Appetite 87 (2015) 330–335

Contents lists available at ScienceDirect

Appetite

journal homepage: www.elsevier.com/locate/appet

Research report

# Synergistic effects of social support and self-efficacy on dietary motivation predicting fruit and vegetable intake

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ARTICLE INFO

*Article history:*
Received 9 July 2014
Received in revised form 8 November 2014
Accepted 24 December 2014
Available online 6 January 2015

*Keywords:*
Dietary behavior
Self-efficacy
Social support
Intention
Motivation

ABSTRACT

*Background:* Self-efficacy and social support are considered relevant predictors of fruit and vegetable intake. This study examines whether the effect of self-efficacy on fruit and vegetable intake is mediated by intention and whether this motivational process is moderated by received dietary social support. *Methods:* A longitudinal study with two measurement points in time, four weeks apart, on fruit and vegetable intake was carried out with 473 students aged 19 years on average (52% women). In a conditional process analysis, dietary intention was specified as a mediator between self-efficacy and fruit and vegetable intake, whereas received dietary support was specified as a moderator of the self-efficacy–intention association, controlling for baseline fruit and vegetable intake. *Results:* Self-efficacy was positively associated with fruit and vegetable intake four weeks later, and intention mediated this process. Moreover, an interaction between received dietary support and self-efficacy on intention emerged. *Conclusions:* The effect of self-efficacy on fruit and vegetable intake was fully mediated by intention. Moreover, received support exhibited a moderating role within the motivational process: high dietary support appeared to accentuate the positive relationship between self-efficacy and dietary intention.



## Introduction

Consuming at least five portions of fruit and vegetables a day is recommended to prevent chronic diseases and maintain good health (Diet, nutrition and the prevention of chronic diseases, 2003). However, although this dietary behavior is widely promoted, breaking unhealthy habits is a difficult self-regulatory task (Slavin & Lloyd, 2012). The process of acquiring regular fruit and vegetable intake of about five portions involves motivational factors that go beyond mere knowledge about nutritional facts. The formation of an intention is instrumental for the initiation and maintenance of healthy dietary behaviors, as it sets a self-regulation process in motion that facilitates later goal-relevant activities (O'Donnell, Greene, & Blissmer, 2014). The present study, therefore, takes a longitudinal social-cognitive perspective (Bandura, 1997) to further the understanding of those psychological mechanisms that underlie healthy eating habits. It is proposed that social exchange processes interact with motivational factors and hereafter contribute to elicit dietary behaviors.

Although, in most of the health behavior theories, social influences are not explicitly specified as determinants, they are generally considered as being facilitating factors for motivation as well as for action. Some recent studies have therefore integrated social support into health behavior change models (e.g. Burkert, Scholz, Gralla, Roigas, & Knoll, 2011; Ochsner et al., 2014). However, while the recent literature underscores the facilitating effect of support in the health behavior change process, the underlying mechanisms remain an unresolved issue. A likely mechanism is the synergistic relationship between self-efficacy and social support on motivation and action, which is in line with Bandura's (1997) social cognitive theory (see Warner, Ziegelmann, Schüz, Wurm, & Schwarzer, 2011). The present study follows this line of reasoning and sets out to examine the putative synergistic effect between self-efficacy and the receipt of social support on fruit and vegetable consumption.

## Dietary self-efficacy

Self-efficacy portrays individuals' beliefs in their capabilities to perform a specific action required to attain a desired outcome (Bandura, 1997). It reflects optimistic self-beliefs when overcoming temptations or adopting a novel course of action. Different

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http://dx.doi.org/10.1016/j.appet.2014.12.223
0195-6663/

challenges could emerge during the course of dietary behavior change, and dietary self-efficacy beliefs may be required to master these tasks successfully. Self-efficacy has been found to be associated with consumption of fruit and vegetables, and individuals with high levels of dietary self-efficacy consume more fruit and vegetables than others (e.g., King et al., 2010).

Evidence for the relevance of self-efficacy for fruit and vegetable intake has also been found in intervention studies, where behavior change techniques led to increases in self-efficacy levels, which were subsequently associated with a more balanced diet (Kreausukon, Gellert, Lippke, & Schwarzer, 2012; Lhakhang, Godinho, Knoll, & Schwarzer, 2014; Luszczynska, Tryburcy, & Schwarzer, 2007).

Self-efficacy is proposed to be relevant in early motivational stages of behavior change, which are directed toward the formation of an intention. In the context of dietary changes, self-efficacy was indeed found to help individuals form dietary goals (e.g., Godinho, Alvarez, Lima, & Schwarzer, 2014). When individuals are already motivated, self-efficacy gives them the confidence to implement their intentions and initiate and maintain behavioral changes in volitional stages of the change process (e.g., Gutiérrez-Doña, Lippke, Renner, Kwon, & Schwarzer, 2009). The focus of the present study is on the motivational process, examining how self-efficacy contributes to form intentions directly, whereas dietary behavior would be affected indirectly later on. Put differently, in the present research design, self-efficacy would affect dietary behaviors in two ways: directly as well as indirectly via intention (Ochsner, Scholz, & Hornung, 2013). In the present case, intention is specified as the most proximal predictor of behavior.

## Received dietary social support

Social support is a relevant variable in the context of health behaviors, either by directly predicting health behavior (e.g., Darbes & Lewis, 2005) or by interacting with other health related factors (e.g., Warner, Ziegelmann, Schüz, Wurm, Tesch-Romer et al., 2011). It refers to the function and quality of social relationships and involves an interactive process between a provider and a receiver. Thus, a distinction can be made between perceived and received social support (Schwarzer & Knoll, 2010). Perceived social support is the recipient's anticipated available support from its social network if needed. As it is a rather stable cognition, which resembles a personality disposition, it is hardly amenable to interventions (Brand, Lakey, & Berman, 1995). Received social support, on the other hand, describes the recipient's report about support he or she received in the past. As received support can be prompted directly in interventions, it is a promising factor to be investigated in the nutritional change process (Yates et al., 2012).

Further, it is necessary to measure received social support specifically for the behavior under study. A recent review suggests that general social support is often not related to a healthy diet, whereas received dietary social support has a strong positive link to healthy eating (Tay, Tan, Diener, & Gonzalez, 2013). Behavior-specific social support may be particularly relevant in the process of goal setting. As pointed out by Scholz, Ochsner, Hornung, and Knoll (2013), received dietary instrumental support predicts dietary intentions.

## Individual and social factors for dietary behavior

Besides its individual regulation, dietary behaviors are often affected by the social context and are therefore expected to be dependent on both self-efficacy and social support according to Bandura's (1997) social-cognitive theory. However, Ochsner et al. (2014) state that research on the interaction between social support and individual regulation of health behavior is still scarce.

The need of studies that investigate the interactions and integration of individual and social factors involved in dietary behaviors is underscored by findings about the psychological resources that best predict fruit and vegetable consumption. In a review conducted by Shaikh, Yaroch, Nebeling, Yeh, and Resnicow (2008), the evidence for the effects of self-efficacy, social support, and knowledge on fruit and vegetable recommendations on consumption were even higher than that of intention. Unfortunately, no distinction was made between perceived and received social support in this review. Previous empirical evidence further suggests a moderating role of received social support on self-efficacy in other health promoting behaviors such as physical activity (Reyes Fernández, Montenegro-Montenegro, Knoll, & Schwarzer, 2014; Warner, Ziegelmann, Schüz, Wurm & Schwarzer, 2011).

In the present study, action self-efficacy, received dietary social support, and intention are therefore chosen as predictors for fruit and vegetable consumption. Scholz et al. (2013) proposed to include social support in the motivational phase of the behavior change process, because it was found to contribute to intention formation. Within the context of physical activity it has been found that social support interacts with motivational self-efficacy to increase action control (Reyes Fernández et al., 2014). Besides the volitional contributions of social support reported in previous literature (Ochsner et al., 2014), this suggests a contribution of social support to motivational processes which might set post-intentional processes into motion.

## Aims

The aim of the present study is to examine the predictive value of self-efficacy, intention, and social support on fruit and vegetable intake in young adults. Moreover, the question is whether self-efficacy directly relates to fruit and vegetable intake or is mediated via intention and whether there is an interaction between self-efficacy and social support on intention.

We examined these hypotheses:

(1) Self-efficacy (T1) predicts fruit and vegetable intake (T2) and intention (T2).
(2) Intention (T2) is associated with fruit and vegetable intake (T2) and also mediates the effect of self-efficacy (T1) on fruit and vegetable intake (T2).
(3) Received dietary social support (T1) not only predicts intention (T2) but is more strongly associated with intention if self-efficacy (T2) is above average as well – assuming a moderating effect. Put differently, supported individuals build intentions more easily and benefit more from being self-efficacious in terms of their fruit and vegetable intake.

## Method

### *Participants and procedures*

First-year students from a Costa Rican university were invited for a study on healthy lifestyles in humanities courses in September 2013. In the Costa Rican University system, each student, from any field, has to take courses on philosophy, communication, history and arts, prior to more specialized courses. These courses are offered in several campuses and several buildings all around the country. The research team visited 20 of these classes and invited about 700 students of these introductory lessons at the main Campus in San José. They did not receive credit or financial reimbursement for their participation, but professors encouraged students to take part in the study during the time spans between lessons. After having given informed consent, 663 students filled out a paper and pencil questionnaire at Time 1 (T1, about 95% of those invited) and directly returned it to the research team. One month later, in a second visit of the research team to their classrooms, 473 (71%) participants filled