Self-regulatory predictors of eating disorder symptoms: Understanding the contributions of action control and willpower beliefs

Elizabeth D. Reese, Garrett A. Pollert, Jennifer C. Veilleux *

Department of Psychological Science, University of Arkansas, 216 Memorial Hall, Fayetteville, AR 72701, United States

ABSTRACT

Action orientation, or the ability to regulate both positive and negative affect to perform goal-directed action, has been associated with eating behavior in previous research. Additionally, differences in beliefs about self-control have been shown to influence behavior, but it is unclear how these beliefs impact disordered eating behavior or how they may interact with other self-regulatory mechanisms to predict eating outcomes. In this study, 1128 participants were recruited online via Amazon Mechanical Turk to answer questions about self-regulation constructs and eating behavior. A three-way moderated regression analysis was used to assess relationships between two subtypes of action orientation (failure-related action orientation, or AOF, which describes an ability to up-regulate positive affect, and decision-related action orientation, or AOD, which describes an ability to down-regulate negative affect), willpower beliefs, and binge eating. Results revealed a significant three-way interaction between AOD, AOF, and willpower beliefs such that the interaction between AOF and willpower beliefs was only significant for those with low AOD. These findings suggest an ability to down-regulate negative affect (*high* AOF) is a protective factor against increased disordered eating, though this may not be the case for individuals with an inability to up-regulate positive affect (*low* AOD) and simultaneously ascribe to beliefs that willpower is a limited resource.

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1. Introduction

Binge eating disorder (BED), a relatively new diagnosable eating disorder as of the publication of the DSM-5 (American Psychiatric Association, 2013), is defined by two key features: (1) the consumption of a large amount of food in a short amount of time and (2) a sense of loss of control over eating behavior. In the United States, BED has a 12-month prevalence rate of 1.7% in women, which is higher than both Bulimia Nervosa (1–1.5%) and Anorexia Nervosa (0.4%) (Smink, van Hoeken, & Hoek, 2013). Beyond diagnosis, more than 29% of college students reported recent bingeing behavior (Kelly-Weeder, Jennings, & Wolfe, 2012), and binge eating is associated with decreased physical health-related quality of life, increased body weight, higher prevalence of obesity and diabetes, and poor social functioning (Wilfley, Wilson, & Agras, 2003) as well as the onset of depressive symptoms and substance use in adolescent populations (Sonneville et al., 2013). In short, binge eating is a serious health-related issue.

A key feature of binge eating disorder is the sense of loss of control that occurs during a binge episode, which is similar to the loss of control that characterizes substance use disorders. This commonality has aided in recent conceptualizations of BED as an addictive-spectrum disorder (Gearhardt, White, & Potenza, 2011; Schreiber, Odlaug, & Grant, 2013;

see also Smith & Robbins, 2013). Many attempts have been made to understand the self-control difficulties that characterize various addictive behaviors, resulting in multiple theories pertaining specifically to self-regulation. One theory thought to capture individual differences in self-control behavior is the Action Control Theory (Kuhl, 1992, 1994a, 1994b). This theory describes the degree to which an individual can successfully plan, initiate, and carry out intended actions. Accordingly, people fall along a continuum of self-regulatory ability, with those highly capable of goal-driven action residing on one end of the spectrum, labeled "action-oriented." These individuals are highly successful at initiating goal-directed action (decision-related action orientation: AOD), which requires the up-regulation, or effortful increase, of positive affect in order to initiate goal-directed behavior. Action oriented individuals are also adept at carrying out intended actions even after experiencing failure (failure-related action orientation: AOF), requiring successful down-regulation, or effortful decrease, of negative affect associated with previously adverse experiences (Kuhl, 1992). Individuals with difficulty regulating positive or negative affect in order to accomplish goals are said to be "state-oriented," meaning that they have greater difficulty up-regulating positive affect and thus cannot translate intentions into action in order to initiate behavior (i.e., low AOD) and are often distracted by negative experiences and previous failures (i.e., low AOF). Thus, state-oriented individuals are less able to self-regulate in order to accomplish goals (Kuhl, 1992), a feature that is highly relevant to addictive behaviors (Quinn & Fromme, 2010; Tibbetts & Whittimore, 2002;

* Corresponding author.
E-mail address: jcveille@uark.edu (J.C. Veilleux).

Wills, Walker, Mendoza, & Ainette, 2006), as well as binge eating (Fischer & Munsch, 2012; Jasinska et al., 2012; Schag et al., 2013). Indeed, action orientation has been studied in the context of several behavioral outcomes. Difficulties with up-regulation of positive affect in order to initiate action (i.e., low AOD) predicted increased alcohol-related negative consequences in a sample of binge-drinking college students (Palfai, McNally, & Roy, 2002) and increased eating dysfunction in undergraduate females (Palfai, 2002). This suggests that the ability to self-regulate (i.e., up-regulate positive affect as well as down-regulate negative affect) in order to initiate and carry-out goal-directed behavior is an important predictor of health-related behaviors.

Aside from understanding individual differences in self-control tendencies, many researchers have focused their attention on understanding the underlying nature of self-control. In the 1990's, Baumeister and colleagues introduced a well-accepted hypothesis describing self-control as a force akin to strength or energy (Baumeister, Bratslavsky, Muraven, & Tice, 1998; Baumeister & Heatherton, 1996). According to this model, the use of self-control over time leaves an individual in a depleted state, with less ability to utilize self-control in subsequent situations (i.e. ego-depletion; Hagger, Wood, Stiff, & Chatzisrantis, 2010). However, work by Job and colleagues (Job, Dweck, & Walton, 2010; Job, Walton, Bernecker, & Dweck, 2015) suggests that ego depletion effects can be accounted for simply by an individual's beliefs about the fundamental nature of willpower. In multiple studies, these researchers demonstrate that those who believe willpower to be a limited resource evidence increased ego-depletion in subsequently demanding tasks, while those who believe that willpower is unlimited do not show ego-depletion effects (Job et al., 2010). Recently, this work has been extended to multiple self-regulatory domains including time management, dietary choices, and monetary spending (Job et al., 2015). In particular, those with beliefs in unlimited willpower showed less procrastination and higher grades in academic settings, decreased unhealthy eating, and less impulsive spending than those with limited willpower beliefs. Thus, even in highly demanding everyday situations, beliefs about the nature of willpower seem to play an important role in self-regulatory ability, a notion with significant implications for addictive behavioral outcomes and binge eating behavior.

Recent theories suggest that several mechanisms, including inhibitory control, personal beliefs about self-control and willpower, motivation, and goal-orientation, contribute to self-regulation success and may interact in specific situations to predict self-regulatory ability (Fujita, 2011). In this study, we aim to understand how separable aspects of self-control (i.e., action control and willpower beliefs) contribute specifically to binge eating behavior and additionally wish to investigate how these self-control factors interact to predict binge-eating outcomes. As such, we have several hypotheses: (1) Action-oriented individuals, or those who are more adept at both up-regulating positive affect (high AOD) and down-regulating negative affect (high AOF) in order to initiate and follow through with goal-directed behavior will evidence decreased binge eating behavior. (2) Beliefs that willpower is an unlimited resource will be associated with decreased binge eating behavior, and (3) these self-regulatory factors, namely action orientation and willpower beliefs, will interact to predict lower rates of binge eating behavior than either factor could alone. In other words, we hypothesize action-oriented individuals who additionally believe willpower to be an unlimited resource will evidence the least binge eating behavior.

2. Methods

2.1. Participants and procedure

The current research was reviewed and approved by the Institutional Review Board at a mid-South university in the United States. Participants were recruited online via Amazon Mechanical Turk (mTurk), a website that pays "workers" small amounts of money to complete tasks online, including surveys and psychological studies. In total, 1128 individuals residing in the United States provided informed consent and completed a set of individual difference measures assessing personality, self-control, emotion regulation, and eating-related behaviors for $3.

2.2. Measures

2.2.1. Action Control Scale (ACS; Kuhl, 1994a)

The ACS is a 36-item scale containing three subscales that measure the degree of action control for decision-related action orientation (e.g., up-regulation of positive affect), failure-related action orientation (e.g., down-regulation of negative affect), and action orientation during successful performance of activities. In the current study, only the decision-related orientation scale ($\alpha = .88$) and the failure-related orientation scale ($\alpha = .72$) were used. Each item has a question stem and two alternative answers, one of which is indicative of action orientation and the other of state orientation. A decision-related action orientation question may begin with a question stem such as "when I have to take care of something important but which is also unpleasant" and will present an action-oriented answer (e.g., "I can do it and get it over with") and a state-oriented answer (e.g., "It can take a while before I can bring myself to do it"). Alternatively, a failure-related action orientation question may begin with a question stem such as "when I am in a competition and have lost every time" followed by an action-oriented answer (e.g., "I can soon put losing out of my mind") and a state-oriented answer (e.g., "the thought that I lost keeps running through my mind").

2.2.2. Eating Disorders Diagnostic Scale (EDDS; Stice, Telch, & Rizvi, 2000)

The EDDS is a 22-item scale that assesses eating habits and attitudes toward eating that are associated with eating pathology (e.g., "During the past six months have there been times when you felt you have eaten what other people would regard as an unusually large amount of food given the circumstances?"). The scale was designed to diagnose Anorexia Nervosa, Bulimia Nervosa and binge eating disorder per the DSM-IV and demonstrated good reliability and validity in comparison to standard interviews (Stice et al., 2000). For the current study, a total score was used to index eating pathology. Because of the propensity of items on the scale assessing binge-related constructs (e.g., days and incidences of binge eating, symptoms associated with loss of control eating), the composite measure can be construed as primarily a measure of binge-eating behavior.[1]

2.2.3. Implicit Beliefs in Willpower (Job et al., 2010)

Implicit Beliefs in Willpower is a 10-item scale measuring the degree to which a person believes in the limited resource theory of self-control (e.g., "After a strenuous mental activity, your energy is depleted and you must rest to get it refueled again"). Items are given on a 6-point Likert-type scale ranging from 1 (Strongly Agree) to 6 (Strongly Disagree), where higher scores indicate greater belief in the limited resource theory. In the current study, the scale demonstrated good reliability ($\alpha = .85$).

2.3. Data analytic strategy

To assess the hypothesized relationship between action control and self-reported binge eating, we conducted a three-way moderated regression using the PROCESS macro in SPSS (Hayes, 2013). Failure-

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[1] To confirm that the EDDS composite score indexes primarily binge behavior, we examined the correlation between the EDDS composite and an index of only the binge items (items 5 through 14), and found that the binge index correlated at .80 with the EDDS total composite score. We also ran the analyses in the current paper with the binge index as the outcome rather than the total EDDS composite and found no differences in the outcome. Thus, we report the total composite as this is the measure described in the literature (Stice et al., 2000).