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Does trait self-control predict weaker desire for unhealthy stimuli? A lab-based study of unhealthy snack intake

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ABSTRACT

Traditionally, self-control has been conceptualized as the effortful overcoming of desires in order to enact goal-consistent behavior. Several researchers have suggested that instead, self-control is effortless, as individuals with high self-control experience less intense desire that conflicts with valued goals. The current study tested whether the relationship between trait self-control and snack intake was mediated by desire strength, or whether those with higher trait self-control were better able to overcome desire to indulge in unhealthy food, controlling for aspects of the food environment and goal motivation. A sample of women with the goal of eating healthily for weight management ($N = 134$) completed a lab-based assessment of snack food consumption and self-report measures of desire strength and trait self-control (generic self-control, and both inhibitory and initiatory subcomponents). As expected, desire strength mediated the relationship between generic self-control and intake, such that higher self-control was related to lower snack intake indirectly via lower desire strength. The relationship between desire and intake was consistent across self-control levels. The same pattern of results emerged for both inhibitory and initiatory self-control. These findings support the contemporary conceptualization of self-control as being effortless due to the reduced strength of unhealthy desires.

1. Introduction

Trait self-control predicts a wide variety of adaptive behaviors and positive outcomes, including academic and work performance, personal adjustment, interpersonal functioning, healthy eating behaviors, and lower levels of alcohol abuse (De Ridder, Lensvelt-Mulders, Finkenauer, Stok, & Baumeister, 2012; Tangney, Baumeister, & Boone, 2004). The traditional conceptualization of self-control is that it enables an individual to effortfully overcome unhealthy desires or impulses in order to act in a way that is consistent with valued longer term goals (De Ridder, de Boer, Lugtig, Bakker, & van Hooft, 2011; Hofmann, Baumeister, Förster, & Vohs, 2012). However, an alternative conceptualization suggests that individuals with higher trait self-control enact goal-consistent behavior effortlessly (Gillebaart & de Ridder, 2015). Rather than having to effortfully overcome unhealthy desires to act in accordance with higher order goals such as healthy eating, individuals with high self-control actually experience less frequent and intense desires to indulge in unhealthy behavior that conflict with those goals.

Hofmann et al. (2012) recently tested these alternative models of self-control. Participants completed an experience sampling procedure in which they carried an electronic device for one week that regularly prompted them to report their desires in the preceding 30 min. They also reported the strength of the desire, whether it conflicted with an alternative goal, whether they tried to resist the desire, and whether their behavior immediately following was goal-consistent. Results revealed that trait self-control did not moderate the relationship between desire strength and goal-consistent behavior, running contrary to the conventional view of self-control. Instead, participants with high trait self-control reported experiencing less frequent and less intense desires conflicting with their goals. Desire mediated the pathway to goal-consistent behavior. These results therefore support the alternative conceptualization of self-control as being effortless, as individuals with higher trait self-control did not experience strong conflicting desires that needed to be effortfully overcome.

Two possible interpretations of Hofmann et al.'s (2012) finding that high trait self-control predicts lower desire have been proposed. These possibilities are not mutually exclusive. The first interpretation is that trait self-control was associated with less desire because individuals with higher self-control are more likely to avoid situations where unhealthy desires might arise (e.g., walking down the chocolate aisle in the supermarket) (Gillebaart & de Ridder, 2015; Hofmann et al., 2012). Here, the potential to experience strong desire in response to tempting cues remains the same across levels of self-control; however, individuals with high self-control report lower

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desire because they encounter potentially problematic desirable stimuli less frequently.

A second possible explanation for Hofmann et al.'s (2012) findings is that individuals with high self-control actually experience less intense desire when faced with unhealthy stimuli. This relationship between trait self-control and lower experience of desire could be attributable to two mechanisms. The first is that individuals with higher trait self-control are said to repeatedly enact goal-consistent responses to environmental cues (e.g., unhealthy snack food), resulting in the automatization of these responses so that they are effortlessly performed (Baumeister & Alquist, 2009; Gillebaart & de Ridder, 2015). This could change the way they experience desire in response to those unhealthy cues in future (Gillebaart & de Ridder, 2015). Indeed, a meta-analysis revealed that generic trait self-control more strongly predicted automatic behaviors (i.e., behaviors that are performed efficiently and unintentionally without awareness and conscious control, such as habitual snacking and addictive behaviors like smoking and alcohol use), than controlled behaviors (i.e., those that require conscious intention or deliberation, such as quitting smoking or making plans) (De Ridder et al., 2012). The relationship between trait self-control and lower intake of unhealthy snacks has also been shown to be mediated by habit strength (Adriaanse, Kroese, Gillebaart, & De Ridder, 2014). Research has demonstrated that reinforcement of a cue-behavior link (e.g., practicing the inhibition of behavioral response to a food cue) influences the subsequent processing of that cue (e.g., the implicit evaluation of that food cue becomes more negative) (Hofmann, Deutsch, Lancaster, & Banaji, 2010; Houben, Nederkoorn, Wiers, & Jansen, 2011; Veling, Aarts, & Stroebe, 2013). A negative automatic evaluation of a stimulus has been linked to lower desire and temptation for that stimulus (Haynes, Kemps, Moffitt, & Mohr, 2014a; Hofmann & Van Dillen, 2012). Therefore, individuals with higher trait self-control could experience less desire when encountering unhealthy stimuli as a result of their habitual goal-consistent responses to those stimuli.

An alternative mechanism underlying the relationship between experienced desire and trait self-control could be a difference in the activation of higher order self-control goals between individuals with high and low trait-self-control. Goals are internal representations of desired states (Austin & Vancouver, 1996). Control theory posits that behavior is guided by hierarchically organized goals. Through a process of negative feedback, the individual's current state is continuously compared to a desired goal state, which guides behavior with the aim of reducing the discrepancy between the current and the goal state (Carver & Scheier, 1982; Powers, 1973). Extending this theory, counteractive control theory predicts that encountering a disturbance (e.g., unhealthy snack food) to a higher order goal (e.g., healthy eating or weight management goal) promotes stronger accessibility of that higher order goal. This higher goal accessibility promotes goal-consistent behavior by directing attention and resources toward reducing the discrepancy between the current state and the goal state (Fishbach, Friedman, & Kruglanski, 2003). Some (e.g., Fishbach et al., 2003; Papies, Stroebe, & Aarts, 2008), but not all (Haynes, Kemps, Moffitt, & Mohr, 2014b), previous research in this area has found a relationship between higher goal accessibility in response to disturbance cues and self-control. This activation of a higher order goal may reduce the desire for unhealthy stimuli, as it has been shown to shape individuals' implicit evaluations of goal-relevant and goal-disturbing stimuli (Ferguson, 2008), which contribute to experienced temptation (Haynes et al., 2014a). Indeed, this relationship between self-control and both higher goal accessibility and lower desire is supported by research showing that individuals with high trait self-control report lower conflict between higher order goals and immediate desires (Hofmann et al., 2012). One behavior (e.g., eating unhealthy food) may undermine one goal (e.g., weight management or staying healthy), while serving other goals (e.g., goal of enjoying food, experiencing positive emotions) simultaneously (Kelly, Mansell, & Wood, 2015). Lower conflict between the goal of weight management and goals served by indulging in unhealthy food predict weight fluctuations and loss of control over eating (Rosenhead & Mansell, 2015). Individuals with higher trait self-control may therefore experience less desire when encountering unhealthy stimuli because they are better able to activate or attend to their higher order self-control goals, reducing goal conflict.

Regardless of the potential mechanism underlying the relationship between trait self-control and desire, it remains to be determined whether higher trait self-control does indeed relate to experiencing less intense desire when encountering unhealthy stimuli. This was beyond the scope of the research conducted by Hofmann et al. (2012). Their experience sampling design allowed participants control over their environmental exposure to desirable stimuli. Therefore, it is possible that lower desire experienced by those with higher self-control could be attributable to those individuals shaping their environments so that they did not encounter unhealthy foods (e.g., avoiding situations where tempting foods are available).

The current study therefore sought to test how trait self-control relates to the desire to consume, and actual consumption of, unhealthy foods. Specifically, we presented participants with unhealthy snack foods for ad libitum consumption in a laboratory setting while controlling aspects of this food environment (e.g., food variety, portion size, allowed eating time). This allowed us to isolate the strength of desire to indulge in unhealthy foods independently of participants' tendencies to control their exposure to unhealthy food stimuli. We recruited a sample of women with the motivation to eat healthily to manage weight, and statistically controlled for the strength of this motivation, as this may affect the extent to which the consumption of unhealthy snack food constitutes a self-control dilemma. We also measured variables which have been shown to affect the strength of desire to consume unhealthy foods and consumption, in order to statistically control for their effects (i.e., hunger, BMI, and general liking of the foods presented; Haynes et al., 2014a; Mela, 2006; Rogers & Hardman, 2015).

We expected that higher trait self-control would be related to lower desire strength to indulge in unhealthy snack foods, and that this desire strength would mediate the pathway between trait self-control and snack intake. An alternative hypothesis in line with the conventional view of self-control was also tested, namely, that self-control would moderate the relationship between desire strength and snack intake. Furthermore, in addition to assessing generic trait self-control, we assessed two specific types of self-control: inhibitory and initiatory. Inhibitory self-control has been found to more strongly predict behaviors requiring inhibition of impulses, like smoking and alcohol consumption, while initiatory self-control more strongly predicted exercise and hours spent studying (De Ridder et al., 2012). As the inhibition of impulses is required to limit consumption of unhealthy snack food, we expected that inhibitory self-control would be more strongly related to desire for unhealthy food than initiatory self-control. However, we predicted that generic trait self-control would be more highly predictive of desire than the inhibitory component alone. This is because the formation of automatized responses to unhealthy food cues that may be partly responsible for the self-control of eating is likely to require initiatory mechanisms (i.e., forming adaptive responses and routines), as well as inhibitory ones.

2. Method

2.1. Participants

The sample consisted of 134 women between the ages of 17 and 25 years ($M = 20.08$, $SD = 2.40$) recruited from the student population of an Australian university. Advertisement materials for the study stated that participants must be motivated to manage weight through healthy eating. This inclusion criterion was specified to ensure that the sample included women for whom eating unhealthy snacks constituted desire that conflicted with a goal. Only women were recruited, as they have higher levels of food craving and overeating than men, but are