Eating Behaviors 23 (2016) 33–40

Contents lists available at ScienceDirect

Eating Behaviors

The reasoned/reactive model: A new approach to examining eating decisions among female college dieters and nondieters

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ARTICLE INFO

Article history:
Received 30 January 2016
Received in revised form 27 June 2016
Accepted 13 July 2016
Available online 15 July 2016

Keywords:
Dietary restraint
Theory of reasoned action
Prototype/willingness model
Nutrition knowledge
Affective associations
Reasoned/reactive model

ABSTRACT

Female college students are prone to unhealthy eating patterns that can impact long-term health. This study examined female students' healthy and unhealthy eating behaviors with three decision-making models. Specifically, the theory of reasoned action, prototype/willingness model, and new reasoned/reactive model were compared to determine how reasoned (logical) and reactive (impulsive) factors relate to dietary decisions. Females ($N = 583$, $M_{age} = 20.89$ years) completed measures on reasoned cognitions about foods (attitudes, subjective norms, nutrition knowledge, intentions to eat foods), reactive cognitions about foods (prototypes, affect, willingness to eat foods), dieting, and food consumption. Structural equation modeling (SEM) revealed the new reasoned/reactive model to be the preeminent model for examining eating behaviors. This model showed that attitudes were related to intentions and willingness to eat healthy and unhealthy foods. Affect was related to willingness to eat healthy and unhealthy foods, whereas nutrition knowledge was related to intentions and willingness to eat healthy foods only. Intentions and willingness were related to healthy and unhealthy food consumption. Dieting status played a moderating role in the model and revealed mean-level differences between dieters and nondieters. This study highlights the importance of specific factors in relation to female students' eating decisions and unveils a comprehensive model for examining health behaviors.

1. Introduction

Many college students consume more foods with added fats and sugars and fewer fruits and vegetables than recommended by dietary guidelines (Anding, Suminski, & Boss, 2001; Racette, Deusinger, Strube, Highstein, & Deusinger, 2005). Eating patterns formed during college may relate to obesity, diabetes, and heart disease (Mannino, Lee, Mitchell, Smiciklas-Wright, & Birch, 2004). Because females diet more and hold more negative cognitions about eating and weight than males, it is important to investigate factors related to eating decisions in order to improve diet and health in college-age women (Kelly-Weeder, 2011; Tapper & Pothos, 2010). This study investigated the utility of three decision-making models for examining female students' eating behaviors, differences in eating decisions among female dieters and nondieters, and the relative importance of specific factors in relation to intentions and willingness to eat foods.

1.1. Examining eating behaviors with decision-making models

The theory of reasoned action (TRA) posits that a behavior (e.g., healthy eating) is predicted by reasoned intentions to engage in the behavior (Fig. 1; Fishbein & Ajzen, 1975). Intentions are influenced by subjective norms and attitudes. Subjective norms are perceptions of social pressure (e.g., "My family thinks I should eat fruit"). Attitudes are thoughts about a behavior (e.g., "I think eating fruit is beneficial"). Although widely used, the TRA is simplistic and additional factors may contribute to eating behaviors (Brewer, Blake, Rankin, & Douglass, 1999; Dohnke, Steinhilber, & Fuchs, 2015; Shepherd & Stockley, 1987).

The prototype/willingness (P/W) model extends the TRA by positing that decisions are also based on reactive factors, namely behavioral willingness and prototypes (Fig. 1; Gibbons, Gerrard, Blanton, & Russell, 1998). Specifically, in situations that encourage unhealthy eating, individuals may show spontaneous willingness to eat certain foods, despite having no rational intention to eat them. The model also posits that individuals hold prototypes about people who engage in specific behaviors (e.g., the stereotypical unhealthy eater), which impact individuals' own willingness to engage in that behavior. For example, people who hold negative prototypes of unhealthy eaters will be less willing to eat unhealthy foods (Gibbons et al., 1998). Although some research has examined prototypes and willingness separately in relation to eating (Gerrits et al., 2010; Ohtomo, Hirose, & Midden, 2011), very little research has holistically examined eating with the P/W model (Dohnke et al., 2015).

Although the TRA assumes that behaviors are reasoned (Fishbein & Ajzen, 1975), it ignores one highly reasoned component: knowledge. Similarly, the P/W model acknowledges reactivity (Gibbons et al.,

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http://dx.doi.org/10.1016/j.eatbeh.2016.07.011
1471-0153/

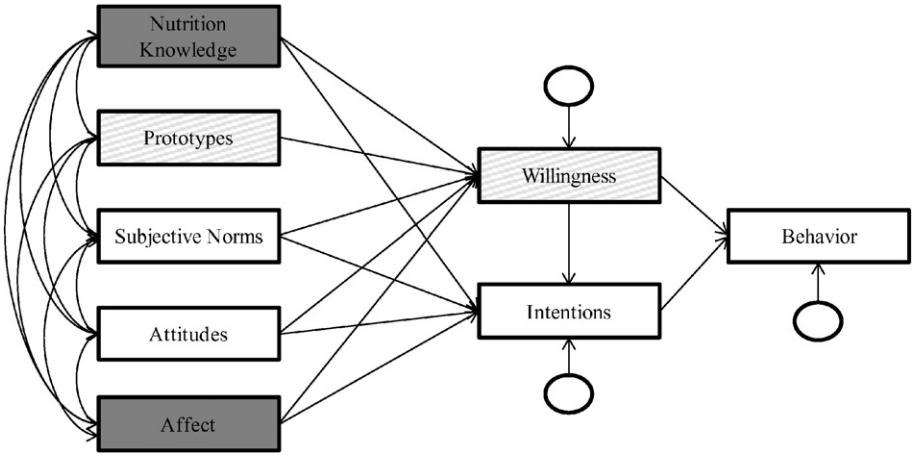

Fig. 1. Theoretical decision-making model for examining eating behaviors. Rectangles are observed variables, circles are residual terms, single-headed arrows are regression paths, and double-headed arrows are correlations. White observed variables originate from the theory of reasoned action (TRA), striped variables originate from the prototype/willingness (P/W) model, and solid variables originate from the reasoned/reactive (R/R) model. Because prototypes are reactive, they do not theoretically influence intentions to engage in a behavior.

1998) but ignores one fundamentally reactive factor: affect. Thus, we extended these models to create a new theoretical model that includes knowledge and affective associations—the reasoned/reactive (R/R) model (Fig. 1).

1.2. Factors related to intentions and willingness

Research supports examining reasoned factors (attitudes, subjective norms, nutrition knowledge) in relation to intentions and willingness to eat foods. Attitudes about foods are related to intentions to eat foods (Brewer et al., 1999; Shepherd & Stockley, 1987). Subjective norms are also related to intentions, although inconsistently (Brewer et al., 1999; Conner, Hugh-Jones, & Berg, 2011; Shepherd & Stockley, 1987; Wong & Mullan, 2009). One study found that attitudes and subjective norms were not related to behavioral willingness, but this should be explored further (Ohtomo et al., 2011). Nutrition knowledge is related to food consumption (Dickson-Spillmann, Siegrist, & Keller, 2011; Kolodinsky, Harvey-Berino, Berlin, Johnson, & Reynolds, 2007). However, findings are mixed regarding the relationship between nutrition knowledge and intentions (Shepherd & Stockley, 1987; Shepherd & Towler, 1992). No studies have examined the relationship between nutrition knowledge and reactive willingness. Examining these reasoned factors with a comprehensive model may shed light on these inconsistent relationships.

Research also supports examining reactive factors (prototypes, affective associations) in relation to intentions and willingness. Holding negative prototypes about unhealthy eaters is related to less unhealthy eating (Gerrits et al., 2010). Dohnke et al. (2015) found bivariate relationships between prototypes and willingness to eat healthy and unhealthy foods; however, in the context of the P/W model, prototypes were not related to willingness. Positive affective associations with foods are related to more consumption (Kiviniemi & Brown-Kramer, 2015; Kiviniemi & Duangdao, 2009; Walsh & Kiviniemi, 2014). Affect about foods may also be related to intentions and willingness, but evidence is lacking (Kiviniemi & Brown-Kramer, 2015). Examining these reactive factors may prove important in understanding intentions and willingness to eat.

1.3. Dieters' eating behaviors

Dieters have more negative attitudes and affect about unhealthy foods and more nutrition knowledge than nondieters (Irmak, Vallen, & Rosen Robinson, 2011; Maas, Keijsers, Rinck, Tanis, & Becker, 2015; York-Crowe, White, Paeratakul, & Williamson, 2006). Research has yet to find relationships between dieting and subjective norms, prototypes, intentions, or willingness (Gerrits et al., 2010). Further, research has yet to examine whether dieting moderates the relationships between eating cognitions and behaviors. Moderation would indicate how the decision-making processes of dieters and nondieters differ, offering insight for interventions. Therefore, this study will examine mean differences between female dieters and nondieters and whether dieting moderates relations between eating cognitions and behaviors.

1.4. The current study

This study had three primary aims. Aim 1 was to compare the utility of the TRA, P/W, and R/R models in examining healthy and unhealthy eating behaviors among female college students. Aim 2 was to examine whether the relations outlined in the best model differ for female dieters and nondieters (moderation) and whether there are mean differences found for these two groups. Aim 3 was to examine the relative importance of factors in the final model.

2. Method

2.1. Participants

Participants were 583 female college students (276 dieters, 307 nondieters) from a public university in Texas (M_{age} = 20.89 years, SD = 1.85). Over one-third (39%) were Caucasian (29% Asian, 14% Hispanic, 6% African American, 6% Middle Eastern, 6% "Mixed/Other"). Approximately 6% were underweight (BMI under 18.5), 64% were normal weight (BMI of 18.5 to 24.9), 19% were overweight (BMI of 25 to 29.9), and 11% were obese (BMI over 30; Centers for Disease Control and Prevention, 2011).

2.2. Procedure

Students were recruited through classes, flyers, and student organizations. They provided informed consent and completed confidential surveys on lab computers. Afterward, height and weight were measured by trained research assistants to calculate BMI (kg/m^2). Participants were offered research exposure credits or entry into a raffle to win one of 25 gift cards worth $50.00. This study was approved by the university's Institutional Review Board.

2.3. Measures

Items on *fruits (e.g., apples, bananas, oranges)* and *vegetables (e.g., carrots, broccoli, squash)* were used to measure cognitions about