

Interpersonal Protection: How Others May Shield Pursuits from Distraction

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Dissertation submitted in partial fulfillment of  
the requirements for the degree of Doctor  
of Philosophy in the Department of  
Psychology and Neuroscience in the Graduate School  
of Duke University

2018

ABSTRACT

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## **Abstract**

Four studies were conducted to determine the process by which other people, referred to as goal defenders, may protect individual goal pursuit by inhibiting goal alternatives, specifically focusing on the way goal defenders may enhance perceptual narrowing, increase state self-control and decrease the value of alternatives. Studies 1A and 1B were conducted in one session via mTurk and used a word recognition task. Results indicate that, depending on trait level self-control capacity, participants who were primed with a goal defender remembered more goal relevant words than goal irrelevant words, while participants in the control condition exhibited the opposite pattern, demonstrating a heightened effect of perceptual narrowing for treatment participants. Study 2 was conducted in a laboratory in one session, and used a "taste test" task to see how well participants would inhibit unhealthy foods after being primed with goal defenders. Findings pointed to an increase in state self-control for participants in the treatment group as trait inhibition increased, and a decrease in actual inhibition of temptation for treatment participants high in trait continuation. Finally, study 3 used a two-session, week-long longitudinal design on TurkPrime to gather self-report data about participants' goal relevant behavior. Participants in the goal defender condition were more likely to see the temptation as less valuable than participants in the goal initiator condition when trait inhibition was high. Implications are discussed.

## Dedication

This dissertation is dedicated to all of my teachers, without whom I would not have been able to accomplish this goal. To my parents, the earliest teachers one can have, I am forever indebted to their support throughout my academic journey, from buying me my first backpack to helping me make sense of my college accounting homework, and for keeping me on the family payroll through 23<sup>rd</sup> grade (much appreciated). To all of the fine public-school teachers that taught me how to read, write and think, in a very real way, they provided the building blocks for this insanely long document. To the social psychology area at Duke, so much of the knowledge I have about social psychology I learned within the walls of Soc/Psy, both from my professors and from my classmates. I will forever be grateful that I chose to go to graduate school at Duke. To my mentor Jim, who has taught me my most valuable research skill – how to actually turn an idea into an experiment. I can only hope that one day I am half as good at plucking a sound study method out of thin air in response to a sliver of a study idea. And finally, to me, for teaching myself throughout this process that getting cocky is always an open invitation for the world to set you straight.

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# 1. Introduction

The history of goals and motivation research in psychology stretches back at least to the theorizing of William James, and his conceptualization of humans as entities with will, a force that helps them control their own futures. Even though the conceptualization of goals and motivation has evolved and changed since James' time, it is undoubtedly true that humans appear to impose some sort of internal force to bring them closer to desired end states over time. Simply put, people pursue goals for the purpose of attaining them at some future point. It is actually hard to think of times when humans aren't pursuing goals, from getting up in the morning and brushing one's teeth for the purpose of long-term oral health, to relaxing on the beach to destress and escape from the daily grind; people are pursuing goals the vast majority of the time. Social psychologists have honored goals and motivation as an important research area in kind, devoting a great deal of time and literature to exploring topics like how trait self-control affects goal attainment, how temptations pose threats to behaving in goal consistent ways, the long-term benefits of attaining one's goals and the component processes of goal pursuit (Tangney, Baumeister, & Boone, 2004; Trope & Fishbach, 2000; Sheldon & Elliot, 1999; Gollwitzer, 1990).

However, the vast majority of existing research examines individuals pursuing goals in a vacuum, which is problematic in many ways. Other people are involved in goal pursuit more often than not. Humans are social animals, and they spend their lives living, working, eating and playing with one another. One only needs to look at the Billboard 100

to see that other people are often the sources of our strongest emotions, as popular songs often relate to potential, current or past romantic partners. Or to classic literature, where the canon could serve as a primer for interpersonal goal pursuit; *Pride and Prejudice* is about finding suitable relationship partners with the aid of an overly insistent parent, *Lord of the Flies* is about how innate human failings get in the way of peaceful coexistence and *The Scarlet Letter* is about the social consequences of engaging in socially unacceptable behavior. It is clear that others affect the creation of our goals, the maintenance of our goals and the ultimate success or failure of our attempts to obtain them. With the sway that others hold over us, it seems odd that so much attention has been devoted to studying individual pursuits on the individual level, ignoring the social context in which said goals are pursued.

Luckily, many researchers have noted the importance of others in individual goal pursuit. Ryan and Deci's self-determination theory suggests that other people may hold such influence over individual goal pursuit that goal pursuers may actually end up pursuing goals that really don't serve intrinsic motivations (2000). Aarts and colleagues have looked at the process by which individuals may pursue goals that they see others pursuing through the process of goal contagion (Aarts, Gollwitzer, & Hassin, 2004). And Dweck's entity theory suggests that forming performance goals in which one's main motivation is to perform well relative to others leads to poorer academic outcomes than pursuing goals for individual mastery reasons (1986). But there is still not enough research

to determine how others play a role in individual goal pursuits, and how the involvement of others in one's goal pursuit improves goal outcomes, as highlighted in the comprehensive transactive goal dynamics theory discussed later in this paper (Fitzsimons, Finkel, & vanDellen, 2015).

In addition to being ubiquitous in our pursuits, others also appear to aid goal pursuit in some cases. Others may advance our pursuits in such a way that we accomplish them more effectively or with more ease than we would have accomplished them alone, as is the case with instrumental others (Fitzsimons & Shah, 2008; Fitzsimons & Shah, 2009). Others appear to be so effective in providing facilitative support in goal pursuit that goal pursuers actually feel closer to individuals who may be helpful to goal pursuit, and nonconsciously distance themselves from individuals who are unhelpful for important pursuits (Fitzsimons & Shah, 2008). Engaging others in goal pursuit may also boost the sense of accountability the goal pursuer feels for the goal outcome, which encourages sustained focus on the pursuit (Seeley & Gardner, 2006).

People have even been known to outsource self-regulation to significant others. Fitzsimons and Finkel found that participants with activated representations of significant others who were instrumental for goal accomplishment actually decreased their effort towards goal attainment, choosing instead to rely on the partner's resources (2011). This was especially true for highly committed partners (Fitzsimons & Finkel, 2011). Such a strategy may be beneficial for goal pursuers because it lessens the amount of effort that

needs to be invested in the pursuit, and likely saves the goal pursuer from depleting their self-regulatory resources (Baumeister, Bratslavsky, Muraven, & Tice, 1998).

Though it has been established that others can activate goal pursuit, and play important roles in those pursuits, less is known about how relational partners help individuals to attain their goals. Research on goal shielding may help to shed light on how significant others may be utilized in protecting goal outcomes. Shah and colleagues introduced the construct of goal shielding, or the idea that people automatically inhibit cues to pursue alternative goals when they are in pursuit of a focal goal (Shah, Friedman, & Kruglanski, 2002). Effective goal shielding actually boosts performance and persistence on focal tasks (Shah et al., 2002). It appears to be useful for protecting the focal goal in multiple ways, including decreasing the cognitive accessibility of alternatives, and shielding focal goals from substitutable goals (Shah et al., 2002). In 2003, Shah extended this research to see how activating mental construals of other individuals might activate goal pursuits, and then shield them from distraction. He found that priming individuals with the names of significant others, like their parents or close friends, effectively served to prime associated goals, and that it also increased the salience of the goal and the ability to inhibit alternative pursuits (Shah, 2003a).

The Shah (2003a) findings provide an exciting foundation for continued research: How might other people act to shield goals? Or, in other words, does the presence of another person effectively come between an individual's goal and the alternatives he or

she could pursue? It is the contention of this work that other people act as goal shields because they create a perceptual barrier between individuals and alternatives, in the sense that they produce goal states in individuals that are strongly defined by perceptual narrowing, a quality associated with implemental mindsets (Büttner, Wieber, Schulz, Bayer, Florack, & Gollwitzer, 2014). It is also suggested that goal relevant individuals may temporarily boost state self-regulatory resources, as they act to shield the individual from recognizing distractions that may test self-control. Further, it contends that there are two kinds of people that may act to influence goals, only one of whom is a goal shield. There are others who help individuals to initiate goal pursuit, known hereafter as goal initiators, and there are others who help individuals to inhibit alternatives, known hereafter as goal defenders. While goal defenders should always act to induce perceptual narrowing and lead to increased performance and persistence, in cases of low commitment, others who are associated with the initiation of goals may actually serve to create goal conflict, in the way that they may promote a volitional state, but then fail to fully block alternatives that can also be initiated. Thus, it is also predicted that human goal defenders will encourage goal pursuers to devalue the alternative they could pursue, as opposed to simply increasing the value of the pursued goal, something that should be more associated with goal initiators.

## **1.1 Goal shielding**

Goal shielding, or the nonconscious tendency to protect focal goals from the influence of alternative goal pursuits, offers a foundation for the current theorizing. Goal shielding theory provides an explanation for how individuals who are committed to their goal pursuits manage to accomplish them in the midst of several attractive alternative pursuits (Shah et al., 2002). Goal shielding is a nonconscious process that appears to be marked by some sort of cognitive block that dampens attention to alternative goals and the means that may be used to attain them, and provides an accompanying increase in the subjective value of the focal goal (Sheh et al., 2002). The theory suggests that goal shielding is a naturally developing, nonconscious skill, and that it is automatically deployed to protect goals from intergoal competition (Shah et al., 2002).

Several characteristics are thought to positively predict goal shielding in the presence of alternative goals, including high levels of goal commitment, the pursuit of prevention goals (i.e. those that focus on avoiding unpleasant or unsafe outcomes, like obligations or duties) in comparison to promotion goals (i.e. those that focus on approaching new heights, like aspirations or ideals) and having a high degree of interference with the goal (Shah et al., 2002). Alternative goals that facilitate focal goal outcomes, as opposed to interfering with them, do not induce goal shielding; however, alternatives that can be seen as substitutes for the focal goal should be seen as redundant, and be shielded from disrupting the focal goal (Shah et al., 2002). Goal shielding is also

engaged more by people who have a high need for closure (see Webster & Kruglanski, 1994). Finally, it is influenced by negative affect, in the sense that anxiety should actually encourage people to inhibit alternatives when pursuing obligations, while depression may be more likely to lead someone to inhibit alternatives when pursuing ideals (Shah et al., 2002). Thus, it appears that the inhibiting effect of goal shielding is dependent on goal specific characteristics, and the motivational and affective circumstances of the intergoal conflict (Shah et al., 2002). In the current work, it is suggested that cognitive associations with human goal defenders can both trigger and strengthen this inhibitory effect.

Goal shielding findings appear to point to two important functions in the goal shielding process: 1). Individuals nonconsciously engage in enhanced inhibition of alternatives that threaten the accomplishment of the current pursuit, and, 2). Individuals experience a subjective perceptual shift in valuing focal goal attainment far more than alternative goal attainment, as exhibited in an increase in indicator variables like goal commitment. Shah's ability to prompt goal shielding by priming a goal-relevant significant other sheds light on the application of these findings (2003a). Goal shielding that is prompted by the psychological presence of an other appears to function in a similar way to self-induced goal shielding, with evidence that individuals recall fewer alternative goals, and often feel more commitment to their goals, after being primed with a goal-relevant other (Shah, 2003a). Shah has established that other humans can prompt individuals to engage in goal shielding, but has also suggested that using significant

others to shield important goals may increase goal attainment above and beyond simply activating a volitional goal state. The way in which goal defenders defend the goals of other people most likely depends upon whether or not those individuals elicit the inhibition of alternatives, and thus act as goal shields by perceptually standing between an individual's goal and alternative goals. It should not elicit an increase in the subjective value of the goal, or an increase in initiation of goal-related behavior associated with goal initiators. This research will seek to expand upon Shah's findings by investigating how individuals may be effectively defending goals by coming between focal goals and alternatives; specifically, by boosting perceptual narrowing so alternatives are not registered and temporarily inflating self-regulatory resources, as well as exploring how human goal defenders act to inhibit alternative goals by leading to a drop in perceived value of those alternatives.

## ***1.2 Counteractive self-control***

People who are successful at self-control appear to have automatic tendencies to approach goals and avoid temptations, something that helps people to avoid self-control conflicts completely (Fishbach & Shah, 2006). But many others have a harder time navigating these kinds of self-control dilemmas that pit one's long-term goal success against one's short-term enjoyment. Fishbach, Trope and colleagues have studied responses to exactly these kinds of self-control dilemmas (before and after goal pursuit primes), and have formulated counteractive control theory to explain how being

confronted with temptations may actually prime goal consistent behavior (Fishbach & Trope, 2005). One of the keys to counteractive self-control is bolstering the value of the goal relative to the value of the temptation. Some researchers suggest that increasing engagement in the goal should lead to an increase in the subjective value of the goal, and thus an increase in motivation to pursue the goal (Fishbach, 2009).

Fishbach and Trope investigated how people navigate short-term costs to behave in goal consistent ways (2005). They found that social monitoring was an important motivator that encouraged people to overlook short-term costs to reap long-term benefits (Fishbach & Trope, 2005). Indeed, other researchers have found that individuals are more likely to avoid temptations in the presence of other people, and they are more likely to act in goal consistent ways when confronted with goal conflict when other people are around (although, not necessarily when they are actively engaged in the same pursuit; Hofmann, Baumeister, Förster, & Vohs, 2012). These findings provide further suggestion that the presence of others may encourage people to act in goal consistent ways, suggesting that counteractive self-control may be more likely to occur in the presence of goal defenders than goal initiators.

It is somewhat less clear exactly how other people may cause individuals to double down on goals in the presence of temptations. Fishbach and Trope suggest that the presence of others may lessen the need for self-control, as some control is outsourced to the external source (2005). In one study, participants took a reading test described as

interesting or boring either alone or in the presence of an experimenter (Fishbach & Trope, 2005). When short-term costs were imposed (i.e., completing a boring reading test), the presence of the experimenter acted as a form of external self-control, such that counteractive self-control didn't need to be engaged at all (Fishbach & Trope, 2005). Without a social monitor, participants had to practice counteractive self-control to make them complete the boring test in order to achieve the goal of completing the experiment (Fishbach & Trope, 2005). This finding suggests that even the mere presence of others can decrease the amount of self-regulatory resources involved in the goal pursuit process. The presence of another person to impress or disappoint can be such a powerful motivator that the power of the temptation to abandon the focal goal actually diminishes. Having to explain to another person why you failed to meet your responsibilities is far more intimidating than having to explain it to yourself. These social monitoring findings suggest that others may be uniquely suited to motivate individuals to attain goals, above and beyond simply priming one with a pursuit. In addition, it may be the case that the presence of others provides a kind of temporary boost to one's self-regulatory resources, giving one the impression one has more available resources than one does or making one more willing to deploy them. This idea is tested in the current work.

Overall, counteractive control theory posits that. when goals are active, people reevaluate temptations in light of their current concerns. When goals are active and cognitively accessible, counteractive self-control is more likely because people

automatically reevaluate the value of temptations in light of their goals (Fishbach, Zhang, & Trope, 2010). For instance, college students with an active achievement goal are more likely to evaluate recreational activities negatively than students without an active achievement goal, and dieters are more likely to evaluate junk food negatively after being reminded of their commitment to their dieting goal (Fishbach et al., 2010). In this way, the relative values of the focal goal and the temptation are magnified when the temptation presents an alternative goal that is harmful to the focal goal. This may be because people engage in counteractive self-control when temptations become available, effectively rendering them less tempting in light of a coveted goal pursuit (Myrseth, Fishbach, & Trope, 2009). It may also be because others are more likely to encourage counteractive self-control when they act to boost inhibition by devaluing the alternative goal, something explored in the present work.

Counteractive self-control can be a potent tool for self-regulators as it can cover a broad range of controlled behavior, from dieting to achievement. Counteractive self-control can even help to head off ethical dilemmas, especially if one can prepare to face an ethical conflict ahead of time in order to recruit additional self-control resources (Fishbach & Woolley, 2015). But it has some inherent problems. People who are already good self-regulators are far more likely to practice counteractive self-control in the first place (Fishbach, Friedman, & Kruglanski, 2003). Also, its efficacy varies with the

importance of the goal, and as the goal becomes less subjectively important, people are less likely to engage in counteractive control efforts (Fishbach et al., 2003).

For these reasons, engaging significant others may encourage counteractive self-control above and beyond the counteractive resources of the individual. Other people may boost our self-control by allowing individuals to outsource control to an external source, decreasing the burden placed on individuals to stick to their goals. Other people may also subjectively increase the value of goals by boosting our sense of accountability for our goal outcomes. Counteractive self-control findings can provide clarification on how individuals may encourage goal-consistent action, but how individuals inhibit the pursuit of alternatives and cognitively boost the value of alternatives depending on the motivational qualities of goals is less well understood. In terms of the present research, it is predicted that something like counteractive self-control is encouraged by goal inhibitors who help to devalue alternatives and encourage the perceptual difference in value between the goal and the temptation that marks counteractive self-control.

Counteractive control focuses on situations in which individuals are faced with temptations, but there is evidence that individuals with high trait self-control actively avoid being confronted with temptations at all (Ent, Baumeister & Tice, 2015). In a series of studies, Ent and colleagues demonstrate that individuals with high trait self-control act to avoid being exposed to temptations as opposed to battling temptation more effectively in the moment (Ent et al., 2015). The Ent et al findings provide evidence for how others

may effectively boost goal outcomes in the moment, by acting to help goal pursuers avoid challenges, as opposed to overcoming them. This work builds on earlier findings from Hoffmann and colleagues that indicates that people who are high in trait self-control have to resist fewer desires during the day than those low in trait self-control (Hofmann, Baumeister, Förster, & Vohs, 2012). Similarly, a meta-analysis on self-control indicated that self-control capacity appears to affect nonconscious behaviors, like forming good habits, more so than conscious behaviors, like resisting temptation (de Ridder, Lensvelt-Mulders, Finkenauer, Stock, & Baumeister, 2012). These findings indicate that traditional investigations of counteractive self-control may be over focusing on the way that the value of goals is increased as opposed to the way in which temptations are effectively devalued. This work hopes to build on traditional self-control research by looking at situations in which counteraction involving devalued alternatives is more likely to occur (i.e. in situations where a goal defender is physically or cognitively present).

### ***1.3 Relational priming***

As suggested above, significant others that prime inhibition or initiation may be powerful forces within the realm of goal pursuit. Expectations about our interactions with significant others appear to activate a representation of the self in the context of the other, leading one to think and behave in a way that is consistent with that interdependent representation of the self (Baldwin, 1995). Early work by Baldwin and Holmes suggested that individuals may have a “private audience” of internal representations of important

others that judge one's behavior (1987). This private audience, once activated, may cause a person to behave in a way that would be acceptable to the salient significant other (Baldwin & Holmes, 1987). For instance, priming subjects with older family members caused them to experience less joy after reading sexually explicit material than priming subjects with friends (Baldwin & Holmes, 1987). These effects appear to be pronounced for private audiences whose approval is somewhat contingent on one's reaction to the salient stimuli (Baldwin & Holmes, 1987).

Later, this concept was honed into the construct of relational schemas, or internal representations of the various behavior expected from individuals in a given situation as a result of a relationship association. Relational schemas represent normative ways of behaving with close relationships partners, and appear to activate thoughts of how a significant other would view and react to one's actions (Baldwin, 1994; Baldwin, 1997). They are made up of a series of expectations within a given context that have formed due to repeated experience, known as if-then contingencies (Baldwin, 1995). By providing context for relational expectations, they provide scripts for interpersonal interactions with familiar others, and they inform the ways people notice, interpret and recall information (Baldwin, 1992). These schemas can drastically affect self-appraisal when active, activating expectancies about the behavior and reaction of both individuals (Baldwin, 1997). For instance, priming a critical significant other led participants to report an increase in negative affect and self-beliefs (Baldwin, 1994).

In a seminal study, Baldwin and colleagues primed subjects with the disapproving face of significant others, like the department chair for graduate students, and found that self-ratings declined following negative as opposed to positive exposure to a significant other (Baldwin, Carrell, & Lopez, 1990). Using slides, Baldwin and colleagues exposed subjects to a 2ms presentation of a disapproving or approving expression, displayed on a familiar (significant) or unfamiliar face, followed quickly by a mask of multi-colored shapes for 10ms (Baldwin et al., 1990). They viewed a total of four exposures with 5s intervals between exposures and, following this procedure, they brainstormed research ideas they were working on (Baldwin et al., 1990). Following exposure to either the disapproving or approving face, self-ratings of the quality of research ideas either decreased or increased, respectively (Baldwin et al., 1990). Baldwin et al argue that such images of significant others activate relational schemas that alter behavior and thought (1990). Baldwin and Sinclair extended these findings to interpersonal acceptance, finding that low self-esteem participants who were primed with failure were more likely to think in terms of rejection when evaluating words related to interpersonal outcomes (1996).

Such schemas exist for self-concepts and specific roles people may hold, such as job titles, as well as for things like stereotypes about specific ethnic or gender groups (Baldwin, 1992). It seems that simply priming a significant other's name is enough to activate the relational schema and to alter self-evaluation as a result (Baldwin, 1994). Once active, relational schemas can make behavior play out automatically, as relational patterns

repeat and become second nature. Many such patterns have been detected among close relationship partners, including those that stem from attachment styles (Hazan & Shaver, 1987), expression of negative affect (Levenson & Gottman, 1983), communal or exchange norms (Clark & Millis, 1979), or even gender differences, as observed in the demand-withdraw pattern between wives and husbands (Christensen & Heavey, 1990). Relational schemas can become closely tied with goals, such that priming that relationship will lead to the nonconscious activation of goals associated with the relevant individual. And because different individuals are associated with different goal domains, different relational schemas should activate different goal pursuits (Fitzsimons & Bargh, 2003). For instance, in an experiment by Fitzsimons & Bargh, participants were much more likely to report pursuing a goal to make their mothers proud than they were to say they pursued a goal to make friends proud (2003).

There's also evidence that activating cognitive representations associated with interpersonal relationships can alter perceptual processing (Baldwin, Bagust, Docherty, Browman, & Jackson, 2014). Since cross-sex relationships often involve more interdependence than same-sex relationships, subjects were primed with either same or opposite sex relationship partners by visualizing the relationship partner for one minute (Baldwin et al., 2014). They then completed a computerized rod and frame task. Individuals primed with opposite sex partners were more likely to display field dependence, displayed through larger mean absolute error, indicating that

interdependent relationships alter perceptual processing (Baldwin et al., 2014). Priming can also affect the perception of subsequent information. Initial priming with personality traits like “reckless” or “adventurous” colored how participants interpreted stories about ambiguous behavior like skydiving (Higgins, Rholes, & Jones, 1977). When the adventurousness schema was activated, subjects were more likely to like the person described in the story, whereas people with an active schema of recklessness had less warm feelings towards the skydiving man from the story (Higgins et al., 1977). This research suggests that activating concepts of others who are specifically involved with inhibition may activate relational schemas that lead to heightened defense of focal goals against alternatives.

Fitzsimons and Bargh demonstrated that relationship partners can bring interpersonal goals to mind. Further, they found that different relational partners are associated with distinct goals, with mothers, for instance, inspiring a far larger desire to make the partner proud of one’s accomplishments compared to romantic partners (2002). Thinking of a person who activates a relational goal can cause a person to act in seemingly goal relevant ways, even when that individual is not the recipient of the goal relevant action. For instance, Fitzsimons & Bargh found that people who were primed with thoughts of friends as opposed to coworkers activated a helping goal and were more likely to volunteer to participate in a subsequent study even though the context of the helping goal was very different (2002). Priming others can also affect how individuals view others

and interpret their actions, particularly their motives. Fitzsimons and Bargh found that priming a goal-relevant other affected how people evaluated a hypothetical other's goals, and how people made attributions about the situational or dispositional nature of people's behavior (2002). This study demonstrated that relational partners can produce automatic goal actions consistent with the auto-motive model of goal pursuit (Fitzsimons & Bargh, 2002; e.g. Bargh & Gollwitzer, 1994).

Because relational schemas are so powerful, it is no surprise that the chronic attachment orientation created by one's early caretakers continues to influence interpersonal scripts in relationships throughout the lifespan. There is evidence that the if-then contingencies activated by conditional relational schemas are moderated by attachment orientation, with people who have a chronic secure attachment orientation displaying a tendency to activate acceptance as opposed to rejection contingencies, and those with preoccupied attachment orientations displaying the opposite (Baldwin & Meunier, 1999). Baldwin and colleagues also found that priming different kinds of attachment relationships increased attraction for potential romantic partners who displayed a similar attachment style, further suggesting that activating cognitive associations related to interpersonal relationships affects an individual's perception (Baldwin, Keelan, Fehr, Enns, & Koh-Rangarajoo, 1996). Attachment styles not only affect expectations for how relationship partners will respond during interactions, they also color the kind of information that is recalled when thinking about the partner, with people

with insecure or ambivalent attachments more likely to expect and recall more negative partner responses (Baldwin, 1995). This provides additional support for the power of significant others to guide our pursuits by guiding our perception, as explored in the present work.

Individual differences are known to impact vulnerability to relational primes. Women appear to be slightly more vulnerable to social rejection and acceptance primes, displaying more self-criticism in the face of rejection cues and less self-criticism when acceptance is primed (Baldwin, Granzberg, Pippus, & Pritchard, 2003). Men were more likely to show a defensive reaction and actually rally in the face of rejection cues, reporting less self-criticism when primed with rejection (Baldwin et al., 2003). Relational qualities are also likely to influence how one behaves based on the activation of a schema. For instance, if the other is perceived as being too controlling, activating a relational schema may actually cause a person to pursue the opposite goal than the one related to that significant other (Chartrand, Dalton, & Fitzsimons, 2007). People who are low in reactance tend not to display this effect. Instead being more likely to pursue goals in line with the goals that are important to the significant other who has been primed (Chartrand et al., 2007).

Relational priming research further demonstrates that primed others activate cognitive associations that guide later perception, behavior and thought. Due to the potency of relational priming in activating not only individual goal states, but suggesting

a private audience in which accountability is boosted due to the mental presence of critical others, it follows that priming individuals who activate or deactivate cognitive networks related to goal pursuit may lead to more potent effects on goal outcomes than simply priming goals. The current work builds on Baldwin and colleagues' findings by using primed others to explore the differences in individuals who act to defend goals and individuals who are goal irrelevant.

#### ***1.4 Goals and automaticity***

Relational priming sheds light on a motivational phenomenon where other individuals become linked with goal pursuit in such a way that their presence may actually trigger goal processes to proceed automatically. This is partially because people who are associated with goal pursuit can be seen as a means of goal attainment based on cognitive associations and the means that serve them within a goal system (Kruglanski, Shah, Fishbach, Friedman, Chun, & Sleeth-Keppler, 2002). The stronger the association between a given means and the goal that means was meant to attain, the more likely that coming in contact with that means will automatically prime pursuit of the related goal (Shah, 2005). This can be so effective that surrounding oneself with means of goal attainment may actually act to make that goal the focus of one's current attention (Shah, 2005). Due to their close proximity, close others are able to prime goals, and may be particularly accessible if the goal pursuer values the other's opinion (Shah, 2005). In addition, as referenced in the relational priming section, mental construals of others may

be closely related to specific goals, and those goals may bring those related individuals to mind, and vice versa, thoughts of those individuals may bring associated goals to mind (Shah, 2003a).

Not only do significant others prime people with goals associated with those significant others, but Shah produced evidence that may influence goal pursuit based on how important or feasible they see such pursuits (2003a). Interpersonal closeness significantly moderates the strength of other priming, with goals being invoked more strongly for close others than less close others (Shah, 2003a). It also appears that priming the related other increases commitment to the goal (Shah, 2003a). In one study, it was found that goal accessibility is related not only to the other person, but to how much value that person puts on the goal, and the value the other person put on the goal led to an increase in commitment from the goal pursuer (Shah, 2003a). This led to improved performance and increased persistence on the part of goal pursuers (Shah, 2003a). Overall, these studies provided evidence that thoughts of others can activate relevant goal states and also enhance the accessibility of the goal, commitment to the goal and effectiveness of goal pursuit (Shah, 2003a).

In another study, Shah demonstrates that priming a significant other that is associated with not achieving the goal as opposed to achieving it actually leads to inhibition effects, which in turn leads to decreased goal accessibility, as demonstrated by increased reaction times in identifying goal relevant words in a lexical decision task and

decreased goal commitment (Shah, 2003a). These effects are more pronounced for others that the goal pursuer feels closer to (Shah, 2003a). This provides further evidence that individuals may act as goal defenders, because they may be automatically associated with the focal goal to such a degree that priming them activates the inhibition of alternative goals. These studies also provide evidence for the role of others in activating important aspects of volitional states, namely perceptual narrowing and automatic associations that encourage automatic goal pursuit.

#### **1.4.1 Perceptual narrowing**

Perceptual narrowing, a common characteristic of goal states, amplifies the salience of goal relevant information and dampens the environmental salience of goal irrelevant information, rendering it more likely to be ignored. Perceptual narrowing can be exhibited both based on cognitive accessibility, as well as the degree to which goals direct one's attention within one's environment. Developmental psychologists **Plebanek** and Sloutsky developed an embedded shapes task in order to test the emergence of such goal directed attention, something that appears to develop in children between the ages of 4 and 7 (2017). Previous to this period, children attend to information in a distributed state, not demonstrating a preference for goal relevant information and exhibiting similar levels of recall for non-relevant shapes (Plebanek & Sloutsky, 2017). In a clever study using a visual search task, subjects were shown 4 picture arrays with 6 drawings in each array and were instructed to search for a particular dimension within each picture array that

was only contained in one of the six drawings (Plebanek & Sloutsky, 2017). When adults and children were asked to do a recognition task, of course adults displayed goal directed perceptual narrowing by outperforming the children on recognition of the drawings they were told to attend to (the ones with the target dimension; Plebanek & Sloutsky, 2017).

However, children who did not display goal directed perceptual narrowing remembered all drawings equally, demonstrating greater attention for non-relevant targets than adults (Plebanek & Sloutsky, 2017). Though the current research will be conducted with adults, who have long had the skill of goal-induced perceptual narrowing, this paradigm may offer insight into which subjects are more effectively primed to inhibit alternative goals by others. Subjects who are cued with a goal defender who effectively induces a goal state should display perceptual narrowing in a visual search task, while subjects who are not primed with a goal relevant significant other should not display as strong of a perceptual narrowing effect. Those subjects should perform more like the children in the Plebanek and Sloutsky study, not because they haven't developed the skill, but because they have not been successfully induced into an implemental mindset by the significant other.

### ***1.5 Goal pursuit and others***

Automatic goal pursuit appears to be related to the subjective value of the goal, as the more committed one is to the pursuit, the more likely one is to engage in goal shielding or counteractive self-control (Shah, 2003a; Trope & Fishbach, 2000). It is unsurprising that

people are more likely to pursue goals that they view as valuable, partially because valuable goals are more likely to be cognitively accessible than less important ones. Fishbach and colleagues have suggested that focusing on successful progress towards a goal may actually discourage people from engaging in further goal consistent action, and that by focusing on the importance of the ultimate goal in light of their own commitment to achieving it, they are motivated to continue their pursuit (Fishbach, Dhar, & Zhang, 2006).

### **1.5.1 Interpersonal pursuit**

Because we spend much of our lives engaged in goal pursuit with colleagues, friends and family, the process of goal pursuit within groups has been well studied. Psychologists have long known that people will engage in social loafing when they are accomplishing group goals. However, some research suggests that this may be moderated by the level of identification one has with the group (Fishbach, Henderson, & Koo, 2011). In cases in which a group member is highly identified with the group, he or she may actually be motivated to take on more than his or her fair share of work, due to the importance of the shared goal (Fishbach et al., 2011). Conversely, people who are low in group identification are more likely to doubt the importance of group goals, and are less likely to derive extra motivation to accomplish such goals (Fishbach et al., 2011). In this way, people who don't identify highly with the group are focused on the value of the goal, and people who are highly identified with the group are focused on the need for goal

progress, leading to motivation and action (Fishbach et al., 2011). This suggests that the strength of the human goal defender will be an important moderator in the current research.

Because our goals and our interpersonal relationships overlap so much, researchers have unsurprisingly uncovered evidence that individuals who are more instrumental for goals, in the sense that they help to facilitate goal pursuit in a way others cannot, are appreciated more while they are helping to advance goals than when they have completed their assistance (Converse & Fishbach, 2012). In one game show style study, participants rated the person they could use as a “lifeline” as being more appreciated during the task than they did after the game was over and they were no longer necessary for goal accomplishment (Converse & Fishbach, 2012). There is some evidence that thinking about the goals that can be accomplished by a given means can actually decrease the enjoyment of using the means to accomplish the goal, decreasing overall rates of goal pursuit even if intentions to pursue the goal are high (Fishbach & Choi, 2012). But pursuing goals with others may help to avoid these issues, as goal pursuit is often more enjoyable with a co-pursuer (i.e. a workout buddy), and it is less likely that goal pursuit will drop off when one is accountable to another (Fishbach & Choi, 2012). Research has also suggested that just the mere presence of others may cause people to err on the side of control when confronted with temptations that conflict with goals (Hofmann et al., 2012).

Representations of others, and representations of ourselves in the context of our relationships with others, are so strong that they can even color how we view non-significant others through processes like projection and transference. Individuals can project their chronic goals onto others, as demonstrated in research by Kawada and colleagues where, for instance, participants viewed a fictional character's behavior as competitive when they had been primed with a competition goal (Kawada, Oettingen, Gollwitzer, & Bargh, 2004). Transference is a more interpersonal social-cognitive phenomenon where the interpersonal scripts associated with one individual become active and are then transferred to another individual (Glassman & Andersen, 1999a). Researchers have shown that chronic accessibility to cognitive representations of significant others can even alter memory for others similar to significant others when that representation is active (Andersen, Glassman, Chen, & Cole, 1995).

Andersen and Chen suggest that the relational self is evoked when people use interpersonal schemas to guide their social interactions (2002). The relational self arises from specific interpersonal situations, so it will differ depending on the social-cognitive associations invoked (Andersen & Chen, 2002). They argue that the stability of the relational self within a given context depends on the chronic cognitive accessibility of that significant other, suggesting that stable and global influences, like parents or romantic partners, are the most likely to evoke a fairly stable relational self (Andersen & Chen, 2002). The active relational self may spill over into other interactions. When primed with

the concept of a significant other, subjects were more likely to infer that a strange other had similar features (Glassman & Andersen, 1999b). This research indicates just how closely linked individuals are with goal pursuit, and how many aspects of goal pursuit may be automatically affected by others.

Other people can also be detrimental influences in goal pursuit. For instance, when drug users were primed with the names of significant others they associated with drug use, the temptation of engaging in drug use became more appealing based on the participant's pattern of drug use, their relational closeness with the primed other, their level of trait self-regulation and their chronic tendencies to disengage from goals (Leander, Shah, & Chartrand, 2009). People can even reduce effort in their goals by seeing other people successfully pursue the same goals in a phenomenon known as vicarious goal satiation (McCulloch, Fitzsimons, Chua, & Albarracín, 2011). However, if a person is highly committed to their own pursuit, this attenuates the effect (McCulloch et al., 2011). There's also evidence that viewing other people engaged in the same pursuit one is tempted to engage in actually lowers resistance to engaging in the activity, negating the inhibitory function of the mere presence of others (Hofmann et al., 2012). These findings suggest that even though individuals may prime motivational states, their influence varies based on a number of factors.

### **1.5.2 Relational goal dynamics**

Recently, Fitzsimons and colleagues have attempted to create a scientific framework for considering goals within close dyads to emphasize the interdependent nature of all goal pursuit (Fitzsimons et al., 2015). Transactive goal dynamics (TGD) theory suggests that two significant others act as a single self-regulating system, such that the goals and actions of each individual affects the goals and actions of the other individual (Fitzsimons et al., 2015). Within the system, each individual has their own self-centered goals, which are outcomes that they desire to achieve for themselves, partner-centered goals, which are goals one partner would like the other partner to achieve and system-centered goals, which are goals that one partner would like to see achieved by both partners (Fitzsimons et al., 2015). Partners can also hold these goals in parallel, such that they both hold the same goal for themselves to achieve or they both hold the same goal for the other partner to achieve (Fitzsimons et al., 2015). Even though goals may be held by one partner, TGD suggests that all goals within the self-regulating system are interdependent, in the way that one's partner can actively help or hurt the other one's chances of goal success (Fitzsimons et al., 2015). TGD elegantly expresses how influential others are in individual goal pursuit: goal pursuit involves others to such a degree that it may be impossible to divorce even our individual pursuits from our closest relationship partners.

In addition to individuals affecting goal pursuit, goal pursuit can affect relationships with individuals. Past research has demonstrated that goal pursuers feel closer to others who help to advance their goals (i.e., are instrumental), relative to those who are not facilitative for goal pursuit (Fitzsimons & Shah, 2008). Furthermore, this effect appears to be somewhat contingent on the importance of the goal, with instrumental others for important goals eliciting more intense feelings of closeness than those who are related to less focal goals (Fitzsimons & Fishbach, 2010). People who see themselves making tangible progress on goals may actually reduce closeness to instrumental others for those goals, and move closer to others who can help to advance alternative goals, in an act of goal balancing (Fitzsimons & Fishbach, 2010).

Goals can be strongly associated with others who are instrumental for goal pursuit, with evidence that priming a specific goal domain can automatically activate cognitions about instrumental others, as well as evidence that people are more likely to approach others who will help to advance goals. Primes that activate certain motives may lead individuals to seek out others with whom they can pursue the goal even if they were not previously associated with the goal. Indeed, priming participants with sexual imagery made them more likely to attempt to form a close relationship with which to satisfy romantic goals (Gillath, Mikulincer, Birnbaum, & Shaver, 2008).

Even though both relationship partners may operate as a single self-regulating system, that is not to say that both partner's goals are advanced in equal measure. There

is evidence that the relationship partner with lower status is far more likely to be vulnerable to goal contagion, where they adopt and pursue the partner's goal, and to partner goal prioritization, where they put significant work into helping their partners achieve goals (Laurin et al., 2016). One partner may also be doing more of the heavy lifting in the goal pursuit, for instance, if one partner outsources self-control to the other partner. There is a suggestion in the literature that outsourcing self-control to another decreases the amount of self-control one must put into a pursuit, and thus may prevent goal disengagement from depletion (Fitzsimons & Finkel, 2011).

Interestingly, religious people may even outsource self-regulatory needs to God (Laurin, Kay, & Fitzsimons, 2012). It appears that religious imagery may make people less likely to indulge in temptations, but it also reduces their effortful goal pursuit, perhaps because God activates a concept of a predestined future (Laurin, Kay, & Fitzsimons, 2012). It also seems easier to shield goals from the motives of others when the other does not interfere with a participant's fundamental motives. For people who value autonomy and distinctiveness, goal shielding is particularly effective in preventing goal contagion from an interfering other (Leander, Shah, & Chartrand, 2011). Within the context of goal dynamics in the current work, it is expected that close goal defenders will activate inhibition of alternatives in a way that is not expected for less close or goal irrelevant others. The current research focuses on how others may aid in goals individuals hold for themselves.

## **1.6 Current questions and hypotheses**

Research on relational priming has demonstrated that activating thoughts of significant others can change behavior in key ways, for instance, priming a student's academic dean leads to more self-criticism of one's novel ideas (Baldwin et al., 1990). These findings suggest that priming others activates related cognitive schemas that guide people's subsequent behavior. Similarly, previous findings by goal researchers that attest to the importance of others within the context of goal pursuit suggest that activating concepts of a significant other can activate goal states, as well as inhibit alternative goals (Fitzsimons & Bargh, 2003; Shah 2003a). Further, research by Shah indicates that others can nonconsciously act to encourage individuals to both initiate goals and to inhibit goals, and they can also affect how committed goal pursuers feel to their goals, as well as affect how goals are perceived or appraised (2003a; 2003b). This provides further evidence that activating these relationships affects not only goal activation, but the way that goals are evaluated in light of those others (Shah, 2003b). This past work has explored multiple ways in which others may influence goal pursuit.

The current research seeks to further examine the implicit impact of others by considering how others may aid pursuits, not by increasing motivation or commitment, but by helping to shield pursuers from the potential distraction and hindrance of temptation and alternative pursuits. The present research examines the possibility that some close others aid goal pursuit by "standing between" important pursuits and

potential distractions. Priming individuals with goal relevant significant others has been proven to trigger goal initiation and goal consistent behavior, but goal relevant significant others may also act as a protective factor in goal pursuit, protecting the goal from the distractions that may be more perceptually available in the absence of a primed other. Research shows that significant others may be seen as instrumental in helping individuals initiate goal relevant actions (Fitzsimons & Shah, 2008), but scholars have been less clear about how individuals may be influencing behavior. Others may also serve goal pursuit by helping to lessen the need to use trait self-control to block temptations, as they outsource the need for that control to an external source (Fitzsimons & Finkel, 2011).

This provides compelling reasoning that individuals may actually have more self-control available to them, not only because the other may pick up some regulatory slack, but because, for a variety of reasons, the presence of the other increases one's own capacity for self-control, as well as one's willingness to employ it. The presence of others, for instance, may increase accountability (Fishbach & Trope, 2005; Fishbach & Choi, 2012; Hofmann et al., 2012), and disclosing goals to others may increase social pressure to attain them (Seeley & Gardner, 2006). Individuals may also draw confidence from the support of others, which alters their appraisals of their own capacity for self-control, as well as their self-efficacy for goal pursuit (see, for example, Shah, 2003b). Moreover, in reducing the salience of alternatives, significant others may reduce the perceived need for self-control when engaging a goal, preventing individuals from conserving self-control they

know they will need to expend later (as would be consistent with the ego depletion model, see Baumeister, 2002). This may make individuals engage the full strength of their self-regulatory abilities because the other brings out a slightly more capable self-regulator than usual, creating an increase in state self-control.

Four studies were conducted in order to explore the ways in which goal defenders may shield important goals from derailment by acting as a defensive line that stands between one's goals and the alternative pursuits that threaten those goals. The studies seek to establish that priming thoughts of goal defenders may act to protect focal goals from the pursuit of alternatives in various ways, for example, by making alternatives less accessible through perceptual narrowing, or by temporarily increasing one's confidence in one's self-regulatory capacity. Finally, this research seeks to establish that goal defenders may not only act to increase the value of focal goals (an effect that is well demonstrated), but they may also act to decrease the value of the alternative goal or temptation, and that this is particularly true for people already high in inhibition themselves. Trait self-control, as well as its three subscales, and goal commitment will be tested as possible moderators. Summarized as hypotheses, the studies seek to establish that:

H1: Goal defenders can effectively shield an individuals' goals by figuratively standing between an individual's goal and the alternatives that would threaten to

derail it. Such protection may undermine both the salience and value of potential alternatives, and strengthen general perceptions of self-control in the pursuer.

H1A: Goal defenders may shield goals from alternatives by inducing a strong state of perceptual narrowing in the goal pursuer. This perceptual narrowing should be more acute than perceptual narrowing that naturally occurs following goal activation.

H1B: Goal defenders may temporarily increase a goal pursuer's self-regulatory abilities.

H1C: While all goal-relevant others should activate goal states, only individuals associated with inhibition will act to protect goals by devaluing temptations, as opposed to increasing the value of focal goals. This effect should be enhanced for people already high in inhibition.

## **2. Study 1A: Perceptual narrowing and others**

Previous research has shown that goal states encourage perceptual narrowing in goal pursuers, such that people who are actively pursuing goals are more likely to notice goal relevant objects and not notice goal irrelevant objects within the environment. It has been repeatedly demonstrated that others can prime goal pursuit in individuals (Fitzsimons & Bargh, 2003). However, it is less clear if people can cause individuals to display unique perceptual narrowing effects beyond those that should accompany all goal states. To this researcher's knowledge, existing studies have only established that priming goal relevant others may inhibit the cognitive accessibility of goal alternatives, a memory effect, but have not demonstrated that visual perceptual narrowing occurs in response to other priming, a perception effect. Studies 1A and 1B attempt to establish that a goal defender will activate a goal state that elicits more potent perceptual narrowing effects than those invoked by simply priming a goal state, indicating that human goal defenders reduce perceptual noise more than self-induced perceptual narrowing. Studies 1A and 1B differ only in tests of moderating variables, with Study 1A investigating the moderating role of goal commitment, and Study 1B testing the moderating role of trait self-control.

Study 1A attempts to establish that perceptual narrowing has occurred as indicated by the amount of goal-relevant, relative to goal-irrelevant, stimuli remembered after a word cloud task. All participants were primed with health goals, but individuals primed with goal defenders were expected to exhibit stronger perceptual narrowing

effects than goal irrelevant close others. For the word cloud task, participants primed with a human goal defender should remember more goal relevant and fewer goal irrelevant words than control participants due to their narrowed attention. Control participants should experience the perceptual narrowing associated with volitional goal states, but to a lesser extent than those primed with significant others. Study 1A also tested goal commitment as a moderator for this effect, predicting that the perceptual narrowing effect may be stronger for individuals that are highly committed to their goals and consider them important.

## **2.1 Method**

### **2.1.1 Participants**

Three hundred and five adult participants (68.1% women,  $M_{\text{age}}=36.42$ ,  $SD=11.4$ , 78.4% white) living in the United States were recruited from Amazon's Mechanical Turk (mTurk). Participants were compensated with \$0.35 in Amazon credit in exchange for approximately 20 minutes of their time.

### **2.1.2 Procedure**

After the informed consent procedure, participants were asked to spend a few minutes thinking and writing about a health goal (Appendix A). The survey required participants to spend at least 75 seconds on this activity, but they could remain on the page as long as they wanted. Next, participants were asked to briefly write about the main obstacle they faced in attaining their health goal. Then participants were randomly

assigned to provide the name of a person who is close to them, but unrelated to their achievement goal (control condition), or the name of a person who would best help them overcome that obstacle (treatment condition). In order to further activate thoughts of the other the participant nominated, they answered several questions about the nominee in a significant other priming measure adapted from Fitzsimons and Bargh (2003; Appendix A). Those open-ended items included a physical description of the other, defining personality traits of the other, hobbies of the other, likes and dislikes of the other, the story of how they met the other and the last time they had contact with the other.

Participants then completed the significant other priming strength measures to indicate how strongly the person was associated with their goal. These measures reflected the perceived importance of the goal for the significant other they named, how disappointed the person would be if the participant failed to achieve the goal and how pleased the person would be if the participant achieved the goal, as well as how interpersonally close the participant is with the other person (Appendix A). They also completed a few questions about how important the goal was, how committed they were to the goal and how much time they planned to spend on the goal in the coming week (Appendix A). These questions were summed to create the goal commitment measure.

Next, participants saw a word cloud composed of 48 food and clothing words. The word cloud included 16 healthy food words (e.g., spinach, mango), 16 unhealthy food words (e.g., pizza, waffle) and 16 clothing words as a control (e.g., sweater, sandals).

Words of approximately matched length were randomly chosen from compiled lists, and a word cloud program created the word cloud using a random order of the words (Appendix A). The relative size of the words was manipulated in order to maintain equal numbers of words in each font size to avoid issues with word prominence from any single category. This was determined by assigning the same font size for the first X number of words from a particular category in a randomized order (i.e., the first two unhealthy words in the randomized list received the largest font size). Participants were instructed to study the words and told that they would be tested on word recognition after studying the word cloud. Participants had 1 minute to study the word cloud before the experiment auto-advanced to the next screen.

Immediately afterwards, they were presented with a variation of a lexical decision task (also adapted from Shah, 2003a) in which they were asked to identify whether words presented in the middle of the screen were from the word cloud or not. In order to determine whether participants recognized the words in the word cloud or were simply guessing, 24 words were added (8 from each category) that did not appear in the word cloud. In total, participants were asked to determine whether or not 72 different words (Appendix A) appeared in the word cloud: the 48 words from the word cloud, as well as the 24 control words that did not appear in the word cloud. Questions were presented randomly to address order effects.

Finally, participants ended the study by completing the Hong reactance scale (Hong & Fraedda, 1996; Appendix A) and answering generic demographic questions about their age, gender, race, income, occupation and native English speaker status.

## **2.2 Results**

### **2.2.1 Analyses**

In order to explore hypothesis 1A, that goal defenders increase perceptual narrowing, as well as to address a possible moderation effect of goal commitment, hierarchical regressions were conducted that tested individual variables in the first model and added interaction effects in the second model. This allowed us to test the strength of the moderation of goal commitment, as hierarchical regressions provide F change statistics to indicate the value of losing degrees of freedom by adding predictors to the model. All dependent variables in this study are predicted by a hierarchical regression including condition (contrast coded with controls as -1 and treatment participants as 1), goal commitment, and baseline accuracy (this variable changes based on the dependent variable) in model 1 and adding the interaction between condition and goal commitment in model 2. F change statistics are noted to indicate the predictive value of adding the interaction effect to the model.

In addition to graphing interactions at +1/-1 standard deviations, floodlight analyses were conducted to help decompose significant or marginally significant interaction effects. Because there were no hypotheses about specific points at which goal

commitment would moderate the relationship between condition and the dependent variables, floodlight analyses were conducted to determine the Johnson-Neyman points of significance, which indicate the values at which the moderating variable transitions from non-significance to significance (see Spiller, Fitzsimons, Lynch, & McClelland, 2013). Floodlight analyses were conducted with Andrew Hayes's PROCESS macro for SPSS (see Hayes, 2012), and graphs were created using JMP, with the manual addition of significant or marginally significant Johnson-Neyman points as indicated by the PROCESS macro output. For PROCESS, condition was dummy coded with the control condition as 0 and the treatment condition as 1, and all variables except the dependent variables were mean centered. Any interactions included in the PROCESS moderation analyses were computed using mean centered moderating variables and the dummy coded condition variable. It is important to note that analyses here are not exact replicas of the analyses in the main body of the paper due to the limitations of the PROCESS macro and the dummy coding of the condition variable, and the moderation analyses that provided the Johnson-Neyman points are provided in Appendix A. It is also important to note that graphs of moderation effects reflect only the independent, dependent and moderating variables to highlight effects and demonstrate overlap in confidence intervals, and do not account for additional variables that were controlled for in analyses. Unless otherwise noted, the coding of these variables is the same in subsequent analyses.

### 2.2.2 Manipulation checks

A visual examination of the data revealed that two participants provided an achievement goal as opposed to a health goal, and one participant did not provide the name of a goal relevant other. Excluding these three participants from the sample does not significantly affect the results (i.e. findings remain at the same or similar  $p$  values). As such, the following tests are reported excluding these participants. This resulted in a sample of 150 for the control condition and 152 in the treatment condition for a total  $n$  of 302.

T-tests were conducted to determine if there were systematic differences between the participants across conditions. Neither goal commitment scores ( $t(300) = -0.724, p = 0.470$ ) nor reactance scores ( $t(184) = 1.047, p = 0.296$ ) differed significantly between the control and treatment conditions. This suggests that the results cannot be accounted for by the importance of the goal or the level of the participant's commitment, nor can they be accounted for by differences in personal reactance to being primed with another person.

The priming strength of the other person was significantly higher for participants in the treatment condition ( $t(300) = -2.870, p = 0.004$ ), but measures indicating interpersonal closeness and concern about the other's opinion of the participant revealed no significant differences between conditions ( $t(300) = -0.569, p = 0.570$  and  $t(300) = -0.931, p = 0.353$ , respectively). This is to be expected since the other priming strength measures reflect

connections between the other and the health goal, and control participants generated a close other who was unrelated to the health goal. These findings suggest that none of the predictors need to be controlled for in the subsequent analyses. The t-tests are reported in Table 1.

**Table 1: Study 1A independent samples T-Tests**

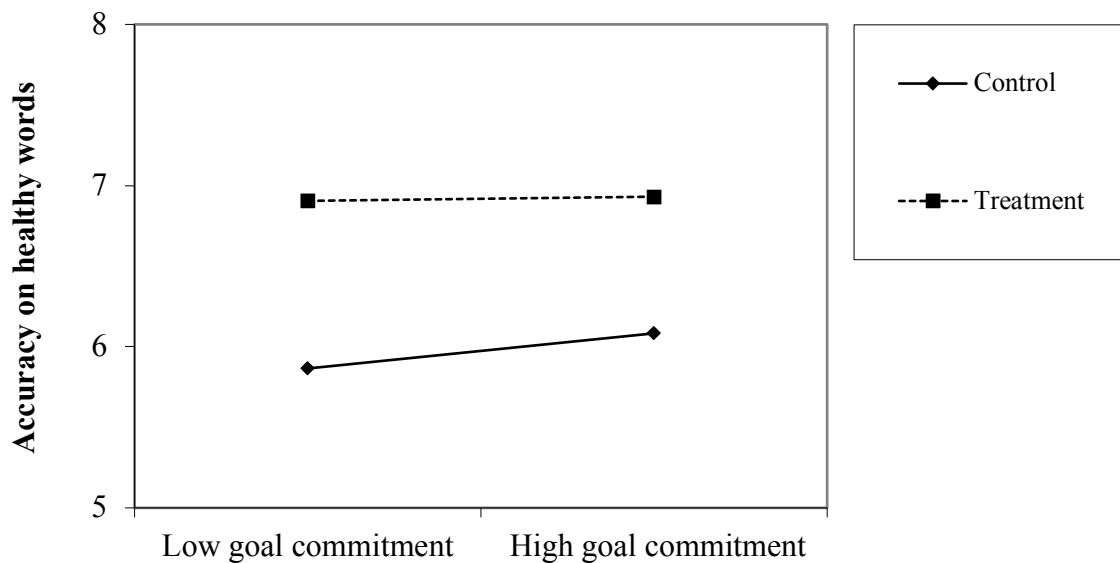
	Condition		<i>t</i>	<i>df</i>	<i>p</i>
	Control <i>M (SD)</i>	Treatment <i>M (SD)</i>			
Other priming strength	26.4 (4.8)	28.2 (5.9)	-2.870	300	0.004
Closeness with other	6.2 (1.1)	6.2 (1.3)	-0.569	300	0.570
Importance of other's opinion	6.2 (1.1)	6.3 (1.2)	-0.931	300	0.353
Reactance	30.6 (6.2)	31.1 (6.3)	1.047	300	0.296
Goal commitment	33.1 (7.1)	32.2 (8.1)	-0.724	300	0.470

**Note: Significant findings marked with asterisk (\*).**

### **2.2.3 Goal relevant word identification accuracy (healthy food words)**

The first of the regression models predicted success on the goal relevant dependent variable – how well did participants remember the words that were the most relevant to their goal pursuit? A hierarchical regression including condition, goal commitment and unhealthy accuracy in the first step ( $F(3,298) = 58.462, p < 0.001, F \text{ Change} = 58.462, p < 0.001$ ), and the interaction between condition and goal commitment in the second step ( $F(4,297) = 45.155, p < 0.001, F \text{ Change} = 1.149, p = 0.285$ ) was significant. The interaction term for condition and goal commitment was not significant, but it was in the logical direction ( $b = -0.048, SE = 0.045; t(297) = -1.072, p = 0.285$ ), suggesting that participants in the treatment condition were performing well at identifying the goal relevant words even when their goal commitment was low, unlike control participants,

who were more likely to remember healthy words when they were high in goal commitment (see Figure 1; Graphs of interactions created according to procedures outlined in Dawson, 2014). This indicates that goal defenders may compensate for a lack of goal commitment during goal pursuit. However, again, this effect did not rise to statistical significance, and neither did the change in  $R^2$  ( $F(4,297) = 1.149, p = 0.285$ ).



**Figure 1: Study 1A non-significant interaction predicting healthy accuracy, controlling for unhealthy accuracy**

There was a simple effect of condition, such that participants in the treatment condition were far more accurate in their identification of healthy words than participants in the control condition ( $b = 0.472, SE = 0.151; t(297) = 3.134, p = 0.002$ ). This supports hypothesis 1A, that goal defenders help to increase the effect of perceptual narrowing. In this case, participants in the treatment condition were obviously more likely to pay

attention to and remember the goal relevant healthy food words. There was no simple effect of goal commitment ( $b = 0.061$ ,  $SE = 0.045$ ;  $t(297) = 1.363$ ,  $p = 0.174$ ). This is interesting and unexpected since goal commitment has traditionally been thought of as one of the major determinants of goal success (Locke & Latham, 2002). See Table 2 for full regression results.

**Table 2: Study 1A moderation of goal word accuracy**

	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i>
DV: Healthy accuracy					
Model 1 (R = 0.609, R <sup>2</sup> = 0.370)					
Condition <sup>1</sup>	0.472	0.151	0.144	3.135	0.002*
Goal commitment <sup>1</sup>	0.066	0.044	0.068	1.485	0.138†
Unhealthy accuracy <sup>1</sup>	0.613	0.048	0.583	12.680	<0.001*
Model 2 (R = 0.611, R <sup>2</sup> = 0.373)					
Condition <sup>2</sup>	0.472	0.151	0.144	3.134	0.002*
Goal commitment <sup>2</sup>	0.061	0.045	0.063	1.363	0.174
Goal commitment * Cond <sup>2</sup>	-0.048	0.045	-0.050	-1.072	0.285
Unhealthy accuracy <sup>2</sup>	0.611	0.048	0.582	12.647	<0.001*

**Note: An asterisk (\*) indicates statistical significance below the  $p = 0.05$  level, a dagger (†) indicates a finding around or below the  $p = 0.15$  level**

#### **2.2.4 Temptation word identification accuracy (unhealthy food words)**

The same regression significantly predicted accuracy in identifying words associated with the alternative goal (step 1  $F(3,298) = 53.809$ ,  $p < 0.001$ ,  $F$  Change = 53.809,  $p < 0.001$ ; step 2  $F(4,297) = 0.052$ ,  $p = 0.820$ ; see Table 3 for regression results).

**Table 3: Study 1A moderation of alternative goal word accuracy**

	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i>
DV: Unhealthy accuracy					
Model 1 (R = 0.593, R <sup>2</sup> = 0.351)					
Condition <sup>1</sup>	-0.203	0.147	-0.065	-1.379	0.169
Goal commitment <sup>1</sup>	-0.049	0.043	-0.053	-1.136	0.257
Healthy accuracy <sup>1</sup>	0.572	0.045	0.601	12.680	<0.001*
Model 2 (R = 0.593, R <sup>2</sup> = 0.351)					
Condition <sup>2</sup>	-0.203	0.148	-0.065	-1.378	0.169
Goal commitment <sup>2</sup>	-0.048	0.043	-0.052	-1.105	0.270
Goal commitment * Cond <sup>2</sup>	0.010	0.043	0.011	0.228	0.820
Healthy accuracy <sup>2</sup>	0.573	0.045	0.602	12.647	<0.001*

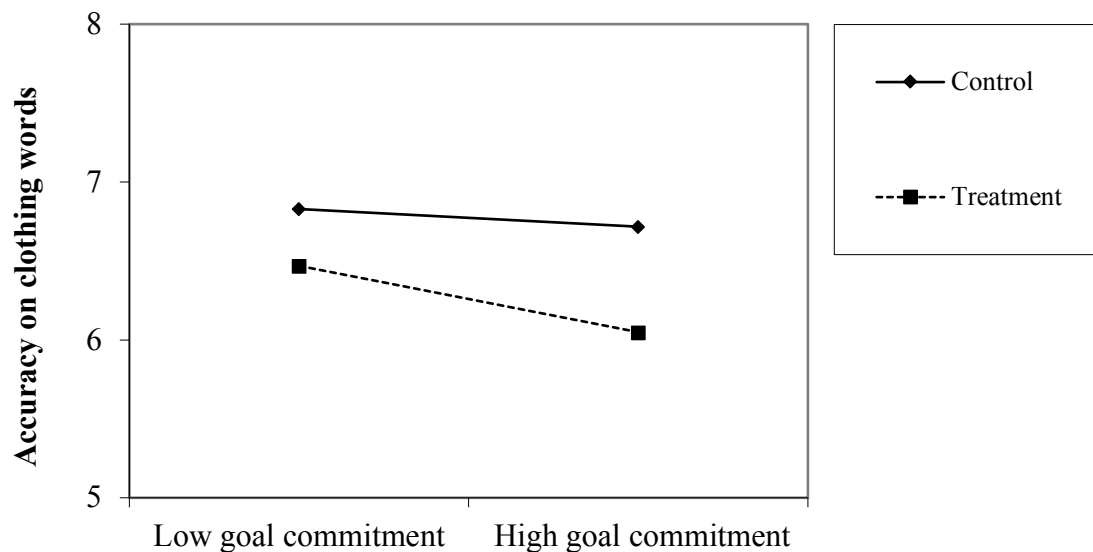
**Note: An asterisk (\*) indicates statistical significance below the  $p = 0.05$  level, a dagger (†) indicates a finding around or below the  $p = 0.15$  level**

However, there is no significant or even moderate interaction effect between condition and goal commitment, suggesting that commitment does not affect attention towards the goal alternative based on condition ( $b = 0.010$ ,  $SE = 0.043$ ;  $t(297) = 0.228$ ,  $p = 0.820$ ). Further, there appears to be no simple effect of goal commitment, though it is in the predicted direction ( $b = -0.048$ ,  $SE = 0.043$ ;  $t(297) = -1.105$ ,  $p = 0.270$ ). The simple effect of condition is approaching marginal and is in the hypothesized direction, suggesting that participants in the treatment condition were somewhat less accurate at identifying unhealthy words than control participants;  $b = -0.203$ ,  $SE = 0.148$ ;  $t(297) = -1.378$ ,  $p = 0.169$ ).

### **2.2.5 Goal irrelevant word identification accuracy (clothing words)**

The same model predicting clothing accuracy was significant ( $F(3,298) = 32.400$ ,  $p < 0.001$ ,  $F$  Change = 32.400,  $p < 0.001$ ; step 2  $F(4,297) = 24.899$ ,  $p < 0.001$ ,  $F$  Change = 2.054,  $p = 0.153$ ), and revealed a marginally significant moderation effect of goal commitment,

such that people in the treatment condition remember fewer goal irrelevant words as their commitment to their goal increases, relative to participants in the control condition who are largely unaffected by goal commitment ( $b = -0.077$ ,  $SE = 0.054$ ;  $t(297) = -1.433$ ,  $p = 0.153$ ; see Figure 2).



**Figure 2: Study 1A marginal interaction predicting clothing accuracy, controlling for healthy accuracy**

There was a simple effect of goal commitment, indicating that people higher in goal commitment were less likely to remember the goal irrelevant (clothing) words than people lower in goal commitment ( $b = -0.133$ ,  $SE = 0.054$ ;  $t(297) = -2.484$ ,  $p = 0.014$ ). There was also a simple effect for condition approaching marginal significance, that trends in the right direction ( $b = -0.257$ ,  $SE = 0.183$ ;  $t(297) = -1.403$ ,  $p = 0.162$ ), suggesting that people in the treatment condition are remembering fewer completely goal irrelevant words. See Table 4 for the full regression results.

**Table 4: Study 1A moderation of goal irrelevant word accuracy**

	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i>
DV: Clothing accuracy					
Model 1 (R = 0.496, R <sup>2</sup> = 0.246)					
Condition <sup>1</sup>	-0.259	0.183	-0.072	-1.413	0.159
Goal commitment <sup>1</sup>	-0.125	0.053	-0.118	-2.346	0.020*
Healthy accuracy <sup>1</sup>	0.544	0.056	0.495	9.696	<0.001*
Model 2 (R = 0.501, R <sup>2</sup> = 0.251)					
Condition <sup>2</sup>	-0.257	0.183	-0.071	-1.403	0.162
Goal commitment <sup>2</sup>	-0.133	0.054	-0.126	-2.484	0.014*
Goal commitment * Cond <sup>2</sup>	-0.077	0.054	-0.073	-1.433	0.153†
Healthy accuracy <sup>2</sup>	0.539	0.056	0.490	9.594	<0.001*

**Note: An asterisk (\*) indicates statistical significance below the  $p = 0.05$  level, a dagger (†) indicates a finding below the  $p = 0.15$  level**

### 2.2.5.1 Floodlight analyses

Floodlight analyses revealed that people in the goal defender condition remembered marginally fewer completely goal irrelevant words than participants in the control condition if goal commitment scores exceeded 16.8 (0.7 points above average), and significantly fewer goal irrelevant words than participants in the control condition when goal commitment scores exceeded 18.4 (2.3 points above average). See figure 3 for an illustration of this effect.

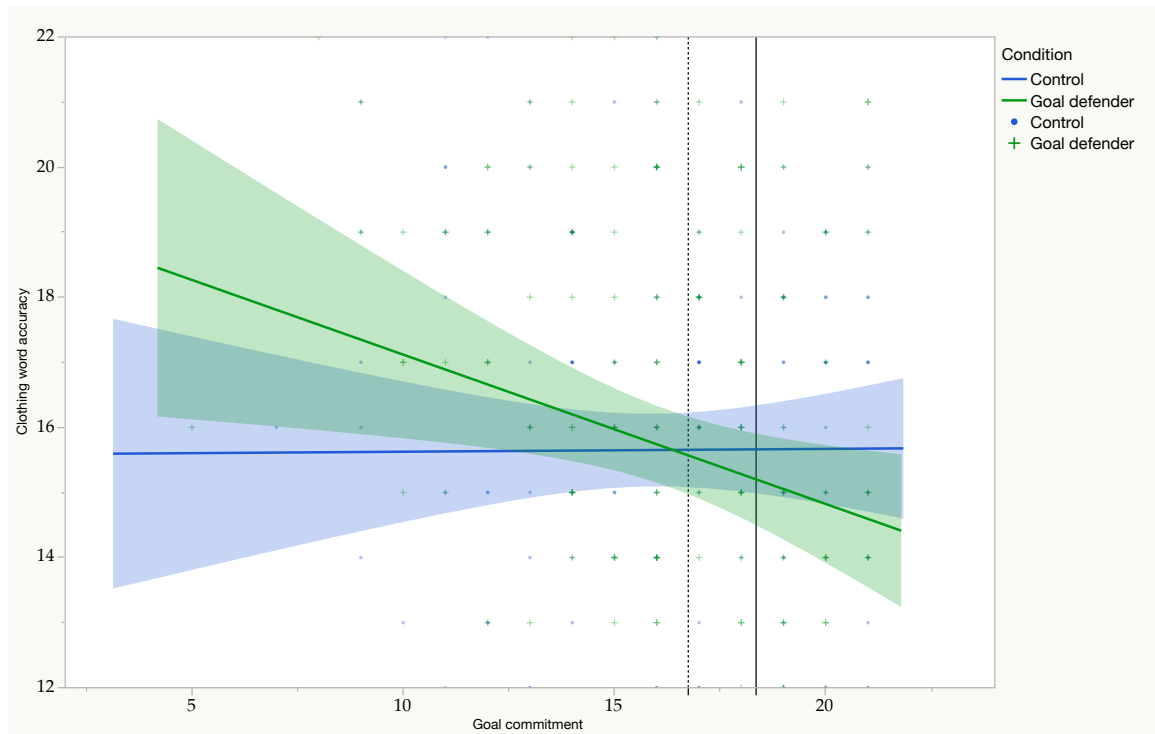


Figure 3: Study 1A clothing word accuracy floodlight

### 2.2.6 Relative dominance of healthy word identification

Even though accuracy scores for unhealthy food word recognition did not differ significantly between groups, participants in the control condition remembered more unhealthy words on average ( $M = 17.25$ ,  $SD = 3.07$ ) than they did healthy words ( $M = 16.50$ ,  $SD = 3.30$ ). This was in contrast to treatment participants, who remembered similar amounts of healthy ( $M = 17.59$ ,  $SD = 3.17$ ) and unhealthy words ( $M = 17.45$ ,  $SD = 3.16$ ). See Table 5 for means and ANOVA results.

**Table 5: Study 1A word identification by condition**

	Condition		<i>F</i> (1, 300)	<i>p</i>	$\eta_p^2$
	Control <i>M</i> ( <i>SD</i> )	Treatment <i>M</i> ( <i>SD</i> )			
Healthy word accuracy	16.5 (3.3)	17.6 (3.2)	8.493	0.004*	0.028
Unhealthy word accuracy	17.2 (3.1)	17.4 (3.2)	0.312	0.577	0.001
Clothing word accuracy	15.7 (3.4)	15.7 (3.8)	0.008	0.929	<.001

**Note: Accuracy scores are sums of how many times participants correctly identified if a word was in the word cloud or not.**

Difference scores were created to reflect the types of words remembered most by subtracting the unhealthy food word accuracy score from the healthy food word accuracy score. The same regression model used to test the other dependent variables significantly predicted difference scores (step 1  $F(3,298) = 3.851, p = 0.010, F$  Change = 3.851,  $p = 0.010$ ; step 2  $F(4,297) = 3.100, p = 0.016, F$  Change = 0.849,  $p = 0.357$ ). However, there was no moderation of goal commitment ( $b = -0.045, SE = 0.049; t(297) = -0.922, p = 0.218$ ), indicating that the relative difference in healthy vs unhealthy words remembered is not moderated by the participant's commitment to the goal.

There was a simple effect of condition, such that participants in the goal defender condition were far more likely to remember healthy words than unhealthy words, compared with the control condition ( $b = 0.434, SE = 0.165; t(297) = 2.625, p = 0.009$ ). However, there was no simple effect of goal commitment ( $b = 0.061, SE = 0.049; t(297) = 1.234, p = 0.218$ ), again demonstrating that goal commitment is not playing a large role in goal success. See Table 6 for full moderation analysis.

**Table 6: Study 1A moderation of difference scores**

	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i>
<b>DV: Healthy Unhealthy Difference</b>					
Model 1 (R = 0.193, R <sup>2</sup> = 0.037)					
Condition <sup>1</sup>	0.434	0.165	0.149	2.627	0.009*
Goal commitment <sup>1</sup>	0.066	0.049	0.077	1.350	0.178
Clothing accuracy <sup>1</sup>	-0.068	0.046	-0.084	-1.471	0.142†
Model 2 (R = 0.200, R <sup>2</sup> = 0.040)					
Condition <sup>2</sup>	0.434	0.165	0.149	2.625	0.009*
Goal commitment <sup>2</sup>	0.061	0.049	0.071	1.234	0.218
Goal commitment * Cond <sup>2</sup>	-0.045	0.049	-0.053	-0.922	0.357
Clothing accuracy <sup>2</sup>	-0.072	0.046	-0.089	-1.559	0.120†

**Note: An asterisk (\*) indicates statistical significance below the  $p = 0.05$  level, a dagger (†) indicates a finding below the  $p = 0.15$  level**

### **2.3 Discussion**

These results indicate that both conditions experienced some degree of perceptual narrowing, such that recognition for both categories of food words was higher than recognition for completely goal irrelevant clothing words. However, in keeping with hypothesis 1A, participants in the treatment condition were most accurate at identifying healthy food words (the most goal relevant words), followed by unhealthy food words (the words associated with the alternative goal) and then completely unrelated words (clothing words). Comparatively, control participants had better recognition for unhealthy words than healthy words, while maintaining a similar performance for control words. This indicates that participants primed with human goal defenders paid relatively less attention to goal irrelevant information in the word cloud, and significantly more attention to goal relevant information (healthy food words) than control participants.

Overall, these results support hypothesis 1A and demonstrate that, in addition to the heightened effects of perceptual narrowing inherent to goal states, participants in the treatment condition are experiencing an enhanced state of perceptual narrowing that centers the most goal relevant information, and participants in the control condition are not downregulating their attention to goal alternatives, as demonstrated by their superior memory for words associated with tempting foods.

Goal commitment appeared to moderate or marginally moderate the relationship between condition and the outcome variables in two ways. First, participants in the treatment condition appeared somewhat more likely to remember healthy food words regardless of goal commitment, while participants in the control condition were more accurate at identifying healthy food words when they were highly committed to their health goal. This suggests that goal defenders may be compensating somehow for low goal commitment and enhancing performance regardless. Goal commitment did appear to matter for participants in the goal defender condition when it came to goal irrelevant clothing words. Goal defender participants were marginally less likely to remember clothing words as their goal commitment increased relative to participants lower in commitment. This suggests that goal characteristics may not matter as much for goal relevant action, but that they may matter for inhibiting goal irrelevant actions.

### **3. Study 1B: Perceptual narrowing and others**

Study 1B was almost identical to study 1A, but it tested trait self-control (and the subscales of trait self-control - inhibition, initiation and continuation) as a moderator for goal defender effectiveness instead of goal commitment. Research indicates that people with high trait self-control achieve their goals more often (Tangney et al., 2004). It is unclear how this effect may interact with the activation of goal relevant others, but I predict that participants who are lower in trait self-control may find goal defenders more helpful for goal attainment than participants already high in trait self-control. Inhibition, a component of self-control involved in stopping oneself from doing things, is expected to be especially important, as individuals high in trait inhibition may experience something of a fit between an other meant to inhibit an alternative and one's own self-control strengths. Other than this one difference, study 1B contains the same measures as study 1A.

#### **3.1 Method**

##### **3.1.1 Participants**

Three hundred and one adult participants (64.5% women,  $M_{\text{age}} = 37.91$ ,  $SD = 13.1$ , 76.4% white) living in the United States were recruited from Amazon's Mechanical Turk (mTurk). Participants were compensated with \$0.35 in Amazon credit in exchange for approximately 20 minutes of their time.

### **3.1.2 Procedure**

The procedure and materials were almost entirely identical to study 1A with one exception. Instead of completing the three-question goal commitment measure, participants completed the Hoyle Davisson self-control Scale (Hoyle & Davisson, 2016; see Appendix A). This scale provides a trait self-control score for each participant, as well as a score for three components of self-control: inhibition, initiation and continuation. Participants completed all other items in the same order as study 1A, with the trait self-control measure placed between the questions about the priming strength of the significant other and the instructions to the word cloud task.

## **3.2 Results**

### **3.2.1 Analyses**

In order to further explore hypothesis 1A, that goal defenders increase perceptual narrowing, as well as to address a possible moderation effect of trait self-control, hierarchical regressions were conducted that tested individual variables in the first model and added interaction effects in the second model. This allowed us to test the strength of the moderation of trait self-control, as hierarchical regressions provide F change statistics to indicate the value of losing degrees of freedom by adding predictors to the model. All dependent variables in this study are predicted by a hierarchical regression including condition, the three subscales of self-control (more details follow), and baseline accuracy (this variable changes based on the dependent variable) in model

1 and adding the three interactions between condition and the subscales of trait self-control in model 2. F change statistics are noted and floodlight analyses are provided.

### **3.2.2 Manipulation checks**

A visual examination of the data revealed that two participants provided an achievement goal as opposed to a health goal, and six participants did not provide the name of a goal relevant other. Excluding these eight participants from the sample does not significantly affect the results (i.e. findings remain at the same or similar p values). As such, the following tests are reported excluding these participants. This resulted in a sample of 148 for the control condition and 145 in the treatment condition for a total n of 293. A visual examination of the data confirmed that each individual in the sample described a health goal they had (most detailing exercise, diet or weight loss goals and a minority wanting to quit smoking or address a chronic health issue) and provided an individual or figure that would help them overcome an obstacle to their goal.

T-tests were conducted to determine if there were systematic differences between the participants across conditions (see Table 7). Neither trait self-control scores ( $t(291) = -1.170, p = 0.243$ ), nor scores for trait inhibition ( $t(291) = -1.353, p = 0.177$ ), trait initiation ( $t(291) = -0.785, p = 0.433$ ) or trait continuation ( $t(291) = -0.920, p = 0.359$ ) differed significantly between conditions. Reactance scores ( $t(291) = 3.000, p = 0.003$ ) did differ between the control and treatment conditions with control participants being more reactive ( $M = 33.44, SD = 7.56$ ) than treatment participants ( $M = 30.44, SD = 7.93$ ). This

shouldn't matter much for the current hypotheses since control participants were primed with goal irrelevant others who should be less likely to raise the hackles of reactive participants. Scores for other priming strength also significantly differed between groups ( $t(291) = -3.401, p = 0.001$ ), but the question indicating interpersonal closeness revealed no significant differences between conditions ( $t(291) = -0.734, p = 0.464$ ). This makes sense since the other priming strength measures reflect connections between the other and the health goal, and control participants generated an other who is unrelated to the health goal. Unlike in study 1A, participants in the treatment condition cared significantly more about what the other thought of them ( $M = 6.44, SD = 1.08$ ) than those in the control condition ( $M = 6.11, SD = 1.38; t(291) = -2.299, p = 0.022$ ). This may be due to the significant differences in reactance among the groups, as reactive people are less likely to say they care about what others think. These findings suggest that the results cannot be accounted for by relative closeness with the individual nominated, nor can they be accounted for by differences in trait self-control. Reactance was controlled for in the study 1B analyses to control for systematic differences in reactance across condition.

**Table 7: Study 1B independent samples T-Tests**

	Condition		<i>t</i>	<i>df</i>	<i>p</i>
	Control <i>M (SD)</i>	Treatment <i>M (SD)</i>			
Other priming strength	26.0 (6.4)	28.4 (5.5)	-3.401	291	0.001*
Closeness with other	6.1 (1.3)	6.2 (1.4)	-0.734	291	0.464
Importance of other's opinion	6.1 (1.4)	6.4 (1.1)	-2.299	291	0.022*
Reactance	33.7 (7.9)	30.7 (7.9)	3.000	291	0.003*
Trait self-control	67.3 (13.4)	69.2 (14.2)	-1.170	291	0.243
Trait inhibition	22.1 (5.0)	22.9 (4.9)	-1.353	291	0.177
Trait initiation	21.9 (6.5)	22.5 (6.5)	-0.785	291	0.433
Trait continuation	20.3 (3.8)	20.7 (4.2)	-0.919	291	0.359

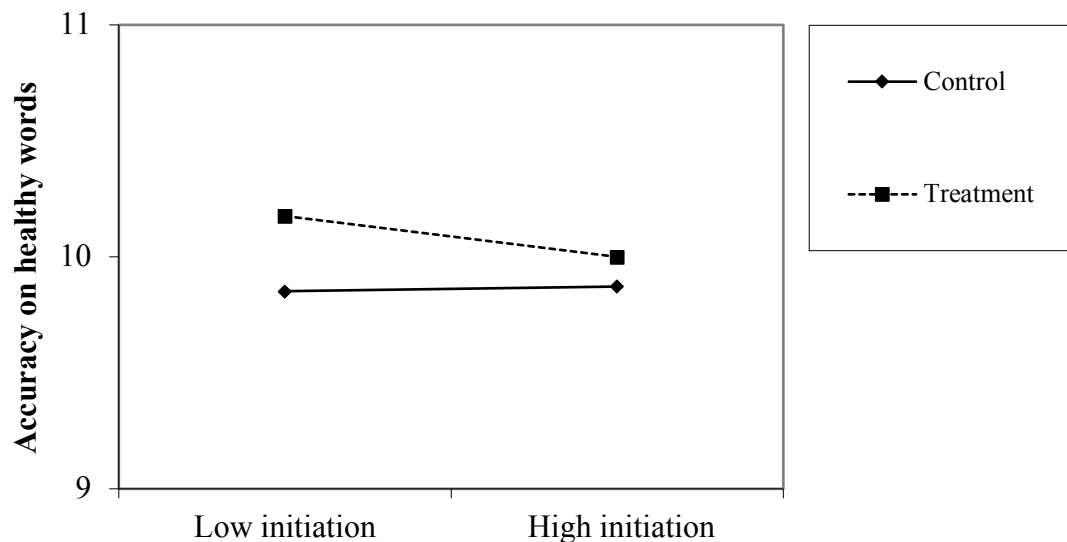
**Note: Significant findings marked with asterisk (\*).**

### **3.2.3 Goal relevant word identification accuracy (healthy food words)**

In order to explore the main effects of condition and the moderating effects of trait self-control on the dependent variables, each variable (healthy food word identification, unhealthy food word identification, clothing word identification and difference scores between healthy and unhealthy food word identification) was predicted from a hierarchical regression including condition, the three subscales of trait self-control, reactance and non-relevant word accuracy in the first step and including the interactions between condition and each of the three subscales of trait self-control in the second step. The original regressions exploring the role of trait self-control as a moderator used the overall measure of trait self-control as opposed to all to the individual subscales and their interaction terms and revealed attenuated moderation effects. This was surprising, so the same regressions were run using the three subscales for self-control and their interactions with condition in lieu of the overall trait self-control score and its interaction with

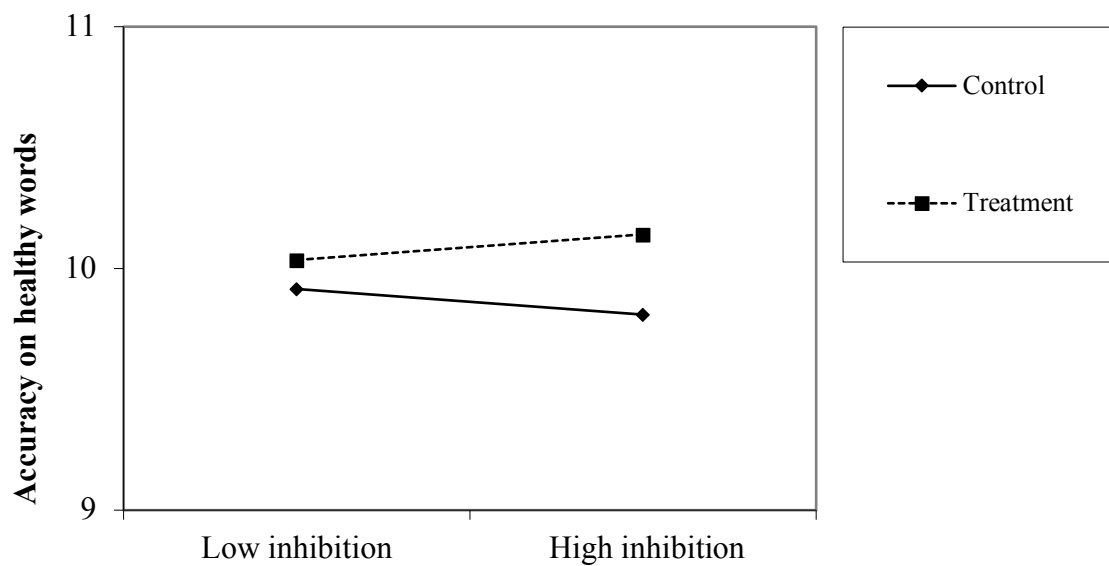
condition. For simplicity's sake, the regressions included here focus on the three subscales, but the moderation tests for the overall self-control measure can be found in Appendix A.

The first regression model significantly predicted accuracy in identifying healthy words (step 1  $F(6,286) = 13.194, p < 0.001, F \text{ Change } 19.139, p < 0.001$ ; step 2  $F(9,283) = 13.194, p < 0.001, F \text{ Change } = 1.217, p = 0.304$ ). None of the moderation effects rose to significance, but the interaction between trait initiation and condition was marginally significant ( $b = -0.049, SE = 0.032; t(283) = -1.535, p = 0.126$ ), and indicated that people who are in the goal defender condition are marginally less accurate at identifying healthy words if trait initiation is high, compared to goal defender participants low in trait initiation. See Figure 3.



**Figure 4: Study 1B marginal interaction predicting healthy accuracy, controlling for unhealthy word accuracy and reactance**

This is unexpected, but predictions largely centered around trait inhibition. The interaction between trait inhibition and condition was approaching marginal significance, and trended in the expected direction, with people in the treatment condition high in trait inhibition remembering more healthy food words than treatment participants lower in trait inhibition ( $b = 0.053$ ,  $SE = 0.040$ ;  $t(283) = 1.322$ ,  $p = 0.187$ ; see Figure 4). This effect was reversed for participants in the control condition, with control participants high in trait inhibition remembering the fewest healthy words.



**Figure 5: Study 1B non-significant interaction predicting healthy accuracy, controlling for unhealthy word accuracy and reactance**

There were no simple effects for condition ( $b = 0.113$ ,  $SE = 0.151$ ;  $t(283) = -0.746$ ,  $p = 0.457$ ), or any of the subscales of trait self-control (all  $ps > 0.2$ ; see Table 8).

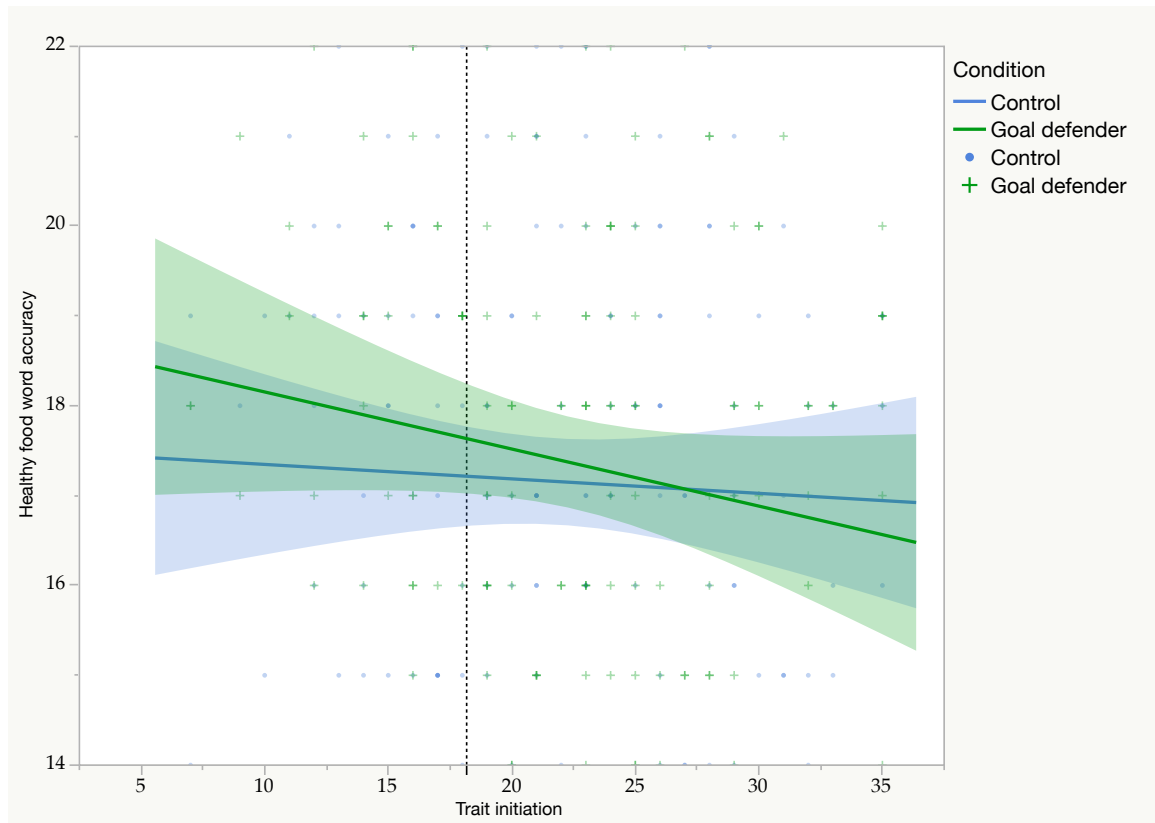
**Table 8: Study 1B moderation of goal word accuracy**

	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i>
DV: Healthy accuracy					
Model 1 (R = 0.535, R <sup>2</sup> = 0.286)					
Condition <sup>1</sup>	0.117	0.151	0.039	0.776	0.439
Trait inhibition <sup>1</sup>	-0.007	0.040	-0.011	-0.171	0.864
Trait initiation <sup>1</sup>	-0.033	0.032	-0.072	-1.022	0.308
Trait continuation <sup>1</sup>	0.037	0.057	0.049	0.643	0.520
Unhealthy accuracy <sup>1</sup>	0.479	0.050	0.503	9.680	<0.001*
Reactance <sup>1</sup>	-0.033	0.021	-0.086	-1.585	0.114†
Model 2 (R = 0.544, R <sup>2</sup> = 0.296)					
Condition <sup>2</sup>	0.113	0.151	0.038	0.746	0.457
Trait inhibition <sup>2</sup>	<0.001	0.041	<0.001	0.003	0.997
Trait initiation <sup>2</sup>	-0.039	0.033	-0.085	-1.194	0.234
Trait continuation <sup>2</sup>	0.036	0.057	0.049	0.638	0.524
Trait inhibition * Cond <sup>2</sup>	0.053	0.040	0.088	1.322	0.187
Trait initiation * Cond <sup>2</sup>	-0.049	0.032	-0.107	-1.535	0.126†
Trait continuation * Cond <sup>2</sup>	0.028	0.057	0.038	0.494	0.622
Unhealthy accuracy <sup>2</sup>	0.485	0.050	0.509	9.759	<0.001*
Reactance <sup>2</sup>	-0.035	0.021	-0.093	-1.698	0.091†

**Note: An asterisk (\*) indicates statistical significance below the  $p = 0.05$  level, a dagger (†) indicates a finding below the  $p = 0.15$  level**

### 3.2.3.1 Floodlight analyses

A floodlight analysis revealed that people in the goal defender condition remembered marginally more healthy food words than participants in the control condition when trait initiation scores were 18.2 or below (4.0 points below average). See figure 2 for an illustration of this marginally significant effect.

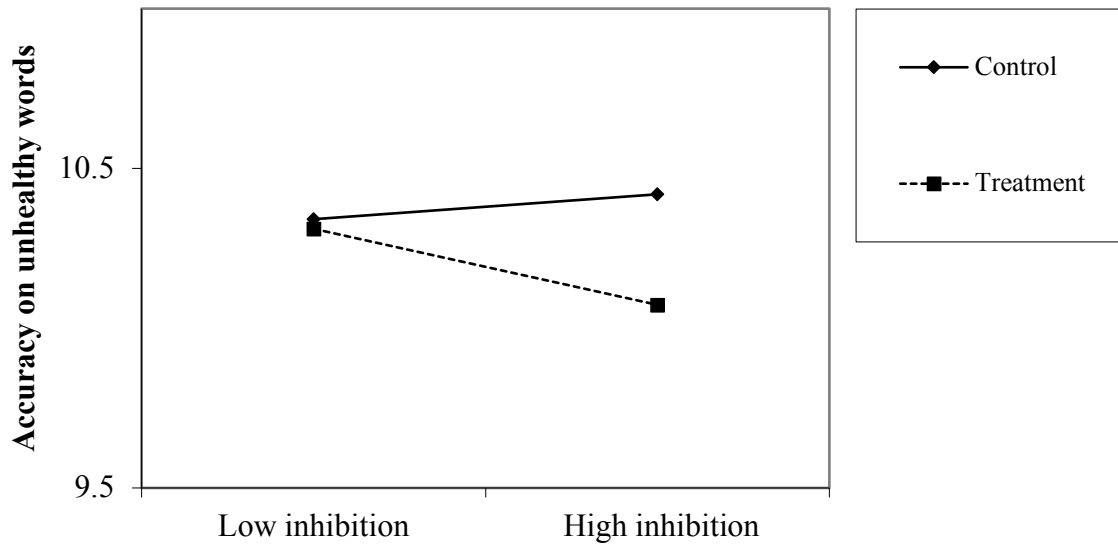


**Figure 6: Study 1B healthy accuracy floodlight**

### **3.2.4 Temptation word identification accuracy (unhealthy food words)**

The same model predicting accuracy on unhealthy food word identification and controlling for healthy word accuracy was significant (step 1  $F(6,286) = 20.702, p < 0.001, F$  Change = 20.702,  $p < 0.001$ ; step 2  $F(9,283) = 14.480, p < 0.001, F$  Change = 1.722,  $p = 0.163$ ). Most importantly, there was a marginally significant interaction between trait inhibition and condition, such that participants in the treatment condition were less likely to remember unhealthy food words if they were high in inhibition, but not low ( $b = -0.079, SE = 0.042; t(283) = -1.902, p = 0.058$ ). There was essentially no moderation effect for participants in the treatment condition low in trait inhibition, who were indistinguishable

from control participants with low trait inhibition. This suggests that people who are primed with goal defenders are more likely to see an increase in their ability to inhibit temptation related words as their trait level inhibitory capacity increases (see Figure 5).



**Figure 7: Study 1B marginal interaction predicting unhealthy accuracy, controlling for healthy accuracy and reactance**

There were no simple effects of theoretical importance, with all of the subscales of trait self-control failing to reach significance (all  $ps > 0.4$ ), and no simple effect of condition (although it does trend in the hypothesized direction). See Table 9 for the complete regression results.

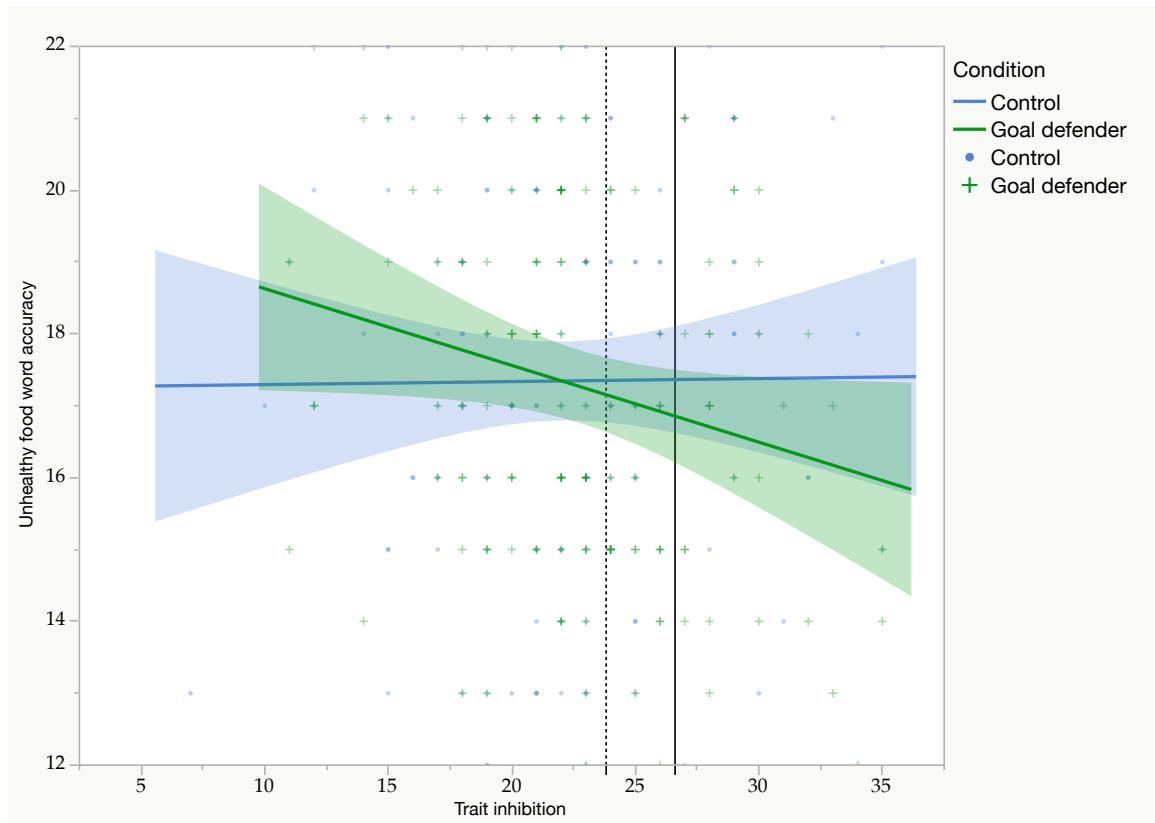
**Table 9: Study 1B moderation of alternative goal word accuracy**

	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i>
<b>DV: Unhealthy accuracy</b>					
<b>Model 1 (R = 0.550, R<sup>2</sup> = 0.303)</b>					
Condition <sup>1</sup>	-0.099	0.157	-0.032	-0.629	0.530
Trait inhibition <sup>1</sup>	-0.032	0.042	-0.051	-0.763	0.446
Trait initiation <sup>1</sup>	-0.037	0.034	-0.077	-1.100	0.272
Trait continuation <sup>1</sup>	-0.014	0.059	-0.018	-0.240	0.810
Healthy accuracy <sup>1</sup>	0.515	0.053	0.491	9.680	<0.001*
Reactance <sup>1</sup>	-0.060	0.021	-0.150	-2.806	0.005*
<b>Model 2 (R = 0.562, R<sup>2</sup> = 0.315)</b>					
Condition <sup>2</sup>	-0.094	0.156	-0.030	-0.601	0.548
Trait inhibition <sup>2</sup>	-0.040	0.042	0.042	-0.965	0.336
Trait initiation <sup>2</sup>	-0.032	0.034	-0.065	-0.935	0.351
Trait continuation <sup>2</sup>	-0.011	0.059	-0.014	-0.179	0.858
Trait inhibition * Cond <sup>2</sup>	-0.079	0.042	-0.125	-1.902	0.058†
Trait initiation * Cond <sup>2</sup>	0.027	0.033	0.057	0.823	0.411
Trait continuation * Cond <sup>2</sup>	-0.012	0.059	-0.016	-0.208	0.835
Healthy accuracy <sup>2</sup>	0.519	0.053	0.495	9.759	<0.001*
Reactance <sup>2</sup>	-0.057	0.021	-0.142	-2.654	0.008*

**Note: An asterisk (\*) indicates statistical significance below the  $p = 0.05$  level, a dagger (†) indicates a finding below the  $p = 0.15$  level**

### 3.2.3.1 Floodlight analyses

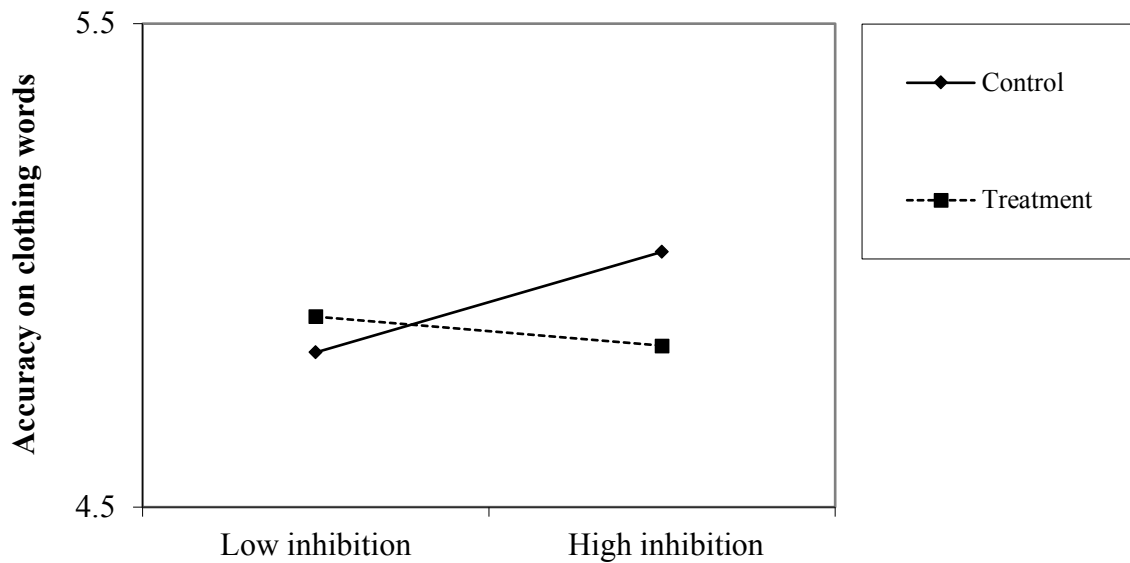
This analysis showed that people in the goal defender condition remembered marginally fewer unhealthy food words than participants in the control condition when trait inhibition scores were 23.8 (1.3 points above average) or above, coming close to or meeting statistical significance (p values for spotlight tests above this point range from 0.05-0.06) at 26.6 (4.1 points above average) or above.



**Figure 8: Study 1B unhealthy word floodlight**

### **3.2.5 Goal irrelevant word identification accuracy (clothing words)**

The same regression predicting goal irrelevant clothing words, controlling for identification of goal relevant healthy food words and reactance was significant (step 1  $F(6,286) = 17.825, p < 0.001, F \text{ Change} = 17.825, p < 0.001$ ; step 2  $F(9,283) = 12.143, p < 0.001, F \text{ Change} = 0.838, p = 0.474$ ). There was a single interaction effect between trait inhibition and condition that approached marginal that suggested that participants in the treatment condition inhibited clothing words more as trait level trait inhibition scores increased ( $b = -0.067, SE = 0.051; t(283) = -1.325, p = 0.186$ ; see Figure 6.).



**Figure 9: Study 1B non-significant interaction predicting goal irrelevant accuracy, controlling for healthy accuracy and reactance**

This means that, for participants high in trait inhibition, being primed with a goal defender helped them to inhibit relatively more goal irrelevant words relative to controls. There was also a marginal main effect of trait initiation, indicating that participants were less likely to remember goal irrelevant words as trait initiation scores increased ( $b = -0.061$ ,  $SE = 0.041$ ;  $t(283) = -1.488$ ,  $p = 0.138$ ). See Table 10 for full regression results.

**Table 10: Study 1B moderation of goal irrelevant word accuracy**

	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i>
DV: Clothing accuracy					
Model 1 (R = 0.522, R <sup>2</sup> = 0.257)					
Condition <sup>1</sup>	-0.034	0.191	-0.009	-0.180	0.858
Trait inhibition <sup>1</sup>	0.044	0.051	0.059	0.872	0.384
Trait initiation <sup>1</sup>	-0.067	0.041	-0.118	-1.649	0.100†
Trait continuation <sup>1</sup>	0.017	0.072	0.019	0.241	0.810
Healthy accuracy <sup>1</sup>	0.631	0.065	0.506	9.765	<0.001*
Reactance <sup>1</sup>	-0.003	0.026	-0.006	-0.106	0.916
Model 2 (R = 0.279, R <sup>2</sup> = 0.256)					
Condition <sup>1</sup>	-0.030	0.191	-0.008	-0.155	0.877
Trait inhibition <sup>1</sup>	0.037	0.051	0.049	0.725	0.469
Trait initiation <sup>1</sup>	-0.061	0.041	-0.107	-1.488	0.138†
Trait continuation <sup>1</sup>	0.018	0.072	0.020	0.253	0.800
Trait inhibition * Cond <sup>1</sup>	-0.067	0.051	-0.089	-1.325	0.186
Trait initiation * Cond <sup>1</sup>	0.038	0.041	0.066	0.928	0.354
Trait continuation * Cond <sup>1</sup>	-0.013	0.072	-0.014	-0.185	0.853
Healthy accuracy <sup>1</sup>	0.636	0.065	0.510	9.806	<0.001*
Reactance <sup>1</sup>	0.001	0.026	0.001	0.026	0.979

**Note: An asterisk (\*) indicates statistical significance below the  $p = 0.05$  level, a dagger (†) indicates a finding below the  $p = 0.15$  level**

### 3.2.6 Relative dominance of healthy word identification

There were no significant differences between the control condition and the treatment condition on identification of healthy words, unhealthy words or clothing words (see Table 11), unlike in study 1A. However, a similar pattern of word identification emerged where control participants were more likely to accurately identify unhealthy words than healthy words, and participants in the treatment condition were similarly accurate at identifying healthy and unhealthy words. These results, while not significant, are in line with both the findings of study 1A and hypothesis 1A.

Even though accuracy scores for unhealthy food word recognition did not differ significantly between groups, participants in the control condition accurately recognized more unhealthy words on average ( $M = 17.38$ ,  $SD = 3.35$ ) than they did healthy words ( $M = 17.14$ ,  $SD = 2.98$ ). This was in contrast to participants in the goal defender condition, who remembered similar amounts of healthy ( $M = 17.50$ ,  $SD = 2.99$ ) and unhealthy words ( $M = 17.48$ ,  $SD = 2.91$ ).

**Table 11: Study 1B word identification by condition**

	Condition		<i>F</i> (1, 291)	<i>p</i>	$\eta_p^2$
	Control <i>M</i> ( <i>SD</i> )	Treatment <i>M</i> ( <i>SD</i> )			
Healthy word accuracy	17.1 (3.0)	17.5 (3.0)	1.073	0.301	0.004
Unhealthy word accuracy	17.4 (3.3)	17.5 (2.9)	0.071	0.790	<.001
Clothing word accuracy	15.8 (3.8)	16.0 (3.7)	0.150	0.699	0.001

**Note: Accuracy scores are sums of how many times participants correctly identified if a word was in the word cloud or not.**

Difference scores were computed to reflect the relative dominance of identifying healthy as opposed to unhealthy words, and used as the dependent variable in the same regression model. Neither the overall models (step 1  $F(6,286) = 0.513$ ,  $p = 0.865$ ,  $F$  Change = 0.526,  $p = 0.788$ ; step 2  $F(9,283) = 0.513$ ,  $p = 0.865$ ,  $F$  Change = 0.491,  $p = 0.688$ ), nor any of the predictors rose to significance or marginal significance (see Table 12).

**Table 12: Study 1B moderation of difference scores**

	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i>
DV: Healthy unhealthy diff					
Model 1 (R = 0.104, R <sup>2</sup> = 0.011)					
Condition <sup>1</sup>	0.155	0.177	0.052	0.877	0.381
Trait inhibition <sup>1</sup>	0.003	0.047	0.005	0.068	0.946
Trait initiation <sup>1</sup>	-0.002	0.038	-0.005	-0.065	0.948
Trait continuation <sup>1</sup>	0.044	0.066	0.059	0.659	0.511
Clothing accuracy <sup>1</sup>	-0.030	0.048	-0.038	-0.636	0.525
Reactance <sup>1</sup>	0.027	0.024	0.071	1.137	0.256
Model 2 (R = 0.127, R <sup>2</sup> = 0.016)					
Condition <sup>2</sup>	0.153	0.178	0.052	0.864	0.388
Trait inhibition <sup>2</sup>	0.007	0.048	0.011	0.140	0.889
Trait initiation <sup>2</sup>	-0.003	0.038	-0.006	-0.076	0.939
Trait continuation <sup>2</sup>	0.041	0.067	0.056	0.615	0.539
Trait inhibition * Cond <sup>2</sup>	0.045	0.047	0.075	0.957	0.340
Trait initiation * Cond <sup>2</sup>	0.011	0.038	0.024	0.297	0.767
Trait continuation * Cond <sup>2</sup>	-0.023	0.067	-0.031	-0.341	0.734
Clothing accuracy <sup>2</sup>	-0.027	0.048	-0.034	-0.562	0.575
Reactance <sup>2</sup>	0.026	0.024	0.070	1.104	0.271

**Note: An asterisk (\*) indicates statistical significance below the  $p = 0.05$  level, a dagger (†) indicates a finding below the  $p = 0.15$  level**

Even though the goal defender condition was not as strong in producing strong mean differences between the two conditions, they trend in the same direction as study 1A.

### **3.3 Discussion**

Similarly to study 1A, these results indicate that both conditions experienced some degree of perceptual narrowing, such that recognition for both categories of food words was higher than recognition for clothing words. Also similarly to study 1A, participants in the treatment condition were somewhat more accurate at identifying healthy food

words (the most goal relevant words), followed by unhealthy food words (words related to the alternative goal) and then by clothing words (words completely unrelated to health). Comparatively, control participants had somewhat better recognition for unhealthy words than healthy words, with their accuracy for clothing words being similar to treatment participants. Even though these main effects were not significant, they were in the same direction as the results of study 1A. This indicates that participants primed with human goal defenders paid relatively less attention to goal irrelevant information in the word cloud, and relatively more attention to goal relevant information (i.e., healthy food words). At the same time, participants primed with goal irrelevant others seemed to pay somewhat more attention to words that directly threatened the health goal (i.e., unhealthy food words) than they did to the goal relevant healthy food words. Overall, these results support hypothesis 1A and demonstrate that, in addition to heightened effects of perceptual narrowing inherent to goal states, participants in the treatment condition are experiencing at least a slightly enhanced state of perceptual narrowing that encourages them to focus attention most on goal relevant information, and participants in the control condition are not downregulating their attention to goal alternatives (i.e., unhealthy food words) relative to goal relevant healthy food words.

This effect appears to be enhanced for treatment participants who have high trait inhibition, as participants primed with human goal defenders that are high in inhibition were less likely to remember unhealthy food words that threatened their health goals than

treatment participants with lower trait inhibition. This effect is predictable, but in the opposite direction as predicted, suggesting that trait level capacity for inhibition may increase to the effectiveness of human goal defenders more for people already high in trait self-control as opposed to compensated for low self-control. It appears that the interaction between trait inhibition and condition also approached marginal significance in the same direction for healthy food words and clothing words as well, with treatment participants remembering relatively more healthy food words and relatively fewer unhealthy food and clothing words as trait inhibition increases. This indicates that trait level inhibitory capacity may indeed moderate the effectiveness of human goal defenders, such that people high in trait inhibition see a boost from goal defenders in both perceptual narrowing and inhibiting alternatives. This appears to be somewhat less effective for treatment participants lower in trait inhibition.

Overall, these results are in line with the results from study 1A, support hypothesis 1A and provide initial evidence for the role of fit between trait level regulatory capacity and the type of other a person is primed with (a goal defender or a goal irrelevant other). In this case, priming a goal defender appears to be enhanced when the person is already high in inhibition.

## 4. Study 2

Findings from studies 1A and 1B indicated that people primed with a goal defender likely did experience a heightened form of perceptual narrowing relative to participants in the control condition, as demonstrated by their heightened recognition of goal relevant words. The fact that control participants are more likely to remember tempting food words relative to healthy food words, and that treatment participants are slightly more likely to remember healthy as opposed to unhealthy good words, indicates that people primed with goal defenders may be relatively less attentive to goal irrelevant as opposed to goal relevant information. However, studies 1A and 1B measured participant performance on a relatively contrived task, studying words in a word cloud, as opposed to actual goal pursuit. This helps us to understand how a person's attention may be affected by the mental presence of a goal defender, but it does not shed light on how that presence may affect actual goal-directed action. The purpose of study 2 was to address the role of goal defenders in the context of real goal-directed behavior through the use of a taste test task in the lab and to address hypothesis 1B, that goal defenders temporarily increase self-control resources.

## **4.1 Study 2 pretest**

### **4.1.1 Method**

#### **4.1.1.1 Participants**

Two hundred and five participants completed the study 2 pretest as part of a larger study on achievement goals. Each rating was made by at least two hundred and two participants.

#### **4.1.1.2 Procedure**

After completing another survey, participants were asked to rate the healthiness of thirty-one snack sized foods (one food, Fruit Crisps, was listed in two ways due to unfamiliarity with the brand name, so the thirty-one ratings represent thirty unique foods). Each food was rated on a scale of *1-Not at all* to *7-Very*.

### **4.1.2 Results**

The items were ordered by healthiness ratings to determine the healthiest and the least healthy items (see Appendix B). Then, we narrowed down the items due to practical concerns. Even though baby carrots topped the list with the highest healthiness rating ( $M = 6.42$ ,  $SD = 1.157$ ), concerns about refrigeration and shelf life were paramount. Similarly, almonds were viewed as very healthy ( $M = 6.27$ ,  $SD = 1.053$ ), but the seriousness of nut allergies led us away from using nuts as a possible food. Vegetable chips ( $M = 5.07$ ,  $SD = 1.601$ ) were seen as too similar to Fruit Crisps, a brand of freeze-dried fruit that seemed to be a more appealing option. In the end, this left us with Fruit Crisps (rated as both freeze-

dried fruit,  $M = 5.47$ ,  $SD = 1.405$ , and Fruit Crisps,  $M = 4.78$ ,  $SD = 1.896$ , due to unfamiliarity with this product name), granola ( $M = 5.14$ ,  $SD = 1.456$ ) and rice cakes ( $M = 5.05$ ,  $SD = 1.601$ ) as the healthy items.

For unhealthy items, the third and fourth least healthy foods, Jolly Ranchers ( $M = 3.07$ ,  $SD = 2.066$ ) and Gobstoppers ( $M = 3.07$ ,  $SD = 2.208$ ) respectively, were eliminated from the list of possible items due to the time it takes to consume these foods, and instead the remaining three least healthy foods were chosen: Skittles ( $M = 3.01$ ,  $SD = 2.131$ ), gummy bears ( $M = 3.06$ ,  $SD = 2.055$ ) and Starburst chews ( $M = 3.08$ ,  $SD = 2.140$ ). It is notable that participants did not see chocolate candies like M & M's as being as unhealthy as fruit-flavored candies, with M & M's (the 9<sup>th</sup> least healthy food) being rated as the least healthy of the chocolate candies ( $M = 3.24$ ,  $SD = 2.146$ ). Means and standard deviations for all foods are provided in Appendix B.

## **4.2 Study 2 method**

### **4.2.1 Participants**

One hundred and seventy-three student participants (59.9% women,  $M_{\text{age}} = 19.04$ ,  $SD = 1.24$ , 45.3% white) from a private university in the Southeastern United States were recruited from an undergraduate student research pool in exchange for one hour of class credit. The recruitment advertisement asked all students to not eat for two hours before the study, and specifically asked students with food allergies and food restrictions to not sign up for the study. Only one student with a food allergy completed the survey. That

individual was allergic to an ingredient in one of the food items so they were unable to answer questions about that food item. Since the food the participant could not consume was one of the healthy foods, this missing data does not affect the analyses in the present research.

#### **4.2.2 Procedure**

Participants completed the study in a private laboratory space in a single session. After signing a consent form, participants were told that they were participating in three different studies over the course of the session in order to decrease suspicion about the study design. First, participants were asked to list an intention to pursue a health goal that they were currently concerned with, but that they had not yet achieved. Then, participants provided the name of two individuals, one who helped them increase their self-control and one who helped them increase their self-esteem. Then, participants were randomly assigned to either the control or the treatment condition and asked to provide more information about the person that increases their self-esteem (control) or the person that increases their self-control (treatment). Participants were asked to answer the questions from the other priming strength measure from studies 1A and 1B (see Appendix A), including how close the participant feels to the person, how important the participant feels their goal is to the other person, how disappointed the person would be if the participant failed to achieve the goal, how much they care what the other thinks of them and how pleased the person would be if the participant achieved the goal. Participants

were then asked to answer two questions about outsourcing their goal to the other they nominated, including how much they rely on the other to help them achieve the goal and how much the other acts to actually accomplish the goal for them. These questions were summed to help establish if human goal defenders have an effect beyond simply serving as targets for goal outsourcing.

In order to assess goal outcomes in context, participants completed the goal commitment measure from studies 1A and 1B (see Appendix A). They also completed the Hoyle Davison self-control scale in order to further explore the roles of trait inhibition and trait initiation (Hoyle & Davison, 2016). They then completed a short state self-control measure (Appendix B) to see if there are any in-the-moment changes in beliefs about one's self-control after other priming. Finally, participants completed the reactance measure from studies 1A and 1B (Appendix A).

Following the initial measures, participants completed a short, unrelated study in order to engender less suspicion about the link between the initial measures and the outcome measures, as well as to maintain the appearance of taking three separate studies.

Next, participants completed a taste test task adapted from McFerren, Dahl, Fitzsimons, & Morales (2010). After confirming that they did not have food allergies, participants saw a series of three instruction screens on DirectRT (Appendix B). Participants were told that they were going to complete a taste test using a variety of foods, that prior to the test they would be able to try six foods, and that they could take as

much of each of the foods as they wanted before answering questions about them (Appendix B). Before each instruction screen, a subliminal prime of either the name of the treatment condition other or the name of the control condition other appeared, based on the condition the participant was assigned to earlier. Due to the speed of the experimental computer, the name was displayed for 20 milliseconds before the instruction screen appeared in order to avoid conscious detection. The subliminal presentation of stimuli was chosen as it is thought to be weaker than supraliminal priming, but more suitable for dismissing concerns of conscious demand characteristics of the other (Bargh & Chartrand, 2000).

The experimenter then showed participants a table where a fixed amount of the six different foods chosen from the pretest were displayed in clear plastic bowls. The participant was given a Chinet disposable plate and told to try at least a little bit of each of the foods, but to take as much as they wanted, and to return to their desk after fixing their plate. Back at the desk, the computer instructed them to eat as much as they wanted of each of the snacks before answering a variety of questions about each of the foods. Target dependent variables were embedded among other items to legitimize the taste test cover story. Target items are marked with an asterisk (\*). Items included a description of the taste profile, how much they enjoyed eating it, how likely they were to purchase the snack in the future, if they would like to consume more of the snack, \*how difficult it was to stop eating the snacks, \*how difficult it was for them to keep their health goal in mind

while eating the snacks and \*how tempted they had been to eat more of each of the foods. Participants ended the study by answering the same demographic questions as studies 1A and 1B. After the participant left, experimenters weighed the leftover food in each of the six bowls, as well as both the total leftover food on the participant's plate and the individual amount of each of the six foods left on the plate to determine how much of each food participants took, and how much of each food they actually consumed and recorded it in a spreadsheet.

## **4.3 Results**

### **4.3.1 Analyses**

In order to explore hypothesis 1B, that goal defenders increase state self-control, as well as to address a possible moderation effect of trait self-control or goal commitment, hierarchical regressions were conducted that tested individual variables in the first model and added interaction effects in the second model. This allowed us to test the strength of the moderation of the subscales of trait self-control and goal commitment, as hierarchical regressions provide F change statistics to indicate the value of losing degrees of freedom by adding predictors to the model. All dependent variables in this study are predicted by a hierarchical regression including condition, the three subscales of self-control (or goal commitment), goal commitment (or overall trait self-control), and outsourcing in model 1 and adding the three interactions between condition and the subscales of trait self-control (or the interaction between condition and

goal commitment) in model 2. F change statistics are noted and floodlight analyses are provided for moderations with significant or marginally significant Johnson-Neyman points.

### **4.3.2 Manipulation checks**

A visual inspection of the data revealed that one participant said they had no current health or fitness goals. An additional 6 participants were removed from the sample because they took or ate more than 3 ounces of food (or more) more than average. This left a total n of 166. More than 53% of participants reported having some sort of goal related to regulating diet or mentioned regulating diet as a pathway to/obstacle in the way of the goal, while 46.4% of participants did not (these goals largely centered around athletic accomplishments like setting personal records and exercise).

A series of t-tests revealed no significant differences between condition based on goal commitment, other priming strength, interpersonal closeness with the other, care about what the other thinks, reactance, trait self-control or state self-control (see Table 13). The amount the participant outsourced their goal pursuit to the person they nominated, however, was significantly different between groups ( $t(164) = 11.100, p < 0.001$ ), with participants in the control condition outsourcing their goal pursuit to the person they nominated significantly more ( $M = 3.96, SD = 2.43$ ) than participants in the treatment condition ( $M = 0.28, SD = 1.79$ ). While this is an unfortunate difference between conditions, it should only act to attenuate results since participants in the control condition may

receive a bigger regulatory boost from the other they nominated. Outsourcing was controlled for in subsequent analyses.

**Table 13: Study 2 independent samples T-Tests**

	Condition		<i>t</i>	<i>df</i>	<i>p</i>
	Control <i>M (SD)</i>	Treatment <i>M (SD)</i>			
Other priming strength	25.0 (4.1)	25.4 (4.8)	-0.645	164	0.520
Closeness with other	6.3 (0.9)	6.2 (1.0)	0.992	164	0.323
Importance of other's opinion	6.1 (1.2)	6.0 (1.2)	0.499	164	0.618
Outsourcing	4.0 (2.4)	0.3 (1.8)	11.100	164	<0.001*
Reactance	30.6 (6.2)	31.1 (6.3)	-0.518	164	0.605
Goal commitment	16.2 (6.0)	17.0 (5.7)	-0.866	164	0.388
Trait self-control	68.0 (12.3)	68.2 (12.2)	-0.077	164	0.938
State self-control	31.6 (4.7)	31.3 (4.8)	0.427	164	0.670

**Note: Significant findings marked with asterisk (\*).**

### 4.3.3 Main hypotheses

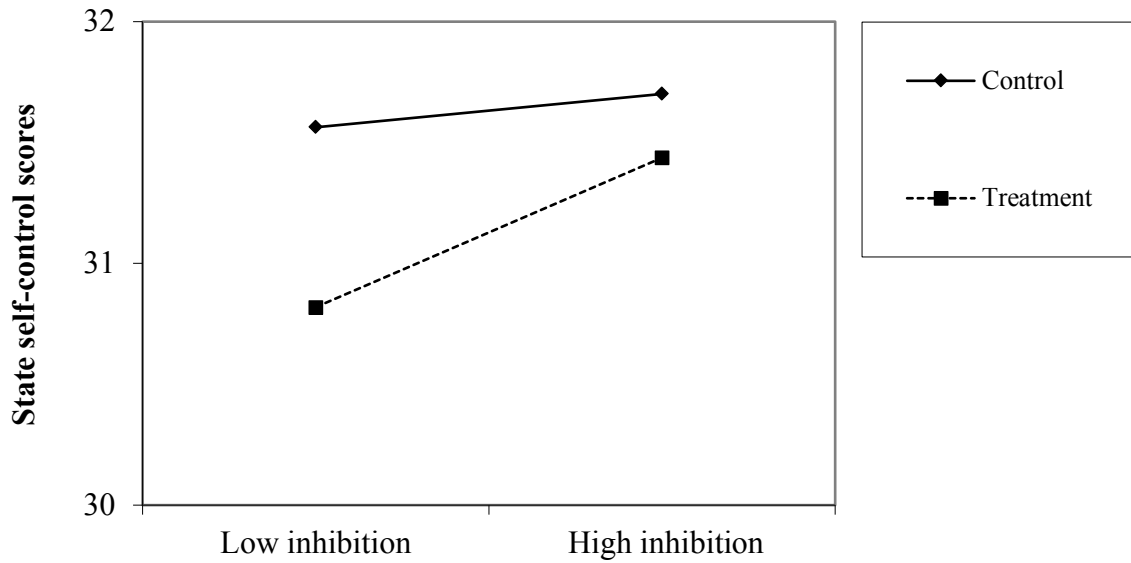
It was predicted that participants in the goal defender condition would be more likely to inhibit temptation, both in the presence of the physical temptation and when thinking about the temptation, than participants in the control condition, and that this effect might be moderated by trait level regulatory capacity or goal commitment. It was further hypothesized that being primed with a goal defender may boost state regulatory resources relative to a person who boosts self-esteem.

In order to explore these hypotheses, as well as the moderating roles of trait self-control and goal commitment, a total of six regressions were run to explore the role of both moderators on each of the three dependent variables. The regressions involving goal commitment as a moderator of the relationship between condition and each of the

dependent variables revealed no significant moderation effects. For simplicity, the analyses for each dependent variable are presented separately, and the non-significant results from the moderation analyses testing the interaction between goal commitment and condition and the overall trait self-control measure can be found in Appendix B.

#### **4.3.3.1 State self-control**

In a significant hierarchical regression predicting state self-control from a regression that included condition, each of the subscales of trait self-control, goal commitment and outsourcing in the first step ( $F(6,159) = 33.932, p < 0.001, F \text{ Change} = 33.932, p < 0.001$ ), and all of the interactions between condition and each of the subscales of trait self-control on the second step ( $F(9,156) = 23.330, p < 0.001, F \text{ Change} = 1.493, p = 0.219$ ), there was a marginally significant interaction between trait inhibition and condition ( $b = 0.120, SE = 0.075; t(156) = 1.613, p = 0.109$ ), such that participants in the treatment condition who were high in trait inhibition got a boost in state level regulatory resources compared to treatment participants low in inhibition (see Figure 7). This does indicate that participants in the goal defender condition did see an increase in state self-control when they are already high in trait inhibition. However, participants in the control condition saw an increase in state self-control regardless of trait inhibition.



**Figure 10: Study 2 marginal interaction predicting state self-control, controlling for outsourcing and goal commitment**

The interaction terms between condition and trait initiation and continuation had very high  $p$  values (both  $ps > 0.8$ ), which suggests that trait inhibition is largely driving the marginal moderation effect that was observed for overall trait self-control (see Appendix B). Full regression results can be found in Table 14.

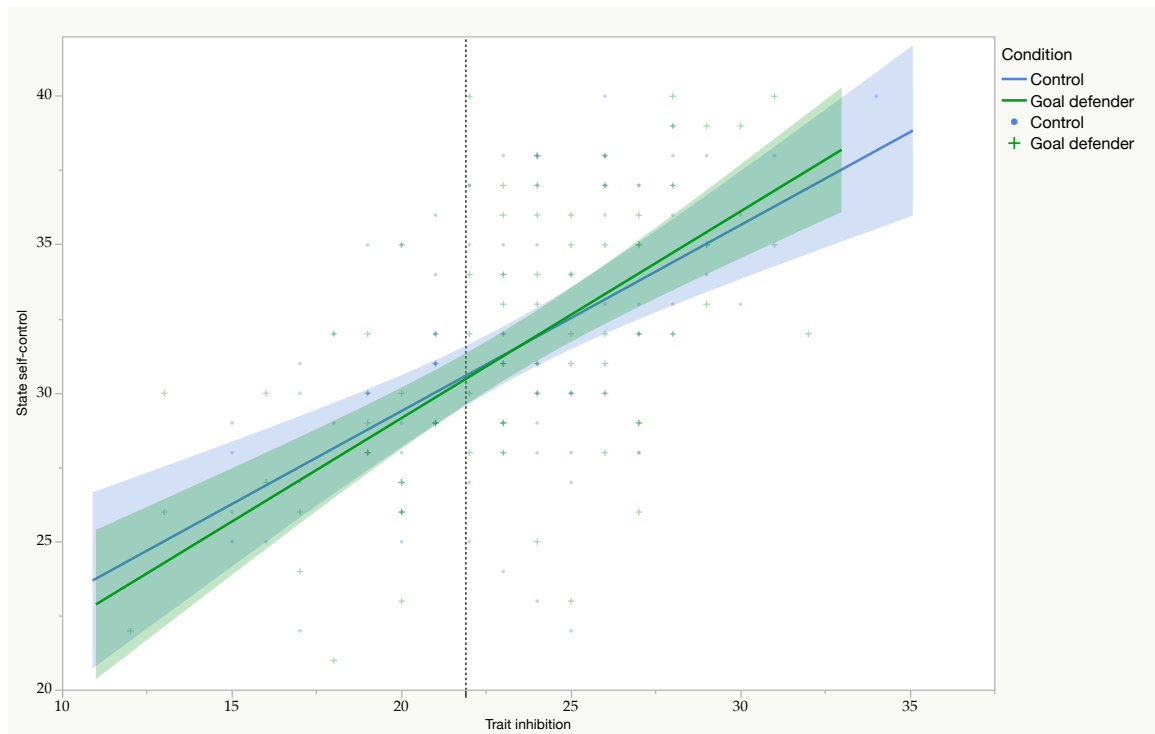
**Table 14: Study 2 moderation of state self-control**

	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i>
DV: State self-control					
Model 1 (R = 0.749, R <sup>2</sup> = 0.561)					
Condition <sup>1</sup>	-0.230	0.260	-0.049	-0.887	0.376
Trait inhibition <sup>1</sup>	0.195	0.076	0.174	2.581	0.011*
Trait initiation <sup>1</sup>	0.190	0.047	0.260	4.020	<0.001*
Trait continuation <sup>1</sup>	0.452	0.079	0.388	5.720	<0.001*
Goal commitment <sup>1</sup>	0.142	0.044	0.175	3.203	0.002*
Outsourcing <sup>1</sup>	0.027	0.089	0.017	0.306	0.760
Model 2 (R = 0.757, R <sup>2</sup> = 0.574)					
Condition <sup>2</sup>	-0.252	0.259	-0.053	-0.974	0.332
Trait inhibition <sup>2</sup>	0.189	0.076	0.168	2.501	0.013*
Trait initiation <sup>2</sup>	0.190	0.047	0.260	4.032	<0.001*
Trait continuation <sup>2</sup>	0.459	0.079	0.394	5.829	<0.001*
Trait inhibition * Cond <sup>2</sup>	0.120	0.075	0.107	1.613	0.109†
Trait initiation * Cond <sup>2</sup>	-0.004	0.048	-0.005	-0.081	0.936
Trait continuation * Cond <sup>2</sup>	0.014	0.077	0.012	0.177	0.860
Goal commitment <sup>2</sup>	0.142	0.045	0.176	3.191	0.002*
Outsourcing <sup>2</sup>	0.034	0.089	0.021	0.384	0.702

**Note: An asterisk (\*) indicates statistical significance below the  $p = 0.05$  level, a dagger (†) indicates a finding below the  $p = 0.15$  level**

#### 4.3.3.1.1 Floodlight analyses

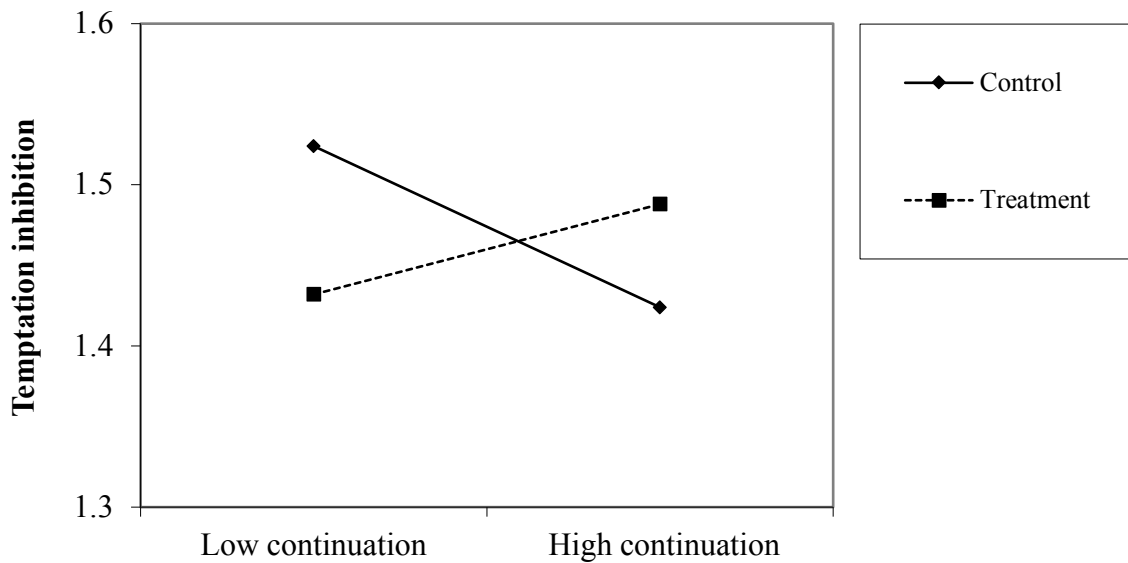
This analysis revealed that people in the goal defender condition had marginally lower state self-control scores than control participants if trait inhibition scores were 21.9 (1.4 points below average) or below.



**Figure 11: Study 2 state self-control floodlight**

#### 4.3.3.2 Temptation inhibition

The same hierarchical regression predicting temptation inhibition was significant (step 1  $F(6,158) = 2.012, p = 0.067, F \text{ Change} = 2.012, p = 0.067$ ; step 2  $F(9,155) = 2.005, p = 0.042, F \text{ Change} = 1.921, p = 0.128$ ). Unexpectedly, the interaction between trait continuation and condition was significant ( $b = 0.039, SE = 0.017; t(155) = 2.258, p = 0.025$ ), but it was in an unexpected direction. Participants high in trait continuation in the control condition were the best at inhibiting unhealthy foods and participants high in continuation in the treatment condition were the second worst at inhibiting unhealthy foods (see Figure 8).



**Figure 12: Study 2 interaction predicting temptation inhibition, controlling for outsourcing and goal commitment**

However, condition appears to help participants who are low in trait continuation, as treatment participants low in trait continuation are inhibiting the tempting foods even more than participants who are higher in trait regulatory capacity. This is untrue for control participants low in trait continuation. This indicates that goal defenders may be helping participants low in trait regulatory capacity in different ways than they are helping people who are already high in self-control. See Table 15 for the full regression results.

**Table 15: Study 2 moderation of temptation inhibition**

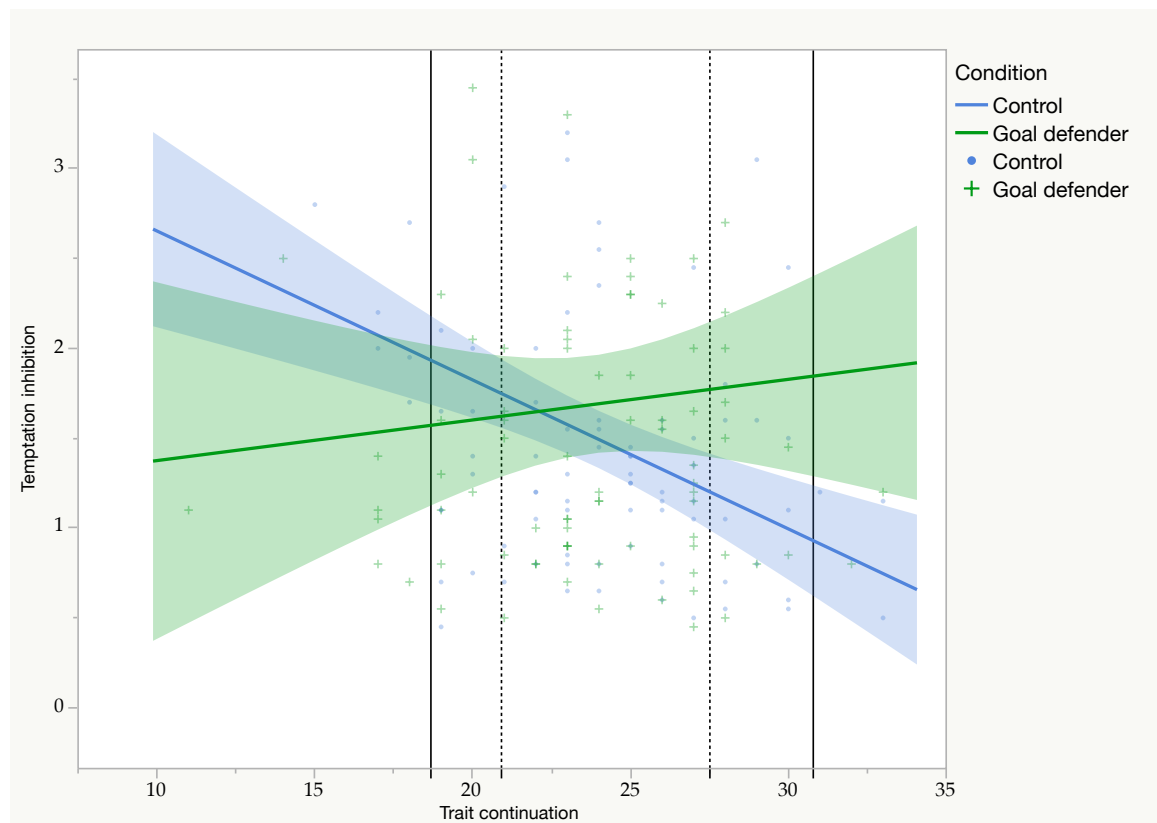
	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i>
DV: Temptation inhibition					
Model 1					
Condition <sup>1</sup>	-0.008	0.059	-0.012	-0.144	0.886
Trait inhibition <sup>1</sup>	-0.018	0.017	-0.101	-1.033	0.303
Trait initiation <sup>1</sup>	-0.016	0.011	-0.141	-1.499	0.136†
Trait continuation <sup>1</sup>	-0.011	0.018	-0.062	-0.627	0.531
Goal commitment <sup>1</sup>	-0.001	0.010	-0.010	-0.131	0.896
Outsourcing <sup>1</sup>	0.017	0.020	0.068	0.836	0.405
Model 2					
Condition <sup>2</sup>	-0.007	0.059	-0.010	-0.125	0.901
Trait inhibition <sup>2</sup>	-0.016	0.017	-0.092	-0.946	0.346
Trait initiation <sup>2</sup>	-0.016	0.011	-0.136	-1.456	0.147†
Trait continuation <sup>2</sup>	-0.011	0.018	-0.061	-0.623	0.534
Trait inhibition * Cond <sup>2</sup>	-0.002	0.017	-0.011	-0.112	0.911
Trait initiation * Cond <sup>2</sup>	-0.010	0.011	-0.089	-0.938	0.350
Trait continuation * Cond <sup>2</sup>	0.039	0.017	0.215	2.258	0.025*
Goal commitment <sup>2</sup>	-0.003	0.010	-0.027	-0.340	0.735
Outsourcing <sup>2</sup>	0.019	0.020	0.075	0.928	0.355

**Note: An asterisk (\*) indicates statistical significance below the  $p = 0.05$  level, a dagger (†) indicates a finding below the  $p = 0.15$  level**

#### 4.3.3.2.1 Floodlight analyses

This analysis revealed that people in the goal defender condition had marginally higher temptation inhibition scores when trait continuation scores were 27.5 (3.6 points above average) or higher, and significantly higher temptation inhibition scores than control participants if trait continuation scores were 30.8 (6.9 points above average) or above. They also had marginally lower temptation inhibition scores when trait continuation scores were 20.9 (3.0 points below average) or below, and significantly lower temptation inhibition scores if trait continuation scores were 18.7 (5.2 points below

average) or lower. Temptation inhibition scores reflect greater inhibition of the tempting food as they decrease.



**Figure 13: Study 2 temptation inhibition floodlight**

#### 4.3.3.3 Perceptual inhibition

An identical model predicting perceptual inhibition was the least significant of the three (step 1  $F(6,159) = 2.248, p = 0.041, F \text{ Change} = 2.248, p = 0.041$ ; step 2  $F(9,156) = 1.643, p = 0.107, F \text{ Change} = 0.478, p = 0.698$ ), but it did reveal a single significant simple effect for trait initiation ( $b = -0.465, SE = 0.186; t(156) = -2.503, p = 0.013$ ). Interestingly, this means that each of the three dependent variables were most associated with a different subscale

of trait self-control. This could very well have contributed to the attenuation of the moderation in the relationship between the manipulation and the dependent variables. See table 16 for full regression results.

**Table 16: Study 2 moderation of perceptual inhibition**

	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i>
<b>DV: Perceptual inhibition</b>					
<b>Model 1</b>					
Condition <sup>1</sup>	0.366	1.014	0.029	0.361	0.718
Trait inhibition <sup>1</sup>	-0.240	0.296	-0.079	-0.812	0.418
Trait initiation <sup>1</sup>	-0.460	0.185	-0.234	-2.489	0.014*
Trait continuation <sup>1</sup>	0.169	0.308	0.054	0.551	0.583
Goal commitment <sup>1</sup>	-0.039	0.173	-0.018	-0.224	0.823
Outsourcing <sup>1</sup>	0.249	0.347	0.058	0.718	0.474
<b>Model 2</b>					
Condition <sup>2</sup>	0.333	1.020	0.026	0.326	0.745
Trait inhibition <sup>2</sup>	-0.260	0.298	-0.086	-0.874	0.384
Trait initiation <sup>2</sup>	-0.465	0.186	-0.236	-2.503	0.013*
Trait continuation <sup>2</sup>	0.121	0.310	0.039	0.391	0.697
Trait inhibition * Cond <sup>2</sup>	0.298	0.294	0.098	1.013	0.313
Trait initiation * Cond <sup>2</sup>	-0.036	0.188	-0.018	-0.193	0.847
Trait continuation * Cond <sup>2</sup>	0.121	0.310	0.039	0.391	0.697
Goal commitment <sup>2</sup>	-0.029	0.176	-0.013	-0.164	0.870
Outsourcing <sup>2</sup>	0.264	0.350	0.062	0.755	0.452

**Note: An asterisk (\*) indicates statistical significance below the  $p = 0.05$  level, a dagger (†) indicates a finding below the  $p = 0.15$  level**

Effects may also have been attenuated by high correlations between some of the predictor variables and the dependent variables. See Table 17 for correlations.

**Table 17: Study 2 correlations**

	1	2	3	4	5	6	7
1. Condition							
2. Tempt. Inhibit.	0.008						
3. Percept. inhibit.	0.037	0.250**					
4. State self-control	-0.033	-0.089	-0.098				
5. Trait initiation	0.033	-0.227**	-0.260**	0.572**			
6. Trait inhibition	-0.015	-0.216**	-0.191*	0.540**	0.517**		
7. Trait continuation	-0.018	-0.185*	-0.128†	0.662**	0.540**	0.504**	
8. Goal commitment	0.067	-0.053	-0.050	0.342**	0.136†	0.160*	0.266**

**Note:\*\* denotes a finding significant at or below the  $p = 0.005$  level, \* denotes a finding significant at or below the  $p = 0.05$  level, a dagger (†) indicates a finding below the  $p = 0.10$  level**

#### **4.4 Discussion**

Overall, there was no main effect of condition that made participants in the goal defender condition inhibit temptation better than participants in the control condition. Instead, it is clear that condition is affecting participants differently through the three subscales of trait self-control. Trait inhibition interacts with condition such that participants in the treatment condition see an increase in state self-control when they are already high in trait inhibition in the first place, indicating that goal defenders may be more helpful for people who are already high in self-control to begin with. However, this doesn't appear to translate into how much unhealthy food participants took or ate (temptation inhibition). This may indicate that goal defenders help to protect goal pursuers from being aware of alternatives, but once pursuers become aware of said alternatives, goal defenders are less useful. Trait continuation significantly moderates the relationship between condition and temptation inhibition scores, such that treatment

participants high in continuation were actually the worst at inhibiting the tempting foods (they took and ate more of them), and control participants who are high in continuation take and eat the least food.

However, participants low in trait continuation in the treatment condition were able to inhibit the temptation of the tempting foods better than participants in the control condition. This may suggest that participants who are already high in trait self-control are not seeing much of an increase in their ability to inhibit temptation, but participants who are lower in trait level self-control capacity may be getting a momentary boost from the goal defender, such that they are better able to fend off temptation in the moment. It is unclear why the goal defender appears to almost be a detriment to participants in the treatment condition, but this result should be taken in context, especially due to the challenges of this sample.

One reason for pause is the low observed power for most of the effects of theoretical interest (almost all indicators have observed power  $< 0.8$ ), indicating that the sample size required to detect these effects may be substantially larger than the current sample, especially in light of the significance of trait level factors. The results of this study may also have been affected by the large difference in goal outsourcing between the two groups of participants, as participants who are outsourcing may have freed up regulatory resources to use in the moment, knowing they will not need to use them later. Evidence shows that people may conserve regulatory resources in the moment in consideration of

later needs, which may have been a more pressing concern for treatment participants (Muraven, Shmueli, & Burkley, 2006). The data also may be affected by the fact that weight loss itself is often tied to self-esteem, possibly meaning that both conditions primed a goal relevant other. Due to these issues, it is difficult to make definitive conclusions based on the current data.

However, the marginal interaction between trait inhibition and condition predicting state self-control may provide some initial evidence indicating that people who are primed with goal defenders see an increase in their state level regulatory resources, as long as they are already high in inhibition to begin with. It appears that initiation and continuation are less likely to be involved in state self-control, which makes sense, as state self-control is often a result of the self-control dilemmas one currently faces. These findings were only marginal, but trended in the expected direction. The significant moderating role of trait continuation was unexpected, but may mean that goal defenders are most effective before one actually encounters a temptation, or in other words, because they help to prevent self-control dilemmas from happening, not to minimize them once they begin. Goal commitment continued to have little to no effect. This is somewhat unexpected, as the literature suggests that goal commitment is often a predictor of goal success, and because goal commitment is significantly correlated with state self-control in this study (Locke, Latham, & Erez, 1988). However, it may be that goal defenders help one

to overcome issues related to low goal commitment in some way, even just by increasing mental accountability, thus making it difficult to detect an effect.

## 5. Study 3

Study 2 addressed some of the external validity issues that were presented in studies 1A and 1B by providing a behavioral measure of goal success. However, not all of the health goals provided by participants were healthy eating or dieting goals, making the dependent variable only loosely related to the primed goal domain for some participants. Study 3 aims to bridge the gap by looking at self-reported behavior over a weeklong period. Study 2 also used a student sample, and students may be less concerned with diet for a variety of reasons, including lack of access to homemade meals and naturally high metabolisms. Study 3 specifically recruited participants who had healthy eating goals off of mTurk, so the sample was likely to be older and more concerned about diet. Finally, all of the previous studies have used only two experimental groups, with one control group and one treatment group with participants primed with a goal defender. Study 3 aims to see if there are differences when people are primed with others who help to inhibit temptations (goal defenders) and others who help to initiate work on goals (goal initiators), while maintaining a separate control group primed with health and fitness celebrities. Because of this third condition, I was able to look at the idea of fit between the primed other and one's trait level regulatory strengths in order to see if people inhibit alternatives better when primed with a goal defender when they are high in trait level inhibition as opposed to low. This study seeks to replicate basic findings from the

previous three studies, as well as to provide evidence for hypothesis H1C, that others associated with inhibition (goal defenders) act to devalue goal alternatives.

## **5.1 Method**

### **5.1.1 Participants**

A group of 400 participants from mTurk were recruited through the TurkPrime website for part 1. The recruitment advertisement made it clear that the study was to be taken in two parts one week or more apart and would investigate healthy eating goals. TurkPrime was used to email participants who participated in part 1 to alert them that part 2 was available. A total of 351 of the original 400 participants were able to be contacted. Out of that group, 324 completed part 2 (66.6% women,  $M_{\text{age}} = 38.45$ ,  $SD = 18.07$ , 77.4% white). This represents a total retention rate of 81%, and a relative retention rate of 91% among participants that could be contacted. Participants were compensated \$0.20 for completing part 1 and \$0.60 for completing part 2. Participants were only eligible to complete part 2 if they had completed part 1 seven or more days before. Part 2 data collection was closed exactly two weeks from the part 1 launch date, giving participants a full week to respond to part 2. Participants were sent three reminder emails to take part 2: one on the day data collection began, one 3 days after release and one the day before part 2 data collection closed.

### **5.1.2 Procedure**

Participants completed the procedure online via the TurkPrime platform in order to ensure continued access to the study participants. This study took place in two parts separated by a week, with mTurkers being contacted through the panel platform to complete part two of the study. In session 1, participants spent a minimum of 75 seconds thinking and writing about a healthy eating goal they had yet to achieve and how they planned to achieve it. Afterwards, participants were asked to complete the goal commitment measure from studies 1A and 2 (Appendix A). They also completed the Hoyle and Davisson self-control scale from studies 1B and 2 (Hoyle & Davisson, 2016; Appendix A). They were then randomly assigned to provide the name of an individual who helps them to begin work on their healthy eating goal (goal initiator condition), the name of an individual who helps them to stay away from things that might get in the way of their healthy eating goal (goal defender condition) or the name of their favorite health and fitness celebrity (control condition). They then completed the other priming strength measure from the previous studies (Appendix A). Finally, they were given these instructions: “There is a week between now and your next session. Work on your dieting goal over the next week and help to boost your self-control by spending a few minutes each day thinking about the person you nominated. Research has shown that other people may help us achieve our goals, and even just thinking about other people may help to encourage goal attainment. Please choose a time of day during which you will spend a

few minutes each day over the next 7 days thinking about the person you nominated.” This was followed by a selection of times they could choose to commit to thinking about the other every day. On day 5 of the intervening week, an email was sent to all participants reminding them to think about the person they nominated each day to ensure compliance.

In the second session, they provided the name of the other they nominated in the first session and indicated how often they saw the other (either in person or virtually) they were supposed to be thinking about over the weeklong period and how often they thought of the other over the week. These items served to activate conceptualizations of the other. Next, participants completed a chart of goal relevant actions initiated throughout the week, inspired by the self-reported use of various self-regulatory strategies in study 1 in Ent, Baumeister and Tice (2015). These include eating healthy, cooking at home, meal planning, participating in a discussion about healthy eating, seeking information about nutrition, joining a dieting support group, buying a book on a diet, seeking information about a specific diet and researching healthy recipes (Appendix C). Goal hindering actions inhibited throughout the week were also included in the chart, including avoiding unhealthy foods, not buying junk food, not going to restaurants with tempting food, not putting oneself in social situations where food can't be resisted and not going into places like the break room that have tempting foods (Appendix C). Then they indicated how successful they felt they had been on their healthy eating goal over the past week on a Likert scale from *1-Not at all successful* to *7-Very successful* to

demonstrate success in the goal outcome. Participants were also asked questions to indicate the value of the alternative to the dieting goal (i.e., recreational enjoyment of food). They also completed the two goal outsourcing items from study 2, as well as the Hong reactance scale (Hong & Fraedda, 1996; see Appendix A). Finally, they answered the demographic questions from the other studies.

## **5.2 Results**

### **5.2.1 Analyses**

In order to explore hypothesis 1C, that goal defenders decrease the value of alternative goals, as well as to address a possible moderation effect of trait self-control and goal commitment, hierarchical regressions were conducted that tested individual variables in the first model and added interaction effects in the second model. This allowed us to test the strength of the moderation of the subscales of trait self-control and goal commitment, as hierarchical regressions provide F change statistics to indicate the value of losing degrees of freedom by adding predictors to the model. All dependent variables in this study are predicted by a hierarchical regression including two dummy coded condition variables testing the differences between the goal defender condition and the control condition (coded 1) and the goal defender condition (coded 2) and the goal initiator condition (coded 3), the three subscales of self-control (or goal commitment), goal commitment (or trait self-control), and reactance in model 1 and adding the three interactions between the dummy coded condition variables and the

subscales of trait self-control (or the interaction between each dummy coded condition and goal commitment) in model 2. F change statistics are noted and floodlight analyses are provided for moderations with significant or marginally significant Johnson-Neyman points.

For PROCESS, condition was contrast coded with the goal defender condition coded as -1, the control condition as 0 and the goal initiator condition as 1, and all variables except the dependent variables were mean centered. Any interactions included in the PROCESS moderation analyses were computed using mean centered moderating variables and the contrast coded condition variable. This allowed us to work around the inability to control for the interaction between a dependent variable and the control condition in the PROCESS macro. Output can be found in appendix C.

### **5.3.1 Manipulation checks**

A visual examination of the data revealed that nine participants failed to provide a health goal (two participants provided an exercise goal and seven participants wrote something unrelated to health goals), one participant provided a health goal they had already achieved, one participant listed themselves as their own significant other and four participants did not provide the name of a goal relevant other at all. The following tests are reported excluding these participants. This resulted in a sample of 90 for the control condition, 107 for the goal defender condition and 112 for the goal initiator condition for a total n of 309.

A one-way ANOVA that included trait self-control and its three subscales, reactance, outsourcing, priming other strength, the closeness with other question, the care about the other's opinion question and goal commitment was conducted to determine if there were systematic differences between the three conditions that may affect the data (see Table 18). The priming strength of the other person was significantly lower for participants in the control condition relative to participants in the two treatment conditions (See Table 10 for means;  $F(2,306) = 59.433, p < 0.001$ ). A Bonferroni comparison revealed significant differences between the control and treatment conditions (both  $ps < 0.001$ ), but no significant differences were found between the two treatment conditions ( $p = 0.658$ ). Similarly, interpersonal closeness and care for the other's opinion of the participant revealed significant differences between conditions ( $F(2,306) = 255.697, p < 0.001$  and  $F(2,306) = 102.173, p < 0.001$ , respectively), but those differences were not significant between the two treatment conditions according to Bonferroni post-hoc comparisons ( $p = 1$  and  $p = 0.434$ , respectively). Outsourcing was also significantly different between the control condition and the two treatment conditions ( $F(2,306) = 5.200, p = 0.006$ ), but Bonferroni post-hoc comparisons indicated no significant differences between the two treatment groups ( $p = 1$ ). This is expected since participants in the control condition are primed with a health and fitness celebrity and the treatment participants are primed with a goal relevant and presumably close other. It also provides evidence that

people in the treatment conditions chose a person that was more likely to influence them than people in the control condition.

Participants did not significantly differ between conditions on goal commitment ( $F(2,306) = 0.830, p = 0.437$ ), trait self-control scores ( $F(2,306) = 0.665, p = 0.515$ ), trait inhibition scores ( $F(2,306) = 0.757, p = 0.470$ ), trait initiation scores ( $F(2,306) = 0.635, p = 0.531$ ) or trait continuation scores ( $F(2,306) = 0.469, p = 0.626$ ). They did significantly differ on reactance scores ( $F(2,306) = 4.006, p = 0.019$ ), with Bonferroni post-hoc comparisons revealing a significant difference between the control condition and the goal defender condition ( $p = 0.024$ ) and a marginally significant difference between the goal defender condition and the goal initiator condition ( $p = 0.077$ ). The treatment conditions did not differ significantly from one another ( $p = 1$ ). While unexpected, this reactivity should attenuate results as opposed to amplify them, presenting only a small problem for data interpretation. Due to this significant difference in reactance, reactance is controlled for in the subsequent analyses.

**Table 18: Study 3 ANOVA**

	Condition			<i>F</i>	<i>df</i>	<i>p</i>
	Control <i>M(SD)</i>	Initiator <i>M(SD)</i>	Defender <i>M(SD)</i>			
Other prime strength	20.6(7.9)	27.9(5.0)	28.9(4.1)	59.433	(2,306)	<0.001*
Closeness with other	3.6(1.7)	6.3(1.1)	6.5(1.0)	157.450	(2,306)	<0.001*
Imp. of other opinion	3.7(2.0)	6.2(1.4)	6.5(0.9)	101.820	(2,306)	<0.001*
Outsourcing	6.8(3.4)	7.9(3.2)	8.3(3.1)	5.200	(2,306)	0.006*
Reactance	29.2(9.4)	31.9(8.6)	32.4(8.0)	4.006	(2,306)	0.019*
Goal commitment	17.2(3.2)	16.8(2.9)	17.2(2.7)	0.437	(2,306)	0.437
Trait self-control	67.9(13.7)	69.7(14.0)	67.7(15.2)	0.665	(2,306)	0.515
Trait initiation	23.0(6.4)	23.5(6.4)	22.5(6.5)	0.635	(2,306)	0.531
Trait inhibition	22.0(4.9)	22.6(5.0)	21.8(5.4)	0.757	(2,306)	0.470
Trait continuation	23.0(4.7)	23.6(4.8)	23.3(4.9)	0.626	(2,306)	0.626

**Note: Significant findings marked with asterisk (\*).**

#### 5.4.1 Main hypotheses

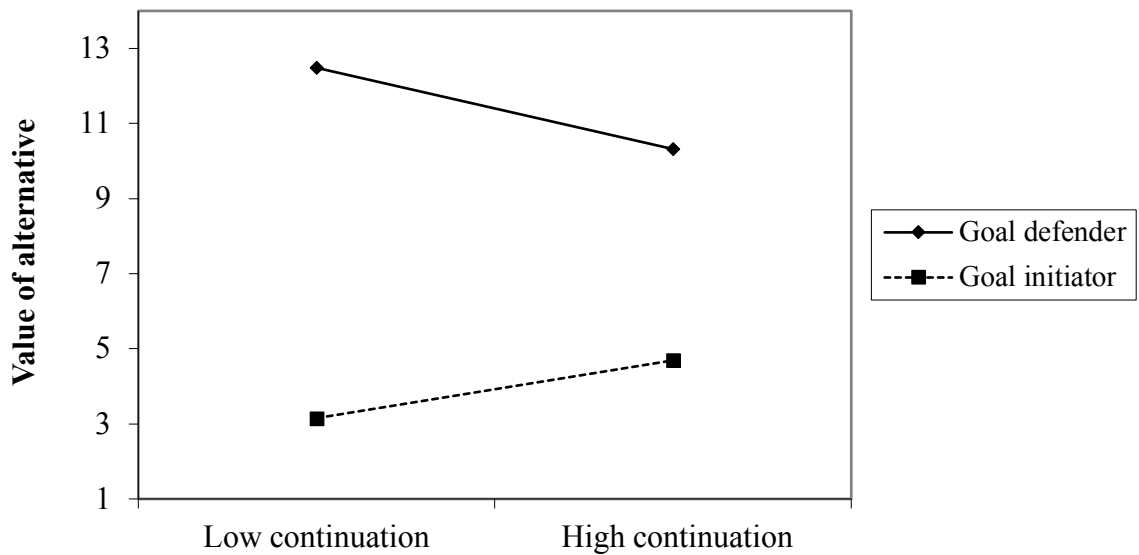
Separate regressions were run to predict each of the four dependent variables: Value of the alternative (recreational food enjoyment), goal success, acts of inhibition the participant completed during the week and acts of initiation the participant completed during the week. To accommodate a three-level categorical predictor in a regression model, condition was dummy coded, and the goal defender group was used as a comparison group, thus isolating differences between both the control condition and the goal defender condition and the goal defender condition and the goal initiator condition. In order to address both main effects and moderation simultaneously, models included the dummy coded variables for condition 1 (the control condition), condition 3 (the goal initiator condition), the three subscales of trait self-control (or a composite measure of trait self-control), goal commitment and reactance as predictors, as well as the interaction

terms between conditions 1 and 3 and the moderator(s) of interest. In total, eight regressions were run, four using the subscales of trait self-control as moderators and four using goal commitment as a moderator (regressions testing goal commitment controlled for overall trait self-control and only included two interaction term – the interactions between the condition 1 and condition 3 variables). Only one of the four goal commitment moderation analyses revealed a marginal moderation effect. As such, the moderation analyses focus on the self-control findings. For simplicity, analyses are broken down by the dependent variable of interest and the goal commitment moderation analyses can be found in Appendix C.

#### **5.4.1.1 Value of alternative**

A hierarchical regression predicting the value of the alternative that included the dummy coded variables for condition 1 (the control condition) and condition 3 (the goal initiator condition), the three subscales of trait self-control (initiation, inhibition and continuation), goal commitment and reactance in the first step and the interaction terms between conditions 1 and 3 ( $F(7,301) = 7.833, p < 0.001, F \text{ Change} = 7.833, p < 0.001$ ), and the three subscales of trait self-control in the second step ( $F(13,295) = 4.642, p < 0.001, F \text{ Change} = 0.933, p = 0.472$ ), was significant. While several significant or marginally significant simple effects were present, all were expected and none were of theoretical importance. None of the interaction terms were significant, but the interaction between the goal initiator condition and trait continuation was marginally significant ( $b = 0.401, SE$

= 0.250;  $t(295) = 1.602$ ,  $p = 0.110$ ), suggesting that people who were in the goal initiator condition saw the alternative goal as more valuable as their trait continuation scores went up relative to the goal defender condition, where people higher in trait continuation placed less value on the alternative. See Figure 9 for an illustration of this effect.



**Figure 14: Study 3 marginal interaction predicting value of alternative, controlling for goal commitment and reactance**

This indicates that the participants in the goal defender condition may have been relatively better at devaluing the alternative goal as their capacity for continuation increased, and that they are generally more likely to devalue the goal than participants in the control condition. See Table 19 for the regression results. This lends support to hypothesis 1C, that goal defenders act to devalue the alternative goal, as opposed to simply increasing the value of the focal goal.

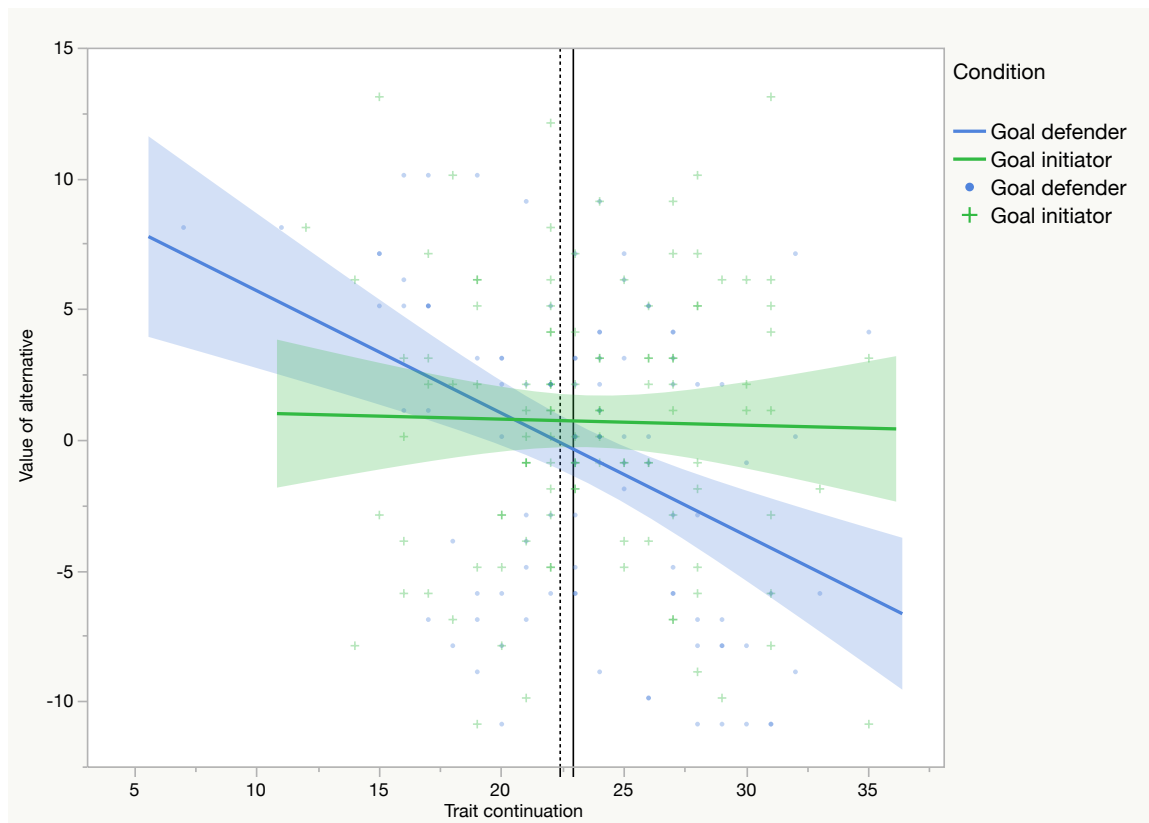
**Table 19: Study 3 moderation of value of alternative**

	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i>
DV: Value of alternative					
Model 1					
Condition 1 dummy (control) <sup>1</sup>	0.815	0.772	0.065	1.054	0.293
Condition 3 dummy (initiator) <sup>1</sup>	1.684	0.725	0.142	-2.322	0.021*
Trait initiation <sup>1</sup>	-0.054	0.069	-0.060	-0.772	0.440
Trait inhibition <sup>1</sup>	-0.292	0.087	-0.259	-3.335	0.001*
Trait continuation <sup>1</sup>	0.021	0.101	0.018	0.212	0.832
Goal commitment <sup>1</sup>	0.196	0.106	0.099	1.853	0.065+
Reactance <sup>1</sup>	0.122	0.038	0.184	3.190	0.002*
Model 2					
Condition 1 dummy (control) <sup>2</sup>	-2.882	6.055	-0.229	-0.476	0.634
Condition 3 dummy (initiator) <sup>2</sup>	-7.768	5.932	-0.653	-1.309	0.191
Trait initiation <sup>2</sup>	-0.005	0.122	-0.006	-0.042	0.967
Trait inhibition <sup>2</sup>	-0.288	0.153	-0.256	-1.878	0.061+
Trait continuation <sup>2</sup>	-0.178	0.189	-0.149	-0.942	0.347
Cond 1 * Initiation <sup>2</sup>	-0.060	0.174	-0.036	-0.347	0.729
Cond 3 * Initiation <sup>2</sup>	-0.072	0.163	-0.048	-0.445	0.657
Cond 1 * Inhibition <sup>2</sup>	-0.002	0.220	-0.001	-0.011	0.991
Cond 3 * Inhibition <sup>2</sup>	0.010	0.211	0.005	0.047	0.962
Cond 1 * Continuation <sup>2</sup>	0.155	0.256	0.292	0.606	0.545
Cond 3 * Continuation <sup>2</sup>	0.401	0.250	0.821	1.602	0.110+
Goal commitment <sup>2</sup>	0.178	0.108	0.090	1.643	0.101+
Reactance <sup>2</sup>	0.114	0.039	0.172	2.921	0.004*

**Note: An asterisk (\*) indicates statistical significance below the  $p = 0.05$  level, a dagger (†) indicates a finding below the  $p = 0.15$  level**

#### 5.4.1.1.1 Floodlight analyses

This analysis revealed that people in the goal defender condition valued the goal significantly less than participants in the goal initiator condition when their trait continuation scores were 22.9434 points (0.3932 points below average) or above, and marginally less than participants who had trait continuation scores of 22.400 or more (0.9366 points below average) or above.



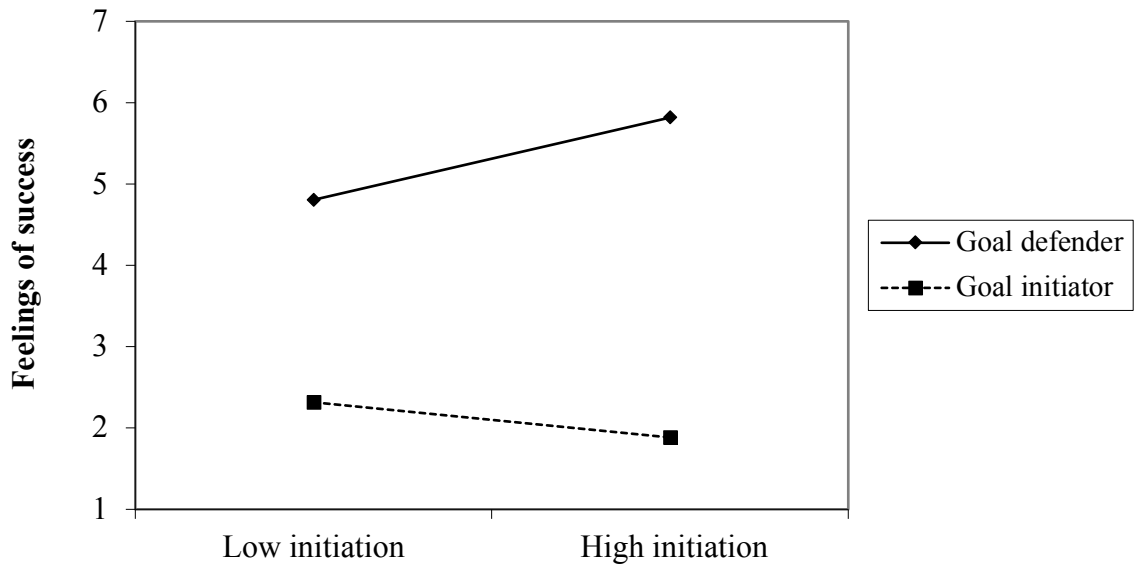
**Figure 15: Study 3 value of alternative floodlight**

#### 5.4.1.2 Success in goal pursuit

The hierarchical regression predicting feelings of success about goal progress over the past week was significant (step 1  $F(7,301) = 5.307, p < 0.001, F \text{ Change} = 5.307, p < 0.001$ ; step 2  $F(13,295) = 4.128, p < 0.001, F \text{ Change} = 2.559, p = 0.020$ ). Several interesting predictors came to light in this model. There was a significant difference in how successful participants felt in the goal initiator condition relative to the goal defender condition, with participants in the goal initiator condition feeling significantly less successful in their goal pursuit than participants in the goal defender condition ( $b = -3.334, SE = 1.418; t(295) = -2.351, p = 0.019$ ), and a marginally significant difference between the control and goal

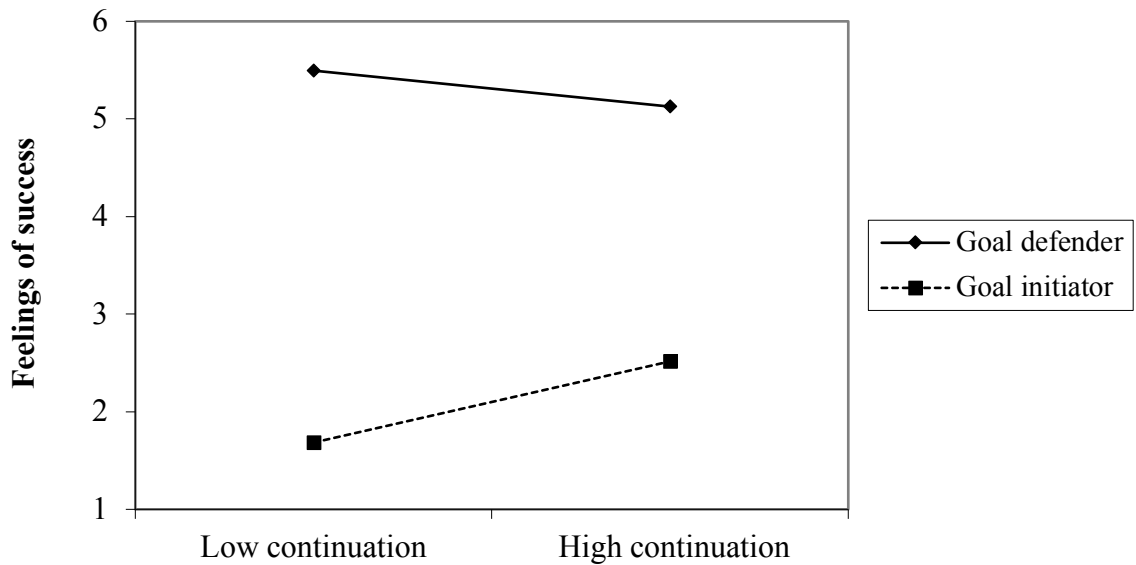
defender conditions trending in the same direction ( $b = -2.540$ ,  $SE = 1.448$ ;  $t(295) = -1.755$ ,  $p = 0.080$ ). This means that people in the goal defender condition feel significantly or marginally more successful in their goal pursuit relative to people in the goal initiator condition as well as participants in the control condition.

There are also three significant or marginally significant interaction effects between condition and trait level self-control variables. There is a significant difference in the relationship between trait initiation scores and goal success between the goal defender and goal initiator conditions, such that participants in the goal initiator condition feel less successful in their goal progress as their trait initiation scores increase relative to the goal defender condition, which shows the opposite pattern ( $b = -0.117$ ,  $SE = 0.039$ ;  $t(295) = -3.016$ ,  $p = 0.003$ ). This exaggerated the simple effect of condition, and indicated that participants in the treatment condition felt even more successful as trait initiation scores increased. See Figure 10 for an illustration of this result.



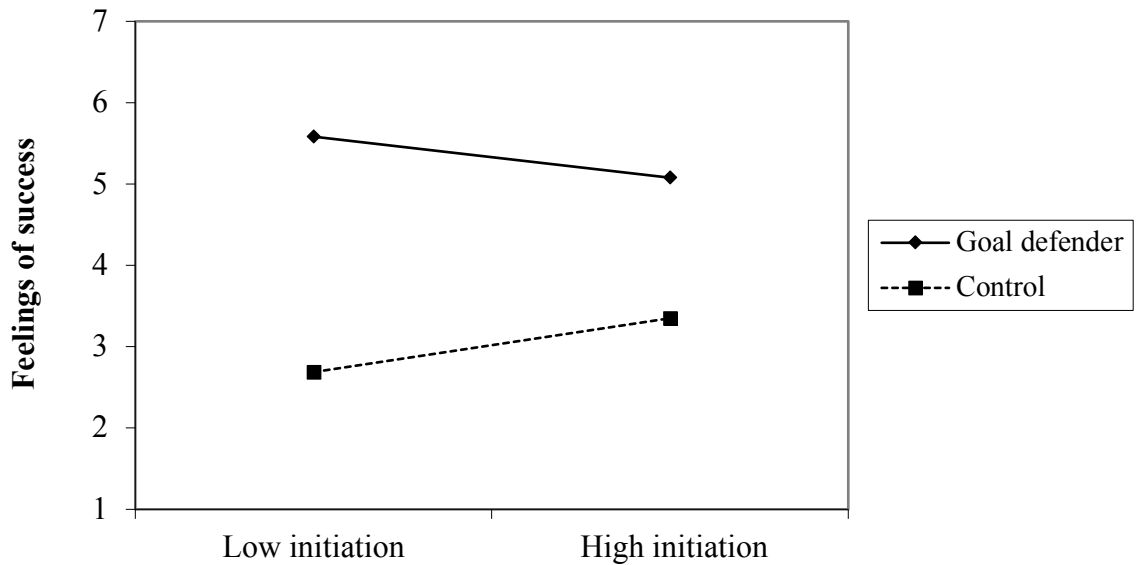
**Figure 16: Study 3 interaction predicting success, controlling for goal commitment and reactance**

There's also a significant difference in the relationship between trait continuation scores and success based on condition, such that participants in the goal initiator condition who were high in trait continuation felt significantly more successful in their goal progress than goal initiator participants with lower trait continuation ( $b = 0.130$ ,  $SE = 0.060$ ;  $t(295) = 2.167$ ,  $p = 0.031$ ). Trait continuation does not appear to affect feelings of success for participants in the goal defender condition by a large margin, but it appears that goal defenders may be helping people compensate for low regulatory capacity slightly more than people with more regulatory resources. See Figure 11.



**Figure 17: Study 3 interaction predicting success, controlling for goal commitment and reactance**

Finally, there's a similar relationship between the control and goal defender conditions where participants in the control condition are marginally more likely to feel successful in their goal progress as trait continuation scores increase compared to participants in the goal initiator condition lower in trait continuation ( $b = 0.100$ ,  $SE = 0.061$ ;  $t(295) = 1.625$ ,  $p = 0.105$ ). See Figure 12.

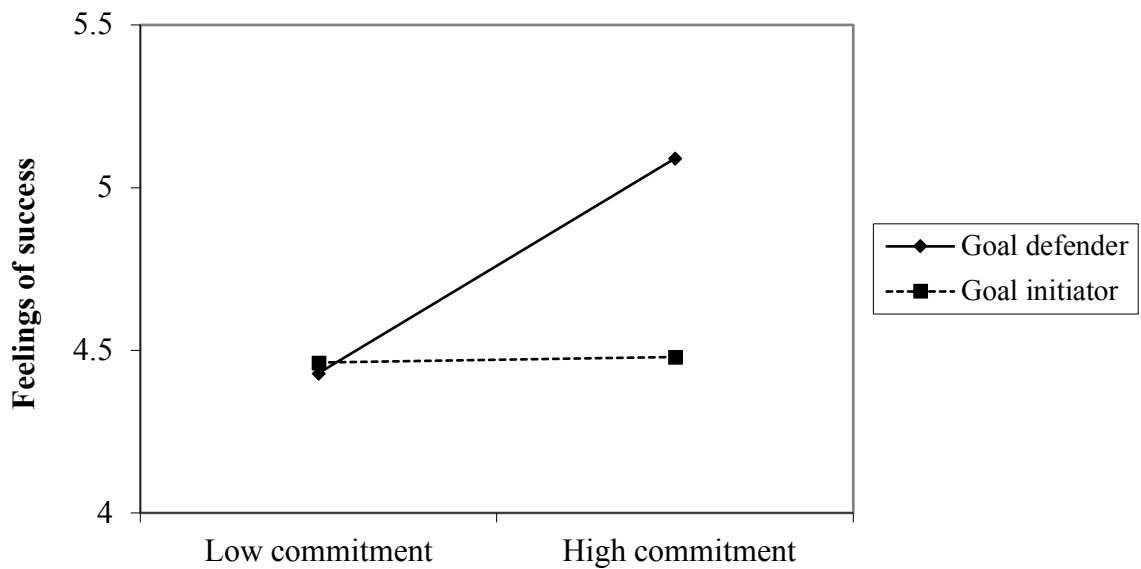


**Figure 18: Study 3 marginal interaction predicting success, controlling for goal commitment and reactance**

Feelings of goal success was the only dependent variable that demonstrated any kind of difference in moderation from goal commitment between the goal defender condition and the control condition. As a whole, these results demonstrate the importance of looking at the individual capacities that make up overall trait self-control, as it is clear that the subscales provide a more nuanced interpretation of results. See Table 11 for full analysis.

Success was also the only dependent variable that even hinted at a moderation effect for goal commitment, with a marginal moderation effect and a significant overall model ( $F(7,301) = 5.508, p < 0.001$ ). In this model, goal commitment moderated feelings of success in goal pursuit by condition (controlling for trait self-control and reactance), such

that participants in the goal defender condition were marginally more likely to feel successful in their goal pursuit when goal commitment was high relative to participants in the goal initiator condition ( $b = -0.115$ ,  $SE = 0.063$ ;  $t(301) = -1.815$ ,  $p = 0.070$ ; see Figure 13).



**Figure 19: Study 3 marginal interaction predicting success, controlling for trait self-control and reactance**

This difference was not significant or marginally significant for the control and goal defender conditions ( $b = -0.081$ ,  $SE = 0.064$ ;  $t(301) = -1.269$ ,  $p = 0.205$ ), but it trended in the same direction, suggesting that the goal defender participants are getting the biggest benefit out of their goal commitment, demonstrated by that fact that they feel the most successful about their pursuits relative to the other two conditions as goal commitment increases.

**Table 20: Study 3 moderation of goal success**

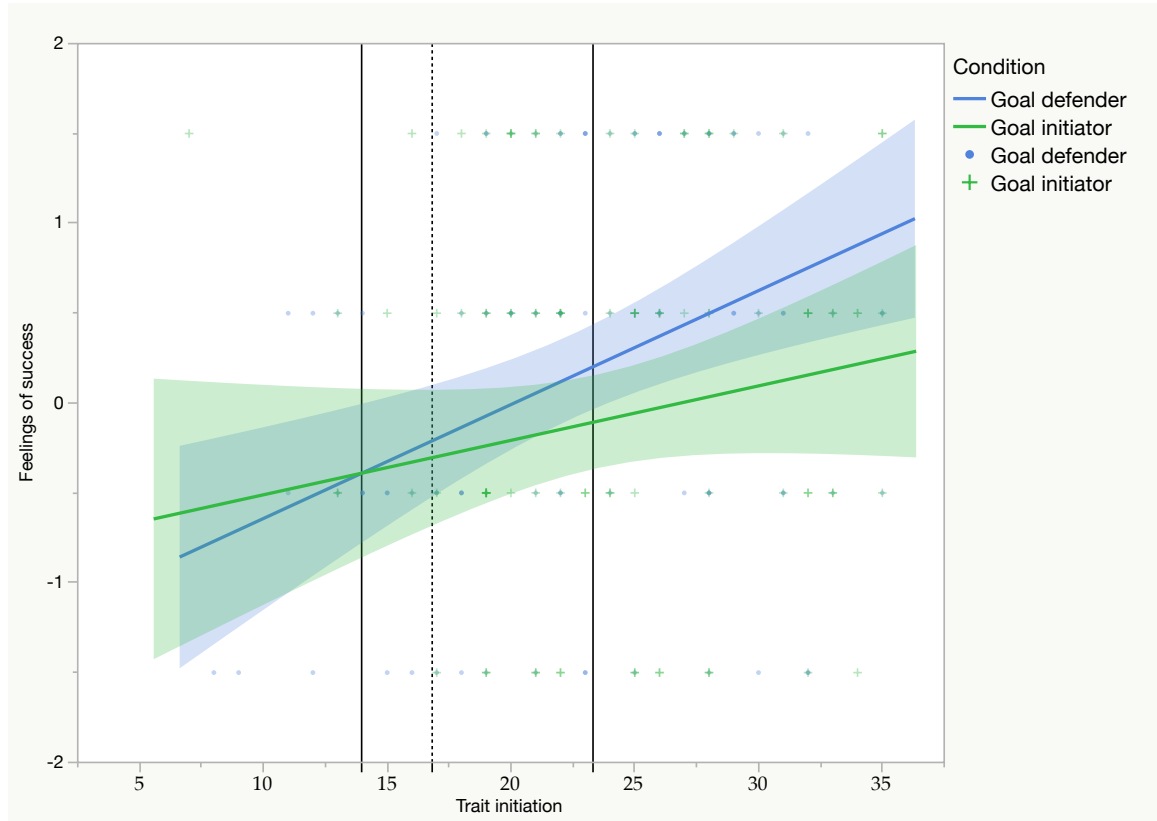
	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i>
DV: Success					
Model 1					
Condition 1 dummy (control) <sup>1</sup>	-0.181	0.188	-0.061	-0.963	0.336
Condition 3 dummy (initiator) <sup>1</sup>	-0.281	0.176	-0.100	-1.597	0.111+
Trait initiation <sup>1</sup>	0.013	0.017	0.064	0.798	0.603
Trait inhibition <sup>1</sup>	0.011	0.021	0.042	0.473	0.425
Trait continuation <sup>1</sup>	0.063	0.025	0.222	2.568	0.011*
Goal commitment <sup>1</sup>	0.030	0.026	0.065	1.178	0.240
Reactance <sup>1</sup>	-0.006	0.009	-0.036	-0.609	0.543
Model 2					
Condition 1 dummy (control) <sup>2</sup>	-2.540	1.448	-0.852	-1.755	0.080+
Condition 3 dummy (initiator) <sup>2</sup>	-3.334	1.418	-1.183	-2.351	0.019*
Trait initiation <sup>2</sup>	0.065	0.029	0.308	2.237	0.026*
Trait inhibition <sup>2</sup>	0.017	0.037	0.065	0.473	0.636
Trait continuation <sup>2</sup>	-0.023	0.045	-0.080	-0.499	0.618
Cond 1 * Initiation	-0.015	0.042	-0.037	-0.353	0.724
Cond 3 * Initiation	-0.117	0.039	-0.331	-3.016	0.003*
Cond 1 * Inhibition	-0.062	0.052	-0.119	-1.177	0.240
Cond 3 * Inhibition	0.038	0.050	0.083	0.749	0.454
Cond 1 * Continuation	0.100	0.061	0.789	1.625	0.105+
Cond 3 * Continuation	0.130	0.060	1.121	2.167	0.031*
Goal commitment <sup>2</sup>	0.037	0.026	0.079	1.429	0.154+
Reactance <sup>2</sup>	-0.007	0.009	-0.046	-0.784	0.434

**Note: An asterisk (\*) indicates statistical significance below the  $p = 0.05$  level, a dagger (†) indicates a finding below the  $p = 0.15$  level**

#### 5.3.1.4 Floodlight analyses

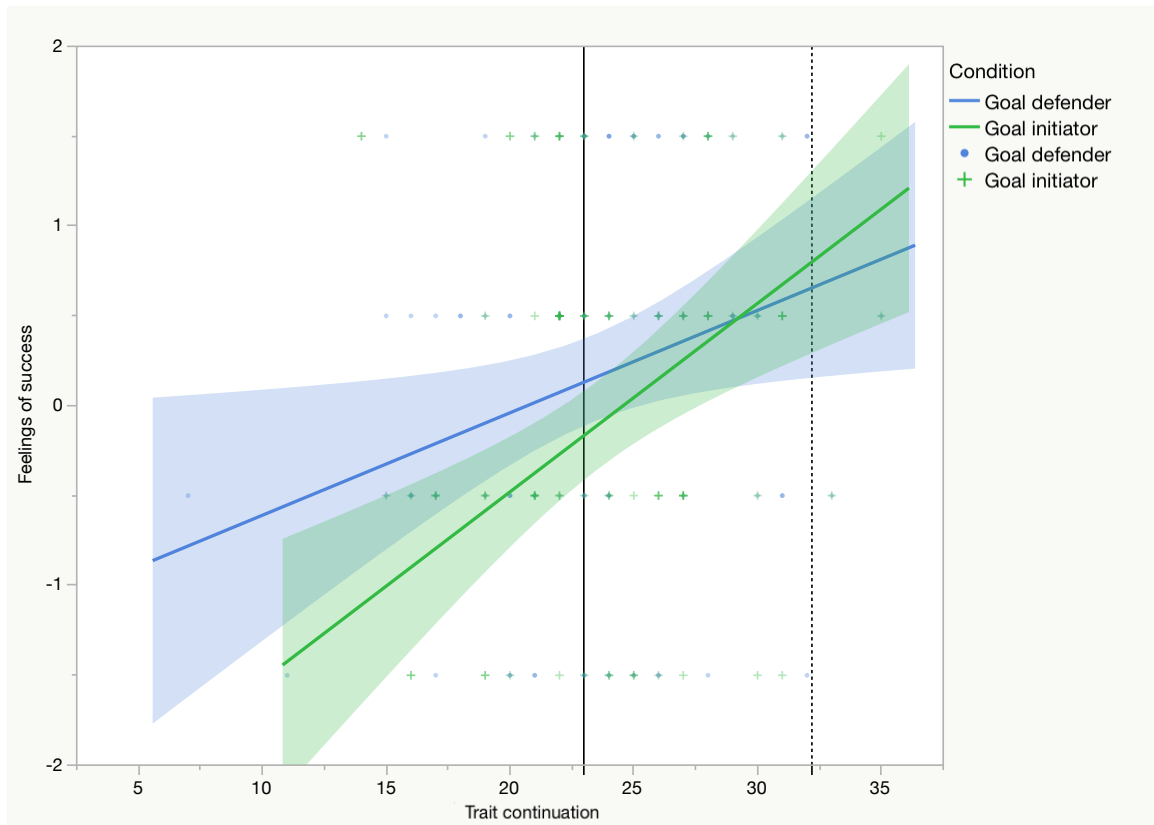
This analysis revealed that people in the goal defender condition felt significantly more successful than participants in the goal initiator condition when their trait initiation scores were 23.3406 or above (0.3374 points above average). It also revealed that goal defender participants felt significantly less successful when their trait initiation scores are below 14.000 (9.0032 points below average) and marginally less when their scores were 16.8000 or below (6.2032 points below average). This graph appears to be

significantly skewed because it does not control for several factors included in the PROCESS model that yielded the Johnson-Neyman points.



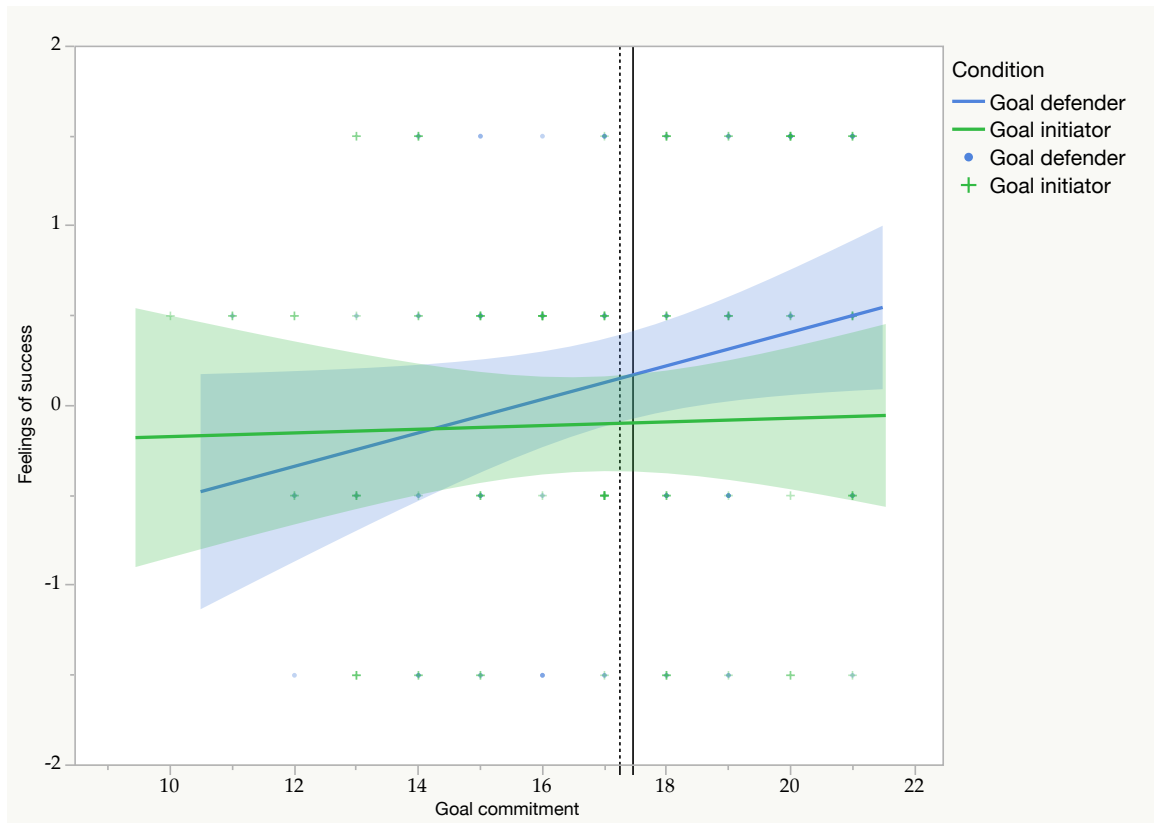
**Figure 20: Study 3 success floodlight analysis with trait initiation**

Floodlight analyses also revealed that people in the goal defender condition felt significantly more successful than participants in the goal initiator condition when their trait continuation scores were between 22.9978 (0.3388 points below average) and below, and marginally less successful than goal initiator participants when trait continuation scores were 32.2000 or above (8.8634 points above average).



**Figure 21: Study 3 success floodlight with trait continuation**

This analysis revealed that people in the goal defender condition felt significantly more successful than participants in the goal initiator condition when their goal commitment scores were 17.4715 (0.1820 points above average) or above, and marginally more significant than participants in the goal initiator condition when their goal commitment scores were 17.2500 (0.4035 points below average) or above.

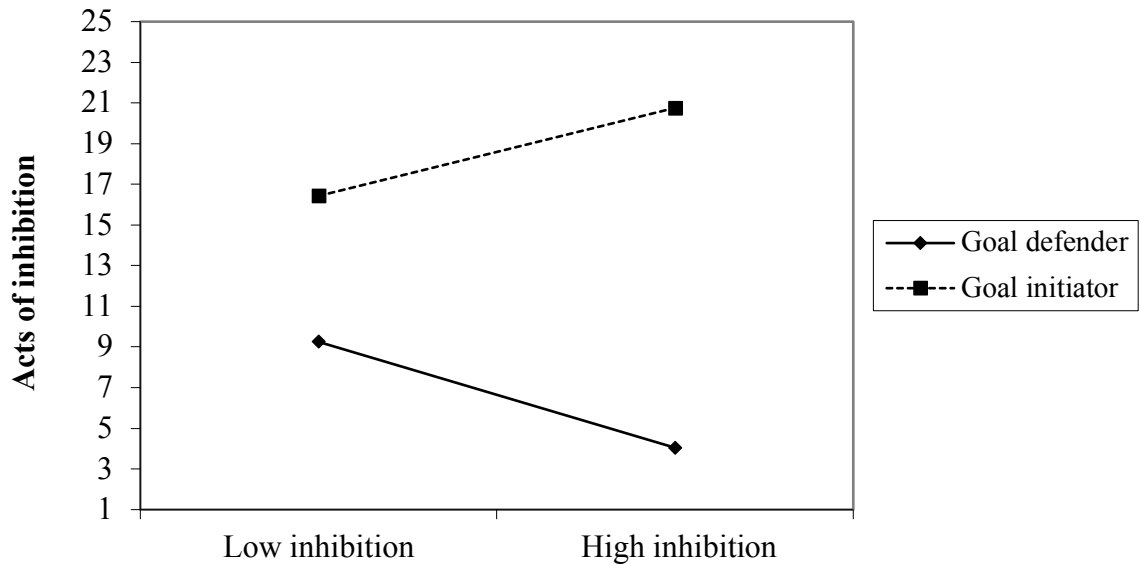


**Figure 22: Study 3 success floodlight with goal commitment**

#### 5.4.1.3 Acts of inhibition

The same regression significantly predicted acts of inhibition (step 1  $F(7,301) = 3.392, p = 0.002, F \text{ Change} = 3.392, p = 0.002$ ; step 2  $F(13,295) = 3.003, p < 0.001, F \text{ Change} = 2.435, p = 0.026$ ). There were no simple effects of condition controlling for the other variables in the model, but there was a significant difference in how trait initiation moderates the relationship between acts of inhibition completed and the goal initiator and goal defender conditions ( $b = 0.971, SE = 0.335; t(295) = 2.901, p = 0.004$ ). The data suggests that participants in the goal initiator condition who are high in trait inhibition completed significantly more acts of inhibition relative to participants in the goal defender condition,

where participants high in trait inhibition performed the fewest acts of inhibition. See Figure 13.



**Figure 23: Study 3 interaction predicting acts of inhibition, controlling for goal commitment and reactance**

This is more evidence that there was no fit between the types of goal consistent acts performed and a participant's trait level regulatory strength. See Table 21 for full regression results.

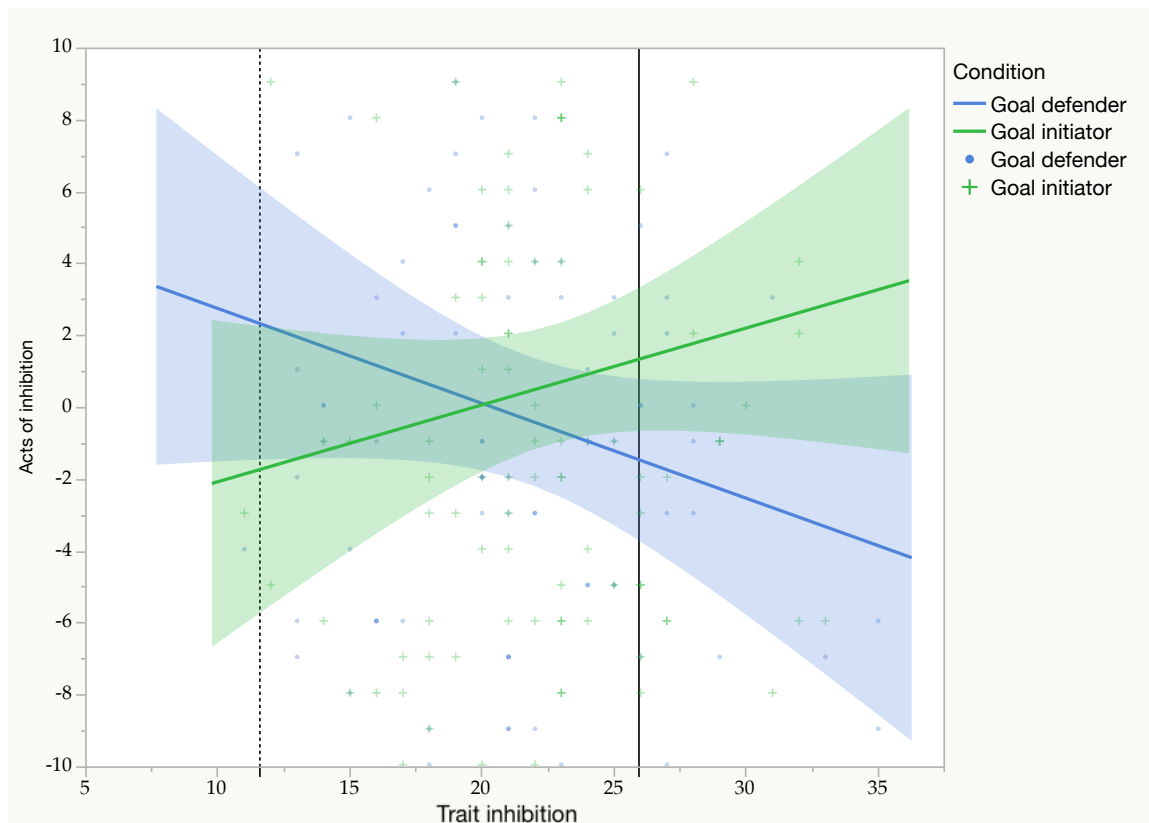
**Table 21: Study 3 moderation of acts of inhibition**

	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i>
DV: Acts of inhibition					
Model 1 (R = 0.270, R <sup>2</sup> = 0.073)					
Condition 1 dummy (control) <sup>3</sup>	0.788	1.247	0.041	0.632	0.528
Condition 3 dummy (initiator) <sup>3</sup>	1.332	1.171	0.073	1.138	0.256
Trait initiation <sup>3</sup>	-0.054	0.112	-0.039	-0.479	0.632
Trait inhibition <sup>3</sup>	-0.004	0.141	-0.003	-0.032	0.975
Trait continuation <sup>3</sup>	0.147	0.163	0.080	0.904	0.367
Goal commitment <sup>3</sup>	0.535	0.171	0.176	3.138	0.002*
Reactance <sup>3</sup>	0.202	0.062	0.197	3.266	0.001*
Model 2 (R = 0.342, R <sup>2</sup> = 0.117)					
Condition 1 dummy (control) <sup>3</sup>	-3.196	9.631	-0.165	-0.332	0.740
Condition 3 dummy (initiator) <sup>3</sup>	12.407	9.436	0.676	1.315	0.190
Trait initiation <sup>3</sup>	0.024	0.194	0.017	0.122	0.903
Trait inhibition <sup>3</sup>	-0.395	0.244	-0.228	-1.622	0.106†
Trait continuation <sup>3</sup>	0.257	0.301	0.139	0.853	0.394
Cond 1 * Initiation <sup>3</sup>	0.117	0.277	0.045	0.422	0.674
Cond 3 * Initiation <sup>3</sup>	-0.260	0.259	-0.113	-1.006	0.315
Cond 1 * Inhibition <sup>3</sup>	0.194	0.349	0.057	0.555	0.580
Cond 3 * Inhibition <sup>3</sup>	0.971	0.335	0.330	2.901	0.004*
Cond 1 * Continuation <sup>3</sup>	0.181	0.408	0.221	0.445	0.657
Cond 3 * Continuation <sup>3</sup>	-0.472	0.398	-0.627	-1.186	0.237
Goal commitment <sup>3</sup>	0.564	0.172	0.185	3.278	0.001*
Reactance <sup>3</sup>	0.223	0.062	0.217	3.587	<0.001*

Note: An asterisk (\*) indicates statistical significance below the  $p = 0.05$  level, a dagger (†) indicates a finding below the  $p = 0.15$  level

#### 5.4.1.3.1 Floodlight analyses

This analysis revealed that people in the goal defender condition completed marginally fewer acts of inhibition than participants in the goal initiator condition when their trait inhibition scores were 11.6 (0.7122 points above average) or below, and significantly more than participants in the goal initiator condition when their trait inhibition scores were 25.93 (3.771 points above average) or above.

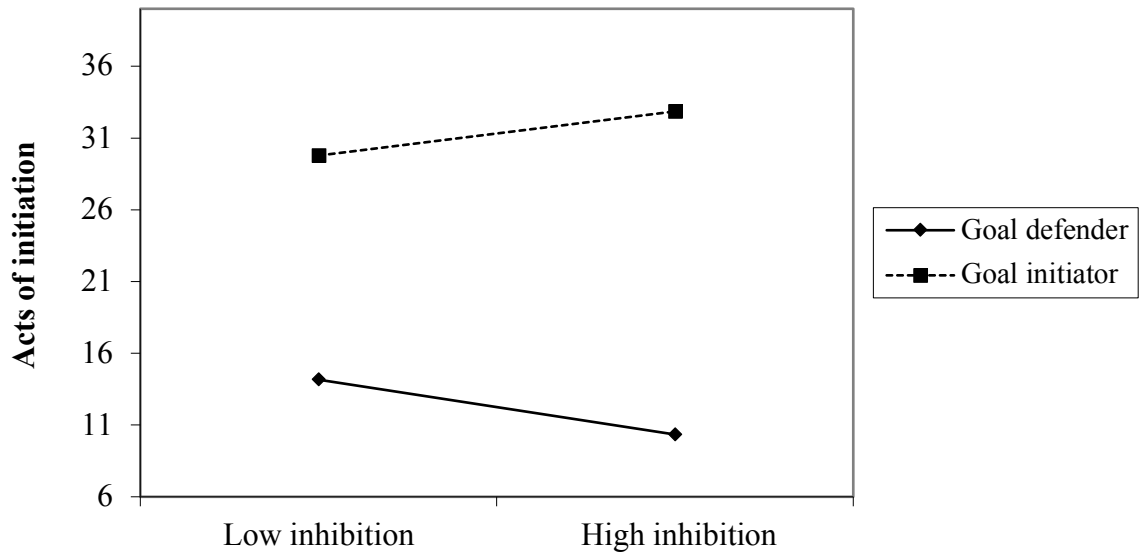


**Figure 24: Study 3 acts of inhibition floodlight**

#### 5.4.1.4 Acts of initiation

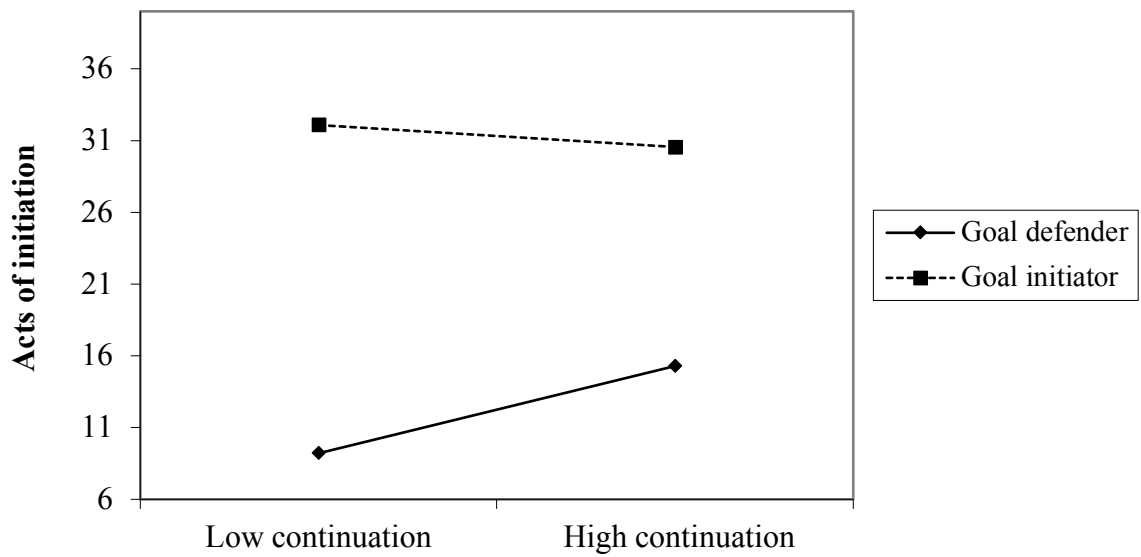
The regression predicting acts of initiation was also significant (step 1  $F(7,301) = 3.691, p = 0.001, F \text{ Change} = 3.691, p = 0.001$ ; step 2  $F(13,295) = 2.997, p < 0.001, F \text{ Change} = 2.093, p = 0.054$ ). The relationship between condition and acts of initiation was moderated by both trait inhibition ( $b = 0.702, SE = 0.277; t(295) = 2.532, p = 0.012$ ) and trait continuation ( $b = -0.824, SE = 0.330; t(295) = -2.498, p = 0.013$ ) in different ways for the goal defender and goal initiator conditions. The first moderation effect suggests that participants in the goal initiator condition who are high in trait inhibition are committing significantly more acts of initiation than participants in the goal defender condition as trait level inhibition

increases. Interestingly, participants in the goal defender condition appear to be committing even fewer acts of initiation as inhibition increases compared to goal defender participants lower in trait inhibition. See Figure 15.



**Figure 25: Study 3 interaction predicting acts of initiation, controlling for goal commitment and reactance**

The second moderation effect suggests that participants in the goal defender condition are committing significantly more acts of initiation if trait continuation is high, and that trait continuation does not moderate the relationship between the goal initiator condition and acts of initiation. See Figure 16.



**Figure 26: Study 3 interaction predicting acts of initiation, controlling for goal commitment and reactance**

There was also a significant simple effect indicating that participants in the goal initiator condition completed significantly more acts of initiation than participants in the goal defender condition ( $b = 15.849$ ,  $SE = 6.248$ ;  $t(295) = 2.537$ ,  $p = 0.012$ ). See Table 22 for regression results.

**Table 22: Study 3 moderation of acts of initiation**

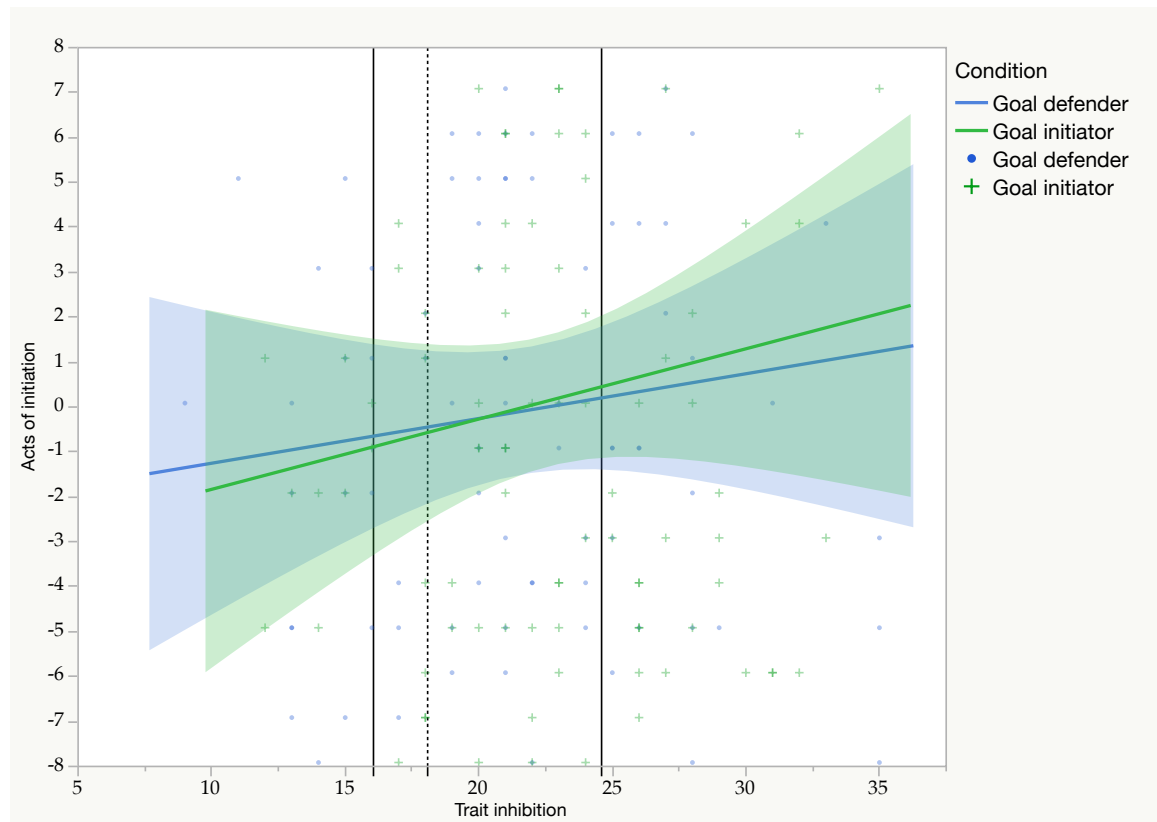
	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i>
DV: Acts of initiation					
Model 1					
Condition 1 dummy (control) <sup>1</sup>	0.439	1.029	0.027	0.427	0.670
Condition 3 dummy (initiator) <sup>1</sup>	0.422	0.966	0.028	0.437	0.662
Trait initiation <sup>1</sup>	0.053	0.093	0.047	0.576	0.565
Trait inhibition <sup>1</sup>	0.021	0.116	0.015	0.182	0.856
Trait continuation <sup>1</sup>	0.128	0.135	0.084	0.953	0.341
Goal commitment <sup>1</sup>	0.637	0.142	0.253	4.470	<0.001*
Reactance <sup>1</sup>	0.124	0.051	0.146	2.417	0.016*
Model 2					
Condition 1 dummy (control) <sup>2</sup>	8.452	7.976	0.526	1.060	0.290
Condition 3 dummy (initiator) <sup>2</sup>	19.799	7.815	1.303	2.534	0.012*
Trait initiation <sup>2</sup>	0.071	0.160	0.063	0.445	0.657
Trait inhibition <sup>2</sup>	-0.291	0.202	-0.203	-1.442	0.150†
Trait continuation <sup>2</sup>	0.536	0.249	0.351	2.152	0.032*
Cond 1 * Initiation <sup>2</sup>	0.136	0.230	0.064	0.594	0.553
Cond 3 * Initiation <sup>2</sup>	-0.144	0.214	-0.075	-0.671	0.503
Cond 1 * Inhibition <sup>2</sup>	0.154	0.289	0.055	0.532	0.595
Cond 3 * Inhibition <sup>2</sup>	0.702	0.277	0.288	2.532	0.012*
Cond 1 * Continuation <sup>2</sup>	-0.336	0.338	-0.493	-0.994	0.321
Cond 3 * Continuation <sup>2</sup>	-0.824	0.330	-1.321	-2.498	0.013*
Goal commitment <sup>2</sup>	0.637	0.142	0.253	4.470	<0.001*
Reactance <sup>2</sup>	0.124	0.051	0.146	2.417	0.016*

Note: An asterisk (\*) indicates statistical significance below the  $p = 0.05$  level, a dagger (†) indicates a finding below the  $p = 0.15$  level

#### 5.4.1.4.1 Floodlight analyses

The trait inhibition moderation effect was significant at scores of 16.0526 (5.329 points below average) or below, marginally significant at scores of 18.1000 (4.029 points below average), demonstrating a marked increase in acts of initiation for the goal defender condition for people low in trait inhibition. Trait inhibition also significantly moderated the relationship between condition and acts of initiation for people higher in trait inhibition, with participants in the goal defender condition with trait inhibition

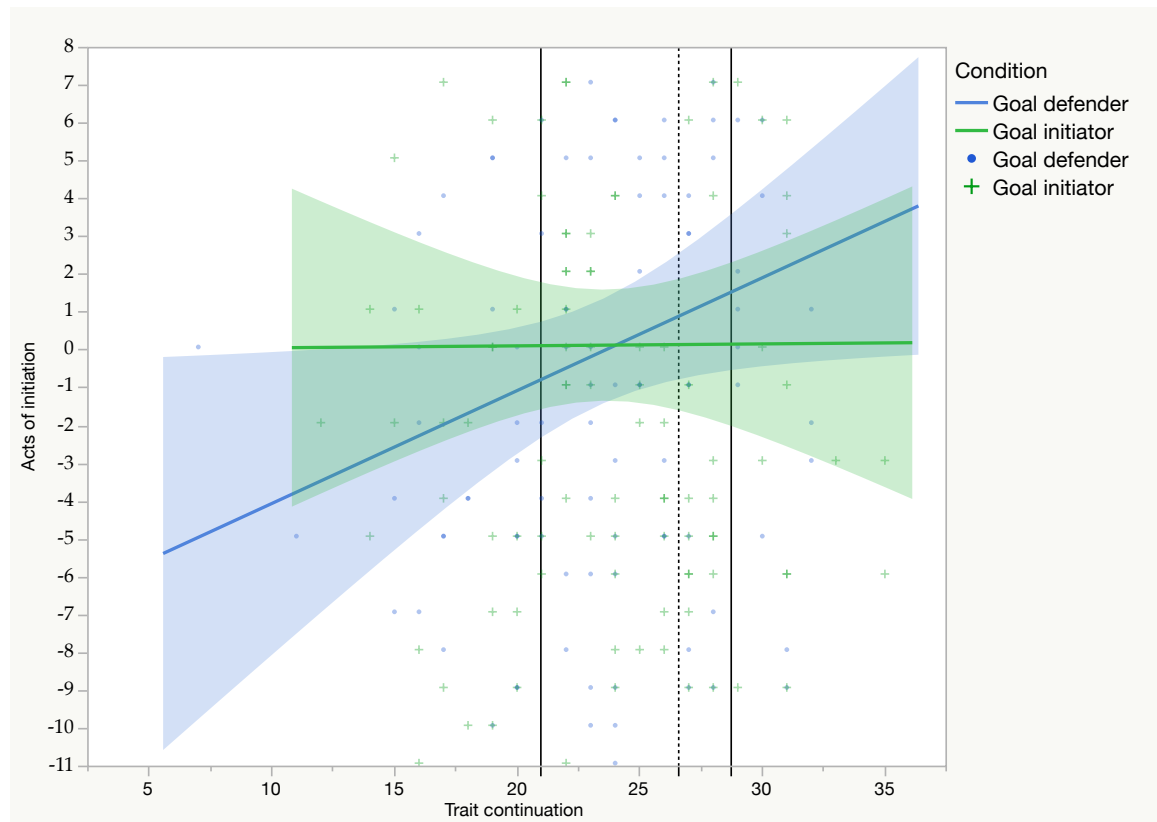
scores over 24.600 (2.471 points above average) completing significantly fewer acts of initiation.



**Figure 27: Study 3 initiation acts with trait inhibition**

The analysis for the continuation moderation revealed that people in the goal defender condition completed significantly fewer acts of initiation than participants in the goal initiator condition when their trait continuation scores were 21.0000 (2.3366 points below average) or below. They also completed marginally more acts of initiation than participants in the goal initiator condition when their trait continuation scores were 26.6 or below (3.2634 points above average), and significantly more acts of initiation than

participants in the goal initiator condition when scores were 28.7294 or above (5.3928 points above average).



**Figure 28: Study 3 initiation acts floodlight with continuation**

## **5.5 Discussion**

Condition membership alone predicted a few outcomes. Participants in the goal initiator condition felt significantly less successful in their goal pursuit over the intervening week than the participants in the goal defender condition, but they also completed significantly more acts of initiation compared to participants in the goal defender condition (and relatively more acts of inhibition as well). Participants in the control condition felt marginally less successful in their goal pursuit than participants in

the goal defender condition, but the major differences were revealed between the goal initiator and goal defender conditions in the moderation analyses.

In line with predictions, participants in the goal defender condition placed marginally less value on the alternative compared to participants in the goal initiator condition such that goal defender participants high in trait continuation rate the alternative goal as less valuable than goal initiator participants high in trait continuation. This difference was not significant between the control and goal defender conditions, but it trended in the same direction, demonstrating that goal defenders help to decrease the value of the alternative goal, as opposed to just increasing the value of the focal goal. This supports hypothesis 1C and suggests that even if goal defenders are not producing more inhibition related actions in goal pursuit, they are devaluing temptations that might derail their goal pursuit more. This helps to establish the true utility of a goal defender; it is not a person who helps to accomplish the goal, a person who makes the goal appear more valuable or motivates one to act in service of the goal, it is a person who helps to devalue the temptation that threatens the current goal, in addition to increasing state level self-control and narrowing focus.

This seems to be supported by the fact that participants in the goal defender condition felt significantly and marginally more successful in their goal pursuit than participants in the goal initiator and control conditions, even though they did not complete as many goal relevant actions. Participants in the goal defender condition felt

more successful than participants in the goal initiator condition when trait initiation was high, with participants high in trait initiation feeling the most successful, but participants in the goal initiator condition felt relatively more successful when they were high in continuation. Goal defender participants also felt more successful than goal initiator participants when trait continuation scores were low. Perhaps participants in the goal initiator condition were better at acting on their goal intentions by committing more goal relevant acts, but they were not as good at controlling their desire to stray from the goal, leading to lower feelings of success. Existing trait self-control capacities may have been used differently based on who participants were primed with, such that being primed with a goal defender is even more effective for people with high inhibition.

Contrary to predictions, participants in the goal initiator condition performed relatively more acts of inhibition and significantly more acts of initiation as their trait inhibition scores increased compared to participants in the goal defender condition. Since the difference between the control and goal defender condition is not significant, but the difference between the goal defender and the goal initiator conditions is, this effect may suggest that people primed with goal initiators complete more goal relevant acts in general. It may also suggest that participants primed with goal defenders performed fewer acts of inhibition because they simply put themselves into fewer situations where they needed to use their capacity for inhibition. Participants high in trait inhibition in the goal defender condition performed the fewest acts of initiation and the fewest acts of

inhibition, perhaps suggesting that participants primed with goal defenders increase regulatory capacity in a way that was not captured by the goal actions measure, but by avoiding self-control dilemmas entirely. This was only different for goal defender participants high in continuation, who completed relatively more acts of initiation than participants high in continuation in the goal initiator condition.

Past research has demonstrated that people high in trait self-control are tempted less throughout the day, possibly through the complete avoidance of temptation (Hofmann et al., 2012). Perhaps goal defenders compound this effect and lead to fewer acts of inhibition through lower need to inhibit, as opposed to more failures to inhibit. Trait inhibition seemed to be particularly important for the amount of goal relevant acts participants in the goal initiator condition performed relative to people in the goal defender condition. This is particularly interesting because this was the case for both acts of initiation and acts of inhibition, which may mean that goal defenders and goal initiators have fit with concepts like approach and avoidance motivation more than specific types of goal relevant actions. However, this may be different for people high in trait continuation, suggesting that such people may be more likely to perform goal actions.

Goal commitment was also tested as a moderator, but it only marginally interacted with condition to predict one outcome variable – feelings of success. Participants in the goal defender condition who were higher in goal commitment felt more successful in their goal pursuit than participants in the goal initiator condition. This difference was not

significant between the control and goal defender conditions, but it trended in the same direction, suggesting that participants in the goal defender condition are experiencing the biggest boost in feelings of success in goal pursuit relative to the other conditions. On its own, goal commitment significantly predicts acts of initiation and acts of inhibition, indicating that it likely had a much larger influence on goal directed behavior than condition for the goal related acts variables, making it difficult to detect an interaction with condition.

Overall, the results of study 3 supported hypothesis 1C by demonstrating that goal defenders act to devalue the goal alternative, not necessarily to increase the value of the overall goal. The main effects indicated that participants in the goal defender condition were somewhat more successful in their goal pursuit than participants in the goal initiator condition, perhaps lending evidence to the idea that goal defenders are uniquely suited to protect pursuits from distraction. The significant difference in reactance among the conditions presented an issue, as reactance emerged as a significant predictor for several outcome variables, accounting for a large amount of variance in several of the regression models. Ideally, another study would be conducted in which participants are equally reactive between conditions. This study also underscored the importance of looking at the individual subscales of trait self-control, as the subscales of self-control moderated the relationship between the condition and the outcome variables in a variety of ways that were largely undetectable when using the composite trait self-

control measure. Only two of the moderation effects were revealed in analyses using the composite measure, and both effects were attenuated.

## **6. Conclusion**

### ***6.1 General discussion***

Overall, the data are generally supportive of the three hypotheses, as well as of the importance of trait self-control as a moderator. In studies 1A and 1B, participants in the treatment condition were relatively more likely to remember the healthy words than the unhealthy words and control participants were relatively more likely to remember unhealthy as opposed to healthy words. This demonstrated a heightened perceptual narrowing effect for participants in the treatment condition, as they were less likely to notice and remember the less goal relevant words included in the word cloud (the unhealthy food and clothing words). The fact that participants in both conditions remembered more unhealthy food words than clothing words suggests that both groups experienced a perceptual narrowing effect associated with goal priming, but that that effect was magnified for participants who were primed with goal defenders. While the main effects from study 1A did not replicate, it is clear that participants in the treatment condition are downregulating their attention to alternatives more than participants in the control condition, who actually remember more words associated with temptation than they do words associated with the health goal.

In study 1A, a marginal interaction predicting goal irrelevant word accuracy also trended in the expected direction, with people in the treatment condition being less likely to remember the completely goal irrelevant clothing words when they were high in goal

commitment. The interaction demonstrating a marginally significant moderating effect of trait inhibition predicting unhealthy word identification suggests that, in study 1B, participants in the goal defender condition are better at inhibiting words associated with temptation relative to participants high in trait inhibition in the control condition. These interactions suggest that the goal defender may be having different effects on the dependent variables based on trait level regulatory capacity, and that there may be a sense of fit between a participant's trait level inhibitory capacity and being primed with a goal defender, such that goal defenders are better at inhibiting goal irrelevant information when participants are also high in trait level inhibition.

Study 2 added some evidence in favor of hypothesis 1B, which suggests that one of the ways that goal defenders may act to help goal pursuers is by increasing the self-control they have in the moment. A moderation effect of trait inhibition was revealed such that participants in the treatment condition who were already high in trait inhibition were higher in state self-control, perhaps indicating that goal defenders do increase regulatory resources available in the moment, but only for people high in trait inhibition to begin with. This is similar to other self-control strategies, which are often more effective for people who are already high in trait level regulatory capacity. For trait continuation, it appears that goal defenders may be increasing temptation inhibition scores for treatment participants high in continuation, but decreasing them for participants low in trait continuation. This indicates that participants low in trait continuation are helped by the

mental presence of the goal defender, but that participants high in trait continuation may be somewhat hindered by it and actually indulge far more than they would in the control condition.

Study 3 provided evidence in favor of hypothesis 1C, that goal defenders specifically act to devalue alternative goals. Participants in the goal defender condition valued the alternative goal (recreational enjoyment of food) marginally less when they were high in trait initiation, and participants in the goal initiator condition valued the alternative goal marginally more when they were high in trait continuation, while goal defender participants saw a boost above goal initiator participants when trait continuation was low. This helps to establish that goal defenders do not act to prime goal relevant behavior the way someone like a goal initiator might, they act to devalue goal irrelevant behavior. As for goal success, participants in the goal defender condition felt more successful in their goal pursuit than participants in the goal initiator condition, but participants in the goal initiator condition who were high in trait continuation felt relatively more successful than goal initiator participants lower in continuation. This indicates that goal defenders may have compensated for this difference in regulatory capacity.

Finally, it appears that participants in the goal initiator condition of study 3 perform relatively more acts of inhibition and significantly more acts of initiation than participants in the goal defender condition, and that this effect is compounded for

participants high in trait inhibition, such that participants high in trait inhibition are performing the most acts of inhibition and initiation in the goal initiator condition, and the opposite pattern is seen in the goal defender condition. This may suggest that participants who are primed with goal initiators are simply accomplishing more goal related acts in general, as initiation should be associated with forward momentum on a goal. People primed with inhibition may show more restraint and commit fewer goal related acts specifically because they face fewer goal related dilemmas. This result is in contrast to study 1B, in which participants in the goal defender condition who are high in trait inhibition were better at inhibiting unhealthy words than controls. The difference in these findings may suggest that there is something of a perceptual fit between goal defenders and goal mindsets, as exemplified by the things that people perceive in their environment, but that there is less of a behavioral fit between the type of other one is primed with and the kinds of behavior one performs. Instead, it may be that people primed with goal defenders complete fewer goal related acts because they inhibit temptation in general, and people primed with goal initiators complete more goal related acts because they are attempting to make forward progress on the goal in general.

Goal commitment largely did not moderate the relationship between condition and the goal outcome variables, as goal commitment rarely or only marginally interacted with condition to affect goal outcomes. In study 1A, goal commitment predicted accuracy on healthy food word identification, such that more committed goal defender participants

saw and recognized more goal relevant information and saw and recognized fewer goal irrelevant clothing words. However, goal commitment did not moderate unhealthy word recognition, demonstrating that it did not help to increase inhibitory abilities for the alternative goal. Goal commitment marginally predicted success on the goal in Study 3, such that participants in the goal defender condition were more likely to report goal success if goal commitment was high, while high goal commitment was indistinguishable from low goal commitment in the goal initiator condition. However, even this effect was only marginally significant, indicating that goal commitment is not playing a large role in these studies. Even though previous literature emphasizes the importance of this variable in goal attainment (Locke & Latham, 2002), this may be seen as evidence that goal defenders do not aid goal pursuers by increasing their dedication to the goal, but by doing things like increasing state level resources or guiding attention away from alternative goals.

Overall, the results support the three hypotheses through the proposed self-control moderation effects. An unexpected factor that emerged was the importance of using all three trait self-control subscales and their interactions in lieu of just an overall trait self-control measure and its interaction(s) with condition. The different subscales were dominant in predicting different types of outcomes, implying that the goal actions measured in this study require more nuanced self-control capacities than previously thought. The fact that the subscales sometimes had the opposite effect based on condition

illustrates the potential for the effects of the subscales to be undetectable when using the overall measure. As the first exploration of the role of goal defenders, the results of the current research are promising and provide evidence that others do sometimes stand between goal pursuers and the alternatives they may otherwise pursue. They may do this by increasing the effect of goal induced perceptual narrowing, as demonstrated by studies 1A and 1B, by increasing state self-control, as demonstrated in study 2, and/or by encouraging devaluation of the alternative goal, as demonstrated in study 3. This makes goal defenders a unique tool for goal pursuers, and differentiates them from other goal relevant close others.

### **6.1.1 Limitations and future directions**

Although each study in the present research attempted to address the limitations of the last, there are some limitations in the current data that provide fruitful directions for future research. Even though not all of the original hypotheses were fully supported by the data, the significant and marginal findings in the expected directions provide encouraging initial evidence for the effectiveness of goal defenders in ignoring alternatives. It also provides evidence that they may increase regulatory strength in the moment. However, there were some significant issues with all of the samples that limit the generalizability of the data. Differences in outsourcing and reactivity between conditions make interpretations of the current data a bit murkier for several studies.

Conducting similar studies with people who differ less between conditions could go a long way to determining how much external validity the current results have.

One issue that may have increased variance between conditions was the difficulty of soliciting the appropriate goal defender, as opposed to simply a goal-relevant close other. Two different methods of soliciting nominations for goal defenders were used across the four studies, focusing on priming others who helped participants overcome obstacles to goal accomplishment or priming others who helped participants to increase their self-control. However, it is unclear if these are the best methods to solicit these nominations, or if they truly produced people who were uniquely related to goals. For instance, in study 2, participants occasionally nominated the same person as helping them increase their self-esteem and self-control, indicating that some of the nominees may serve more than one regulatory purpose. Further investigation into the best way to solicit nominations for goal defenders would help to clarify their role in goal pursuit. It would also be useful to test the role of goal defenders in other goal domains, as goal defenders may be more helpful for some goal domains than for others. For instance, health goals often require a good amount of inhibiting alternative goals like eating tempting food, but other types of goals, like social and entertainment goals, do not require as much inhibition, and likely rely more on initiation.

Based on study 2, priming a person who increases self-control or self-esteem did not seem as effective as priming someone who helps to overcome obstacles or an

unrelated close other. People in the control condition of study 2 were outsourcing their goal quite a bit to someone who was supposed to be theoretically uninvolved in the goal pursuit. That suggests that they were not as uninvolved as would have been ideal, something that is made unambiguous in the other studies by asking for either a person unrelated to goal pursuit or a generic other the participant doesn't know. In a follow up to this study, it would be a good idea to move away from this manner of manipulating goal defenders.

Another limitation is the disconnect between the dependent variables and the actual goals set by the participants in studies 1A, 1B and 2. Even though all of these studies contained behavioral dependent variables – recognition or temptation inhibition – they were not closely connected to the goal for studies 1A and 1B, and were only closely connected to the goal for a portion of the participants in study 2 (many participants' health goals did not involve avoiding junk food). For a participant who has a health goal related to exercise, food temptations may not be a reflection of goal related behavior. Study 3 did directly measure the outcomes from healthy eating goals participants set themselves, however, the dependent variables were retroactive self-report measures. This leaves a prime avenue for future researchers to either create an observable lab task in which the outcome variables are more reliably associated with the generated goals, or to create an experience sampling study to eliminate the issue of retroactive reporting.

Because this line of research is so new, and because the role of others in individual goal pursuit is gaining more attention, there is much to build on. However, the initial studies provided a nice foundation to explore from. Based on the results observed, goal defenders definitely affect goal directed thought and behavior, but more exploration is needed to confirm the effects found in the current research.

## **Appendix A: Study 1A and 1B**

### **1A. Study 1A measures**

#### **1A.1 Health goal formation**

“Think about a health goal you have, but that you have not yet achieved. A health goal might be something like cutting back on saturated fat or exercising more. Spend a few minutes thinking about that goal and writing about it in the box provided below. You may write about things like what the goal will require of you, how you might go about achieving it, obstacles you may face, etc.”

#### **1A.2 Significant other priming measure**

Participants saw a series of open-ended essay questions on the screen that asked them about the other person. Those questions include “*What does [the person the participant nominated] look like?*”; “*What are some defining personality traits that [the person the participant nominated] has?*”; “*What hobbies does [the person the participant nominated] have?*”; “*What does [the person the participant nominated] like?*”; “*What does [the person the participant nominated] dislike?*”; “*How did you meet [the person the participant nominated]?*”; and “*When is the last time you had contact with [the person the participant nominated]?*”

#### **1A.3 Significant other priming strength**

The potency of the significant other as a strong source of goal priming will be assessed by summing participant responses to five questions: “*How close do you feel with [name of other autoinserted]?*” answered on a Likert-type scale from 1-Not at all close to 7-

*Extremely close; “How important is your health goal to [name of other autoinserted]?”* answered on a Likert-type scale from 1-*Not at all important* to 7-*Extremely important*; *“How disappointed would [name of other autoinserted] be in you if you failed to achieve your health goal?”* answered on a Likert-type scale from 1-*Not at all disappointed* to 7-*Extremely disappointed*; *“How much do you care about what [name of other autoinserted] thinks about you?”* answered on a Likert-type scale from 1-*Not at all* to 7-*A great deal*; and *“How pleased would [name of other autoinserted] be if you achieved the health goal?”* answered on a Likert-type scale from 1-*Not at all pleased* to 7-*Extremely pleased*. Higher scores reflect more relative importance of the other and his or her opinion of the participant. This measure is used in all studies (1A, 1B, 2 and 3).

#### **1A.4 Goal commitment**

Participant commitment to the health goal was assessed by summing three questions to create a composite score: *“How committed are you to achieving your health goal?”* answered on a Likert-type scale from 1-*Not at all committed* to 7-*Extremely committed*; *“How important is achieving the health goal to you?”* answered on a Likert-type scale from 1-*Not at all important* to 7-*Extremely important*; and *“How much time do you plan on devoting to your health goal over the coming week?”* answered on a 7-point scale where 1-*Less than 30 minutes*, 2-*30 minutes or less*, 3-*An hour or less*, 4-*An hour and a half or less*, 5-*Two hours or less*, 6-*Two and a half hours or less*, 7-*Three hours or more*.



Squash\*, Eggplant\*, Kale\*, Peach\*, Quinoa\*, Cherry\*, Turnip\*,  
Banana\*

Unhealthy words: Soda, Sausage, Butter, Bacon, Sugar, Waffle, Pasta, Fries,  
Burger, Burrito, Ribs, Doughnut, Cookie, Pizza, Taco, Pancake,  
Syrup\*, Candy\*, Chocolate\*, Cereal\*, Biscuit\*, Milkshake\*,  
Cream\*, Lemonade\*

Clothing words: Coat, Jewelry, Sweater, Apron, Blazer, Gloves, Glasses, Sandals,  
Cardigan, Shirt, Beret, Belt, Anorak, Pajamas, Suit, Dress,  
Shorts\*, Shoes\*, Parka\*, Jacket\*, Sundress\*, Camisole\*, Pants\*,  
Kimono\*

## 1A.7 Reactance

Reactance was assessed with the 11-item Hong Psychological Reactance Scale (Hong & Fraedda, 1996). Higher scores on this variable indicate higher levels of trait reactance. This measure is used in all studies (1A, 1B, 2 and 3).

Please indicate the number that most closely matches your opinion.

*Strongly disagree* 1 – 2 – 3 – 4 – 5 *Strongly agree*

1. I become frustrated when I am unable to make free and independent decisions.
2. I become angry when my freedom of choice is restricted.

3. It irritates me when someone points out things which are obvious to me.
4. Regulations trigger a sense of resistance in me.
5. I find contradicting others stimulating.
6. When something is prohibited, I usually think “that’s exactly what I am going to do.”
7. I resist the attempts of others to influence me.
8. It makes me angry when another person is help up as a model for me to follow.
9. When someone forces me to do something, I feel like doing the opposite.
10. I consider advice from others to be an intrusion.
11. Advice and recommendations induce me to do just the opposite.

## **2A. Study 1A supplemental tables and figures**

### **2A.1 Floodlight analyses**

**Table 23: Study 1A moderation of clothing accuracy**

	<i>B</i>	<i>SE B</i>	<i>t</i>	<i>p</i>	<i>LLCI</i>	<i>ULCI</i>
DV: Clothing accuracy						
Model 1 (R = 0.506, R <sup>2</sup> = 0.256)						
Condition <sup>1</sup>	-0.479	0.363	-1.320	0.188	-1.194	0.236
Goal commitment <sup>1</sup>	-0.056	0.072	-0.787	0.432	-0.197	0.085
Goal commitment * Cond <sup>1</sup>	-0.152	0.107	-1.423	0.156	-0.361	0.058
Healthy accuracy <sup>1</sup>	0.539	0.055	9.720	<0.001*	0.430	0.648

**Note: An asterisk (\*) indicates statistical significance below the  $p = 0.05$  level, a dagger (†) indicates a finding below the  $p = 0.15$  level. Overall model significance:  $F(4,300) = 25.7501, p < 0.001$**

### **3A. Study 1B measures**

#### **3A.1 Self-control scale**

Trait self-control was assessed with the self-control scale by Hoyle and Davisson (2016). Higher scores on this scale indicate greater trait self-control capacity. There are also three subscales, calculated by summing the measures marked as related to inhibition, initiation or continuation respectively. This measure is used in multiple studies (1B, 2 and 3).

Please read each statement carefully and indicate how often your own behavior reflects the tendency.

*Hardly ever 1 - 2 - 3 - 4 - 5 Nearly always*

1. I am able to resist temptations. (Inhibition)
2. I waste a lot of time before getting down to work. (R; Initiation)
3. Once I have decided to quit doing something I shouldn't, I don't look back.  
(Continuation)
4. I have trouble resisting my cravings. (R; Inhibition)
5. I delay as long as possible before starting something I expect to be unpleasant.  
(R; Initiation)
6. I am able to keep doing what I think I should do, even when other people would stop. (Continuation)

7. I can deny myself something I want but don't need. (Inhibition)
8. I waste time on things that don't really matter, rather than working on things that do. (R; Initiation)
9. When I commit to doing something difficult, I see it through to the end.  
(Continuation)
10. My bad habits cause problems for me. (R; Inhibition)
11. I just can't seem to get going, even when I have much to do. (R; Initiation)
12. Not much can stop me from honoring a commitment to better myself.  
(Continuation)
13. When I want something that is bad for me, I go after it anyway. (R; Inhibition)
14. Even when the list of things to do is long, it is easy for me to get started.  
(Initiation)
15. When I am doing something I don't want to do, I find it hard to continue. (R;  
Continuation)
16. I am able to control how I react to impulses. (Inhibition)
17. I get started on new projects right away. (Initiation)
18. After I have started a challenging task, I find it easy to stick with it.  
(Continuation)
19. If I want to do something I know I shouldn't, I won't do it. (Inhibition)
20. I do nothing despite having plenty to do. (R; Initiation)

21. I find it easy to keep with good behavior. (Continuation)

#### 4A. Study 1B supplemental tables and figures

##### 4A.1 Overall self-control measure

The following figures use the overall trait self-control measure as a moderator instead of the three trait self-control subscales. Using the three subscales revealed a more nuanced picture of the role of trait regulatory capacity, whereas this model revealed no significant or marginally significant interactions.

**Table 24: Study 1B moderation of healthy accuracy**

	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i>
<b>DV: Healthy accuracy</b>					
Model 1 (R = 0.533, R <sup>2</sup> = 0.284)					
Condition <sup>1</sup>	0.121	0.151	0.041	0.803	0.423
Trait self-control <sup>1</sup>	-0.006	0.011	-0.028	-0.540	0.590
Unhealthy accuracy <sup>1</sup>	0.482	0.049	0.505	9.762	<0.001*
Reactance <sup>1</sup>	-0.031	0.020	-0.081	-1.503	0.134 <sup>†</sup>
Model 2 (R = 0.533, R <sup>2</sup> = 0.285)					
Condition <sup>1</sup>	0.121	0.151	0.041	0.803	0.423
Trait self-control <sup>1</sup>	-0.006	0.011	-0.029	-0.546	0.585
Condition * Trait self-control <sup>1</sup>	0.003	0.011	0.014	0.274	0.784
Unhealthy accuracy <sup>1</sup>	0.483	0.050	0.506	9.736	<0.001*
Reactance <sup>1</sup>	-0.031	0.021	-0.081	-1.493	0.137 <sup>†</sup>

**Note: An asterisk indicates statistical significance above the  $p = 0.05$  level, a dagger (†) indicates a finding below the  $p = 0.15$  level; Overall model significance: step 1  $F(4,288) = 28.605, p < 0.001, F$  Change = 28.605,  $p < 0.001$ ; step 2  $F(5,287) = 22.826, p < 0.001, F$  Change = 0.075,  $p = 0.784$**

**Table 25: Study 1B moderation of unhealthy accuracy**

	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i>
DV: Unhealthy word accuracy					
Model 1 (R = 0.550, R <sup>2</sup> = 0.303)					
Condition <sup>1</sup>	-0.097	0.156	-0.031	-0.623	0.534
Trait self-control <sup>1</sup>	-0.028	0.012	-0.125	-2.440	0.015*
Healthy accuracy <sup>1</sup>	0.516	0.053	0.492	9.762	<0.001*
Reactance <sup>1</sup>	-0.059	0.021	-0.147	-2.796	0.006*
Model 2 (R = 0.554, R <sup>2</sup> = 0.307)					
Condition <sup>2</sup>	-0.098	0.156	-0.031	-0.627	0.531
Trait self-control <sup>2</sup>	-0.028	0.012	-0.123	-2.390	0.017*
Condition * Self-control <sup>2</sup>	-0.015	0.011	-0.065	-1.327	0.186
Healthy accuracy <sup>2</sup>	0.514	0.053	0.490	9.736	<0.001*
Reactance <sup>2</sup>	-0.059	0.021	-0.148	-2.815	0.005*

**Note:** An asterisk indicates statistical significance above the  $p = 0.05$  level, a dagger (†) indicates a finding below the  $p = 0.15$  level; Overall model significance step 1  $F(4,288) = 31.245, p < 0.001, F$  Change = 31.245,  $p < 0.001$ ; step 2  $F(5,287) = 25.414, p < 0.001$ ; step 2  $F(5,287) = 25.414, p < 0.001, F$  Change = 1.761,  $p = 0.186$

**Table 26: Study 1B moderation of clothing accuracy**

	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i>
DV: Clothing word accuracy					
Model 1 (R = 0.515, R <sup>2</sup> = 0.265)					
Condition <sup>1</sup>	-0.023	0.191	-0.006	-0.122	0.903
Trait Self-control <sup>1</sup>	-0.010	0.014	-0.036	-0.688	0.492
Healthy accuracy <sup>1</sup>	0.637	0.065	0.511	9.869	<0.001*
Reactance <sup>1</sup>	-0.001	0.026	-0.003	-0.053	0.958
Model 2 (R = 0.516, R <sup>2</sup> = 0.266)					
Condition <sup>2</sup>	-0.024	0.191	-0.006	-0.123	0.902
Trait Self-control <sup>2</sup>	-0.009	0.014	-0.035	-0.664	0.507
Condition * Self-control <sup>2</sup>	-0.008	0.014	-0.031	-0.607	0.545
Healthy accuracy <sup>2</sup>	0.636	0.065	0.510	9.838	<0.001*
Reactance <sup>2</sup>	-0.002	0.026	-0.003	-0.060	0.952

**Note:** An asterisk indicates statistical significance above the  $p = 0.05$  level, a dagger (†) indicates a finding below the  $p = 0.15$  level; Overall model significance step 1  $F(4,288) = 25.949, p < 0.001, F$  Change = 25.949,  $p < 0.001$ ; step 2  $F(5,287) = 20.787, p < 0.001, F$  Change = 0.368,  $p = 0.545$

**Table 27: Study 1B moderation of overall trait self-control**

	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i>
DV: Healthy unhealthy difference					
Model 1 (R = 0.100, R <sup>2</sup> = 0.010)					
Condition <sup>4</sup>	0.156	0.176	0.053	0.886	0.376
Trait self-control <sup>4</sup>	0.011	0.013	0.052	0.860	0.390
Clothing Accuracy <sup>4</sup>	-0.029	0.047	-0.036	-0.610	0.542
Reactance <sup>4</sup>	0.028	0.023	0.075	1.208	0.228
Model 2 (R = 0.116, R <sup>2</sup> = 0.013)					
Condition <sup>4</sup>	0.157	0.176	0.053	0.889	0.375
Trait self-control <sup>4</sup>	0.011	0.013	0.050	0.823	0.411
Condition * Trait self-control <sup>4</sup>	0.012	0.013	0.057	0.978	0.329
Clothing Accuracy <sup>4</sup>	-0.027	0.047	-0.034	-0.566	0.572
Reactance <sup>4</sup>	0.028	0.023	0.075	1.218	0.224

**Note: An asterisk indicates statistical significance above the  $p = 0.05$  level, a dagger (†) indicates a finding below the  $p = 0.15$  level; Overall model significance step 1  $F(4,288) = 0.731, p = 0.571, F$  Change = 0.731,  $p = 0.571$ ; step 2  $F(5,287) = 0.776, p = 0.568; F$  Change = 0.957,  $p = 0.329$**

#### 4A.2 Floodlight analyses

**Table 28: Study 1B moderation of healthy accuracy with initiation**

	<i>B</i>	<i>SE B</i>	<i>t</i>	<i>p</i>	<i>LLCI</i>	<i>ULCI</i>
DV: Healthy accuracy						
Model 1 (R = 0.568, R <sup>2</sup> = 0.322)						
Condition <sup>1</sup>	0.158	0.300	0.528	0.598	-0.432	0.748
Trait inhibition <sup>1</sup>	0.001	0.041	0.003	0.998	-0.080	0.080
Trait initiation <sup>1</sup>	0.004	0.044	0.090	0.928	-0.082	0.090
Trait continuation <sup>1</sup>	0.055	0.055	1.000	0.318	-0.054	0.164
Trait inhibition * Cond <sup>1</sup>	0.053	0.040	1.322	0.187	-0.026	0.133
Trait initiation * Cond <sup>1</sup>	-0.091	0.063	-1.443	0.150†	-0.215	0.033
Trait continuation * Cond <sup>1</sup>	0.028	0.057	0.494	0.622	-0.084	0.140
Unhealthy accuracy <sup>1</sup>	0.485	0.050	9.759	<0.001*	0.388	0.583
Reactance <sup>1</sup>	-0.041	0.021	-1.990	0.048*	-0.081	<0.001

**Note: An asterisk (\*) indicates statistical significance below the  $p = 0.05$  level, a dagger (†) indicates a finding below the  $p = 0.15$  level. Overall model significance:  $F(9,291) = 15.5589, p < 0.001$**

**Table 29: Study 1B moderation of unhealthy accuracy with inhibition**

	<i>B</i>	<i>SE B</i>	<i>t</i>	<i>p</i>	<i>LLCI</i>	<i>ULCI</i>
DV: Unhealthy accuracy						
Model 1 (R = 0.585, R <sup>2</sup> = 0.342)						
Condition <sup>1</sup>	-0.308	0.315	-0.978	0.329	-0.928	0.312
Trait inhibition <sup>1</sup>	0.039	0.058	0.667	0.505	-0.075	0.153
Trait initiation <sup>1</sup>	-0.050	0.034	-1.491	0.137†	-0.117	0.016
Trait continuation <sup>1</sup>	-0.002	0.058	-0.029	0.977	-0.117	0.113
Trait inhibition * Cond <sup>1</sup>	-0.143	0.084	-1.703	0.090†	-0.309	0.022
Trait initiation * Cond <sup>1</sup>	0.002	0.033	0.067	0.947	-0.063	0.068
Trait continuation * Cond <sup>1</sup>	0.035	0.058	0.601	0.549	-0.080	0.150
Healthy accuracy <sup>1</sup>	0.542	0.053	10.247	<0.001*	0.438	0.646
Reactance <sup>1</sup>	-0.066	0.021	-3.091	0.002†	-0.108	-0.024

**Note: An asterisk (\*) indicates statistical significance below the  $p = 0.05$  level, a dagger (†) indicates a finding below the  $p = 0.15$  level. Overall model significance:  $F(9,291) = 16.7822, p < 0.001$**

## Appendix B: Study 2

### 1B. Study 2 pre-test results

Table 30: Study 2 food pretest results

	Mean	SD
Baby carrots	6.42	1.157
Almonds	6.27	1.053
Freeze dried fruit (generic name for Fruit Crisps)*	5.47	1.405
Granola*	5.14	1.456
Vegetable chips	5.07	1.494
Rice cakes*	5.05	1.601
Fruit Crisps	4.78	1.896
Fruit leather	4.73	1.985
Corn nuts	4.50	1.961
Pretzels	4.32	1.768
Popcorn	4.32	1.757
Sweet potato chips	4.14	1.882
Baked potato chips	4.08	1.872
Bugles	3.71	2.285
Hershey's kisses	3.50	2.144
Cookies	3.42	2.053
Nerds	3.36	2.323
Sour Patch Kids	3.31	2.305
Twix bars	3.29	2.231
Mike and Ikes	3.29	2.252
Snickers bars	3.26	2.139
M & Ms	3.24	2.146
Potato chips	3.21	2.077
Jelly beans	3.20	2.184
Laffy Taffy	3.19	2.269
Dum Dum lollipops	3.09	2.093
Starburst chews*	3.08	2.140
Gobstoppers	3.07	2.208
Jolly Ranchers	3.07	2.066
Gummy bears*	3.06	2.055
Skittles*	3.01	2.131

Participants in the study 2 pretest were asked to respond to a matrix style item with the instruction, “Indicate how healthy each food item is by choosing an option on the scale provided” with a scale from *1-Not at all* to *7-Very* to rate each food item listed in the table below. Foods chosen for use in study 2 are marked with asterisks (\*).

## **2B. Study 2 materials**

### **2B.1 Health and fitness goal formation**

“Think about a health and fitness goal you have, but that you have not yet achieved. A health and fitness goal might be something like exercising more or cutting back on saturated fat. Spend a few minutes thinking about that goal and writing about it in the box provided below. You may write about things like what the goal will require of you, how you might go about achieving it, obstacles you may face, etc.”

### **2B.2 State self-control measure**

“Please use the scale provided to indicate how much this statement reflects how you feel right now.”

*Does not describe me at all 1---2---3---4---5 Describes me very well*

1. I have good self-control.
2. I am capable of accomplishing my goals.
3. I feel like I have all of the tools I need to accomplish my goals.
4. I am focused on my goals.
5. I feel that I have the ability to stay on track with my goals.

6. I make plans in order to streamline my goal pursuit.
7. I am good at resisting things that may distract me from my goals.
8. I am good at accomplishing goals.

### **2B.3 Other priming and instructions**

Participants were primed with either the individual that increased their self-esteem (control condition) or the individual that increased their self-control (treatment condition) by flashing the name of the person for 20 ms before three different instruction screens. The instructions were shown as follows:

\*\*\*Name of nominated other flashed for 20 ms\*\*\*

Screen 1- "You are about to take part in a task in which you will be asked to taste test several foods and answer questions about your experiences with them. Press the space bar to continue."

\*\*\*Name of nominated other flashed for 20 ms\*\*\*

Screen 2- "During the taste test, you will be asked to try 6 different foods. You may take as much as you like of any of the foods, but you must try all of them. Please try the foods before beginning so that you can devote your focus to the questions. Press the space bar to continue."

\*\*\*Name of nominated other flashed for 20 ms\*\*\*

Screen 3- "Please go to the food station in the lab and procure a sample of each of the available foods and bring it back to this station. Once you have sampled the foods, please begin the questions. Press the space bar to continue."

## **2B.4 Consumer taste test task**

The taste test task was designed to approximate real life self-control dilemmas that participants with health goals may face. The foods used in the study were Quaker Oats Salt and Pepper Popped Rice Cakes, KIND Oats and Honey Granola Clusters with Toasted Coconut, Brothers All-Natural Assorted Freeze-Dried Fruit Crisps, original mix Skittles, original mix Starburst fruit chews and Haribo Gummy Bears. Each participant saw 1 ounce each of Rice Cakes and Fruit Crisps, 2 ounces of Granola, 4 ounces of Skittles, 4.1 ounces of Starburst chews and 4.05 ounces of Gummy Bears in 0.3 oz. clear plastic bowls, with scoops provided to maintain cleanliness. Experimenters were instructed to offer a full mix of flavors for each candy and to set up the food display the same way each time, as demonstrated in the diagram below. Chinet disposable plates were used, which weigh an average of 0.85 oz.



Once at the food station, participants were given the following verbal instructions by the experimenter: “That’s your plate right there (point to plate). You will be asked questions about these six foods, so you need to try at least a little bit of all of the foods, but you can take as much as you like. Once you make your plate, you can bring it back to the desk.” Measurements of food left on the plate and food taken from the bowls was calculated by either subtracting the weight of the plate from the food left on the plate, or subtracting the weight of each bowl of food at the end of the experiment from the original weight of the bowl.

## **2B.5 Temptation inhibition**

The score for a participant’s ability to inhibit the unhealthy foods was the sum of two measures: How much of the unhealthy items participants took to taste and how much of the unhealthy items they actually ate calculated by subtracting what is left on the plate

by what the participant took from the bowls. Lower scores on this variable indicate more effective inhibition of temptations.

## **2B.6 Perceptual inhibition**

Several items were summed to create a score that indicated the degree to which participants inhibited the tempting foods. This score is the sum of the scores from the self-reported ratings from the items, *“How difficult was it for you to stop eating the [food option]?”*; *“How tempted were you to eat more of the [food option]?”*; and *“How difficult was it for you to keep your health and fitness goal in mind while eating the [food option]?”* on a scale from 1-Not at all to 7-Very for only the snacks deemed unhealthy. The lower the total score on this variable, the better the participant inhibited the unhealthy options, as demonstrated by the fact that the tempting options elicit the need for less willpower.

## **3B. Study 2 supplemental tables and figures**

### **3B.1 Overall self-control analyses**

The following analyses use the overall trait self-control measure and its interaction with condition as opposed to the subscales and their individual interactions with condition.

**Table 31: Study 2 self-control moderation of condition on state self-control**

	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i>
DV: State self-control					
Model 1 (R = 0.737, R <sup>2</sup> = 0.543)					
Condition <sup>1</sup>	0.044	0.331	0.009	0.132	0.895
Trait self-control <sup>1</sup>	0.260	0.021	0.671	12.382	<0.001*
Goal commitment <sup>1</sup>	0.044	0.331	0.009	0.132	0.895
Outsourcing <sup>1</sup>	0.031	0.021	0.081	1.532	0.127†
Model 2 (R = 0.742, R <sup>2</sup> = 0.551)					
Condition <sup>2</sup>	0.044	0.331	0.009	0.132	0.895
Trait self-control <sup>2</sup>	0.260	0.021	0.671	12.382	<0.001*
Condition * Trait self-control <sup>2</sup>	0.031	0.021	0.081	1.532	0.127†
Goal commitment <sup>2</sup>	0.162	0.044	0.201	3.695	<0.001*
Outsourcing <sup>2</sup>	0.161	0.118	0.096	1.369	0.173

**Note: An asterisk (\*) indicates statistical significance above the  $p = 0.05$  level, a dagger (†) indicates a finding below the  $p = 0.15$  level; Overall model significance: Step 1 –  $F(4,161) = 47.863, p < 0.001, F$  Change = 47.863,  $p < 0.001$ ; Step 2-  $F(5,160) = 39.213, p < 0.001, F$  Change = 2.649,  $p = 0.106$**

**Table 32: Study 2 self-control moderation of condition on temptation inhibition**

	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i>
DV: Temptation inhibition					
Model 1 (R = 0.266, R <sup>2</sup> = 0.071)					
Condition <sup>1</sup>	-0.010	0.058	-0.013	-0.165	0.869
Trait self-control <sup>1</sup>	-0.015	0.005	-0.252	-3.237	0.001*
Goal commitment <sup>1</sup>	-0.001	0.010	-0.008	-0.098	0.922
Outsourcing <sup>1</sup>	0.018	0.020	0.072	0.897	0.371
Model 2 (R = 0.278, R <sup>2</sup> = 0.078)					
Condition <sup>2</sup>	-0.011	0.058	-0.015	-0.194	0.847
Trait self-control <sup>2</sup>	-0.015	0.005	-0.251	-3.218	0.002*
Condition * Trait self-control <sup>2</sup>	0.005	0.005	0.083	1.089	0.278
Goal commitment <sup>2</sup>	<0.001	0.010	-0.001	-0.017	0.986
Outsourcing <sup>2</sup>	0.018	0.020	0.072	0.898	0.371

**Note: An asterisk (\*) indicates statistical significance above the  $p = 0.05$  level, a dagger (†) indicates a finding below the  $p = 0.15$  level; Overall model significance: Step 1 –  $F(4,160) = 3.040, p = 0.019, F$  Change = 3.040,  $p = 0.019$ ; Step 2 -  $F(5,159) = 2.672, p = 0.024, F$  Change = 1.187,  $p = 0.278$ )**

**Table 33: Study 2 self-control moderation of condition on perceptual inhibition**

	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i>
DV: Perceptual inhibition					
Model 1					
Condition <sup>1</sup>	0.247	1.010	0.019	0.245	0.807
Trait self-control <sup>1</sup>	-0.253	0.082	-0.243	-3.108	0.002*
Goal commitment <sup>1</sup>	-0.007	0.171	-0.003	-0.041	0.967
Outsourcing <sup>1</sup>	0.291	0.341	0.068	0.853	0.395
Model 2					
Condition <sup>2</sup>	0.253	1.014	0.020	0.249	0.804
Trait self-control <sup>2</sup>	-0.253	0.082	-0.243	-3.099	0.002*
Condition * Trait self-control <sup>2</sup>	-0.012	0.080	-0.012	-0.154	0.878
Goal commitment <sup>2</sup>	-0.008	0.172	-0.004	-0.048	0.962
Outsourcing <sup>2</sup>	0.291	0.342	0.068	0.851	0.396

**Note: An asterisk (\*) indicates statistical significance above the  $p = 0.05$  level, a dagger (†) indicates a finding below the  $p = 0.15$  level; Overall model significance: Step 1 –  $F(4,161) = 47.863, p < 0.001, F \text{ Change} = 47.863, p < 0.001$ ; Step 2-  $F(5,160) = 39.213, p < 0.001, F \text{ Change} = 2.649, p = 0.106$**

### **3B.2 Goal commitment analyses**

The following analyses did not provide evidence of moderation of any of the dependent variables based on goal commitment, and were omitted from the main text of the paper.

**Table 34: Study 2 commitment moderation of condition on state self-control**

	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i>
DV: State self-control					
Model 1 (R = 0.737, R <sup>2</sup> = 0.543)					
Condition <sup>1</sup>	-0.289	0.262	-0.061	-1.100	0.273
Goal commitment <sup>1</sup>	0.159	0.044	0.196	3.575	<0.001*
Trait self-control <sup>1</sup>	0.259	0.021	0.668	12.211	<0.001*
Outsourcing <sup>1</sup>	0.059	0.088	0.037	0.664	0.508
Model 2 (R = 0.737, R <sup>2</sup> = 0.544)					
Condition <sup>2</sup>	-0.289	0.263	-0.061	-1.100	0.273
Goal commitment <sup>2</sup>	0.158	0.045	0.195	3.541	0.001*
Condition * Goal commitment <sup>2</sup>	-0.015	0.044	-0.019	-0.348	0.728
Trait self-control <sup>2</sup>	0.258	0.022	0.667	12.160	<0.001*
Outsourcing <sup>2</sup>	0.060	0.089	0.038	0.677	0.499

**Note: An asterisk (\*) indicates statistical significance above the  $p = 0.05$  level, a dagger (†) indicates a finding below the  $p = 0.15$  level; Overall model significance: Step 1 –  $F(4,161) = 47.863, p < 0.001, F$  Change = 47.863,  $p < 0.001$ ; Step 2-  $F(5,160) = 38.106, p < 0.001, F$  Change = 0.121,  $p = 0.728$**

**Table 35: Study 2 commitment moderation of condition on temptation inhibition**

	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i>
DV: Temptation inhibition					
Model 1 (R = 0.266, R <sup>2</sup> = 0.071)					
Condition <sup>1</sup>	-0.010	0.058	-0.013	-0.165	0.869
Goal commitment <sup>1</sup>	-0.001	0.010	-0.008	-0.098	0.922
Trait self-control <sup>1</sup>	-0.015	0.005	-0.252	-3.237	0.001*
Outsourcing <sup>1</sup>	0.018	0.020	0.072	0.897	0.371
Model 2 (R = 0.278, R <sup>2</sup> = 0.077)					
Condition <sup>2</sup>	-0.011	0.058	-0.015	-0.189	0.851
Goal commitment <sup>2</sup>	-0.002	0.010	-0.016	-0.203	0.839
Condition * Goal commitment <sup>2</sup>	-0.010	0.010	-0.081	-1.048	0.296
Trait self-control <sup>2</sup>	-0.016	0.005	-0.257	-3.292	0.001*
Outsourcing <sup>2</sup>	0.018	0.020	0.075	0.939	0.349

**Note: An asterisk (\*) indicates statistical significance above the  $p = 0.05$  level, a dagger (†) indicates a finding below the  $p = 0.15$  level; Overall model significance: Step 1 –  $F(4,160) = 3.040, p = 0.019, F$  Change = 3.040,  $p = 0.019$ ; Step 2-  $F(5,159) = 2.653, p = 0.025, F$  Change = 1.098,  $p = 0.296$**

**Table 36: Study 2 commitment moderation of condition on perceptual inhibition**

	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i>
DV: Perceptual inhibition					
Model 1					
Condition <sup>1</sup>	0.247	1.010	0.019	0.245	0.807
Goal commitment <sup>1</sup>	-0.007	0.171	-0.003	-0.041	0.967
Trait self-control <sup>1</sup>	-0.253	0.082	-0.243	-3.108	0.002*
Outsourcing <sup>1</sup>	0.291	0.341	0.068	0.853	0.395
Model 2					
Condition <sup>2</sup>	0.239	1.010	0.019	0.236	0.814
Goal commitment <sup>2</sup>	-0.016	0.171	-0.007	-0.095	0.924
Condition * Goal commitment <sup>2</sup>	-0.166	0.167	-0.076	-0.996	0.321
Trait self-control <sup>2</sup>	-0.256	0.082	-0.246	-3.139	0.002*
Outsourcing <sup>2</sup>	0.306	0.341	0.072	0.897	0.371

Note: An asterisk (\*) indicates statistical significance above the  $p = 0.05$  level, a dagger (†) indicates a finding below the  $p = 0.15$  level; Overall model significance: Step 1 –  $F(4,161) = 2.858, p = 0.025, F$  Change = 2.858,  $p = 0.025$ ; Step 2-  $F(5,160) = 2.484, p = 0.034, F$  Change = 0.992,  $p = 0.321$

### 3B.3 Floodlight analyses

**Table 37: Study 2 moderation of state self-control**

	<i>B</i>	<i>SE B</i>	<i>t</i>	<i>p</i>	<i>LLCI</i>	<i>ULCI</i>
DV: State self-control						
Model 1 ( $R = 0.758, R^2 = 0.574$ )						
Condition <sup>1</sup>	-6.082	3.524	-1.726	0.086†	-13.004	0.878
Trait inhibition <sup>1</sup>	0.069	0.109	0.630	0.530	-0.146	0.284
Trait initiation <sup>1</sup>	0.190	0.047	4.032	0.001*	0.097	0.283
Trait continuation <sup>1</sup>	0.459	0.079	5.829	<0.001*	0.303	0.614
Trait inhibition * Cond <sup>1</sup>	0.241	0.149	1.613	0.109†	-0.054	0.535
Trait initiation * Cond <sup>1</sup>	-0.038	0.048	-0.081	0.936	-0.098	0.090
Trait continuation * Cond <sup>1</sup>	0.014	0.077	0.177	0.860	-0.138	0.165
Goal commitment <sup>1</sup>	0.142	0.045	3.191	0.002*	0.054	0.231
Outsourcing <sup>1</sup>	0.034	0.089	0.384	0.702	-0.141	0.209

Note: An asterisk (\*) indicates statistical significance below the  $p = 0.05$  level, a dagger (†) indicates a finding below the  $p = 0.15$  level. Overall model significance:  $F(9,156) = 23.3296, p < 0.001$

**Table 38: Study 2 moderation of temptation inhibition**

	<i>B</i>	<i>SE B</i>	<i>t</i>	<i>p</i>	<i>LLCI</i>	<i>ULCI</i>
DV: Temptation inhibition						
Model 1 (R = 0.323, R <sup>2</sup> = 0.104)						
Condition <sup>1</sup>	-0.016	0.117	-0.137	0.891	-0.248	0.215
Trait inhibition <sup>1</sup>	-0.016	0.017	-0.946	0.346	-0.050	0.018
Trait initiation <sup>1</sup>	-0.016	0.011	-1.456	0.147†	-0.037	0.006
Trait continuation <sup>1</sup>	-0.050	0.025	-2.011	0.046*	-0.100	-0.001
Trait inhibition * Cond <sup>1</sup>	-0.002	0.017	-0.112	0.911	-0.035	0.032
Trait initiation * Cond <sup>1</sup>	-0.010	0.011	-0.938	0.350	-0.031	0.011
Trait continuation * Cond <sup>1</sup>	0.079	0.035	2.258	0.025*	0.010	0.147
Goal commitment <sup>1</sup>	-0.004	0.010	-0.340	0.735	-0.024	0.017
Outsourcing <sup>1</sup>	0.019	0.020	0.928	0.355	-0.021	0.058

Note: An asterisk (\*) indicates statistical significance below the  $p = 0.05$  level, a dagger (†) indicates a finding below the  $p = 0.15$  level. Overall model significance:  $F(9,155) = 2.0048, p = 0.0421$

## Appendix C: Study 3

### 1C. Study 3 materials

#### 1C.1 Healthy eating goal formation

“Think about a healthy eating goal you have, but that you have not yet achieved, that you plan to work on over the coming week. A healthy eating goal might be something like cutting back on carbs or eating more vegetables. Spend a few minutes thinking about that goal and writing about it in the box provided below. You may write about things like what the goal will require of you, how you might go about achieving it, obstacles you may face, etc.”

#### 1C.2 Other instructions and time selection

“There is a week between now and your next session. Work on your healthy eating goal over the next week and help to boost your self-control by **spending a few minutes**

**each day thinking about the person you nominated** (the person you nominated is the goal relevant person you were asked to name earlier in the survey). Research has shown that other people may help us achieve our goals, and even just thinking about other people may help to encourage goal attainment. **Please choose a time of day during which you will spend a few minutes each day over the next 7 days thinking about the person you nominated.**

At what time will you spend a few minutes thinking about the person you nominated each day? This individual is the person whose name you were asked to provide and who you answered questions about earlier in the survey."

### **1C.3 Goal relevant initiation**

This variable will reflect how many goal relevant actions participants initiated throughout the intervening week. This measure served to indicate how capable participants are at initiating goal relevant actions, with larger numbers indicating greater capability initiating. Items that reflected goal initiation in the goal action chart are "Ate healthy food," "Cooked at home," "Devoted time to meal planning," "Looked for healthy recipes," "Ate before going to a location with tempting food," "Bought a book about a diet," "Joined a dieting support group," "Sought nutritional information," "Sought the guidance of a nutritionist or doctor" and "Participated in a discussion on dieting."

#### **1C.4 Goal relevant inhibition**

This variable score will reflect how many goal irrelevant actions participants inhibited throughout the intervening week. This measure will serve to indicate how capable participants are at inhibiting alternative goals, with larger numbers indicating greater capacity for inhibiting. Items that reflected goal inhibition in the goal action chart are "Thought of buying junk food but then didn't," "Avoided a restaurant with tempting, unhealthy food," "Made a healthy choice at a restaurant with tempting, unhealthy food," "Avoided locations at work where there is tempting food, like the break room," "Did not attend a social function centered around unhealthy food," "Brushed your teeth to make yourself stop eating," "Looked at a picture of yourself near your goal appearance in order to resist a temptation," "Thought about eating junk food and then ate something healthy instead," "Thought of eating out but made something at home instead" and "Put back unhealthy food while shopping at the grocery store."

#### **1C.5 Value of alternative**

Because currently existing scales on the value of dietary goals focus a great deal on a physically attractive appearance (see Stice, Mazotti, Krebs, & Martin, 1998 and Cash, Melnyk, & Krabosky, 2004), the value the participant places on the alternative to their dieting goal, recreational enjoyment of food, was assessed by borrowing from integrated regulation research. Integrated regulation results from compatibility between one's actions and one's values during goal pursuit (Pelletier, Dion, Slovinec-D'Angelo, & Reid,

2004). Actions that are integrated with the self should be viewed as more valuable due to this intrinsic association (Pelletier et al., 2004). This measure is adapted from a subscale on integrated regulation for eating healthy from Pelletier and colleagues (2004). The score for the value of the alternative is the sum of the ratings from the four items. Lower scores indicate lower valuations on the alternative goal of eating for hedonic pleasure.

“Please use the scale to indicate how much each item corresponds your personal views.”

Does not correspond at all 1---2---3---4---5---6---7 Corresponds exactly

1. Eating for pleasure is an integral part of my life.
2. Eating for pleasure is part of the way I have chosen to live my life.
3. Not regulating my eating behaviors has become a fundamental part of who I am.
4. Eating for pleasure is congruent with other important aspects of my life.

## ***2C. Study 3 supplemental tables and figures***

### **2C.1 Overall self-control**

The following moderation analyses use the overall measure of trait self-control and its interactions with the dummy coded condition variables for the control and goal initiator conditions as opposed to the three subscales of trait self-control and their interactions with the dummy coded conditions (total of 9 variables).

**Table 39: Study 2 self-control moderation of condition on value of alternative**

	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i>
DV: Value of alternative					
Model 1 (R = 0.374, R <sup>2</sup> = 0.140)					
Condition 1 dummy <sup>1</sup>	0.784	0.776	0.062	1.011	0.313
Condition 3 dummy <sup>1</sup>	1.619	0.728	0.136	2.226	0.027*
Trait self-control <sup>1</sup>	-0.103	0.022	-0.258	-4.658	<0.001*
Goal commitment <sup>1</sup>	0.197	0.106	0.100	1.857	0.064+
Reactance <sup>1</sup>	0.131	0.037	0.198	3.546	<0.001*
Model 2 (R = 0.389, R <sup>2</sup> = 0.151)					
Condition 1 dummy <sup>1</sup>	0.805	0.775	0.064	1.038	0.300
Condition 3 dummy <sup>1</sup>	1.582	0.726	0.133	2.179	0.030*
Trait self-control <sup>1</sup>	-0.144	0.034	-0.361	-4.189	<0.001*
Cond 1 * Trait self-control <sup>1</sup>	0.028	0.054	0.036	0.523	0.601
Cond 3 * Trait self-control <sup>1</sup>	0.098	0.050	0.144	1.953	0.052+
Goal commitment <sup>1</sup>	0.180	0.106	0.091	1.691	0.092+
Reactance <sup>1</sup>	0.129	0.037	0.194	3.470	0.001*

**Note: An asterisk (\*) indicates statistical significance below the  $p = 0.05$  level, a dagger (†) indicates a finding below the  $p = 0.15$  level; Overall model significance: Step 1  $F(5,303) = 9.874, p < 0.001, F$  change = 9.874,  $p < 0.001$ ; Step 2  $F(7,301) = 7.663, p < 0.001, F$  change = 1.977,  $p = 0.140$**

**Table 40: Study 3 self-control moderation of condition on success**

	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i>
DV: Success					
Model 1 (R = 0.322, R <sup>2</sup> = 0.103)					
Condition 1 dummy <sup>1</sup>	-0.185	0.188	-0.062	-0.982	0.327
Condition 3 dummy <sup>1</sup>	-0.295	0.177	-0.105	-1.671	0.096+
Trait self-control <sup>1</sup>	0.025	0.008	0.260	2.941	0.004*
Goal commitment <sup>1</sup>	0.030	0.026	0.065	1.173	0.242
Reactance <sup>1</sup>	-0.002	0.009	-0.010	-0.181	0.857
Model 2 (R = 0.323, R <sup>2</sup> = 0.104)					
Condition 1 dummy <sup>2</sup>	-0.185	0.188	-0.062	-0.982	0.327
Condition 3 dummy <sup>2</sup>	-0.295	0.177	-0.105	-1.671	0.096+
Trait self-control <sup>2</sup>	0.025	0.008	0.260	2.941	0.004*
Cond 1 * Trait self-control <sup>2</sup>	0.007	0.013	0.039	0.546	0.585
Cond 3 * Trait self-control <sup>2</sup>	0.004	0.012	0.026	0.342	0.732
Goal commitment <sup>2</sup>	0.030	0.026	0.065	1.173	0.242
Reactance <sup>2</sup>	-0.002	0.009	-0.010	-0.181	0.857

**Note:** An asterisk (\*) indicates statistical significance below the  $p = 0.05$  level, a dagger (†) indicates a finding below the  $p = 0.15$  level; Overall model significance: Step 1  $F(5,303) = 6.996, p < 0.001, F$  change = 6.996,  $p < 0.001$ ; Step 2  $F(7,301) = 3.871, p < 0.001, F$  change = 0.156,  $p = 0.856$

**Table 41: Study 3 self-control moderation of condition on acts of inhibition**

	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i>
<b>DV: Acts of inhibition</b>					
Model 1 ( $R = 0.27, R^2 = 0.071$ )					
Condition 1 dummy <sup>3</sup>	0.747	1.243	0.038	0.600	0.549
Condition 3 dummy <sup>3</sup>	1.281	1.166	0.070	1.098	0.273
Trait self-control <sup>3</sup>	0.023	0.035	0.037	0.643	0.521
Goal commitment <sup>3</sup>	0.542	0.170	0.178	3.187	0.002*
Reactance <sup>3</sup>	0.216	0.059	0.211	3.634	<0.001*
Model 2 ( $R = 0.29, R^2 = 0.083$ )					
Condition 1 dummy <sup>3</sup>	0.906	1.242	0.047	0.729	0.466
Condition 3 dummy <sup>3</sup>	1.337	1.164	0.073	1.149	0.251
Trait self-control <sup>3</sup>	-0.040	0.055	-0.065	-0.721	0.471
Cond 1 * Trait self-control <sup>3</sup>	0.169	0.086	0.141	1.950	0.052†
Cond 3 * Trait self-control <sup>3</sup>	0.057	0.080	0.055	0.715	0.475
Goal commitment <sup>3</sup>	0.514	0.171	0.169	3.011	0.003*
Reactance <sup>3</sup>	0.227	0.060	0.221	3.809	<0.001*

**Note:** An asterisk (\*) indicates statistical significance below the  $p = 0.05$  level, a dagger (†) indicates a finding below the  $p = 0.15$  level; Overall model significance: Step 1  $F(5,303) = 4.626, p < 0.001, F$  change = 5.148,  $p < 0.001$ ; Step 2  $F(7,301) = 3.871, p < 0.001, F$  change = 1.915,  $p = 0.149$

**Table 42: Study 3 self-control moderation of condition on acts of initiation**

	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i>
DV: Acts of initiation					
Model 1 (R = 0.28, R <sup>2</sup> = 0.078)					
Condition 1 dummy <sup>1</sup>	0.421	1.026	0.026	0.410	0.682
Condition 3 dummy <sup>1</sup>	0.394	0.962	0.026	0.410	0.682
Goal commitment <sup>1</sup>	0.575	0.140	0.228	4.100	<0.001*
Trait self-control <sup>1</sup>	0.066	0.029	0.130	2.275	0.024*
Reactance <sup>1</sup>	0.109	0.049	0.128	2.223	0.027*
Model 2 (R = 0.29, R <sup>2</sup> = 0.085)					
Condition 1 dummy <sup>2</sup>	0.436	1.027	0.027	0.425	0.671
Condition 3 dummy <sup>2</sup>	0.444	0.962	0.029	0.461	0.645
Trait self-control <sup>2</sup>	0.093	0.046	0.182	2.035	0.043*
Cond 1 * Trait self-control <sup>2</sup>	0.010	0.072	0.010	0.144	0.885
Cond 3 * Trait self-control <sup>2</sup>	-0.083	0.066	-0.096	-1.252	0.211
Goal commitment <sup>2</sup>	0.586	0.141	0.232	4.151	<0.001*
Reactance <sup>2</sup>	0.114	0.049	0.134	2.310	0.022*

Note: An asterisk (\*) indicates statistical significance below the  $p = 0.05$  level, a dagger (†) indicates a finding below the  $p = 0.15$  level; Overall model significance: Step 1  $F(5,303) = 5.148$ ,  $p < 0.001$ ,  $F$  change = 5.148,  $p < 0.001$ ; Step 2  $F(7,301) = 3.988$ ,  $p < 0.001$ ,  $F$  change = 1.084,  $p = 0.340$

## 2C.2 Goal commitment analyses

Goal commitment was largely uninformative as a moderator with only one marginal interaction predicting increased success for the goal defender condition participants as commitment increases relative to the goal initiator condition participants.

**Table 43: Study 3 commitment moderation of condition on value of alternative**

	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i>
DV: Value of alternative					
Model 1 (R = 0.28, R <sup>2</sup> = 0.078)					
Condition 1 dummy <sup>1</sup>	0.784	0.776	0.062	1.011	0.313
Condition 3 dummy <sup>1</sup>	1.619	0.728	0.136	2.226	0.027*
Goal commitment <sup>1</sup>	0.197	0.106	0.100	1.857	0.064†
Trait self-control <sup>1</sup>	-0.130	0.022	-0.258	-4.658	<0.001*
Reactance <sup>1</sup>	0.131	0.037	0.198	3.546	<0.001*
Model 2 (R = 0.29, R <sup>2</sup> = 0.085)					
Condition 1 dummy <sup>1</sup>	2.959	4.629	0.235	0.639	0.523
Condition 3 dummy <sup>1</sup>	-2.025	4.523	-0.170	-0.448	0.655
Goal commitment <sup>1</sup>	0.163	0.193	0.083	0.845	0.399
Cond 1 * Goal commitment <sup>1</sup>	-0.126	0.265	-0.177	-0.476	0.634
Cond 3 * Goal commitment <sup>1</sup>	0.216	0.262	0.312	0.824	0.410
Trait self-control <sup>1</sup>	-0.103	0.022	-0.259	-4.659	<0.001*
Reactance <sup>1</sup>	0.132	0.037	0.199	3.571	<0.001*

Note: An asterisk (\*) indicates statistical significance below the  $p = 0.05$  level, a dagger (†) indicates a finding below the  $p = 0.15$  level; Overall model significance: Step 1  $F(5,303) = 5.148$ ,  $p < 0.001$ ,  $F$  change = 5.148,  $p < 0.001$ ; Step 2  $F(7,301) = 3.988$ ,  $p < 0.001$ ,  $F$  change = 1.084,  $p = 0.340$

**Table 44: Study 3 commitment moderation of condition on success**

	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i>
DV: Success					
Model 1 (R = 0.322, R <sup>2</sup> = 0.103)					
Condition 1 dummy <sup>2</sup>	-0.192	0.188	-0.064	-1.023	0.307
Condition 3 dummy <sup>2</sup>	-0.297	0.176	-0.105	-1.686	0.093†
Goal commitment <sup>2</sup>	0.032	0.026	0.068	1.240	0.216
Trait self-control <sup>2</sup>	0.028	0.005	0.295	5.220	<0.001*
Reactance <sup>2</sup>	-0.002	0.009	-0.013	-0.225	0.822
Model 2 (R = 0.337, R <sup>2</sup> = 0.114)					
Condition 1 dummy <sup>2</sup>	1.205	1.116	0.404	1.079	0.281
Condition 3 dummy <sup>2</sup>	1.661	1.091	0.589	1.522	0.129†
Goal commitment <sup>2</sup>	0.100	0.047	0.215	2.154	0.032*
Cond 1 * Goal commitment <sup>2</sup>	-0.081	0.064	-0.479	-1.269	0.205
Cond 3 * Goal commitment <sup>2</sup>	-0.115	0.063	-0.700	-1.815	0.070†
Trait self-control <sup>2</sup>	0.029	0.005	0.304	5.376	<0.001*
Reactance <sup>2</sup>	-0.002	0.009	-0.014	-0.240	0.810

Note: An asterisk (\*) indicates statistical significance below the  $p = 0.05$  level, a dagger (†) indicates a finding below the  $p = 0.15$  level; Overall model significance: Step 1  $F(5,303) = 6.996$ ,  $p < 0.001$ ,  $F$  change = 6.996,  $p < 0.001$ ; Step 2  $F(7,301) = 5.508$ ,  $p < 0.001$ ,  $F$  change = 1.705,  $p = 0.184$

**Table 45: Study 3 commitment moderation of condition on acts of inhibition**

	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i>
DV: Acts of inhibition					
Model 1 (R = 0.266, R <sup>2</sup> = 0.071)					
Condition 1 dummy <sup>1</sup>	0.747	1.243	0.038	0.600	0.549
Condition 3 dummy <sup>1</sup>	1.281	1.166	0.070	1.098	0.273
Goal commitment <sup>1</sup>	0.542	0.170	0.178	3.187	0.002*
Trait self-control <sup>1</sup>	0.023	0.035	0.037	0.643	0.521
Reactance <sup>1</sup>	0.216	0.059	0.211	3.634	<0.001*
Model 2 (R = 0.274, R <sup>2</sup> = 0.075)					
Condition 1 dummy <sup>1</sup>	7.639	7.427	0.393	1.029	0.305
Condition 3 dummy <sup>1</sup>	8.802	7.258	0.480	1.213	0.226
Goal commitment <sup>1</sup>	0.835	0.310	0.274	2.695	0.007*
Cond 1 * Goal commitment <sup>1</sup>	-0.400	0.425	-0.363	-0.942	0.347
Cond 3 * Goal commitment <sup>1</sup>	-0.441	0.421	-0.412	-1.047	0.296
Trait self-control <sup>1</sup>	0.027	0.036	0.043	0.746	0.456
Reactance <sup>1</sup>	0.216	0.060	0.210	3.625	<0.001*

Note: An asterisk (\*) indicates statistical significance below the  $p = 0.05$  level, a dagger (†) indicates a finding below the  $p = 0.15$  level; Overall model significance: Step 1  $F(5,303) = 4.626$ ,  $p < 0.001$ ,  $F$  change = 4.626,  $p < 0.001$ ; Step 2  $F(7,301) = 3.481$ ,  $p < 0.001$ ,  $F$  change = 0.647,  $p = 0.525$

**Table 46: Study 3 commitment moderation of condition on acts of initiation**

	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i>
DV: Acts of initiation					
Model 1 (R = 0.280, R <sup>2</sup> = 0.078)					
Condition 1 dummy <sup>1</sup>	0.421	1.026	0.026	0.410	0.682
Condition 3 dummy <sup>1</sup>	0.394	0.962	0.026	0.410	0.682
Goal commitment <sup>1</sup>	0.575	0.140	0.228	4.100	<0.001*
Trait self-control <sup>1</sup>	0.066	0.029	0.130	2.275	0.024*
Reactance <sup>1</sup>	0.109	0.049	0.128	2.223	0.027*
Model 2 (R = 0.285, R <sup>2</sup> = 0.081)					
Condition 1 dummy <sup>1</sup>	1.526	6.129	0.095	0.249	0.804
Condition 3 dummy <sup>1</sup>	5.885	5.989	0.387	0.983	0.327
Goal commitment <sup>1</sup>	0.712	0.256	0.282	2.785	0.006*
Cond 1 * Goal commitment <sup>1</sup>	-0.064	0.351	-0.070	-0.183	0.855
Cond 3 * Goal commitment <sup>1</sup>	-0.324	0.347	-0.366	-0.932	0.352
Trait self-control <sup>1</sup>	0.068	0.029	0.134	2.324	0.021*
Reactance <sup>1</sup>	0.108	0.049	0.127	2.202	0.028*

Note: An asterisk (\*) indicates statistical significance below the  $p = 0.05$  level, a dagger (†) indicates a finding below the  $p = 0.15$  level; Overall model significance: Step 1  $F(5,303) = 5.148$ ,  $p < 0.001$ ,  $F$  change = 5.148,  $p < 0.001$ ; Step 2  $F(7,301) = 3.810$ ,  $p < 0.001$ ,  $F$  change = 0.508,  $p = 0.602$

## 2C.3 Floodlight analyses

Table 47: Study 3 moderation of value of alternative

	<i>B</i>	<i>SE B</i>	<i>t</i>	<i>p</i>	<i>LLCI</i>	<i>ULCI</i>
DV: Value of alternative						
Model 1 (R = 0.411, R <sup>2</sup> = 0.169)						
Condition <sup>1</sup>	-0.152	0.087	-1.748	0.082†	-0.323	0.019
Trait inhibition <sup>1</sup>	0.011	0.021	0.530	0.596	-0.030	0.052
Trait initiation <sup>1</sup>	0.018	0.017	1.099	0.273	-0.015	0.051
Trait continuation <sup>1</sup>	0.057	0.024	0.024	0.020*	0.009	0.105
Trait inhibition * Cond <sup>1</sup>	0.021	0.025	0.846	0.398	-0.028	0.071
Trait initiation * Cond <sup>1</sup>	-0.059	0.019	-3.044	0.003*	-0.097	0.021
Trait continuation * Cond <sup>1</sup>	0.063	0.030	2.116	0.035*	0.004	0.121
Goal commitment <sup>1</sup>	0.032	0.026	1.236	0.218	-0.019	0.082
Reactance <sup>1</sup>	-0.007	0.009	-0.786	0.433	-0.025	0.108

Note: An asterisk (\*) indicates statistical significance below the  $p = 0.05$  level, a dagger (†) indicates a finding below the  $p = 0.15$  level. Overall model significance:  $F(9,299) = 5.4933, p < 0.001$

Table 48: Study 3 moderation of success

	<i>B</i>	<i>SE B</i>	<i>t</i>	<i>p</i>	<i>LLCI</i>	<i>ULCI</i>
DV: Success						
Model 1 (R = 0.377, R <sup>2</sup> = 0.142)						
Condition <sup>1</sup>	-0.152	0.087	-1.748	0.082†	-0.323	0.019
Trait inhibition <sup>1</sup>	0.011	0.021	0.530	0.596	-0.030	0.052
Trait initiation <sup>1</sup>	0.018	0.017	1.099	0.273	-0.015	0.051
Trait continuation <sup>1</sup>	0.057	0.024	2.343	0.020*	0.009	0.105
Trait inhibition * Cond <sup>1</sup>	0.021	0.025	0.846	0.398	-0.028	0.071
Trait initiation * Cond <sup>1</sup>	-0.059	0.019	-3.044	0.025*	-0.097	0.021
Trait continuation * Cond <sup>1</sup>	0.063	0.030	2.116	0.035*	0.004	0.121
Goal commitment <sup>1</sup>	0.032	0.026	1.236	0.218	-0.019	0.082
Reactance <sup>1</sup>	-0.007	0.009	-0.786	0.433	-0.025	0.108

Note: An asterisk (\*) indicates statistical significance below the  $p = 0.05$  level, a dagger (†) indicates a finding below the  $p = 0.15$  level. Overall model significance:  $F(9,299) = 5.4933, p < 0.001$

**Table 49: Study 3 moderation of acts of inhibition**

	<i>B</i>	<i>SE B</i>	<i>t</i>	<i>p</i>	<i>LLCI</i>	<i>ULCI</i>
DV: Acts of inhibition						
Model 1 (R = 0.317, R <sup>2</sup> = 0.101)						
Condition <sup>1</sup>	0.682	0.579	1.177	0.240	-0.458	1.823
Trait inhibition <sup>1</sup>	-0.021	0.140	-0.152	0.879	-0.296	0.254
Trait initiation <sup>1</sup>	-0.040	0.111	-0.362	0.718	-0.259	0.179
Trait continuation <sup>1</sup>	0.165	0.162	1.017	0.310	-0.154	0.483
Trait inhibition * Cond <sup>1</sup>	0.502	0.167	3.001	0.003*	0.173	0.831
Trait initiation * Cond <sup>1</sup>	-0.059	0.019	-3.044	0.025*	-0.097	0.021
Trait continuation * Cond <sup>1</sup>	-0.247	0.198	-1.246	0.214	-0.636	0.143
Goal commitment <sup>1</sup>	0.563	0.170	3.317	0.001*	0.229	0.897
Reactance <sup>1</sup>	0.212	0.061	3.480	0.001*	0.092	0.331

Note: An asterisk (\*) indicates statistical significance below the  $p = 0.05$  level, a dagger (†) indicates a finding below the  $p = 0.15$  level. Overall model significance:  $F(9,299) = 3.7218, p = 0.002$

**Table 50: Study 3 moderation of acts of initiation**

	<i>B</i>	<i>SE B</i>	<i>t</i>	<i>p</i>	<i>LLCI</i>	<i>ULCI</i>
DV: Acts of initiation						
Model 1 (R = 0.333, R <sup>2</sup> = 0.111)						
Condition <sup>1</sup>	0.271	0.477	0.567	0.571	-0.668	1.210
Trait inhibition <sup>1</sup>	-0.005	0.115	-0.040	0.968	-0.231	0.222
Trait initiation <sup>1</sup>	0.068	0.092	0.630	0.529	-0.123	0.238
Trait continuation <sup>1</sup>	0.154	0.133	1.155	0.249	-0.108	0.416
Trait inhibition * Cond <sup>1</sup>	0.354	0.138	2.573	0.011*	0.083	0.625
Trait initiation * Cond <sup>1</sup>	-0.079	0.106	-0.741	0.459	-0.288	0.131
Trait continuation * Cond <sup>1</sup>	-0.407	0.163	-2.497	0.013*	-0.728	-0.086
Goal commitment <sup>1</sup>	0.622	0.140	4.451	<0.001*	0.347	0.898
Reactance <sup>1</sup>	0.116	0.050	2.312	0.021*	0.017	0.214

Note: An asterisk (\*) indicates statistical significance below the  $p = 0.05$  level, a dagger (†) indicates a finding below the  $p = 0.15$  level. Overall model significance:  $F(9,299) = 4.1369, p < 0.001$

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## Biography

Mallory Roman was born in Evanston, Illinois on October 2, 1987. She was raised and spent most of her school-aged years in Alpharetta, Georgia. She attended the University of Georgia for her undergraduate degrees, earning a bachelor of science in psychology and a bachelor of science in family and consumer sciences in fashion merchandising on May 13, 2011. From there, she went on to work as a lab manager at the Massachusetts Institute of Technology's Sloan School of Management in a marketing psychology lab before attending Duke University for graduate school and earning a master of arts in social psychology on May 15, 2016. Roman has published her work, entitled "The importance of peer approval in the sartorial purchasing patterns of University of Georgia students," in *College Student Journal*, and has several projects in various stages of completion. During her time at Duke, Roman received a graduate student fellowship, as well as two graduate summer fellowships.