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Case Report

The role of valence weighting in impulse control

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ABSTRACT

We propose that individuals' valence weighting biases—the extent to which they tend to overweight positive or negative valence in attitude generalization—play an important role in impulse control. Specifically, people who tend to overweight positive valence should likewise overweight impulses, which are essentially urges to achieve positively-valued outcomes, in their initial appraisals of self-control situations, leading to a greater likelihood of impulse control failure. Conversely, people who underweight positive valence should also underweight impulses in these initial evaluative appraisals and should thus be more likely to successfully control their impulses. However, we predicted this relationship would hold only for individuals low in trait self-control, since those high in trait self-control should be both motivated and able to override their initial valence weighting-based appraisals. We supported these predictions across two studies using different impulse control performance measures: a frustrating anagram task (Study 1) and a Stroop task (Study 2).

1. Introduction

Self-control conflicts are a ubiquitous part of everyday experience (Rocklage, Pietri, & Fazio, 2015). We all know the feeling of struggling to reign in impulses that clash with our long-term goals, whether this means resisting the temptation to have a second slice of pie, holding one's tongue when the discussion at a family gathering turns political, or controlling the urge to check one's e-mail. Self-control conflicts are usually characterized by two competing forces: an impulse or desire toward an immediate, concrete reward, and a more abstract long-term goal (e.g., Kotabe & Hofmann, 2015; Mischel, 1974). Successful self-control is thus often a matter of inhibiting impulses (e.g., Baumeister & Heatherton, 1996; Hofmann, Friese, & Strack, 2009; cf. Fujita, 2011). Past research has explored numerous factors that affect self-control, including (but not limited to) trait willpower (Tangney, Baumeister, & Boone, 2004), working memory capacity (Hofmann, Gschwendner, Friese, Wiers, & Schmitt, 2008), abstract vs. concrete construal (Fujita, Trope, Liberman, & Levin-Sagi, 2006), hot vs. cold cognition (Metcalfe & Mischel, 1999), implementation intentions (Gollwitzer & Sheeran, 2006), recent exertion resulting in depletion of resources (Vohs, Baumeister, & Schmeichel, 2012) or motivational shifts (Inzlicht & Schmeichel, 2016), and beliefs about depletion (Clarkson, Hirt, Jia, & Alexander, 2010; Job, Dweck, & Walton, 2010). The current research explores another variable related to self-control: individuals' valence weighting tendencies.

1.1. Valence weighting tendencies as a fundamental individual difference

An individual's valence weighting tendencies reflect how one integrates positive and negative information about novel situations or stimuli and, in particular, whether positive or negative attitudes generalize more strongly in the formation of one's initial evaluation (Fazio, Pietri, Rocklage, & Shook, 2015; Rocklage & Fazio, 2014). For example, imagine visiting a quirky local ice cream parlor that serves chocolate cayenne ice cream. This new flavor might in some ways resemble both things you like (e.g., chocolate, spiciness) and dislike (e.g., you were disappointed by the last bizarre flavor combination you tried). Forming a quick initial evaluation of the new flavor requires weighting its resemblance to these known positives and negatives. As such, any general tendencies you have to overweight either positive or negative valence during this process would bias your initial appraisal of the new flavor.

This valence weighting tendency (i.e., the extent to which one overweights positives or negatives during attitude generalization) is a fundamental individual difference with implications across a variety of domains. For instance, biases in valence weighting predict judgments regarding the potential for interpersonal rejection and threat assessment more generally (Pietri, Fazio, & Shook, 2013b), as well as emotional reactivity to negative events (Pietri, Fazio, & Shook, 2012). In one study, weighting bias predicted how many new friends first-semester college freshman made as they navigated the rocky transition to college life (Rocklage et al., 2015), and in another, weighting bias predicted changes in depressive symptoms across a semester (Pietri,

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Vasey, Grover, & Fazio, 2015). In addition, weighting bias has been found to relate to judgments involving risk assessment, as well as with actual behavior in a "push your luck" game with money at stake (Pietri et al., 2013b). Other work has produced similar results by manipulating weighting bias, demonstrating its causal effects (Pietri & Fazio, 2017; Pietri, Fazio, & Shook, 2013a).

Valence weighting tendencies are both empirically and conceptually distinct from other individual difference constructs regarding valence sensitivity (see Fazio et al., 2015). For example, empirically, weighting bias does not relate to measures of approach/avoidance temperament (Elliot & Thrash, 2010), promotion/prevention focus (Lockwood, Jordan, & Kunda, 2002), or BIS/BAS (Carver & White, 1994). Conceptually, it is distinct from these constructs in that valence weighting tendencies shape the initial evaluative appraisals that people construct on-the-spot upon encountering novel stimuli (Rocklage & Fazio, 2014). Many factors affect what people *do* with those appraisals, but those effects likely occur farther "downstream" relative to valence weighting.

1.2. Valence weighting and impulse inhibition

We propose that valence weighting plays an important and as yet unstudied role in self-control. As discussed earlier, inhibiting an impulse to gain an immediate, salient reward is often central to self-control conflicts. Consistent with recent theoretical perspectives (Kotabe & Hofmann, 2015), we argue that impulses are by their very nature associated with positive valence—they are "desires" or urges to act (or not act) so as to achieve some immediate positive outcome. Even impulses that might on their surface seem negative (e.g., the urge to skip one's dentist appointment) actually lead to outcomes that are desired in the moment (e.g., not being at the dentist). Thus, when forming an initial appraisal of a self-control situation, people with a more positive valence weighting bias should tend to overweight the impulse or desire and hence be more likely to act on the impulse, whereas those with a more negative valence weighting bias should underweight the impulse and hence be more likely to successfully inhibit it.

1.3. Potential moderators of the relation between valence weighting and impulse control

We do not expect, however, that valence weighting tendencies will *always* influence impulse control. Past research suggests that weighting bias influences initial evaluative appraisals, which only affect downstream judgments and behaviors when people lack the opportunity or motivation to override those initial appraisals and engage instead in more extensive deliberation (Rocklage & Fazio, 2014). For instance, participants exposed to a news article espousing the value of following one's intuition showed a relationship between weighting bias and risky behavior, such that those with a more positive weighting bias tended to gamble more in the same "push your luck" game mentioned previously; however, for those exposed instead to an article espousing the value of overriding one's intuition, this relationship was attenuated (Rocklage & Fazio, 2014, Experiment 2). Similarly, the relationship between valence weighting tendencies and self-control should be strongest among people who lack the opportunity (e.g., poor executive control) or motivation (e.g., weak or inconsistent goals) to override their initial evaluations (Fazio & Olson, 2014). In the current work, we assessed one such potential moderator, participants' trait level of self-control. Trait self-control, measured via self-report, predicts outcomes as varied as college grades, psychological adjustment, binge-eating, and alcohol abuse (Tangney et al., 2004). People who are especially adept at self-control should have both the ability and the motivation to override their initial valence-weighting-based response tendencies, thus attenuating the link between weighting bias and impulse control performance.

1.4. Current research

We sought to explore the relationship between valence weighting biases and impulse control across two studies, each with a different behavioral task requiring impulse inhibition. In Study 1 we measured how readily participants gave in to their impulse to skip particularly frustrating anagrams, and in Study 2 we used a Stroop (1935) task as a measure of impulse inhibition. In each study, we also measured trait self-control (Tangney et al., 2004) to assess whether it moderated the relationship between valence weighting tendencies and performance.

2. Study 1

We administered a performance-based measure of valence weighting tendency,[1] along with a behavioral measure of impulse control (a frustrating anagram task) and a self-report measure of trait self-control. We entertained two related hypotheses. First, we expected that the extent to which participants overweighted positives (vs. negatives) would predict how often they gave in to the impulse to pass on particularly frustrating anagram trials. However, given the potential moderators discussed previously, we thought it possible that this relationship would only occur for participants low in trait self-control. For participants high in trait self-control, the relationship between valence weighting and impulse control might be attenuated, since these participants would be motivated and able to override their initial valence weighting-based appraisals.

2.1. Method[2]

2.1.1. Participants

Based on the sample sizes of past studies employing the BeanFest paradigm as the performance-based measure of valence weighting, as well as participant availability during the semester, we recruited 74 undergraduates who completed the study in partial fulfillment of a course requirement. We excluded two participants who showed very poor learning of game beans (< 0.4 correctly classified, where 0.5 is chance)[3] during the BeanFest test phase, leaving a final sample of 72 (34 women, 38 men).

2.1.2. Overview

Participants first completed a performance-based measure of their valence weighting tendencies called BeanFest. The BeanFest game begins with a learning phase in which participants encounter various "beans" and, over time, learn which will add or detract from their score. We measure each participant's valence weighting tendencies as the extent to which they overweight resemblance to known positive or negative game beans when judging novel beans in a subsequent test phase. Participants then completed our behavioral measure of impulse control, a timed anagram task that, unbeknownst to participants, included unsolvable anagrams. Participants could choose to pass on any anagram. We reasoned that on unsolvable anagrams, participants would become frustrated and experience the impulse to pass. The frequency with which they followed this impulse served as the dependent measure. At the end of the session, following some exploratory measures intended as a pilot test for future research, participants completed a self-report measure of trait self-control.

[1] Past research suggests individuals are unable to accurately self-report their valence weighting tendencies, hence the need for a performance-based measure (Fazio et al., 2015; Pietri et al., 2013a).

[2] In both studies, all data were collected prior to data analysis. We report all exclusions, measures, and manipulations.

[3] These two participants' learning scores were extreme (2.86 SDs from the mean of the remaining 72 participants). Including these poor learners slightly strengthens the critical 2-way interaction (from $p = 0.02$ to $p = 0.01$).