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Correlational study and randomised controlled trial for understanding and changing red meat consumption: The role of eating identities

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ABSTRACT

Rationale: The present studies aimed to contribute to the literature on psychological variables involved in reducing red meat consumption (RMC).
Objective: Study 1 investigated whether the theory of planned behaviour (TPB), plus healthy-eating and meat-eating identities, could explain intentions to reduce RMC. Study 2 evaluated the effectiveness of an SMS text message intervention on self-monitoring to reduce RMC.
Methods: In Study 1, data were collected daily using online food diaries for one week and a TPB questionnaire. Study 2 was a randomised controlled trial assessing pre– and post–RMC and TPB constructs by online food diaries and questionnaires over a one-week period. Participants were Italian undergraduates in each study (Study 1: $N = 405$; Study 2: $N = 244$). In Study 2, participants were randomly allocated to control and message condition groups. Participants in the message condition group received a daily SMS, which reminded them to monitor RMC, while participants in the control group did not receive any message. Only students who completed all measures were considered in the analyses (Study 1: $N = 342$; Study 2: $N = 228$).
Results: Study 1 showed that affective and instrumental attitudes, perceived behavioural control, and meat-eating identity explained intentions to reduce RMC, while subjective norm, past behaviour, and healthy-eating identity did not. Study 2 showed that an SMS intervention was effective in increasing intentions and reducing RMC. Mediation analyses indicated partial serial mediation through healthy-eating and meat-eating identities and intentions.
Conclusion: The present studies provide support for the predictive validity of TPB in explaining intentions to reduce RMC and for the efficacy of an SMS intervention targeting self-monitoring in reducing RMC. Findings confirmed the important role of eating identities in explaining intentions to reduce RMC and in changing this behaviour.

During the last century, economic development, urbanisation, and changes in the food industries have produced a massive increase in red meat consumption (RMC; Stabler, 2011; Popkin, 2001) in the Western world. This has led to a vivid debate about this eating behaviour and its impact on the environment and health (e.g., Pluhar, 2010). In this regard, studies indicate a correlation between high consumption of red meat and a high risk of developing different types of cancer, type 2 diabetes, coronary heart diseases, and obesity (e.g., Pan et al., 2012). These findings have been recently endorsed by the World Health Organization (2015), who classified the excessive consumption of red meat as potentially carcinogenic to humans.

Despite the proven risks, especially in Western countries, RMC exceeds the recommended amount suggested by health institutions (e.g., WCRF/AICR, 2007), which is not more than two medium servings of red meat per week (approximately 200 g a week; e.g., Bach-Faig et al., 2011). In fact, Europeans on average consume 51 g per day of red meat (women consume an average of 33.1 g per day). In Italy, men consumed an average of 57.8 g per day of red meat whereas women consumed 40.8 g (Rohrmann et al., 2013).

Despite the importance of this topic, few scholars have focused their research interests on reduction of meat consumption and no studies have been conducted in southern European populations

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(but see Bertolotti et al., 2016). The present research aimed to address this gap in the literature and contribute to our understanding of factors involved in this behaviour.

1. Theory of planned behaviour for predicting meat consumption

For this purpose, Ajzen's theory of planned behaviour (TPB; Ajzen, 1991) provides a useful model for the analysis of these eating behaviours, as several studies have shown TPB constructs to be strong predictors of dietary behaviours (e.g., Armitage and Conner, 2001; Conner and Norman, 2005; McEachan et al., 2011). This theory posits that intention to perform a behaviour is the best predictor of that behaviour and that intention is explained by attitude, subjective norm, and perceived behavioural control (PBC) in relation to that behaviour.

The few studies on meat consumption using the TPB model have led to divergent results. Although some authors showed that only attitude predicted intentions to reduce meat consumption (Sparks et al., 1997; Zur, 2012; Zur and Klöckner, 2014), other researchers found that PBC and subjective norm were also important predictors (Graça et al., 2015; Richetin et al., 2011). Yet, previous studies failed to investigate the role of self-identity on intentions to consume meat even though several studies have examined the role of self-identity within the TPB. Finally, there is a lack of studies in the literature that examined the role of self-identity in predicting RMC controlling for past behaviour.

2. Self-identity

Generally, the concept of self-identity refers to a salient aspect of one's self-perception. In line with identity theory (Stryker, 1968), the self can be considered as a social construct related to the individuals' different roles in social contexts. Roles are formed by internalised expectations about role-appropriate behaviour (Simon, 1992); therefore, the more significant the identity, the more it should enhance the intention to implement the associated behaviours (Charng et al., 1988). Moreover, people could perform a behaviour as a reflection of the kind of person they are (e.g., Ball and Tasaki, 1992). Specifically, consuming different products could be considered as part of a person's self-presentation used as a strategy for expressing their identity to others (Goffman, 1959).

Food consumption acquires an important role in the development of individual identities because food products can be used to construct and preserve individual narratives of the self (Somers, 1994). The choice of a particular food is connected with concerns over identity (e.g., Fox and Ward, 2008; Stead et al., 2011), and people perceive that individuals' character traits can be comparable with the food that they consume (Nemeroff and Rozin, 2000). In summary, the self-identity expressed through personal eating habits is particularly relevant as food is pivotal in our sense of identity (Fischler, 1988) and identity is linked to eating behaviour (Oyserman et al., 2014).

Evidence suggests that self-identity represents an additional predictor of dietary intentions over and above TPB variables (Carfora et al., 2016a; Caso et al., 2016; Sparks and Guthrie, 1998; Sparks et al., 1995). The only attempt to consider self-identity as an additional component within the TPB applied to meat intake was the research of Povey et al. (2001), which demonstrated that the self-identity as healthy eater did not have a significant impact on intention. In this work, intention to eat a meat diet was explained by positive attitude, followed by PBC and subjective norm. Another dimension of self-identity could potentially be related to meat consumption. Specifically, considering findings that nutrition and related health consequences of meat consumption were less relevant when meat identification increased (Allen and Ng, 2003), we hypothesised that meat-eating identity (Blake et al., 2013) could be a useful predictor of intention to reduce meat consumption. Furthermore, this hypothesis is in line with recent "discourse on meat" findings, which centred on "talk about meat (speaking), cooking and eating (doing), the enactment of meat-eater identities (being), the assessment of eating behaviours (valuing), and beliefs about meat (believing)" (Bohm et al., 2015, p. 102). This study showed that one of the most important aspects was the centrality of the meat-eater identity, compared with the responsibility for one's own wellbeing; only the latter was related to the beliefs about the health advantages of reducing meat intake.

3. Intervention for reducing meat intake

Furthermore, given the previously highlighted benefits of reducing RMC, it could be interesting to use TPB framework to develop and test an intervention to reduce RMC. Few studies have reported interventions to reduce RMC. Scrimgeour (2012) reported a significant effect of an intervention based on web-based information targeting beliefs about meat consumption, meat consumption attitudes, and intention. The intervention was found to decrease positive attitudes towards meat and increase intentions to eat less meat. Allen and Baines (2002) reported a manipulation of the symbolic meaning of meat to increase intention to eat more fruit and vegetables and their consumption 3 weeks later. Berndsen and van der Pligt (2004) manipulated the relative impact of a cognitive versus affective focus when judging risks concerning the consumption of meat. They found that after 3 weeks, only participants in the affective condition reported higher intentions to reduce meat intake and less consumption of meat over the previous 3 weeks.

In the present study, we tested a text message intervention to reduce RMC. In the last decade, the use of text messages (*SMS*) has been used as strategy to promote health because of their useful characteristics, such as convenience, immediacy, and low cost (e.g., Kharbanda et al., 2009). Particularly, text messaging appears to be a useful method to communicate health messages to undergraduate students given their high use of SMS (Totten et al., 2005). The efficacy of mobile text messaging intervention in producing positive change in health behaviour has been demonstrated in several studies (e.g., Hall et al., 2015; Rodgers et al., 2005; Woolford et al., 2010) and supported in a meta-analysis of 38 studies (Orr and King, 2015).

Some studies have shown that SMS reminders to individuals to monitor health was an effective strategy to promote health behaviours linked to diet and weight loss (e.g., Napolitano et al., 2013), physical activity (e.g., Hurling et al., 2007), smoking cessation (e.g., Rodgers et al., 2005), and disease self-management (Franklin et al., 2006). Self-monitoring appears to be a relevant strategy to change eating behaviours linked to weight loss (e.g., Baker and Kirschenbaum, 1993; Butryn et al., 2011), especially when participants used a paper and pencil food diary for recording their food consumption (Burke et al., 2011; Helsel et al., 2007). To date, studies that used SMS for reminding individuals to monitor RMC have not been conducted. Self-monitoring of RMC, using a daily food diary, could decrease this consumption because it could help to identify any discrepancies between current and desired levels of consumption (Fishbach et al., 2012; Myrseth and Fishbach, 2009). Specifically, Michie et al. (2009) reported that interventions that combined self-monitoring with other behavioural change techniques were significantly more effective than other interventions for health behaviours. In a comprehensive review, Harkin et al. (2016) showed large effects of self-monitoring on behaviour when the information was recorded, perhaps because