



The role of Compensatory Health Beliefs in eating behavior change: A mixed method study



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ABSTRACT

Compensatory Health Beliefs (CHBs), defined as beliefs that an unhealthy behavior can be compensated for by engaging in another healthy behavior, are assumed to hinder health behavior change. The aim of the present study was to investigate the role of CHBs for two distinct eating behaviors (increased fruit and vegetable consumption and eating fewer unhealthy snacks) with a mixed method approach. Participants ($N = 232$, mean age = 27.3 years, 76.3% women) were randomly assigned to a fruit and vegetable or an unhealthy snack condition. For the quantitative approach, path models were fitted to analyze the role of CHBs within a social-cognitive theory of health behavior change, the Health Action Process Approach (HAPA). With a content analysis, the qualitative approach investigated the occurrence of CHBs in smartphone chat groups when pursuing an eating goal. Both analyses were conducted for each eating behavior separately. Path models showed that CHBs added predictive value for intention, but not behavior over and above HAPA variables only in the unhealthy snack condition. CHBs were significantly negatively associated with intention and action planning. Content analysis revealed that people generated only a few CHB messages. However, CHBs were more likely to be present and were also more diverse in the unhealthy snack condition compared to the fruit and vegetable condition. Based on a mixed method approach, this study suggests that CHBs play a more important role for eating unhealthy snacks than for fruit and vegetable consumption.

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1. Introduction

Following a healthy diet is linked to better health. For example, fruit and vegetable consumption is associated with a lower risk of stroke (He, Nowson, & MacGregor, 2006; Hu, Huang, Wang, Zhang, & Qu, 2014) and type 2 diabetes (Wang, Fang, Gao, Zhang, & Xie, 2016). In contrast, it has been estimated that inadequate fruit and vegetable consumption is responsible for 2.6 million deaths per year worldwide (Lock, Pomerleau, Casuser, Altmann, & McKee, 2005). Similarly, high sugar and fat intake can increase blood glucose, which is a main risk factor for heart attack, stroke and obesity (World Health Organization, 2014). Obesity in turn is associated with cardiovascular disease, type 2 diabetes, cancer,

osteoarthritis and psychological illnesses such as depression (Dixon, 2010). As obesity rates are increasing worldwide (Doytch, Dave, & Kelly, 2016), understanding mechanisms to promote healthy eating is crucial for prevention.

Healthy eating comprises several different behaviors. The World Health Organization (2014) recommends limiting the intake of sugar or fat, for example by reducing the amount of unhealthy snacks, and increasing the numbers of fruits and vegetables consumed. These two eating behaviors represent different forms of behavioral change: Eating more fruits and vegetables requires striving for and promoting a healthy behavior. In contrast, eating fewer unhealthy snacks requires reducing and inhibiting an unhealthy behavior. There is evidence that different determinants underlie the prediction of these eating behaviors (Allom & Mullan, 2014). Thus, investigating different eating behaviors and their relevant predictors separately might be of special advantage to promote a healthy diet.

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1.1. Compensatory Health Beliefs and health behavior change

Following a healthy diet can be difficult, and only a few individuals can successfully change their eating behavior in the long run (e.g. Wing & Phelan, 2005). Having a long-term goal for healthy eating (e.g. eating less sugar) but then getting the offer of a delicious cake, individuals may experience a motivational conflict and cognitive dissonance (Festinger, 1962) resulting in a bad feeling. It is assumed that individuals activate Compensatory Health Beliefs (CHBs; Knäuper, Rabiau, Cohen, & Patriciu, 2004) to mitigate such unpleasant states (Rabiau, Knäuper, & Miquelon, 2006) and to justify indulgence (Rabiau et al., 2006). CHBs are beliefs that the negative consequences of an unhealthy behavior (e.g. eating chocolate) can be compensated for with the assumed positive effects of an executed healthy behavior (e.g. exercise). Thus, the activation of CHBs can lower intentions to resist the desire for unhealthy food (Knäuper et al., 2004), which in turn can help to explain the occurrence of unhealthy eating (Kronick, Auerbach, Stich, & Knäuper, 2011) despite the intention to eat healthily. There is evidence that CHBs are negatively associated with intention for different health behaviors such as physical activity (Berli, Loretini, Radtke, Hornung, & Scholz, 2014), smoking (Berli et al., 2014; Fleig et al., 2015; Radtke, Scholz, Keller, & Hornung, 2012) and unhealthy eating (Radtke, Inauen, Rennie, Orbell, & Scholz, 2014).

To provide a stronger test for the predictive value of CHBs in eating behavior, recent studies have investigated CHBs as an additional predictor to a widely established health behavior model: the Health Action Process Approach (HAPA; Berli et al., 2014; Fleig et al., 2015; Radtke et al., 2012; Radtke, Kaklamanou, Scholz, Hornung, & Armitage, 2014; Schwarzer, 2008; Storm et al., 2016). The HAPA distinguishes between a motivational phase of intention formation and a volitional phase of translating the intention into behavior. The motivational phase includes self-efficacy, outcome expectancy, and risk awareness to predict intention. The volitional phase includes action planning and action control as predictors for behavior and as mediating constructs between intention and behavior (Sniehotta, Scholz, & Schwarzer, 2005). However, recent study results on CHBs and HAPA point in different directions regarding the predictive value of CHBs for intention and behavior. On the one side, no relation was found for fruit and vegetable consumption and the intention to eat fruits and vegetables (Storm et al., 2016). A further study showed no relation between CHBs and the intention and behavior for fat and sugar intake (Radtke et al., 2014). On the other side, there is evidence for a positive relation between CHBs and calorie intake (Kronick et al., 2011; Radtke et al., 2014) and for a negative relation between diet-specific CHBs and intention to diet (Fleig et al., 2015). In addition to the direct effects of CHBs on intention and behavior, secondary analyses were conducted to investigate whether individuals with higher CHBs show a lower application of action planning and action control (Fleig et al., 2015; Radtke et al., 2012, 2014).

Overall, research on the role of CHBs in health behavior change shows mixed results for different eating behaviors. No study so far has investigated the role of CHBs for different behaviors simultaneously in the same health domain. To bridge this gap, this study investigated the role of CHBs in eating behavior change by making a distinction between two different eating behaviors: increasing fruit and vegetable consumption and avoiding unhealthy snacks.

1.2. Situation-specific CHBs to excuse unhealthy eating

To date, most studies have assessed CHBs with generally formulated items in order to capture overall beliefs about compensation (e.g. Ernsting, Schwarzer, Lippke, & Schneider, 2013).

As hypothesized from the CHBs model (Rabiau et al., 2006), such beliefs arise in situations where people are facing a motivational conflict. Thus, a recent study about snacking behavior has focused on state CHBs, which are situation-specific and address a specific behavior (Radtke et al., 2014). The authors have found that exercise-related state CHBs (e.g. “I do not need to keep myself from snacking, because I will engage in physical activity later on today”) are positively associated with calories consumed. However, state CHBs were only marginally predictive for snacking behavior and it is assumed that people may have different thoughts about and excuses for their unhealthy behavior (Kaklamanou, Armitage, & Jones, 2013; Radtke et al., 2014). Another approach to examine such excuses or justifications for unhealthy eating is asking participants to recall situations where they have indulged in unhealthy eating and to report their thoughts (Taylor, Webb, & Sheeran, 2014; Verhoeven, Adriaanse, De Vet, Fennis, & De Ridder, 2015). Using this approach, however, retrospective and response biases can occur. No study so far has focused on situations where people indulge in unhealthy behavior to investigate situation-specific CHBs. Further, previous studies about excuses have assessed unhealthy eating with snacking behavior only. Research about excuses for low fruit and vegetable consumption is missing. As eating behaviors underlie different forms of behavior change, we assume that situation-specific CHBs depend upon the health behavior people engage in. Therefore, this study aims to examine situation-specific CHBs for two eating behaviors: fruit and vegetable consumption and eating unhealthy snacks.

To investigate situations in which people think about how to compensate for their unhealthy behavior, a real-life setting should be analyzed. It has been shown that individuals seek the internet for health-related information (Rice, 2006) and that they are using forums or chat groups to communicate with others about health to feel better able to cope with the situation they are facing (Tanis, 2008). Further, mobile devices for data collection and interventions in real life settings have been used before (Bernhardt et al., 2009; Gerber, Stolley, Thompson, Sharp, & Fitzgibbon, 2009). Thus, a chat group in a real life setting may serve as a useful way to evaluate individuals' thoughts about their eating behavior and to investigate situation-specific CHBs.

1.3. Aim of the present study

The study's aim was to investigate the role of CHBs for two different eating behaviors: fruit and vegetable consumption and eating unhealthy snacks. A mixed method approach was chosen for both eating behaviors separately. To assess the association between CHBs and the two eating behaviors, the quantitative analysis investigated the predictive value of CHBs over and above standard motivational and volitional constructs of the HAPA. To analyze situation-specific CHBs for both eating behaviors in the context of pursuing an eating goal, with a qualitative analysis, group messages from smartphone chat groups were rated. This approach was applied to expand existing knowledge about CHBs in order to understand barriers of health behavior change.

2. Method

The study was approved by BLINDED FOR REVIEW and was carried out in accordance with the ethical guidelines of the Helsinki Declaration (World Medical Association, 2001).

2.1. Study design

This study was part of a larger randomized controlled trial on the effects of social support groups on healthy eating (see BLINDED

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