faul et al., 2007). The sample size was calculated for an F-test of the linear multiple regression fixed model, testing the R^2 increase after adding predictors to the model (Cohen, 1988). The effect size $f^2 = 0.03$ was based on the smallest narrative effect size reported in the meta-analysis (Perrier & Ginis, 2018). The required statistical power was 80% and the p-value was set at 0.05 (Cohen, 1988). The number of predictors was set according to the most complex, mediation model stated in Hypothesis 2, that included one tested predictor and three predictors in total (Faul et al., 2009). The number of participants calculated as a function of those requirements was 264.

Data Collection

Data for the study were collected via an online platform Prolific between 22 and 30 June 2020. The platform was chosen for its reliability, as samples obtained on online platforms generally correspond with results from the field (Coppock, 2019). Also, Prolific allowed me to recruit a sample that satisfied the following criteria. First, the research was intended to explore low SES groups. Given that income is one of the most objective indicators of socio-economical position (Galobardes et al., 2006a, 2006b), only low-income participants were included. The low-income threshold was adapted from the official definition of the UK Government that considers low-income to be 60% of the median of the average household income (Department for Work and Pensions, 2016). The threshold reported for London in 2019 was £17,760 (Office for National Statistics, 2020). With regards to the income categories offered by Prolific, the first recruitment criterion was the household income not exceeding £15,999 annually. Second, to increase a sense of identification with a character in the narrative, all recruited participants were based in London. Remaining criteria were English as the first language, age over 18 years and no participation in pilot study related to this research. Participants were paid on average £7.77 per hour for the participation in the main research and £5.38 per hour in the pilot testing. 11 participants were recruited for a pilot test. Expecting approximately 10% non-response rate, 297 participants were recruited for the main study.

Sample Characteristics

The sociodemographic sample characteristics are summarised in Appendix A. Almost 68% of the sample were women. The average age of the participants was 31 years. The most frequently reported education level was undergraduate. On average, the quality of the

participants' diet tended to be more healthy than unhealthy. The mean score in SSES was five out of 10.

Procedure

The experiment was conducted online. The questionnaire (Appendix B), including experimental treatment, was created on platform Qualtrics and distributed via Prolific. After opening the link, the purpose of the study was broadly explained. Then, participants were asked to indicate their consent. Next, each participant was randomly allocated to read narrative or informational health message for an unlimited time. The assignment to narrative or informational group was considered as treatment, or, independent variable. After reading the message, participants were asked to fill a questionnaire, which measured intentions to engage in a healthy diet as dependant variable, self-efficacy as mediating variable, and SSES as moderating variable. Participants also indicated the understanding of the message, quality of the previous diet in terms of health, and their sociodemographic characteristics (age, gender, and education) as possible control variables. Moreover, they were asked to answer an open-ended question about their perception of the message that was subject to qualitative analysis. One extra question was included as an attention check (Oppenheimer et al., 2009). Finally, participants were thanked and debriefed. The average time of completion was nearly 9 minutes. The ethical approval for the research was obtained prior to data collection from LSE Ethics Committee.

Materials

To estimate the causal effect of narrative on intentions, the two experimental messages must have been identical in everything except for the narrative aspect (Kreuter et al., 2010). Therefore, I created two versions of health text-based dietary message (Appendix C) with regards to the similar studies of narratives in health communication (Braverman, 2008; Davis et

al., 2017; Falzon et al., 2015; Foulon & Ginis, 2013; Gray & Harrington, 2011; Quintiliani & Carbone, 2005; Zebregs et al., 2015). To ensure the equal quality of narrative and informational message, they both contained healthy diet recommendations based on limiting the intake of 3 risky nutritional components - fat, salt, and sugar. Similar to previous studies, the recommendations were adapted from the official guidelines of the two public health authorities, WHO (2020) and National Health Services (NHS) (2018). Materials were shortened, simplified, and modified to increase their relevance for low SES groups. I incorporated statements on lack of time, money, and knowledge to both messages, as those are the most common barriers associated with poor dietary habits of low SES groups (Inglis et al., 2005). Additionally, I omitted the recommendation on fruits and vegetable intake, as their relatively high prices might make them less accessible for low-income individuals (Drewnowski, 2003; Drewnowski & Specter, 2004; Gandal & Shabelansky, 2009).

Messages were similar in length and they both followed the same structure. The outline of poor nutrition habits was followed by statements on their consecutive health complications. Then, concrete steps to limit the intake of fat, salt, and sugar were presented. Finally, the message stated the benefits associated with healthy dietary change. The two messages were framed in terms of gain, as it was associated with larger narrative effects on intentions than loss frame (De Graaf et al., 2016; Falzon et al., 2015; Gray & Harrington, 2011).

Overall, the only intended difference between messages was the presence of the key narrative characteristics. The narrative message presented a fictional story of a character Paul who changed his diet. I further modified the form of the narrative according to the literature, to make the narrative message as effective as possible. I incorporated references that indicated that the character was from London and signalled his low SES status, specifically his routine

occupation and low income (Galobardes et al., 2006a, 2006b) to maximize the familiarity, similarity, and liking of the narrative (De Graaf et al., 2016; Dillard & Main, 2013; Kreuter et al., 2007; Larkey et al., 2015; Slater et al., 2003). Furthermore, the story adopted a first-person perspective (De Graaf et al., 2016; Nan et al., 2015; Robinson & Knobloch-Westerwick, 2017). Finally, the language was checked and corrected with a native speaker from London, to avoid an artificial tone of the story. On the other hand, the informational message did not employ any character or story and offered general recommendations on dietary change, referring to the WHO and NHS.

Pilot Testing

To ensure the equality of the two messages in all aspects but the storytelling, I conducted two rounds of pilot tests. In a within-subject design, participants were exposed to both messages at the same time to indicate perceived differences between them, their understandability and possible suggestions to improve the messages (see Appendix D). The first version of messages was tested with a convenience sample of 16 post-graduate students. Both narrative and informational message scored high in understanding, $M_{nar} = 9.5$, $M_{inf} = 9.38$; Max = 10. The average value of perceived similarity was 8.1. The prevailing reported difference was the element of the story. Based on responses that indicated the low realism and excessive length, the narrative message was rewritten with the help of native English speaker and the most demanding recommendations were removed, so both messages were shortened.

In the second round of the pilot testing, 11 respondents from a target study population hired via Prolific indicated that the modified narrative message was slightly more understandable than the informational message, $M_{nar} = 9.0$, $M_{inf} = 8.46$; Max = 10. Based on responses, both messages were again shortened and words that were reported as incomprehensible were omitted.

The average perceived similarity between the message was 7.9 out of 10. Participants mostly referred to a different point of view, but also viewed informational message as more complicated, with longer and more complex sentence structures. Given that this was reported despite the equal content and length of the message, I decided to include message understanding as separate control variable into the main study.

Measures

Reliability analysis of all Likert scales in the study revealed satisfactory internal consistency of items with Cronbach's alpha more than or close to .70 (Aron & Aron, 1999). Therefore, scores for items within each scale were averaged to produce a single score for each variable (see Appendix E).

Behavioural intentions were measured using seven-point Likert scale with three items examining the intentions to engage in dietary behaviours addressed in the health message and one item examining general dietary intentions, similar to previous studies (Gray & Harrington, 2011; Rhodes et al., 2002). The questions were anchored in dietary plans, for instance, "I plan to limit my fat intake", $\alpha = .76$.

Measurement of self-efficacy was also adapted from previous research (Campbell, 1999; Quintiliani & Carbone, 2005; Ranjit et al., 2015; Slater et al., 2003). A seven-point Likert scale measured the self-efficacy using four items, such as "How sure are you that you can eat healthy over the next month?", with three further variations addressing the self-efficacy related to the limiting nutritional components mentioned in the message, $\alpha = .81$.

SSES was measured using MacArthur ladder that provides a summative, single-item measure of psychological perception of social status, which was empirically related to several health-outcomes (Adler et al., 2000). Participants were shown a picture of a social ladder. They

were asked to place themselves on the rug according to where do they think they stand within the society. The rug one indicated the lowest, the rug 10 the highest position in terms of money, education, and job.

Understanding of the message was measured by seven-point Likert scale using two items, as in the study by Slater and colleagues (2003), $\alpha = .87$.

The quality of the previous diet with regards to health was measured by seven-point Likert scale with four items asking about participants' diet generally, as well as about eating behaviours concerning the three specific areas addressed in the message, $\alpha = .68$.

Additionally, participants indicated their age, gender, and education level.

To elicit thoughts, views, or feelings that could provide me with additional insights on how the message was perceived and so to interpret the quantitative data, I created following open-ended question: "Would the message that you've just seen help you to make up your mind about your diet? Why?". The full questionnaire is shown in Appendix B.

Data Analysis

Quantitative analysis was conducted in software R. The significance threshold (p-value) was set at $< .05$, and the confidence level was 95%. Prior to the main analysis, data were reverse-coded and reviewed for attention checks, missing values, and withdrawals. Next, I analysed whether the data satisfy assumptions for t-test and linear regression analysis. Hypothesis 1 was tested conducting a two-sample t-test, followed by multiple linear regression analysis to control for possible covariates. To test Hypothesis 2, a multiple linear regression model with an interaction term was constructed. I tested Hypothesis 3 using the mediation package in R, following the Baron-Kenny procedure and Bootstrapping method with 2000 resamples (Imai et al., 2010; Tingley et al., 2014). In the exploratory analysis, the same procedure was used for

moderated mediation analysis. To explore further associations between variables, I performed correlational analysis (Cohen, 1988), followed by multiple linear regression analysis.

For qualitative analysis, I used software ATLAS.ti. I conducted thematic analysis following the approach of Braun and Clarke (2006), as its great flexibility enabled me to extract meaningful patterns even from short pieces of data. I coded the responses to the open-ended question separately for each message condition and both positive and negative views of the message (Creswell & Poth, 2016). This allowed me to explore the perspectives of four distinct groups within my total sample separately (Ivankova et al., 2006). After recurrent refinement and regrouping of codes, I identified and defined a set of themes that summarised important patterns of the data.

Results

Quantitative Analysis

Preliminary Analysis

Data Manipulation. The data of insufficient quality were excluded from the analysis. Out of 297 participants, six subjects who did not pass the attention check and 23 subjects who did not answer at least one question were excluded from the study. No further exclusions were made. Data from 268 participants were eligible for the analysis. For the purpose of Hypothesis 2 testing, a new variable named “Low subjective socioeconomic status” (low SSES) was created from reversed scores of “Subjective socioeconomic status” (SSES).

Tests of Statistical Assumptions. The analysis showed that all necessary assumptions of t-test and multiple linear regression were satisfied (see Appendix F).

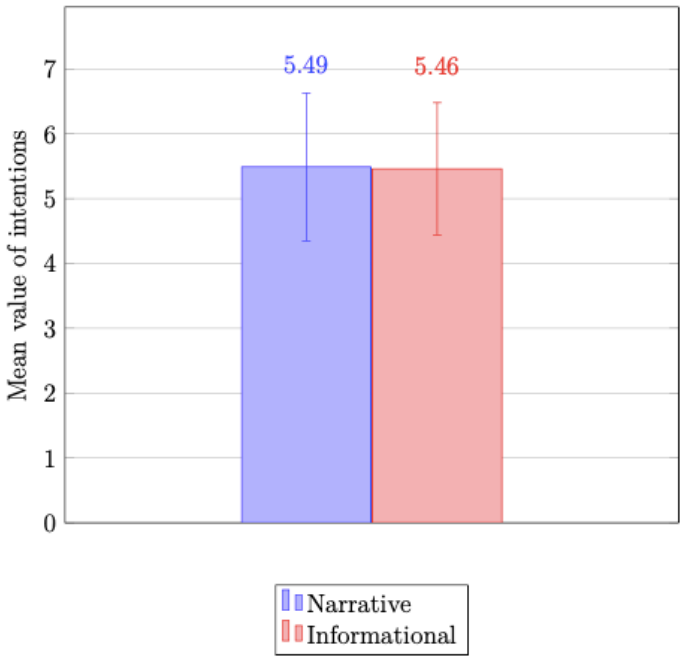
Descriptive statistics. Summary statistics for all variables of the study interest across conditions are reported in Appendix A.

Hypotheses Testing

Hypothesis 1. Hypothesis 1 predicted that participants exposed to the narrative dietary message will display increased intentions to healthy eating in comparison to participants exposed to the informational dietary message. Average score in reported behavioural intentions was slightly higher in the narrative than in informational group, $M_{nar} = 5.46$, $SD_{nar} = 1.02$; $M_{inf} = 5.49$, $SD_{inf} = 1.14$ (Figure 1). The two-sample t-test revealed that the difference, $M_{diff} = 0.03$ was not statistically significant, $t(266) = -0.22$, $p = .828$, 95% CI [–0.29, 0.23]. Thus, the analysis failed to reject the null hypothesis that there was no association between narrative message and intentions to eat healthy in the population.

Figure 1

Mean Values of Intentions for Narrative and Informational Group



Note. $N = 268$.
The error bars represent standard deviations.
Intention scores range from 1 to 7.

Controlling for understanding, previous diet, SSES, gender, education, and age in following multiple linear regression analysis, Model 1 showed no significant effect of narrative on intentions, $b = –.06$, $SE = 0.13$, $t(254) = –0.5$, $p = .617$, 95% CI [–0.31, 0.19]. However, both understanding and previous diet were significant predictors of intentions, $b = .06$, $SE = 0.06$, $t(254) = 5.60$, $p < .001$, 95% CI [0.21, 0.43]; $b = .16$, $SE = 0.06$, $t(254) = 2.82$, $p = .005$, 95% CI [0.05, 0.27], respectively. One unit increase in understanding is associated with 0.32 unit increase in intentions, $d = 0.32$ indicates small effect. One unit increase in the quality of previous diet increases intentions by 0.16 units with $d = 0.16$, therefore, with small effect size. The regression coefficients for all covariates of Model 1 are displayed in Appendix G.

Given $F(12, 254) = 4.88$ with $p < .001$, the multiple linear regression Model 1 was significant. It explained 20% of total variation, $R^2 = 0.20$. Consistently with t-test results, regression analysis indicated no relationship between narrative message and behavioural intentions in the population. Therefore, Hypothesis 1 was not supported.

Hypothesis 2. According to Hypothesis 2, the effect of the narrative message on intentions to eat healthy will be moderated by SSES, such that the effect will be largest for individuals with the lowest SES.

A multiple linear regression Model 2 (see output in Table 1) revealed, that controlling for understanding, previous diet, gender, education, and age, the interaction between narrative message and low SSES was a significant predictor of behavioural intentions, $b = .15$, $SE = 0.07$, $t(254) = 2.15$, $p = .033$, 95% CI [0.01, 0.29]. Being exposed to the narrative message, one unit increase in low SSES is associated with 0.15 unit increase in intentions to eat healthy. Cohen's d = 0.16 indicates small effect size.

The regression model including the interaction between narrative and low SSES was statistically significant, $F(14,253) = 4.93$, $p < .001$, and explained 21.4% of total variance in behavioural intentions, $R^2 = 0.214$. Adding the interaction term to the model increased the proportion of total variance explained by 1.4% ($R_\Delta = 0.014$).

Table 1

Model 2: Multiple Regression Analysis of Predictors of Intentions with Interaction between Narrative and Low SSES

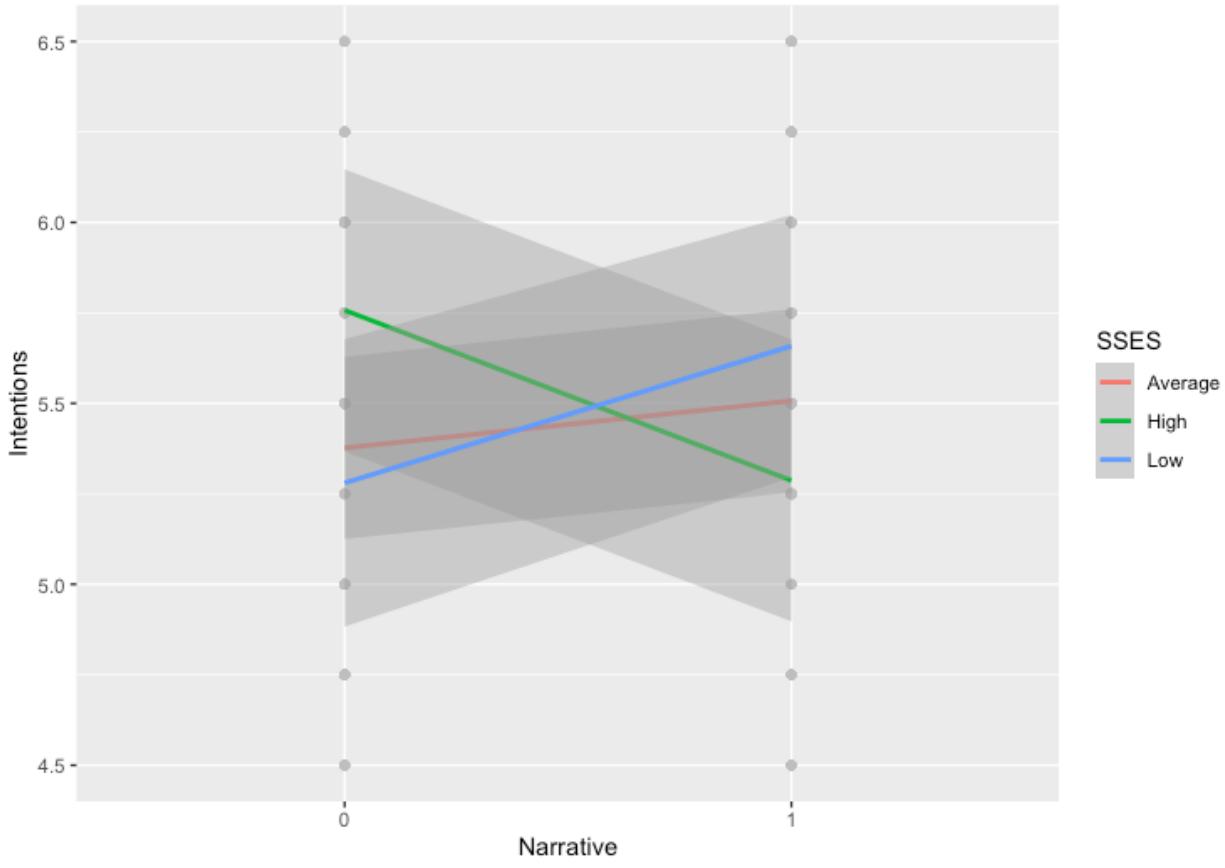
Predictors	Estimates	*SE*	95% CI		*p*
			LL	*UL*	
Intercept	2.57	0.77	1.06	4.08	**.001****
Narrative message	−0.94	0.43	−1.78	–0.10	**.029***
Low SSES	–0.07	0.05	–0.18	0.03	.152
Understanding	0.32	0.06	0.20	0.43	**<.001*****
Previous diet	0.16	0.06	0.05	0.27	**.006****
Gender†					
Female	0.08	0.13	–0.18	0.34	.561
Other gender	0.85	0.73	−0.57	2.28	.240
Education ††					
Secondary education	0.67	0.61	–0.53	1.87	.272
High school diploma	0.25	0.60	–0.94	1.43	.679
Technical/community college	0.67	0.61	–0.53	1.87	.271
Undergraduate degree	0.62	0.60	–0.57	1.81	.309
Graduate degree	0.50	0.61	–0.70	1.69	.417
Doctorate degree	0.85	0.74	–0.60	2.31	.284
Age	0.00	0.00	–0.00	0.01	.352
Narrative message * Low SSES	0.15	0.07	0.01	0.29	**.033***

Note. $N = 268$. *** $p < .001$. ** $p < .01$. *$p < .05$.
† Male as baseline. †† No formal qualifications as baseline.
SSES = subjective socioeconomic status.
SE = standard error.
CI = confidence interval. LL = lower limit. UL = upper limit.
$R^2 = 0.214$. $F(14, 253) = 4.93$. $p < .001$.

The Figure 2 displays predicted values of behavioural intentions based on exposition to narrative message for the three levels of SSES; average = 5.16 (*M*), high > 6.93 (*M* + 1 *SD*), and low < 3.43 (*M* – 1 *SD*). The fitted values suggest that within the narrative condition, participants of low SSES scored slightly higher in intentions to eat healthy than participants of average and high SSES.

Figure 2

Moderation Effect: Predicted Values of Intentions by Message Condition and SSES



Note. N= 268.
SSES = Subjective socioeconomic status.
Values of SSES. Average = 5.18 (*M*). High > 6.93 (*M* + 1 *SD*). Low < 3.43 (*M* – 1 *SD*).
SSES scores range from 1 to 10. Intentions scores range from 1 to 7.
Figure displays 95% confidence intervals.

These findings reject the null hypothesis that there is no moderation effect of low SSES on the effect of the narrative on intentions. There is a positive association between narrative message and intentions to eat healthy moderated by low SSES, such that the positive effect of narrative is largest for those with the lowest SSES. Therefore, the results provide evidence to support Hypothesis 2.

Hypothesis 3. Hypothesis 3 stated that the positive effect of the narrative message on intentions to eat healthy will be mediated by self-efficacy.

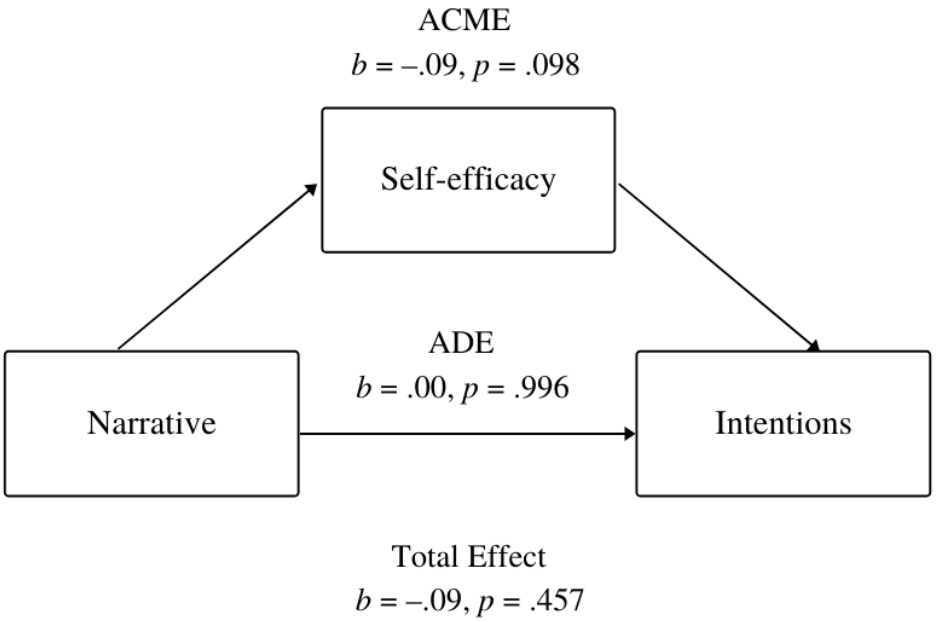
To estimate the average causal mediation effect, the analysis followed the Baron-Kenny procedure (Imai et al., 2019) with the narrative message as explanatory, intentions as an outcome, and self-efficacy as mediating variable. The analysis using nonparametric bootstrap with 2000 resamples revealed that the total effect of narrative on intentions was not significant, $b = –.09$, $p = .457$, 95% CI [–7.80, 6.64], what is in line with results of Hypothesis 1 testing.

Given that the literature assumes that the mediation effect is likely to be small, the analysis proceeded further by examining the mediation effect (Hayes, 2018; Shrout & Bolger, 2002). However, the average causal mediation effect (ACME) of self-efficacy on intentions was not significant, $b = –.09$, $p = .098$, 95% CI [–0.20, 0.02]. The average direct effect (ADE) of narrative message on intentions controlling for self-efficacy was not significant either, $b = .00$, $p = .996$, 95% CI [–0.21, 0.22]. Mediation Model 3 is displayed in Figure 3. The output of the causal mediation analysis is in Appendix H.

The findings fail to reject the null hypothesis that there is no mediating effect of self-efficacy on the relationship between narrative message and intentions to eat healthy. Therefore, there is not enough evidence to support Hypothesis 3.

Figure 3

Model 3: Causal Mediation Analysis



Note. $N = 268$.
2000 simulations.

Exploratory Analysis

Hypothesis 3 Extension: Moderated Mediation Analysis. Given that the positive effect of the narrative message on behavioural intentions was significant in interaction with low SSES, it can be assumed that the mediation effect of self-efficacy is moderated by low SSES. The analysis of moderated mediation was conducted following the Baron-Kenny procedure, with the narrative message as explanatory, intentions as outcome, self-efficacy as mediating, and low SSES as moderating variable.

Table 2 summarises the results of analysis using nonparametric bootstrap with 2000 resamples that revealed no total effect of narrative on intentions neither for participants scoring low (M – 1 SD), $b = .15$, $p = .400$, 95% CI [–0.19, 0.46]; nor for those scoring high (M + 1 SD)

on SSES, $b = -.32$, $p = .081$, 95% CI [–0.69, 0.03]. Accordingly to the mediation Model 3, there was no significant average causal mediation effect (ACME) among nor low, neither high SSES participants, $b = -.04$, $p = .644$, 95% CI [–0.20, 0.15]; $b = -.14$, $p = .053$, 95% CI [–0.30, 0.00]; respectively. The average direct effect (ADE) was also insignificant at both low and high level of SSES, $b = .19$, $p = .252$, 95% CI [–0.12, 0.49]; $b = -.18$, $p = .296$, 95% CI [–0.56, 0.15]; respectively. The differences between low and high SSES participants in ACME, $b = .10$, $p = .382$, 95% CI [–0.12, 0.34], and ADE, $b = .11$, $p = .121$, 95% CI [–0.08, 0.83], were not significant either. Therefore, there is not sufficient evidence that the mediating effect of self-efficacy on the association between narrative message and intentions is moderated by low SSES.

Table 2

Moderated Mediation Analysis: Effect of Narrative on Intentions, Moderated by SSES and Mediated by Self-Efficacy

Moderator (SSES)	Pathway	*b*	95% CI		*p*
			LL	*UL*	
	Mediation effect (ACME)	–0.04	–0.20	0.15	.644
M – 1*SD*	Direct effect (ADE)	0.19	−0.12	0.49	.252
	Total effect	0.15	–0.19	0.46	.400
	Mediation effect (ACME)	–0.14	–0.30	0.00	.053
M + 1*SD*	Direct effect (ADE)	–0.18	−0.56	0.15	.296
	Total effect	–0.32	–0.69	0.03	.081

Note. N= 268.
SSES = Subjective socioeconomic status.
2000 simulations.
CI = confidence interval. LL = lower limit. UL = upper limit.

Correlational Analysis. The matrix of Pearson's correlations reported in Table 3 indicates further statistically significant associations between intentions, self-efficacy, and their potential explanatory variables included in the study.

Table 3

Correlation Matrix: Pearson's r for Study Variables.

Variable	1	2	3	4	5	6	7	8	9
1. Narrative message	–								
2. Intentions	.01	–							
3. Self-efficacy	–.04	.52***	–						
4. SSES	–.04	.05	.21***	–					
5. Understanding	.11	.37***	.25***	.04	–				
6. Previous diet	.08	.23***	.48***	.20**	.16**	–			
7. Gender	–.01	.06	.03	–.01	.05	.00	–		
8. Education	.02	.13*	.24***	.24***	.09	.28***	–.02	–	
9. Age	.02	.13*	.11	–.05	.12*	.09	–.05	.02	–

Note. $N = 268$. *** $p < 0.001$. ** $p < 0.01$. *$p < 0.05$.
SSES = Subjective socioeconomic status

Intentions significantly and positively correlated with a number of its potential explanatory variables. There was a strong association between intentions and self-efficacy, $r(266) = .52$, $p < .001$, and moderate association between intentions and understanding, $r(266) = 0.37$, $p < .001$. There was a weak correlation of intentions with previous diet, $r(266) = .23$, $p < .001$; education, $r\ (266) = .13$, $p < .05$; and age , $r(266) = .13$, $p < .05$.

Apart from association with intentions, self-efficacy also significantly and positively correlated with its multiple possible explanatory variables. There was a strong correlation

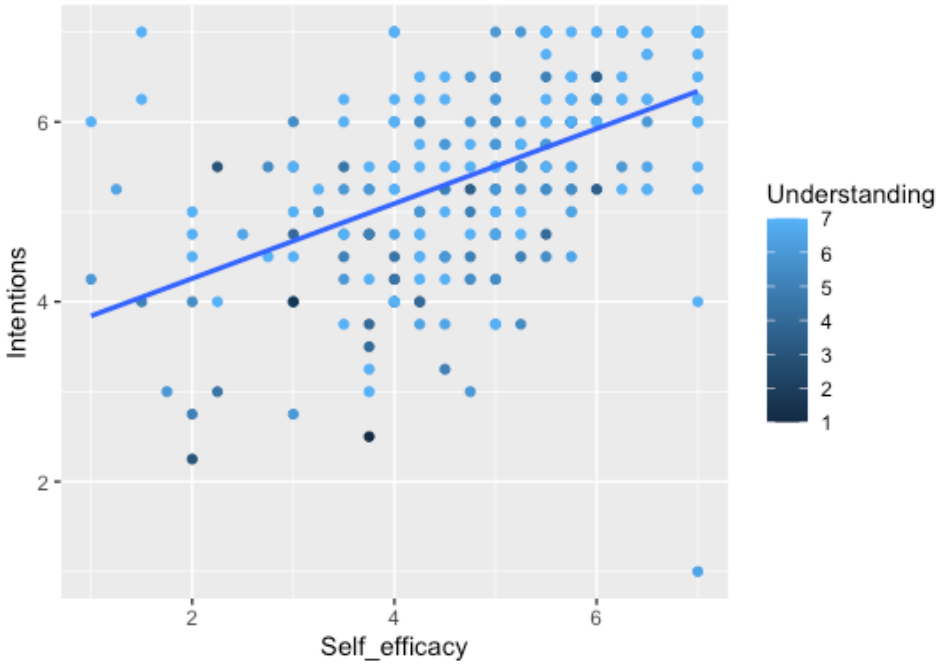
between self-efficacy and previous diet, $r(266) = .48$, $p < .001$. With a small effect sizes, self-efficacy correlated with SSES, $r(266) = .21$, $p < .001$; understanding, $r(266) = .25$, $p < .001$; and education, $r(266) = .24$, $p < .001$.

Regression Analysis. Multiple linear regression models revealed the extent to which the potential predictors from the correlational matrix (Table 3) can explain the variation in intentions and self-efficacy.

Predictors of Intentions. Model 4 (Appendix I) included intentions as outcome variable and self-efficacy, understanding, previous diet, age, and education as explanatory variables suggested by correlational analysis. In line with the results of Hypothesis 2 testing, the interaction between narrative message and low SSES was added as another explanatory variable. Regression analysis revealed that only self-efficacy, $b = .37$, $SE = 0.05$, $t(254) = 7.49$, $p < .001$, 95% CI [0.27, 0.47], and understanding, $b = .24$, $SE = 0.05$, $t(254) = 4.68$, $p < .001$, 95% CI [0.14, 0.35] were significant predictors of intentions. One unit increase in self-efficacy was associated with 0.24 units increase in intentions. Given $d = 0.41$, the effect of self-efficacy on intentions is small. One unit increase in understanding is associated with 0.37 unit increase in intentions with $d = .27$, therefore, a small effect. The relationship between intentions, self-efficacy, and understanding is plotted in Figure 4.

Figure 4

Predicted Values of Intentions Based on Understanding and Self-Efficacy



Note. N= 268.
Scores for intentions, self-efficacy and understanding range from 1 to 7.

Contrarily to Model 2 (see Hypothesis 2), which did not include self-efficacy as explanatory variable, the interaction between narrative and low SSES was not significant predictor of intentions anymore, b = .11, SE = 0.06, $t(254) = 1.78$, p = .076, 95% CI [–0.01, 0.24]. Previous diet was not significant predictor either, b = –.03, SE = 0.06, $t(254) = –0.51$, p = .609, 95% CI [–0.14, 0.08]. Model 4 was able to explain 35,2% of total variation in intentions, R^2 = .352, what is 13.8% increase in comparison to Model 2, R_Δ= 0.138. Model 4 was statistically significant, $F(13, 254) = 10.63$, $p < .001$. Therefore, self-efficacy appears to be stronger predictor of intentions than low SSES, narrative message, and previous diet.

Predictors of Self-efficacy. Model 5 (Appendix J) with self-efficacy as outcome variable and previous diet, understanding, and education as explanatory variables indicated, that all explanatory variables have statistically significant effect on self-efficacy. Previous diet was positively related to self-efficacy, $b = .48$, $SE = 0.06$, $t(259) = 7.71$, $p < .001$, 95% CI [0.36, 0.61], with a small effect size, $d = 0.42$. One unit increase in previous healthy diet was associated with 0.48 units increase in perceived self-efficacy. Understanding had also a positive effect on self-efficacy, $b = .21$, $SE = .07$, $t(259) = 3.30$, $p < .01$, 95% CI [0.09, 0.34], with $d = .19$ indicating small effect size. All levels of education were also significantly and positively related to self-efficacy. Model 5 explains 31.1% of total variation in self-efficacy, $R^2 = 0.311$, and is statistically significant, $F(8, 259) = 14.59$, $p < .001$.

Qualitative Analysis

Themes emerged from answers to the open-ended question on the helpfulness of the message across narrative and informational condition are reported in the codebook in Appendix K.

Narrative Condition – Positive Views

Views of participants who considered narrative message to be helpful to make up their mind about their diet reflected three main themes.

First, participants appreciated the example of a healthy diet journey which they found in Paul. Referring to Paul's story as motivational, they described his example as inspiring, useful, and empowering. Participants indicated that Paul's story made the dietary change seem easy and gave them hope that it is possible. *"I constantly think about how I need to change my diet but I never get to do it. When I saw that message, it reminded me that I need to eat healthily and the fact that the person says that it helped them to feel better gives me some hope and motivation".*

Second, participants expressed positive views on the format of the narrative message. According to the responses, the narrative message provided them with a clear explanation of dietary principles, which was specific, tangible, and concise. Participants found it easy to apply the information to their life. *"Paul laid out how he was before, how he changed it, and where he is now which makes it very easy to visualise how I would do the same".*

Third, the narrative message was considered helpful among participants as it raised the awareness of nutrition importance. Both fears of health issues and health benefits associated with diet, that were stressed in the narrative message were seen as reasons to make a change. *"The message shows implications of bad health and when I hear about the difficulties someone experiences due to their diet, I tend to get worried and then try to eat healthy myself so that I cannot get into such trouble. Hence, by reading this message about Paul made me realize that I need to stay healthy too and definitely need to change my diet".*

Narrative Condition – Negative Views

The narrative message was not evaluated positively by all the participants. Those who indicated that the narrative message was not helpful mainly referred to low message credibility, dietary preconceptions, and low control over their diet.

Participants showed low trust in the narrative message. The story seemed too generic and not genuine enough. They found it difficult to relate to the main character or the health issues highlighted in the story. *„It didn't read a genuine story to me – I didn't believe in Paul".*

Different dietary preconceptions were another reason why the narrative message was not evaluated as helpful. Participants were already following various types of diet; more or less in line with the content of the message. They found the narrative message useless, because the recommendations were either already known and followed, or irrelevant due to their specific

dietary principles. *"I am already aware of the facts in the message and do my best to implement them everyday".*

Finally, the narrative message was not viewed as useful due to the low control that participants had over their diet. They stated that dietary change is difficult to achieve, and it cannot be evoked merely by reading a message. Unhealthy dietary patterns were attributed to external factors, such as low income or feelings. *"My diet is dictated by my low income".*

Informational Condition – Positive Views

Participants in the informational condition also considered the message helpful to make up their mind about their diet, mainly for reasons reflected in the three following themes.

First, similar to participants in narrative condition, participants who read the informational message also indicated that the message encouraged them to make a change. They referred to the message as inspiring, eye-opening, and convincing. It evoked a reflection over participants' diet and related dietary issues or benefits. *"It has allowed me to reflect on my diet and eating habits. It has also allowed me to plan my diet for the next month and helped me identify which things I need to consume less of. Thank you".*

Second, the informational message format seemed to be appreciated in a similar way as the narrative message. It provided clear, understandable, and specific information in a simple manner. *"Explanation is simple and clear and makes me want to take note and try to do the things it says for my health".*

Third, participants in the informational condition viewed the content of the message as a helpful reminder of useful nutritional information. For some appreciated new strategies to improve their diet. *"Whilst I know that a health diet is essential - for now and for the longer-*

term, reading it, in plain, accessible, black and white is a sobering reminder that one needs to consistently try much harder ".

Informational Condition – Negative Views

Conversely, participants who did not evaluate the informational message as helpful mentioned message format, the dietary preconceptions, and low control over their diet.

Participants pointed out various aspects related to the format of the informational message which they did not like. Apart from finding the message too broad and complicated, participants described it as impersonal, not engaging, or not informative enough. *"It was very wordy and the statements had no statistics. There was a lack of a personal touch or anecdote".*

Similar to the narrative condition, participants exposed to the informational message also referred to their pre-existing dietary beliefs. Those were in accordance with or in contradiction with the message and lowered their perceived benefit from the message. *"I already eat healthily; the message makes no difference as I already know the information".*

Finally, low control over diet emerged as a reason why the informational message was not considered helpful. As with the narrative message, the informational message was not sufficient to evoke a dietary change. Participants mentioned several external factors that impeded healthy eating, such as lack of time, energy, or income, alongside with stress and influence of others. *"I binge eat when I'm stressed and that's ruined many of my attempts at dieting".*

Discussion

This research investigated the effects of narrative promotion of healthy diet to the low SES groups. The results of the experiment did not support Hypothesis 1 that the narrative form of the message on a healthy diet would have a positive effect on intentions to eat healthy. Overall, there was no difference in behavioural intentions between participants exposed to

narrative and informational message. Despite the absence of the main effect, a statistically significant interaction between narrative message and low SSES provided support for Hypothesis 2. The effect of the narrative on intentions was moderated by low SSES, such that there was a significant positive effect on the intentions for participants with the low SSES. Hypothesis 3 that the effect of the narrative message on intentions would be mediated by self-efficacy was not supported. Exploratory analysis revealed that self-efficacy was not a mediator of the narrative effects on intentions neither for low SSES population and that intentions were predicted by self-efficacy and understanding of the message. Self-efficacy appeared to be predicted by previous diet, understanding of the message, and education. Qualitative findings showed divergent evaluations of the messages across the sample and a variety of individual preferences for different message aspects.

No evidence to support Hypothesis 1 might be attributed to the sampling error. The average value of SSES (M = 5, Max = 10), as well as high prevalence of university-educated participants within the sample, indicate that the low-income sampling criterion on Prolific was not sufficient to generate a sample that would on average display the characteristics of low SES population. However, Hypothesis 1 assumed low SES sample. Given that population characteristics appear to be an important moderator of narrative effects (Perrier & Ginis, 2018), the mismatch between intended and recruited sample might have contributed to the lack of the evidence to support Hypothesis 1. This is in line with the evidence supporting Hypothesis 2 on moderation, indicating that low levels of SSES are associated with positive narrative effects on intentions. Therefore, even though the study found no advantage of the narrative over the informational message overall, the significant SSES moderation effect suggests that if the sample

would represent low SES population more accurately, the Hypothesis 1 might have been supported as well.

The significant moderation effect of low SSES and narrative message on intentions provides empirical support for the notion that narratives might be an optimal tool of healthy diet promotion to socioeconomically deprived groups (Kreuter et al., 2007; Davis et al., 2017; Murphy et al., 2013). This finding implies that alongside with education and income, the perception of one's low SES might be the moderator of narrative effects. Therefore, the impact of narratives may depend on the psychological mechanisms associated with the subjective experience of poverty (Sheehy-Skeffington, 2020).

However, the interaction between narrative message and low SSES was small. Controlling for self-efficacy and understanding, the moderation effect lost its significance as predictor of intentions. Qualitative analysis revealed several external factors one's diet, such as individual preferences, beliefs habits, or personal circumstances that might have overruled the impact of the message. Moreover, the mean scores of behavioural intentions to eat healthy in both groups were considerably high. This might be due to social desirability bias associated with healthy diet (Miller et al., 2014; Mossavar-Rahmani et al., 2013) or prior awareness of the importance of the healthy diet (Moyer-Gusé, 2008; Moyer-Gusé & Nabi, 2010). It is possible that less popular health-related topics would leave a greater role to the promotional messages, and possibly larger differences between narrative and informational condition.

Finally, even though self-efficacy appeared to be a significant predictor of dietary intentions, as outlined in the literature (Ajzen, 2002; Bandura, 1999; Seeman, 2008), it did not mediate narrative effects on intentions - neither generally, nor for low SSES participants. Slater and colleagues (2003) argued that that the observational learning of self-efficacy is conditioned

by identification with the character of the story. Qualitative findings reflected issues with identification that might have contributed to the lack of narrative effects on self-efficacy. An alternative explanation might be that self-efficacy is not a subject of observational learning from narratives at all. In such case, the relationship between narrative effects and low SES would lie in psychological mechanisms other than self-efficacy. Even though narratives increased self-efficacy in study by Ranjit and colleagues (2015), this might be due to the message aspects that were not necessarily related to the storytelling itself. The findings suggest that one of such aspects might be the understandability.

Apart from sampling error, the results of this study suffer limitation concerning message design. Message characteristics moderate narrative effects in many known and unknown manners (Shen et al, 2015). Despite my aim to construct the narrative message according to previous empirical findings to increase its effectivity, the complexity of such task possibly led to overlooking of some message aspects that decreased its persuasiveness. Qualitative findings pointed at flaws in the message design, such as low believability of the story or lack of connection to the character. Higher quality of the story might have yielded different results.

This study has several implications. The findings support the notion that the effects of narratives in health promotion vary according to the target audience (Perrier & Ginis, 2018). Specifically, they provide evidence suggesting that for low SES populations, narratives might be more suitable form of nutrition promotion than informational messages. This research adds a layer of comparison to informational message to the previous evidence of use of narratives in this context (Ranjit et al., 2015; Unger et al., 2009). Results suggest that the key mechanisms of narrative persuasion may not depend on self-efficacy. Therefore, further research should examine role of possible mediators of narrative effects, particularly associated with the

psychological mechanisms of low SES populations. Deeper understanding of narrative processing would allow to further optimize the use of narratives in health communication practice so that they can contribute to the reduction of health disparities.

To conclude, this experimental study investigated the effects of narrative versus informational dietary message on low SES groups. Based on previous research, hypotheses stated that the narrative message will have positive effects on intentions to eat healthy, that will be moderated by low SSES and mediated by self-efficacy. A between-subject experimental study examined the effects of the exposure to either narrative or informational message on behavioural intentions and self-efficacy. Results showed that there was no overall difference in intentions between narrative and informational condition. However, narrative message had positive, but small effect on intentions for participants of low SSES. Self-efficacy did not mediate the narrative effect on intentions. The results of this study suggest that narratives might be an effective tool to promote healthy diet to socioeconomically disadvantaged populations, but more research on narrative mechanisms is needed for their optimal use in future.

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Appendices

Appendix A

Descriptive Statistics of Study Variables

Variable	Informational		Narrative		Full sample	
	n = 136	50.7%	*n* = 132	49.3%	*N* = 268	100%
Gender†						
Male	45	16.8%	39	14.6%	84	31.3%
Female	89	33.2%	93	34.7%	182	67.9%
Other	2	0.8%	0	0.0%	2	0.0%
Education†						
No formal qualification	3	1.1%	0	0.0%	3	1.1%
Secondary education	14	5.2%	17	6.3%	31	11.6%
High school diploma	28	10.5%	27	10.1%	55	20.5%
Technical/community college	21	7.8%	19	7.1%	40	14.9%
Undergraduate degree	34	12.7%	47	17.5%	81	30.2%
Graduate degree	34	12.7%	19	7.1%	53	19.8%
Doctorate degree	2	0.8%	3	1.1%	5	1.8%

Note. †Chi-square test of differences between conditions not applicable due to cell counts under 5.

Sample Characteristics: Continuous Variables

Variable	Narrative (*n* = 136)		Informational (*n* = 132)		Difference (p-value)	Full Sample *N* = 268	
	M	*SD*	*M*	*SD*		*M*	*SD*
Age ††	31	13.7	31	13.1	.760	31	13.4
SSES ††	5.1	1.7	5.3	1.8	.537	5.2	1.8
Previous diet ††	4.4	1.3	3.4	1.1	.447	4.4	1.2

Note. †† Two-sample t-tests found no statistically significant difference between the two conditions ($p > 0.05$).
SD = Standard deviation.
SSES = Subjective socioeconomic status, scores range from 1 to 10.
Previous diet = Quality of previous diet with regards to health, scores range from 1 to 10.

Measures of Study Interest: Continuous Variables

Variable	Narrative (*n* = 136)		Informational (*n* = 132)		Full Sample *N* = 268	
	M	*SD*	*M*	*SD*	*M*	*SD*
Intentions	5.48	1.14	5.45	1.02	5.47	1.08
Self-efficacy	4.86	1.43	4.96	1.26	4.91	1.35
Understanding	6.41	0.99	6.16	1.21	6.23	1.11

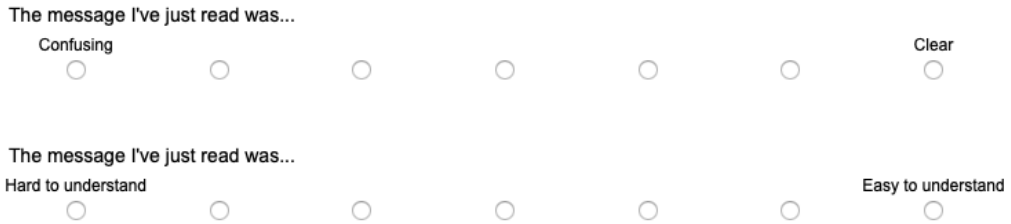
Note. *SD* = Standard deviation.
All variables scores range from 1 to 7.

Appendix B

Study Questionnaire

The questionnaire followed a health message. The lines divide blocks of questions in order as they appeared on the screens of participants. Each block contains items measuring one or more variables of interest.

Understanding of the message.



Behavioural intentions

Self-efficacy

How sure are you that you can eat healthy over the next month?

Not at all sure ○ ○ ○ ○ ○ ○ ○ Completely sure

How sure are you that you can limit your intake of fat over the next month?

Not at all sure ○ ○ ○ ○ ○ ○ ○ Completely sure

How sure are you that you can limit your intake of salt over the next month?

Not at all sure ○ ○ ○ ○ ○ ○ ○ Completely sure

How sure are you that you can limit your intake of sugar over the next month ?

Not at all sure ○ ○ ○ ○ ○ ○ ○ Completely sure

Qualitative question

Would the message that you've just seen help you to make up your mind about your diet?

Yes ○ No ○

Why? (Write as much as you want).

Subjective socioeconomic status

Think of a ladder (see image) as representing where people stand in society.

At the **top** of the ladder are the people who are **best off**—those who have the most money, most education and the best jobs.

At the **bottom** are the people who are **worst off**—who have the least money, least education and the v jobs or no job.

The higher up you are on this ladder, the closer you are to people at the very top and the lower you are closer you are to the bottom.

Where would you **put yourself** on the ladder? Choose the number whose position best represents wh would be on this ladder.

○ 10
○ 9
○ 8
○ 7
○ 6
○ 5
○ 4
○ 3
○ 2
○ 1

Quality of previous diet and attention check

How healthy would you say is your diet now?

Not at all healthy ○ ○ ○ ○ ○ ○ ○ Completely healthy

I eat too much fat.

Completely agree ○ ○ ○ ○ ○ ○ ○ Completely disagree

I eat too much salt.

Completely agree ○ ○ ○ ○ ○ ○ ○ Completely disagree

Please, mark the number 3 here.

1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○

I eat too much sugar.

Completely agree ○ ○ ○ ○ ○ ○ ○ Completely disagree

Sociodemographic characteristics

Highest education level completed

- ○ No formal qualifications
- ○ Secondary education
- ○ High school diploma
- ○ Technical/community college
- ○ Undergraduate degree
- ○ Graduate degree
- ○ Doctorate degree

Gender

- ○ Male
- ○ Female
- ○ Other
- ○ Prefer not to say

Age

Appendix C

Experimental Messages

A. Narrative condition

Please, read a story of a construction worker Paul from south London who has recently changed his diet.

My journey to healthy diet

"I used to have a pretty unhealthy diet. I thought I didn't have enough money, time and energy to care about it. I had no idea how dangerous the unhealthy eating can be until I spotted first symptoms of developing heart disease. My blood pressure was high, and I wasn't feeling very good. I had to make a change. It was quite hard to break my old habits, but it was worth it. Here's how I did it.

I largely reduced my intake of saturated fat. When cooking, I steam or boil instead of frying. Plus, I have replaced butter, lard, and ghee with rapeseed, corn, or sunflower oils. I eat reduced-fat dairy products and lean meats, or I trim visible fat from meat.

I used to consume too much salt and I was completely unaware of it. Much of that salt had already been in the food when I bought it. Now I avoid processed foods like ready meals and processed meats, cheese, or salty snacks. I limit the condiments like soy sauce, fish sauce, or stock cubes when preparing food. What also helped me was keeping salt and sauces off the table during meals but just seasoning my food before serving it.

I try to reduce my intake of sugar too. I replaced most of my sugary snacks with fresh fruit and raw vegetables. Also, I don't drink sugar-sweetened beverages anymore. Instead of sugary fizzy drinks, now I try to drink at least 6 to 8 glasses of water and lower sugar drinks like tea and coffee every day.

Those few steps really made a difference. My blood pressure is lower, and I have more energy than I did before. Honestly, I have never felt better in my life. And after all, that change was not that hard as I thought."

The advices Paul follows are recommended for most people, but people with special dietary needs or a medical condition should ask their GP or a registered dietitian for advice.

B. Informational condition

Please, read an advice on maintaining a healthy diet from the World Health Organisation and National Health Services.

Recommendations on healthy diet

Many people nowadays have an unhealthy diet. This is often caused by lack of money, time, energy, or awareness. Unhealthy eating is a major global risk to health. It leads to the development of diseases such as diabetes, stroke, cancer, or obesity. A healthy change in diet can effectively prevent many diseases and improve health outcomes. There are a few basic steps to maintain a healthy diet that you should follow.

The intake of saturated fat should be reduced. When cooking, reduce the fat intake by steaming or boiling instead of frying. Also, you should replace butter, lard and ghee with rapeseed, corn, or sunflower oils. Eat reduced-fat dairy product and lean meats, or trim visible fat from meat.

Most people consume too much salt without being aware of it. About three-quarters of the salt you eat is already in the food when you buy it. Avoid processed foods like ready meals; processed meats, cheese, or salty snacks. You should also limit the consumption of condiments like soy sauce, fish sauce, or stock cubes when preparing food. It is recommended not to keep salt or sauces on the table. Instead, season your food before serving it.

The intake of sugar should be reduced to less than 10% of total energy intake. Sugary snacks should be replaced by fresh fruit and raw vegetables. Limit the consumption of sugar-sweetened beverages like sugary fizzy drinks. However, remember to drink at least 6 to 8 glasses of water and lower sugar drinks like tea and coffee every day.

Eating a healthy, balanced diet is an important part of maintaining good health. Healthy diet prevents the development of non-communicable diseases and can help you feel your best. Making healthier choices does not have to be hard.

This advice on healthy diet applies for most people. However, people with special dietary needs or a medical condition should ask their GP or a registered dietitian for advice.

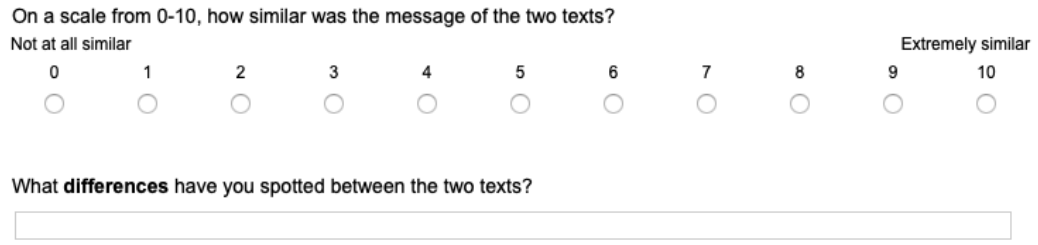
Sources:
World Health Organisation
National Health Service

Appendix D

Pilot Test Questionnaire

1. *Understandability (asked first after narrative, second after informational message)*

2. *Perceived differences between the two messages*



Appendix E

Internal Consistency Analysis

Values of Cronbach's Alpha for Study Scales

Scale	Number of items	α
Intentions	4	.76
Self-efficacy	4	.81
Understanding	2	.87
Previous diet	4	.68

Note. $N = 268$.
Scales ranged from 1 to 7.

Appendix F

Assumptions Tests

Preliminary analysis was conducted to assure that the assumptions necessary for further statistical analysis would be satisfied. The Shapiro-Wilk test indicated that neither intentions, nor self-efficacy were not normally distributed (both $p < .001$). However, both t-test and multiple linear regressions are considered to be robust to violations of nonnormality (Edgell & Noon, 1984; Havlicek & Peterson, 1977), being valid for any distribution with a "sufficiently large" sample, which simulations studies often set at less than 100. Levene's test for homogeneity of variance has been satisfied for both variables of interest. Visual inspection confirmed that the linearity assumption has been satisfied. The matrix of Pearson's Bivariate Correlation among all independent variables displayed no value over .80, therefore, the assumption of multicollinearity has been satisfied.

Appendix G

Multiple Linear Regression Model 1

Model 1: Multiple Linear Regression Analysis of Predictors of Intentions

Predictors	Estimates	*SE*	95% CI		*p*
			LL	*UL*	
Intercept	2.29	0.70	0.90	3.67	**.001****
Narrative message	−0.06	0.13	−0.31	0.19	.681
Understanding	0.32	0.06	0.21	0.43	**<.001*****
Previous diet	0.15	0.06	0.05	0.27	**.005****
SES	–0.00	0.04	−0.08	0.07	.938
Gender †					
Female	0.07	0.13	–0.19	0.33	.596
Other	0.93	0.73	−0.50	2.37	.202
Education ††					
Secondary education	0.53	0.61	–0.67	1.73	.388
High school diploma	0.11	0.60	–1.07	1.30	.851
Technical/community college	0.48	0.61	–0.71	1.67	.430
Undergraduate degree	0.47	0.60	–0.72	1.66	.436
Graduate degree	0.36	0.61	–0.84	1.56	.555
Doctorate degree	0.75	0.74	–0.71	2.20	.315
Age	0.00	0.00	–0.01	0.01	.382

Note. $N = 268$.
*** $p < 0.001$. ** $p < 0.01$.
CI = confidence interval. LL = lower limit. UL = upper limit.
† Male as baseline. †† No formal qualifications as baseline.
$R^2 = 0.200$. $F(12, 254) = 4.88$. $p < .001$.

Appendix H

Output of the Causal Mediation Analysis

Mediation Model: Effect of Narrative on Intentions, Mediated by Self-Efficacy

	Estimates	95% CI		*p*
		LL	*UL*	
ACME	–0.09	–0.20	0.01	.087
ADE	0.00	−0.23	0.21	.988
Total Effect	–0.09	–0.34	0.15	.493
Proportion Mediated	1.06	–6.66	7.13	.468

Note. N= 268.
2000 simulations.
CI = confidence interval. LL = lower limit. UL = upper limit.

Appendix I

Multiple Linear Regression Model 4

Model 4: Multiple Linear Regression Analysis of Predictors of Intentions

Predictors	Estimates	*SE*	95% CI		*p*
			LL	*UL*	
Intercept	2.36	0.70	1.00	3.71	**.001****
Narrative message	−0.64	0.13	−1.40	0.12	.101
Low SSES	–0.02		–0.12	0.07	.612
Self-efficacy	0.37		0.27	0.47	**<.001*****
Understanding	0.24	0.06	0.14	0.35	**<.001*****
Previous diet	–0.03	0.06	–0.14	0.08	.609
Age	0.00	0.04	–0.01	0.01	.431
Education †					
Secondary education	–0.04	0.61	–1.15	1.06	.937
High school diploma	–0.28	0.60	–1.36	0.80	.606
Technical/community college	–0.05	0.61	–1.14	1.05	.930
Undergraduate degree	–0.01	0.60	–1.10	1.07	.980
Graduate degree	–0.17	0.61	–1.27	0.92	.753
Doctorate degree	–0.03	0.74	–1.36	1.30	.963
Narrative message * Low SSES	0.11	0.00	–0.01	0.24	.076

Note. $N = 268$.
*** $p < 0.001$. ** $p < 0.01$.
CI = confidence interval. LL = lower limit. UL = upper limit.
† No formal qualifications as baseline.
$R^2 = 0.352$. $F(13, 254) = 10.63$. $p < .001$.

Appendix J

Multiple Linear Regression Model 5

Model 5: Multiple Linear Regression Analysis of Predictors of Self-efficacy

Predictors	Estimates	*SE*	95% CI		*p*
			LL	*UL*	
Intercept	–0.22	0.70	–1.72	3.67	0.769
Understanding	0.21	0.06	0.36	0.43	**<.001*** **
Previous diet	0.48	0.06	0.09	0.27	**.001** **
Education †					
Secondary education	2.04	0.61	0.69	3.40	**.003** **
High school diploma	1.48	0.60	0.15	2.81	**.029***
Technical/community college	1.93	0.61	0.58	3.27	**.005** **
Undergraduate degree	1.86	0.60	0.53	3.18	**.006** **
Graduate degree	2.00	0.61	0.66	3.34	**.004** **
Doctorate degree	2.55	0.74	0.90	4.20	**.003** **

Note. $N = 268$.
*** $p < 0.001$. ** $p < 0.01$.
CI = confidence interval. LL = lower limit. UL = upper limit.
† No formal qualifications as baseline.
$R^2 = 0.311$. $F(8, 259) = 14.59$. $p < .001$.

Appendix K

Codebook

Group	Themes	Codes	Examples
Narrative condition – positive views	Motivational example	Inspiring example Change seems easy Seeing others is useful Empowered Example gives hope	*"I constantly think about how I need to change my diet but I never get to do it. When I saw that message, it reminded me that I need to eat healthily and the fact that the person says that it helped them to feel better gives me some hope and motivation."* *"I have also started my health and fitness journey recently. I have been cutting out the things that have been mentioned already and have been cutting down on carbohydrates as well. Reading this post has helped me motivate myself to keep going, as this person has seen changed, so I will hopefully see changes soon. "*
	Convenient message format	Clear explanation Specific, tangible Short Transferable	*"The message passed was concise and informative... I'm gonna follow his schedule."* *"Paul laid out how he was before, how he changed it, and where he is now which makes it very easy to visualise how I would do the same."*
	Raises awareness	Fear of health issues Health benefits	*"The message shows implications of bad health and when I hear about the difficulties someone experiences due to their diet, I tend to get worried and then try to eat healthy myself so that I cannot get into such trouble. Hence, by reading this message about Paul made me realize that I need to stay healthy too and definitely need to change my diet."*
Narrative condition – negative views	Low trust in message	Generic story Not genuine story Low perceived vulnerability Lack of connection to the character	*"It didn't read a genuine story to me – I didn't believe in Paul."* *"It is just one person and different methods work for different people."*

	Dietary preconceptions	Diet is not transferable	*"I am already aware of the facts in the message, and do my best to implement them everyday."* *"As individuals we all have different tolerances, syndromes/diseases and lifestyle choices."*
		Already aware of recommendations	
		Already following recommendations	
		Following own healthy diet	
		Following specific diet	
	Low control over diet	Change is difficult	*"My diet is dictated by my low income."* *"Because only my own feelings control it."* *"The main challenge for me is actually changing habits. It doesn't matter the message, I think there's an element of inner strength that should push me forward."*
		Feelings matter	
		Income matters	
		Message is not enough for change	
Informational condition – positive views	Encouraged to make a change	Wants to prevent health issues	*"It has allowed me to reflect on my diet and eating habits. It has also allowed me to plan my diet for the next month and helped me identify which things I need to consume less of. Thank you."* *" Coincidentally, I am starting my diet today. I am starting with jogging around the local park in a few hours. So, in a way, I see the message as an inspiration to start eating healthy."*
		Desire for health benefits	
		Convincing message	
		Eye opening	
		Inspired	
		Evoked reflection	
	Convenient message format	Clear information	*"Explanation is simple and clear and makes me want to take note and try to do the things it says for my health."* *"It is straight to the point and not too longwinded."*
		Specific enough	
		Understandable	
		Simple	
	Appreciation for message content	Helpful reminder	*"I'm a little lazy and often need telling plenty of times."* *"Whilst I know that a health diet is essential - for now and for the longer-term, reading it, in plain, accessible, black and white is a sobering reminder that one needs to consistently try much harder. "*
		Useful information	
		Offers new strategies	

			"I was already trying to eat cleaner but the message included some points that I had not previously considered such as not keeping salt or sauces on the table which I often do and use, or not using stock cubes when cooking which are a staple of my cooking. This has given me strategies that will make healthy eating easier."
Informational condition – negative vies	Unappealing message format	Information overload	*"It was very wordy and the statements had no statistics. There was a lack of a personal touch or anecdote."* *"It's too clinical."* *"It seems too complicated."*
		Impersonal	
		Missing statistics	
		Too broad	
		Not engaging	
		Complicated	
	Dietary preconceptions	Already aware of recommendations	*"Healthy diets are about balance. As people don't understand how to make a balanced diets messages like this promote one extreme. If you understand your food and eat whole well balanced meals then you are not avoiding fat and sugar you are just consuming it in moderation which is what I do."* *"I already eat healthily; the message makes no difference as I already know the information."*
		Already following recommendations	
		Everything in moderation	
		Following specific diet	
		Satisfaction with current diet	
		Scepticism towards recommendations	
	Low control over diet	Binge eating under stress	*„I binge eat when I'm stressed and that's ruined many of my attempts at dieting."* *"Seeing as I live with my mum and she decides what I have for dinner; it is difficult for me to choose when and how I will change my diet. Additionally, I'm trying to turn vegan and so what I eat highly depends on whether I am able to."*
		Change seems too difficult	
		Convenience matters	
		Lack of energy	
		Income matters	
		Message is not enough for change	
		Others' influence	
		Lack of time	