Ego depletion and conscientiousness as predictors of behavioral disinhibition: A laboratory examination

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ABSTRACT

The self-regulatory strength model proposes that an individual's ability to alter his or her own responses is a limited resource that becomes depleted in situations requiring its use—a phenomenon referred to as ego depletion. Although theory suggests that individuals vary characteristically in what situations may activate their personality dynamics, there has been a paucity of studies investigating broad personality traits in relation to ego depletion. Conscientiousness, which represents an individual's ability to control one's impulses and persevere towards goal-directed behavior, is a trait within the Five Factor Model comprised of six lower facets with particular relevance to ego depletion. The present study tests the hypothesis that state depletion impacts the links between conscientiousness traits and behavioral disinhibition. In a sample of 214 undergraduates who underwent an experimental ego depletion paradigm, results suggest that ego depletion moderates the effect of domain level conscientiousness, as well as facet level self-discipline and deliberation, on food choice. This finding indicates individuals high in trait self-control may be specifically activated by state ego depletion, allowing for individuals high on these traits to persist in making less dysregulated choices after being depleted.

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The ability to effectively regulate one's thoughts, feelings, and behaviors is central to healthy functioning. The self-regulatory strength model proposes that an individual's ability to alter his or her own responses is a limited resource that becomes depleted through use—a phenomenon referred to as ego depletion (for a review, see Baumeister, Vohs, & Tice, 2007). Thus, engaging in self-control at one point in time is thought to create a temporary reduction in the self's ability to engage in further volitional action. Significant support for this model exists; a recent meta-analysis of 83 studies suggested a medium-to-large effect size (Cohen's $d = 0.62$) of ego depletion on subsequent self-control tasks (Hagger, Wood, Stiff, & Chatzisarantis, 2010).

The strength model emphasizes state depletion of self-regulatory resources, as self-regulatory strength is viewed as temporary vulnerability after the exercise of self-regulatory effort. However, previous literature demonstrates the relevance of trait characteristics and individual differences to understanding ego depletion. Certain characteristics of an individual or group of people may provide greater sensitivity or resistance to the effects of ego depletion. For instance, the degree to which individuals view specific self-regulatory challenges as effortful has been shown to moderate the effect of ego depletion such that only individuals who report needing to use effort to engage in self-control demonstrate

behavioral disinhibition (vanDellen, Hoyle, & Miller, 2012). Other researchers have found that beliefs about whether self-control are a limited resource and individual differences in sensitivity to depletion moderate the effects of ego-depletion manipulations on state self-control (Salmon, Adriaanse, De Vet, Fennis, & DeRidder, 2014).

An alternative perspective on this research is that state factors may moderate the impact of personality traits or individual differences on various behavioral outcomes. Specific states or situational variables may limit or magnify the effects of personality on specific behaviors (Mischel & Shoda, 1998). As such, we posit that ego depletion may be a state contextual factor particularly relevant to individuals possessing certain personality traits. That is, some behavioral outcomes may only be trait-dependent in some situations. We suggest ego-depletion may be one such state.

Consistent with broader appeals for advancing understanding of the ways trait and state processes function in concert to drive behavioral outcomes, there recently have been specific calls for empirical work investigating personality traits and state ego depletion. For example, Hagger et al. (2010) note the paucity of research investigating the interaction between ego depletion and personality traits or individual differences, and suggest that these types of investigations are essential in their ability to "provide information on underlying processes and boundary conditions" (p.20). In keeping with this notion, a process model of ego depletion was recently proposed in which ego depletion dulls attention to self-control cues and heightens impulsivity by

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producing a shift in attention away from goal conflict and towards cues of reward or gratification (Inzlicht & Schmeichel, 2012). As such, researchers have been encouraged to continue investigation of individual differences that could potentially interact with the process of ego depletion, especially individual differences relating to control of motivation or attention.

Trait self-control has been specifically identified as an ideal starting point for clarifying the process of state ego depletion. Although many different trait models of personality exist (e.g., see Costa & McCrae, 1992; Tellegen, 1985), the Five Factor Model, a hierarchical model consisting of five higher-order domains: Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness, has become the most widely-used personality framework in psychology, and has accumulated a substantial body of empirical literature investigating it in relation to a wide array of outcomes, including clinical disorders, health, interpersonal outcomes, and occupational choices (Ozer & Benet-Martinez, 2005). Regarding trait self-control in particular, Conscientiousness represents an individual's ability to control one's impulses and persevere towards goal-directed behavior. Within the widely used Revised NEO Personality Inventory (NEO PI-R; Costa & McCrae, 1992), Conscientiousness is a higher order domain composed of six lower facets—competence, order, dutifulness, achievement striving, self-discipline, and deliberation.

Although there is a substantial body of literature documenting the significant relation between trait self-control and behavior outcomes (e.g., de Ridder, Lensvelt-Mulders, Finkenauer, Stok, & Baumeister, 2012), only a few studies have previously investigated the interaction between trait self-control and ego depletion in predicting behavioral outcomes. Results of an initial investigation of the relation between individual differences in self-control and ego depletion suggested that higher levels of self-control at the trait level may be protective against the effects of ego depletion (Dvorak & Simons, 2009). A recent study, however, found an interaction effect in the opposite and unexpected pattern such that individuals with high trait self-control demonstrated greater depletion effects (Imhoff, Schmidt, & Gerstenberg, 2014). Additionally, two studies failed to identify a significant interaction between trait self-control and ego depletion in predicting subsequent behavior (Gailliot & Baumeister, 2007; Nes, Carlson, Crofford, de Leeuw, & Segerstrom, 2011).

These inconsistencies may relate to the specific assessment approaches for measuring trait self-employed within the literature. Multiple studies rely on a composite of items across different measures of varying facets of trait self-control, and do not include analyses in which these specific facets or measures are investigated individually. For example, while FFM Conscientiousness was specifically investigated in relation to ego depletion in one previous study (Nes, Carlson, Crofford, de Leeuw, & Segerstrom, 2011), this study used a brief measure of the FFM that only allows for measurement of the five domains and does not provide facet level information. Additionally, several of the studies (e.g., Gailliot & Baumeister, 2007) have used the Self-Control Scale, a self-report measure developed via a literature review and generating a pool of 93 items, followed by deleting items with low item-total correlations, duplicate items, and items likely to demonstrate gender differences (Tangney, Baumeister, & Boone, 2004). Although this measure has been shown to have sound psychometrics properties and to predict relevant outcomes (Schmeichel & Zell, 2007; Tangney et al., 2004); it is notable that it does not connect to a broader personality model (e.g., the FFM) or allow for investigation of specific facets of trait self-control at a lower order level.

Recently, it has been noted that the specificity provided by lower-order facets has much to offer the study of personality and individual differences (e.g. Paunonen, 1998; Paunonen & Ashton, 2001), and some personality scientists have called for the use of narrow scales in place of scales measuring only broader, multidimensional scales (e.g., Strauss & Smith, 2009; Oswald & Hough, 2011). We propose that measurement of individual differences at the domain and facet level

using a measure of the FFM such as the NEO PI-R, a widely validated measure connected to a larger model of personality, could provide more specific information regarding the interaction effects between trait self-control and ego depletion on subsequent task performance. An investigation of the potential for state depletion to moderate the impact of specific trait self-control facets on behavioral disinhibition could provide a more nuanced understanding of the underlying processes and boundary conditions likely to shape the experience and expression of ego-depletion.

As such, the present investigation attempts to more specifically characterize the relation between trait and state self-control in relation to behavioral outcomes utilizing the most widely used and psychometrically validated measure of the FFM, the NEO PI-R, in order to investigate the role of Conscientiousness at the domain as well as facet level. An experimental methodology was used to evaluate how ego depletion effects vary across levels of Conscientiousness and its facets, testing the hypothesis that state depletion activates the link between trait Conscientiousness and behavioral disinhibition, such that individuals higher on Conscientiousness may make less dysregulated food choices. Additionally, analyses of the four of other FFM domains were conducted in order to provide a test of discriminant validity of the hypothesized relation between state depletion and trait Conscientiousness and behavioral disinhibition.

1. Method

1.1. Participants and procedure

Participants were 214 undergraduate (87% female) students recruited from a research participant pool. Participants completed self-report measures in a semi-private cubicle and subsequently were randomly assigned to complete a typing task under one of two conditions. Ego depletion tasks involving writing or typing while omitting specified letters are common manipulations of depletion used with similar samples (e.g., Schmeichel & Zell, 2007) as the response inhibition required to complete these tasks requires the exercise of self-control. In the present study, in the control typing condition, participants retyped a text exactly as it appeared on a handout they were provided. In the depletion condition, participants retyped the paragraph with additional instructions not to type any *e*s or spaces as they retyped the paragraph. This specific variant of this task requires participants to use self-control because viewing letters while typing automatically activates corresponding keypresses (Rieger, 2004) and, as such, the typing rules require the participants to override the urge to automatically type each letter. Furthermore, the task has been used successfully to manipulate ego depletion in previous research (Mead, Baumeister, Gino, Schweitzer, & Ariely, 2009; Muraven, Gagné, & Rosman, 2008; Muraven, Shmueli, & Buckley, 2006; Schmeichel & Vohs, 2009). Experimenters were blind to participants' condition. Upon completion, the experimenter offered participants either chocolate or carrots as a thank you for their participation. Food choice is an often-used measure of ego depletion that serves as a valid indicator of behavioral disinhibition extending beyond issues of diet (Hagger et al., 2010). Food choice was coded such that carrot choice corresponded to 0 and chocolate choice corresponded to 1.

1.2. Measures

1.2.1. Revised NEO Personality inventory (NEO PI-R)

The NEO PI-R (Costa & McCrae, 1992), is a 240-item self-report measure of the FFM of personality that assesses the five FFM broad personality domains (Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness) as well as the six lower-order facets underlying each dimension. Participants report how much they agree with each statement using a one (*disagree strongly*) to five scale (*strongly agree*). Cronbach alpha for the Conscientiousness domain was .90, whereas alphas for the facets ranged from .59 to .79 with a median of .68.