

REGRET AS A MODULATORY SYSTEM:  
HOW IMAGINED FUTURES BECOME REAL PASTS

BY

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**TABLE OF CONTENTS**

	Page
ABSTRACT .....	v
INTRODUCTION .....	1
METHOD .....	25
RESULTS .....	29
DISCUSSION .....	45
REFERENCES .....	65
APPENDIX A <sup>1</sup> .....	74
APPENDIX A <sup>2</sup> .....	75
APPENDIX A <sup>3</sup> .....	78
APPENDIX A <sup>4</sup> .....	79
APPENDIX B .....	82
CURRICULUM VITA .....	83

## ILLUSTRATIONS AND TABLES

	Page
I. Figure 1. A proposed theoretical model for the regret modulatory system. ....	19
II. Table 1. Missing data and percentage of complete data for all study variables. ....	30
III. Table 2. Cronbach’s alpha for all study variables with more than one item. ....	31
IV. Table 3. Correlations and descriptive statistics for all relevant study variables. ....	33
V. Figure 2. Conscientiousness moderates the relationship between Anticipated Regret positively predict Study Habit Quality in the first week. ....	36
VI. Figure 3. Conscientiousness moderates the relationship between Anticipated Regret positively predict Study Habit Quality in the second week. ....	38
VII. Figure 4. Anticipated Inconsistency mediates the relationship between Anticipated Regret and Study Habit Quality. ....	39
VIII. Figure 5. Behavior-Goal Inconsistency mediates the relationship between Study Habit Quality and Retrospective Regret. ....	41
IX. Figure 6. Desire to Change Future Behavior moderates the relationship between Retrospective Regret and Anticipated Regret. ....	43

## ABSTRACT

The goal of this research was to empirically test a proposed theory that was developed to explain how humans simulate future undesirable outcomes, evaluate their past behaviors, and potentially grow from these experiences through anticipated and retrospective regret. Using a longitudinal design, we measured students' study habit quality, study habit quantity, study goals, anticipated regret, retrospective regret, and behavior-goal inconsistency. From this, we proposed four specific hypotheses: (a) conscientiousness will moderate the relationship between study habits and anticipated regret, (b) anticipated regret will positively predict study habits mediated through anticipated inconsistency, (c) the consistency-fit mediation findings from Seta et al. (2001) will replicate such that poor decisions will predict increased levels of retrospective regret, mediated through behavioral-goal inconsistency (d) retrospective regret will predict future anticipated regret will be mediated through a desire to change future behavior. We found that conscientiousness may moderate the relationship between anticipated regret and study habits (though it does uniquely predict study habits), anticipated regret does positively predict study habits mediated through anticipated inconsistency, the consistency-fit mediation findings were replicated, and the relationship between retrospective regret and anticipated regret is moderated by a desire to change future behavior. These findings suggest that regret indeed plays an important and functional role in day-to-day self-regulation and goal-setting.

## INTRODUCTION

Henry David Thoreau suggested that people should “never look back unless [they] are planning to go that way.” But perhaps Thoreau’s sentiment is misguided; looking back can provide useful lessons about how the future ought to play out, regardless of whether people plan to repeat the past or not. As Landman (1993) introduces in her seminal text on regret, perfunctory understandings of regret—much like what Thoreau suggests—paint a portrait of regret that is bleak and apocalyptic (e.g., “a stringy-haired, boneless woman sunk in the dead arms of the past”). That is, regret has been historically conceived of as a purely negative emotion characterized by a state of paralysis, ruminative and unduly pessimistic obsessions, and counterproductive admissions of failure (Landman, 1996). This approach pegs regret as a destructive emotion to be mitigated and avoided at all costs (Landman, 1993).

Today, however, regret is typically defined as a cognitive-affective state, made up of mental activity including assessments and evaluations, as well as a negative affective appraisals (Landman, 1996). The more utilitarian and pragmatic component of regret is comprised of a set of cognitive properties, including the realizing of potential decision alternatives, appraisal of decision quality, and the evaluation of outcomes (Landman, 1993). However, because the experience of regret also involves *self-relevant* reflections and evaluations about potentially negative experiences it is also affective in nature. In the study of emotions and facial expressions the feeling regret is nestled within the constellation of inferiority emotions—including shame, shyness, guilt, embarrassment, and respect—which are connoted by a bowed and angled head tilt (Mignault & Chaudhuri, 2003). A further distinction worth noting is that of the temporal perspective—anticipated regret is regret that focuses on a potential future negative outcome,

whereas retrospective regret is regret that focuses on past unfavorable outcomes (Landman, 1996).

Although empirical evidence indicates that regret is a common and frequently occurring negative affective experience (e.g., Shimanoff, 1984) and that increased feelings of regret can negatively impact well-being, even more negative consequences of regret tend to occur when people do not perceive opportunities to change outcomes (Wrosch, Miller, Scheier, Schulz, & Carver, 2005). Contemporary research is beginning to change the conceptualization of regret as a purely destructive emotion to account for its more functional role (e.g., Epstude & Roese, 2008; Seta, Seta, McElroy, & Hatz, 2008). Some researchers even go so far as to suggest that regret operates in a specifically functional capacity, through its unique role as an evaluator of past behavior and a motivator of future behavior (e.g., Epstude & Roese, 2008; Seta, McElroy, & Seta, 2001; Seta et al., 2008; Seta & Seta, 2013; Zeelenberg & Pieters, 2007). This is because regret may be functional in helping people plan, evaluate and learn from their behaviors (Landman, 1996; Zeelenberg & Pieters, 2007). For example, the child who fails to heed his mother's warning not to touch the red-hot iron is likely to regret his rebellious curiosity. However, some regret also helps people plan their future behaviors (Abraham & Sheeran, 2003; Abraham & Sheeran, 2004; Bell, 1982; Loomes & Sugden, 1982). This type of regret is called anticipated regret and involves imagining the outcomes that would arise from a less-than-desirable behavior before that behavior actually occurs. Returning to our example, the next time this child's curiosity perks up, he will likely rub the wound on his hand, let out a sigh of relief, and retreat away from the scalding stovetop, all the more wiser because of the lesson he had previously learned.

One might conclude anticipated regret and retrospective regret may function similarly, albeit one prior to a decision and the other after a decision. Indeed, neuroscientific research demonstrates concordance between the implicated brain regions in both forms of regret, which further reinforces the notion that they may be similar (Coricelli et al., 2005; Coricelli, Dolan, & Sirigu, 2007). However, Landman (1996) notably suggested that anticipated regret may prove useful in a way that is qualitatively different from retrospective regret—so the story of these two processes is undoubtedly more complicated than their mere temporality or shared brain regions. The similarities and differences between these two forms of regret have not been thoroughly investigated.

It may be that these different types of regret work together as two parts of one functional process. Research suggests that people generally view regret favorably relative to other negative emotions, despite the fact that regret is both phenomenologically unpleasant and aversive (Saffrey, Summerville, & Roese, 2008; Shimanoff, 1984; Zeelenberg, Beattie, & Van der Pligt, 1996). The disparity between regret's aversiveness and its potential for functionality remains largely unexplored (Koch, 2014). The main purpose of this paper is to investigate the relationship between anticipated and retrospective regret and how this relationship contributes to a regret's functional role in behavioral regulation. Although there are several important theories that address processes that underlie retrospective regret (e.g., norm theory) and anticipated regret (e.g. regret theory), for the purpose of this research endeavor, I focused on two theoretical views that seem especially relevant to self-regulation—anticipated regret within the theory of planned behavior (Ajzen, 1991) and retrospective regret from the consistency-fit perspective (Seta et al., 2001). The consistency-fit perspective may be an especially helpful place to start because it takes a functional approach in conceptualizing retrospective regret. However, I will also provide a



brief review of norm theory (Kahneman & Miller, 1986) because it has been the most influential theoretical account of retrospective regret over the last several decades.

### **Retrospective Regret: Norm Theory and the Consistency-Fit Perspective**

Although one might be inclined to trace retrospective regret's earliest conceptualizations elsewhere (as far back as Socrates), Kahneman and Miller's (1986) norm theory is perhaps the most relevant theory when considering the processes that underlie the experience of retrospective regret. Norm theory contends that the normality of a decision is directly related to the extent to which the decision will produce regret when its outcomes are undesirable; normality is how typical the components of a decision are within the behavioral repertoire of the decision-maker (e.g., taking a usual route to the airport versus trying a short cut). Given the same degree of decision-outcome negativity, more regret is predicted to result from a decision involving typical (e.g., usual routes) versus atypical (short cuts) decisions, because there are more counterfactuals associated with atypical versus typical behavior.

Counterfactuals are simulated representations of alternative realities, including alternative outcomes to a decision (Kahneman & Miller, 1986). The cognitive activity involved in this process involves comparisons of the decision outcomes to the imagined mental representations of simulated alternative realities (counterfactuals). This model suggests that norms act as frames of reference, that several alternatives can be evoked simultaneously, these alternatives need not be consciously retrieved (they can be unconscious), and that they can be fragmentary in nature (Kahneman & Miller, 1986). The norms that people use when evaluating a given outcome are not examined until after the outcome occurs; in this sense, norms act as a sort of "reasonable point of reference" to be used when evaluating an outcome (Kahneman & Miller, 1986). Of note, norm theory rests on the assumption that an outcome effortlessly elicits these

outcome alternatives and that these alternatives are used for the sake of comparison. Further, norm theory contends that counterfactuals are more readily accessible following decisions of action compared to inaction because actions are seen as more controllable and thus easier to envision how one could have acted differently (Kahneman & Miller, 1986). Thus, decisions of action (e.g. choosing to go out) are seen as more regrettable than decisions of inaction (e.g. choosing to stay home) according to norm theory.

In summary, according to norm theory, norms serve as the parameters used in the establishment of counterfactual thoughts had a decision-maker chosen differently. As such, when events are mentally compared to their counterfactual alternatives, the degree of normality of the event is contingent upon the availability of counterfactual alternatives (Kahneman & Miller, 1986). The more counterfactual alternatives that are generated, the greater an event is said to mutable. The mutability of an event—that is, the degree to which it can be perceived as changeable—as norm theory and its academic progeny see it—is directly related to any regret that may be experienced following an event (Gleicher et al., 1995).

The consistency-fit approach is contrary to the perspectives of Kahneman and Miller (1986) in that differences in regret levels are not thought to be mediated by counterfactuals. Rather, according to the consistency-fit model, counterfactuals serve a moderating function of increasing the intensity of retrospective regret, but are not necessary in the production of regret per se. In support of this view, Seta and colleagues (2001) found that consistency factors, rather than counterfactuals mediated feelings of regret. Moreover, Seta et. al (2008) demonstrated that counterfactuals moderated, rather than mediated, regret whereas consistency factors played a mediational function. The most vital component of the consistency-fit theory is whether the decision is consistent or inconsistent with a person's personality orientation, goals, or mood

states (Seta et al., 2001, 2008; Seta & Seta, 2013). The extent to which a behavior is in line with these factors define its consistency-fit (e.g., Seta et al., 2008). For example, a decision to order a fattening dessert that turns out to be poor would produce more regret in the context of different life-goals. In the context of an active goal to lose weight, ordering a poor tasting, high calorie dessert would be expected to produce more regret than the same decision (and same dessert) in the context of activated goals to gain weight. Research has supported this prediction (Seta et al., 2008). The consistency-fit perspective is especially well-suited to address the functional aspects of regret in the context of self-regulation because here regret is conceptualized as serving a critical function by providing affective information about how one's decisions fit with his/her goals. Thus, regret acts as an affective signaler by informing an individual that he/she is deviating from his/her goals (Seta et al., 2008). Regret is determined by the amount a behavior is consistent with the goals, personality orientations, or mood of the decision-maker, rather than the nature of the decision per se. This information can be functional in guiding a person toward choices and behaviors that are instrumental for goal-achievement (Seta et al., 2008).

In an early test of the consistency-fit approach, Seta and colleagues (2001) predicted consistency would mediate the relationship between action/inaction and feelings of regret. As predicted, their findings revealed that action/inaction decision type did not predict regret, but consistency did mediate judgments of regret. They found that as the consistency-fit relationship increased, feelings of regret decreased (Seta et al., 2001). In another instantiation of consistency's role in regret, when participants were manipulated to have either an active or inactive mood, consistency produced feelings of regret. In the active mood condition, more regret was found when participants made decisions involving errors of omission rather than with errors of commission. As predicted, the opposite was true for participants in the inactive mood

condition: more regret was associated with errors of commission compared to omission (Seta et al., 2001). These findings again buttress the notion that the consistency of a decision, within the context of a decision-makers orientation (and not necessarily the normality of a decision in general) directly relates to, and is responsible for corresponding levels of regret.

When considering how people sets goals to change (as opposed to maintain) their behaviors, the normal way of being must be deviated from. As such, the consistency of a decision is dependent on the type of goal—whether it be to change or maintain a behavior, as opposed to simply what is typical (Seta & Seta, 2013). In this sense, the consistency-fit perspective makes a different prediction about regret, as compared to norm theory. Norm theory would suggest that poor decisions involving atypical behaviors should always be more regrettable because they necessarily deviate from the norm. However, because change involves doing something that is different from the norm, the consistency-fit perspective predicts that, in the context of change goals, behaviors that are typical should actually be more regrettable than atypical behaviors (Seta & Seta, 2013). Seta and Seta (2013) succinctly explain this idea by suggesting that what is ‘normal’ is not what is ‘typical’ but what action should be taken based on the decision-maker’s goals.

Using a retrospection paradigm asking participants to think about behaviors they wanted to change or maintain, Seta and Seta (2013) demonstrated that typical behaviors were more regrettable with goals to change behavior. On the other hand, they found that atypical behaviors were more regrettable in goals involving maintenance of behavior. These results are contrary to the norm theory predication that decisions to take action are simply more regrettable than inaction decisions. It should be noted that Seta and Seta (2013) found these effects even after

considering the judged typicality and the temporal distance of the decision (Gilovich & Medvec, 1994; Kahneman & Miller, 1986).

Many contemporary theories of regret define counterfactual production as synonymous with feelings of regret (Connolly & Zeelenberg, 2002; Gilovich & Medvec, 1994; Kahneman & Miller, 1986; Roesse & Olson, 2014); the consistency-fit approach treats counterfactuals as separate (but related) to the experience of regret (Seta et al., 2008). That is, counterfactual thinking is not a fungible substitute for the experience of regret. However, according to the consistency-fit perspective counterfactuals *are* related to regret, though decidedly not synonymous. In one iteration of the well-known Mr. Paul paradigm, Seta and her colleagues (2008) examined the role of counterfactual generation before and after decisions. First, the Mr. Paul paradigm was presented as it was in Kahneman and Tversky's (1982) original work, only in this case Mr. Paul was described as being a risk-taker. Following the vignette, participants reported initial regret judgments. Next, participants were asked to imagine as many "if only" alternatives for Mr. Paul as they could think of, and then were subsequently asked to make another judgment of how much regret Mr. Paul felt. When examining how counterfactual generation was related to pre- and post-counterfactual generation judgments of regret, a positive relationship between the amount of counterfactuals generated and the net increases in judgments of regret was found.

The consistency-fit perspective allows for the examination of a whole host of goal-setting and decision-making contextual factors, which makes it an ideal approach to examine behavioral regulation. This has been suggested previously—for instance, Seta and Seta (2013) importantly point out that regret likely conveys crucial feedback about whether a decision-maker's actions (or lack thereof) are in line with his/her goals. Indeed, the consistency-fit of a behavior and its

consequent levels of regret may act as the affective cues requisite for comparators in the test phase within regulatory feedback-loops (Seta et al., 2008). These test phases, as detailed by Carver and Scheier (1981) rely upon a comparison of the actual event to a standard or a goal—thus, this model is line with the logic provided by consistency’s role in judgments of regret. Decisions that are consistent with self-set standards and goals are viewed as less regrettable, even if the decision resulted in a poor outcome. Conversely, when decisions are inconsistent with these standards, they will be seen as more regrettable by the decision-maker (Seta & Seta, 2013).

In addition, the consistency-fit perspective has the ability to account for personality orientations within the decision-making process. With the exception of very few studies (Courneya, Bobick, & Schinke, 1999; Stone, Jawahar, & Kisamore, 2010) most research in regret fails to adequately account for this seemingly crucial component of the equation. Previous research on the consistency-fit perspective has demonstrated that the personality orientation of the decision-maker plays a key role in determining the consistency-fit and, thus, subsequent feelings of regret. For example, Seta et al. (2001) examined regret following poor outcome decisions involving action or inaction for participants who were classified as risk-seeking or risk-averse. As predicted, for risk-seekers, decisions not to act were found to be inconsistent and highly regrettable, whereas for those who were risk-averse decisions to act were seen as inconsistent and highly regrettable. Thus, relatively high levels of regret were associated with inactive risk seekers and active risk-averse participants. In another instance, participants were asked to retrospect on their past decisions to go out and socialize or to stay home and not socialize (Seta et al., 2008). This study included measures of participants’ levels of introversion/extraversion. This personality factor was found to interact with retrospections on participants’ past “poor” decisions to go out or stay home, such that introverts regretted going

out more than staying home, and extraverts regretted staying home more than going out. These results support the notion that the consistency of a decision—and thus the regret following that decision—is in part a function of the decision-makers' personality orientation; the consistency-fit of decisions with respect to these orientations determine what kinds of decisions produce more regret. Most recently, conscientiousness was found to influence the consistency-fit process in a similar manner to the way detailed above (Valshtein & Seta, 2015). Participants high in conscientiousness tended to have higher levels of regret in the context of missing class.

However, this effect was also moderated by the severity of the outcome, such that in decisions that resulted in relatively severe outcomes (missing an exam), conscientiousness was not a significant predictor of regret ratings. It was only in the low severity condition (missing class), where high levels of conscientiousness were associated with higher regret ratings. Similar findings were seen in a third-person paradigm in which high and low conscientious participants made judgments about the levels of regret that would be experienced by others. These findings illustrates a degree of personality-behavior consistency, whereby certain personality orientations are more prone to experience higher levels of regret, especially when the negative outcomes of a failure are relatively low. These results support the view that the consistency of a decision in relation to decision-makers' goals and personality orientations mediate feelings of regret (Seta et al. 2001, 2008; Seta & Seta, 2013).

In sum, the consistency-fit perspective of regret suggests that decision-making does not occur in isolation: that our past decisions and feelings influence our current behaviors, and that current decisions will necessarily influence our future decisions, is embedded within the theory. Retrospective regret is suggested to serve as feedback and anticipated regret serves to steer our behaviors away from these negative outcomes. However, to date, research examining the

consistency-fit perspective has only done so looking at retrospective regret. So far, this paper has only examined the extant literature on the effects of retrospective regret. One purpose of the present research is to assess the functionality of a consistency-fit model of anticipated regret. But to understand the full scope of regret's functionality, we also need to examine the relevant research on anticipated regret.

### **Anticipated Regret and the Theory of Planned Behavior**

An important distinction needs to be made between *anticipatory* and *anticipated* regret. Anticipatory emotions (cf. Loewenstein, Weber, Hsee, & Welch, 2001) refer to emotions experienced in the present with regards to future states. On the other hand, anticipated emotions (cf. Richard, van der Pligt, & de Vries, 1996a) refer to the expectation of emotions that could be contingent upon a future event coming to fruition. Anticipated regret is not regret that follows ill-advised behavior, but rather it is a cognitive-affective state that preempts behavior. As per the recommendations of Koch (2014) anticipated regret will heretofore refer to the latter definition and not the former. That is, anticipated regret refers to the anticipated level of regret when construing a behavior gone awry, *not* the emotions arising from the mere thought of the event going awry (independent of its occurrence).

Referred to as regret theory or decision theory, the earliest conceptions of regret are models that explore the role of anticipated regret within the process of making a decision (Bell, 1982; Loomes & Sugden, 1982). When Savage (1951) proposed the minimax *regret* principle, he was perhaps more accurately introducing a minimax *anticipated* regret principle. Savage's (1951) original theory purported that people deduce the maximum possible regret for each behavioral option in a given situation and then subsequently choose the option with the least amount of regret. This theory was not about the experience of regret following a failed decision,



rather it was about using an *a priori* simulation of a “decision-gone-wrong” as a rational criterion in decision-making. Similarly, Bell (1982) alluded to the idea of anticipated regret as a rational component of making a choice. Janis and Mann (1977) argued that the anticipation of regret is a delay of action in order to deliberate upon the potential ramifications of choosing to act or not act. They describe it as a “convenient generic term” to help explain effects of “the various worries that beset a decision maker before any losses actually materialize” (Janis & Mann, 1977, p. 222). There are at least two major points we can glean from this early research: anticipated regret is also commonly experienced, and is as a result, centrally implicated during the prodromal moments of a behavior.

The theory of planned behavior is perhaps the most prominent contemporary theoretical orientation to examine anticipated regret, although as I will discuss, this variable was not a part of the theory as it was initially presented (Ajzen, 1985, 1988, 1991). Similar to the theory of reasoned action from which it was derived (Fishbein & Ajzen, 1975), the theory of planned behavior rests on the assumption that intentions are the strongest predictors of behavior. The theory proposed a number of important constructs that predict intentions to behave: attitudes, subjective norms, perceived behavioral control, and past behavior. Attitudes refer to an individual’s positive or negative evaluations of a behavior. Subjective norms relate to what an individual believes his/her peers think about a particular behavior. Perceived behavioral control is the summation of an individual’s beliefs about the degree of control they have in performing a behavior. Each of these factors contribute to an individual’s intention to perform a behavior, which is—as the theory of reasoned action assumed—one of the strongest predictors of overt behavior (Fishbein & Ajzen, 1975).

In the years following the introduction of the theory of planned behavior, increased scholarly attention generated additional constructs that were added to the theory—these additions included moral norms, belief salience, self-identity, and affective beliefs (Conner & Armitage, 1998, 2002; Parker, Manstead, & Stradling, 1995). Most importantly, the theory of planned behavior was changed from a strictly cognitive model to a model including anticipated affective reactions as an important predictor of planned behavior. Among the affective components added to the model was anticipated regret. (Parker, Manstead, & Stradling, 1995; Richard, van der Pligt, & de Vries, 1996a). Anticipated emotions differ from other predictors of intention in that they assist in behavioral self-regulation prior to feedback regarding an event. Compared to attitudes and norms, anticipated emotions are more fluid and dependent on contextual factors (e.g., Bagozzi & Dholakia, 1999). Richard, van der Pligt, and de Vries (1995) examined the influence of anticipated affective reactions on behavioral choice and found that anticipated affective reactions predicted intentions over and above more general attitudes and evaluations toward the behavior (Richard, van der Pligt, & de Vries, 1996a). Ultimately, they distinguish anticipated affective reactions from more attitudes more generally in two key ways: a) an evaluation of a behavior can be wildly different from the affective reaction it elicits and b) the time perspective with which the behavior is being considered may be wider when in the context of anticipated affect. For example, a person may favorably evaluate a decision to go out drinking with friends, but may also anticipate negative feelings following that behavior. That is, a person can have anticipated regret about not having a good time; but a negative attitude regarding binge drinking.

In a similar investigation of anticipated regret, Richard, van der Pligt, and de Vries (1996b) used a longitudinal methodology to further examine the role of time perspective in the

context of sexual risk-taking behavior. They concluded that employing an anticipated regret manipulation, induced by focusing on a wider time-perspective prior to sexual behavior, actually increased intentions to engage in preventive sexual behavior. Participants who thought more about the feelings of regret they would experience *after* sex resulted in more risk-averse sexual behavior in the future. Similar to the tactic used by Richard, van der Pligt, and de Vries (1996b), Sheeran and Orbell (1999) told participants to take a wider time perspective and think about their feelings after they did not play the lottery, in order to motivate risk-seeking behavior. Over and above other theory of planned behavior variables, anticipated regret explained a unique amount of variance in risk-seeking behavior. In subsequent studies, Abraham and Sheeran (2003, 2004) once more found that anticipated regret moderated the relationship between intentions and behavior, such that participants were more likely to exercise if they anticipated regretting a failure to exercise. This finding suggests that by drawing decision-makers' attention to the possible outcomes associated with a failure to act on intentions can offer additional commitment to those very intentions. In successive studies Abraham and Sheeran (2003, 2004) again experimentally manipulated anticipated regret and again found the same moderating effect of anticipated regret on intention-behavior concordance; further, they found that this effect was mediated by the stability of those intentions over time (Abraham & Sheeran, 2003).

Of note, Sheeran and Orbell (1999) claim that one reason anticipated regret may be predictive of behavior is because they "bind people to their intentions" through reminding them of the future aversive emotion that will come, provided they fail to act. Although not suggested by these authors, one potential way to explain the mechanism through which anticipated regret may be able to bind people to their intentions is through behavior-goal consistency factors. It may be that manipulating people's level of anticipated regret, is in actuality priming them to

think about whether their inactions (but in other contexts, likely their actions, too) are consistent with their goals. Given similar predictions made in the original consistency-fit model of retrospective regret, this pattern of results would not be surprising (Seta et al., 2001). In line with this supposition, Sheeran and Orbell (1999) found that anticipated regret (in a different context than Abraham & Sheeran, 2003) did in fact moderate intention-behavior concordance, insofar as people were more likely to play the lottery when they anticipated regretting a failure to play the lottery. Thus, anticipated regret may facilitate greater consistency-fit between participants' intentions and their behavior.

Sometimes intentions do not predict the successful completion of a behavior (Rhodes & de Bruijn, 2013). This discordance is known as the intention-behavior gap, and the reasons for its existence are complex, though to some degree also self-evident (Fishbein & Ajzen, 1975; Rhodes & de Bruijn, 2013). For the purpose of this paper, the particulars of this gap are not especially germane; however, one especially relevant conceptualization of the intention-behavior gap sees regret as a resultant emotional state when intentions fail to produce desirable (and perhaps also goal-consistent) behaviors. This understanding of the intention-behavior gap would be well-addressed using a consistency-fit approach. According to the consistency-fit approach, decision outcomes and decision processes are assumed to be different constructs and were found to be differentially predictive of regret (Seta et al., 2001). Similarly, Pieters and Zeelenberg's (2005) examined decision process quality as a potential source of regret and found that the quality of a decision process can be thought of as a self-evaluation of how well a decision-maker arrived at a given decision. Regardless of the valence of a given decision outcome, the quality of the decision process was found to be positively mediate the relationship between behaviors and subsequent judgments of regret (Pieters & Zeelenberg, 2005). Pieters and Zeelenberg (2005)

concluded that the inconsistency of decision outcomes with goals disappears when the quality of the decision process is high because it makes the decision more justifiable (Pieters & Zeelenberg, 2005). Taken together, these findings further illustrate that decision makers think about and evaluate regret-inducing decision processes, independent of decision outcomes. This is interesting because it shows that intention–behavior inconsistency can be common and can act as yet another source of regret—this, as they claim at the conclusion of their paper, means that “bad decisions and deciding badly may [both] be regrettable” (Pieters & Zeelenberg, 2005).

### **Putting the Pieces All Together: Regret as a Modulatory System**

At its most fundamental, much of human behavior can be encapsulated in terms of goals. Broadly, behavior is the continued endeavor of moving toward and away from different types of stimuli through goal-setting, striving, and achieving. Goals exist to motivate, direct, and provide meaning for human behavior—yet, goals would carry no worth if they were not critically related to human behavior. According to the tenets of control theory, goals serve as standards or reference values for feedback processes (Carver & Scheier, 1981; Rasmussen, Wrosch, Scheier, & Carver, 2006). In other words, goals are the guidelines that we use to frame and understand the successes and failures of our worlds. The possibility of a consistency-fit approach to behavioral regulation model has been discussed in previous research, though no empirical work has yet to support predictions about the impact of regret on future behavior in the context of the consistency-fit (Seta et al., 2008; Seta & Seta, 2013). Broadly, negative emotions are functional because they tell decision-makers that the current state of affairs is unacceptable and requires attention that will bring about the end of whatever problematic circumstances exist (Schwarz, 2000). More specifically, the consistency-fit of a decision with respect to individuals’ goals and personality orientation, as expressed through experienced levels of regret (a negative emotion)

may provide useful affective information within regulatory feedback-loops (Seta et al., 2008; Seta & Seta, 2013). Given the breadth of its past research, there is reason to believe that using the consistency-fit perspective to study anticipated regret, retrospective regret, and the ways in which they affect each other in the context of planned behavior would produce a broader explanatory system than past models of human behavior (Seta et al., 2001, 2008; Seta & Seta, 2013).

Outside of the consistency-fit regret perspective, there already exists support for the importance of consistency in regulatory processes. Building off work Higgin's (2000) work regarding regulatory fit and value, Camacho, Higgins, and Luger (2003) argue that what fits is what "feels right"—in other words, when a decision-maker's strategy for goal pursuit is in keeping with their regulatory orientation, the regulatory fit is appropriate. When this fit is somehow violated, decision-makers are aware and can tell it feels wrong. The take-home message of this work is that to understand what decision-makers value—and thus what goals they set and how they will act—we must also establish how they arrive at what they value. This approach is, by the authors' own accord, remarkably similar to the view of and pattern of results put forth in the development of the consistency-fit perspective (Camacho, Higgins, & Luger, 2003; see Seta et al., 2001).

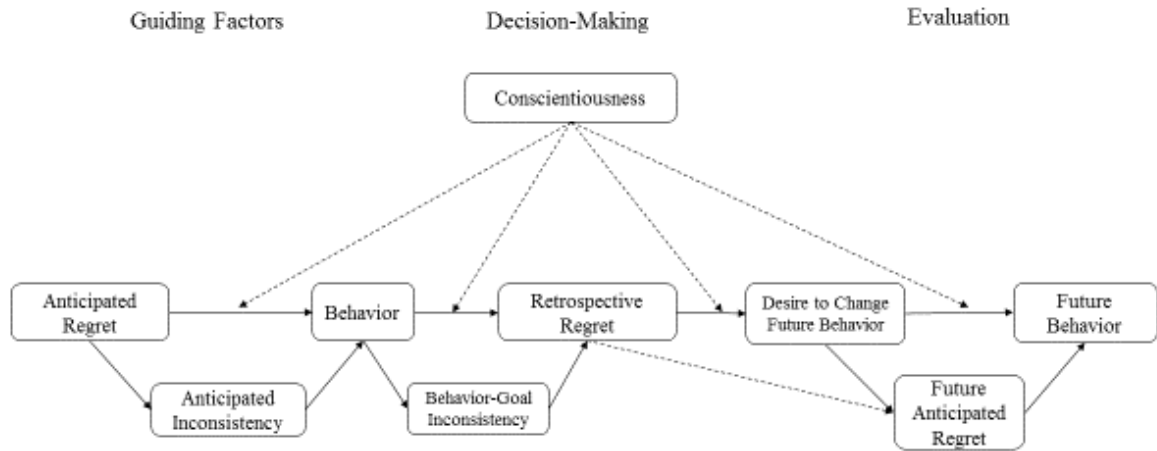
Even though there has been a great deal of research on retrospective regret and anticipated regret, key questions remain unanswered. Past research has separately documented the effects of both retrospective and anticipated regret on decision-making, but how the two types of regret are related to each other has yet to be investigated. Although some researchers have discussed how they may be related (e.g., Zeelenberg & Pieters, 2007), limited empirical research has been actually conducted on the topic. One of the goals of this research is to begin

empirically testing a proposed model that is designed to describe how humans think about future undesirable outcomes, evaluate their past behaviors, and potentially grow from these experiences. Based on past research, it seems reasonable to suggest that regret plays an especially important role in these processes—in fact, we might even say that regret modulates our behavior. The word modulate means to adjust, regulate, or modify, often in the context of voice tone or volume. Anticipated regret and retrospective regret may be two parts of one harmonious behavioral modulating process. This research project aims to empirically test if this claim—that regret functions as a modulatory system—is viable.

Regret as a modulatory system would build upon the ideas of the consistency-fit perspective and the theory of planned behavior. Figure 1 illustrates this theoretical model. Broadly, this iterative model would be continuous in nature and broken up into three broad elements: guiding factors, decision-making, and a period of evaluation following behavior. In addition to assuming cyclicity, this model's framework resembles something similar to the structure found in the Rubicon model of volitional processes (Gollwitzer, 1990; Heckhausen & Gollwitzer, 1987; Schmitz & Wiese, 2006). *Guiding factors* operate in similar ways to the predecisional phase and deals with questions of how regret is implicated in how people select and plan to execute their goals. The *decision-making* phase resembles the action phase and deals primarily with goal pursuit and locomotive regulatory states (Avnet & Higgins, 2003). The *evaluation following behavior* period operates similarly to the postdecisional phase and attempts to address how people use regret to evaluate their past behavior and reevaluate their goals.

Figure 1.

A proposed theoretical model for the regret modulatory system.



**Guiding Factors.** Past behavior and intentions, as previously demonstrated by the theory of planned behavior research, directly predict future behavior, and thus should act as guiding factors (e.g., Abraham & Sheeran, 2003, 2004; Ajzen, 1991; Perugini & Bagozzi, 2001; Rhodes & de Bruijin, 2013; Sheeran & Orbell, 1999). A multitude of research has demonstrated that past behavior predicts future behavior (e.g., Ouellette & Wood, 1998). The theory of planned behavior has shown that intentions, attitudes (indirectly), and self-efficacy (indirectly) also guide future behaviors (Ajzen, 1991). In addition to past behavior, intentions, descriptive norms (e.g., Cooke, Sniehotta, & Schuz, 2007), and desires (Perugini & Bagozzi, 2001), anticipated regret ought to serve as a guiding factor for behavior in its own right, through its ability to motivate through the comparison of possible decision outcomes (Abraham & Sheeran, 2003, 2004; Seta et al., 2001; Sheeran & Orbell, 1999). While numerous studies (e.g., Bagozzi & Dholakia, 2003;



Perugini & Bagozzi, 2001) have shown that anticipated regret affects decision-making, the mechanism remains unclear. One possibility is that anticipated regret comes from a decision process whereby the decision maker compares a goal-related decision with activated goals, standards and values (e.g., Bagozzi & Dholakia, 2003; Seta et al., 2001). Anticipated regret can result from imagined discrepancies or inconsistencies between the undesirable decision-outcomes and the relevant goal. The level of anticipated regret can provide information about the possible levels of regret that would potentially follow from decisions leading to undesirable goal-related outcomes, and thereby serve to motivate persons to enact decisions that lead to goal-attainment. Much evidence, as was discussed above, suggests that anticipated regret is an important factor in determining future behavior.

**Decision-Making.** The *de facto* behavior and the cognitive-affective experience of regret transmit information from the present decision into future decision-making and goal-setting processes. The consistency-fit between a goal and a subsequent behavior is dictated by the totality of situational and dispositional characteristics of the decision-maker (e.g., Seta et al., 2001). Although the regret modulatory system suggests that consistency-fit may be implicated in the *guiding factors* phase, current evidence for the consistency-fit perspective only exists within the decision-making evaluation element of the modulatory system. Based on person-specific motivators and goal-relevant personality orientations, decision-makers establish intentions to behave in ways that will bring them closer towards the desired outcome (e.g., Ajzen, 1991; Perugini & Bagozzi, 2001; Seta et al., 2008). In order to achieve this desired or intended outcome, the decision-maker sets and activates particular goals en route to achieving that outcome (Gollwitzer, 1999; Zeelenberg, Nelissen, Breugelmans, & Pieters, 2008). Following a goal's activation, the behavior's occurrence can be either consistent or inconsistent with the

decision-makers' goal-relevant motivations, orientations, attitudes, and personality. The level of ensuing regret is mediated through the perceived consistency of a behavior (Seta et al., 2001).

**Evaluation following behavior.** In the evaluation phase, the central process of translating post-decisional information—in the form of retrospective regret—into future decisional guidelines ought to operate through a modification of expectations about future behaviors (Inman, 2007; Zeelenberg & Pieters, 2007). Retrospective regret and the evaluation of past decisions offers the possibility for goal disengagement (Wrosch, Scheier, & Miller, 2003). Disengagement from unattainable goals then allows for the subsequent re-engagement of new goals and a transition back into the planning of future goals via the *guiding factors* phase. Learning from past decisions is a critical component of the *evaluation following behavior* phase. Inman (2007) attempted to parse this notion of learning from self-reproach in the context of regret through the notion of *should* expectations. He suggests that a crucial process in regulating regret is the remembering of forgone alternative for the purpose of improving future outcomes.

Recent research by Seta, Seta, Petrocelli, and McCormick (2015) find that people express regret for decisions that lead to *positive* outcomes (e.g., profit) when they generate counterfactuals about possibilities for even greater levels of positive alternative outcomes. They suggest that a downside of hedonistic human nature is dissatisfaction with “real” positive outcomes when better outcomes are imagined—a form of counterfactual thinking. Offering additional backing for the importance of counterfactuals and *should* expectations in feedback following a decision, Landman, Vandewater, Stewart, and Malley (1995) found that reporting counterfactual thinking was associated with emotional distress in the short-term, but motivational benefits when broadening scope to the long-term. The modification of these expectations and subsequent recollection of relevant emotional states and past behaviors, in turn

affects the decision makers' future guiding factors. In another look at feedback, Larrick and Boles (1995) demonstrated that the type of feedback a decision-maker receives changes the decision-maker's level of risk aversion. That is, when decision-makers get feedback about the nature of the decision they made (whether the alternative was better or worse), their evaluation of that decision changes, ultimately suggesting that decision-makers evaluate their past decisions.

**The role of personality.** Across each segment of the regret modulatory system, goal-relevant personality orientations likely play an important role in the relevance of regret in shaping behavior. Some previous research has already investigated the role of personality in self-regulatory processes and even more research implicates it in goal-setting and decision-making processes. As previously discussed, in a study looking at individual differences in sociability via trait extraversion, Seta and colleagues (2008) found that the consistency of a decision to stay home or to go out with friends was dependent upon whether participants were extraverted or introverted. This relevant personality orientation was a critical determinant in how consistent participants viewed the decision to go out or stay home—extraverts viewed going out as more consistent, whereas introverts viewed staying home as more consistent. Regret levels following decisions to go out or to stay home differed depending based on whether that decision was consistent or inconsistent with the participants' personality. In this case, extraverts reported more regret from a negative outcome to stay home compared to an introvert with the same negative outcome from staying home; however, the reverse was true when considering a negative outcome while going out. More recently, Valshtein and Seta (2015) found that conscientiousness also predicts feelings of retrospective regret such that participants high in conscientiousness report more regret, regardless of the decision outcome, whereas participants with lower levels of

conscientiousness showed higher levels of regret when the negative outcomes of a decision were relatively serious. Thus the role of personality in determining consistency-fit relationships and regret has been investigated. The importance of personality has also been demonstrated in the context of the theory of planned behavior. In numerous studies looking at, for example, exercise behavior, as well as eating behavior, various goal-relevant personality traits predict intentions to behave (Chen, 2007; Rhodes & Courneya, 2003, 2005; Rhodes, Courneya, & Jones, 2004). However, none of the empirical work looking at personality in the theory of planned behavior has also considered regret.

### **Hypotheses**

In order to empirically test the possibility that regret can function within a modulatory system in planned behavior, I derived four hypotheses. First, mirroring the findings presented by Valshtein and Seta (2015), conscientiousness should moderate the relationship between anticipated regret and study habits (Hypothesis 1), such that the effect of conscientiousness on study habits will be greater for people with low levels of anticipated regret. Conversely, in people with high levels of anticipated regret, conscientiousness will report higher quality study habits. Next, based on the work by Abraham and Sheeran (2003, 2004), I hypothesized that anticipated regret would predict future study habits and that this relationship would be mediated through anticipated inconsistency, such that the more regret participants anticipated, the better the study habits they would report (Hypothesis 2). In accordance with past consistency-fit research (e.g., Seta et al., 2001), I expected to replicate the relationship between behavior (in this case, study habits) and retrospective regret. Study habits would predict retrospective regret, mediated through behavior-goal inconsistency, such that poorer study habits will be associated with higher levels of retrospective regret (Hypothesis 3). Pulling from Inman's (2007)

supposition that *should* expectations are what differentiate the functional, learning component of regret from its more negative aspects (what he terms reproach), I sought to explore how learning may occur within the regret modulatory system. Thus, I hypothesized that retrospective regret would predict future anticipated regret, such that higher levels of retrospective regret regarding week one would be associated with higher levels of anticipated regret when thinking about week two (when people regret the past, they are more likely to anticipate experiencing that same regret a week later). Further, I hypothesized that this relationship would be mediated through the desire to change future behavior (Hypothesis 4), such that people high in retrospective regret will display a higher desire to change their behavior for the upcoming week and subsequently anticipate more regret. The regret modulatory system suggests that goal-setters and decision-makers utilize regret not simply as an evaluation of past behaviors or as a crystal ball for future behaviors, but rather as a dynamic, cognitive-affective state that *continuously* helps guide and revise behavioral trajectories en route to accomplishing goals.

## METHOD

### Participants

One hundred and sixty participants (92 women) were recruited from introductory psychology courses at Wake Forest University. Participants volunteered for this study as part of their introductory psychology course research requirement options. They were compensated a total of two hours of research credit.

### Design, Measures, and Procedure

Participants recruited for this study were given the information that they would be taking part in a research study about expectations and study habits among college psychology students. All participants signed-up online for a timeslot to come into the research lab (Time 1) as well as the first series of five daily emails (Behavior 1). At the end of the first in-lab visit, participants were asked to sign-up for a second in-lab visit (Time 2), in addition to a second round of five daily emails (Behavior 2). Each in-lab visit involved filling out various questionnaires and each daily email included four questions related to study habits over the past 24 hours (see Appendix A). In accordance with past research paradigms used in the theory of planned behavior (Abraham & Sheeran, 2003, 2004), a brief definition of what strong study habits entail was included at the beginning of Time 1 questionnaires and Time 2 questionnaires. A brief reminder of this definition was also included in each daily email. To control for differences in study habits due to week-to-week differences in workload, participants were also asked about how busy they expected to be in the upcoming week.

**Time 1 measures and procedure.** Upon arrival in the research lab, participants were greeted and instructed to sit at a desk in the study room. After signing the informed consent, participants answered questions on their computers using the online survey platform Qualtrics.

Qualtrics is a software system that allows for the creation of surveys in order to collect data remotely over the internet. All data from this study were collected via Qualtrics and downloaded for data cleaning and analysis via the in-system dialog.

***Demographics and study habits description.*** Participants first completed demographic questions and the Big Five personality inventory including Conscientiousness (see Appendix B; Saucier, 1994). Then a six-point description of strong study habits was presented and participants were asked to respond “yes” or “no” to whether or not they understood what constituted strong study habits. Strong study habits, according to the description participants read, included the presence of behaviors such as planning ahead and finding an ideal place to study, and the absence of behaviors like thinking catastrophically, cramming, etc. All participants affirmed that they did in fact understand the provided definition of strong study habits (Appendix A<sup>1</sup> contains complete items descriptions).

***Past behavior and guiding factors for week 1.*** Next, participants answered questions regarding a number of relevant constructs—Past Study Behavior, Intentions, Anticipated Regret, and Anticipated Inconsistency. Past Study Behavior was comprised of participants’ most recent semester GPA, the most recent exam score, and self-reported quality of past study habits (e.g., *I have a good work ethic*). In addition to reporting their Past Study Behavior, participants also reported their intentions to practice strong study habits in the upcoming week.<sup>1</sup> All items were measured on a 1 to 10 Likert scale where higher scores indicated more intentions to study in the upcoming week. Participants then answered two questions about the amount of regret they anticipated experiencing if they did not practice strong study habits in the upcoming week (Anticipated Regret). Both items were measured on a 1 to 10 Likert scale where higher scores

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<sup>1</sup> Some of the measures detailed above are not germane to the present analyses, but were collected for exploratory analyses.

indicated more anticipated regret. Finally, participants responded to three items related to the amount of behavior-goal inconsistency they thought they would experience if they did not practice strong study habits in the next week (e.g., *If I do not practice strong study habits in the next week, it would feel as though I acted inconsistently with my goals and values*). All items were measured on a 1 to 10 Likert scale where higher scores indicated more Behavior-Goal Inconsistency.

Additionally, participants were asked about their current study goal, as well as how important that goal was to them—goals could be to change or maintain their current study habits. Appendix A<sup>2</sup> contains the complete list of items used at Time 1.

**Behavior 1 and 2, study habits and procedure.** Following completion of in-lab Time 1 measures and then again following in-lab Time 2 measures, participants began receiving daily emails the next day. These daily emails were sent via Qualtrics each morning at 8:00 am, with one follow-up reminder sent each afternoon at 4:00 pm to ensure completeness. Each email contained four items regarding study habits from the previous day—two items about subjective study habit quality (e.g. *How successful have you been in practicing strong study habits in the past 24 hours?*; Study Habit Quality), one item about current study habit goals (e.g. *Which best describes your current academic goal?*) and one item asking about the number of hours studied in the past 24 hours (Study Habit Quantity). Scores on the subjective Study Habit Quality items could range from 1 to 10, where higher scores indicated stronger study habits (e.g., *How successful have you been in practicing strong study habits in the past 24 hours?*). Participants were also asked about whether their goal was to study more, study less, or maintain their current study habits. Finally, participants were asked about how much they studied over the past 24 hours by selecting how many hours they studied, to the nearest tenth of an hour. Appendix A<sup>3</sup> contains the daily email items.



**Time 2 measures and procedure.** After completing five daily emails as detailed above, participants again came into the lab to fill out many of the same measures as Time 1, but with the a few changes.

***Evaluation following behavior.*** Participants first answered five questions regarding how much regret they felt about practicing (or rather failing to practice) strong study habits over the past week (Retrospective Regret; e.g., *When I think about my study habits the past week, I feel regret*). All items were on a 1 to 10 Likert scale, where higher scores indicated more experienced regret when thinking about the past week. Next, participants answered three items related to how (in)consistent they viewed their study habits with their values and goals (Behavior-Goal Inconsistency; e.g., *With regards to only my study habits, this past week has not been consistent with who I am as a person*). All items were on a 1 to 10 Likert scale, where higher scores indicated more inconsistency when thinking about the past week. Then participants answered four items pertaining to their Desire to Change Future Behaviors (e.g., *I intend to practice study habits in the same way I have in the past*). All items were on a 1 to 10 Likert scale, where higher scores indicated more desire to change future behaviors. Appendix A<sup>4</sup> contains the complete list of items used to measure evaluation variables collected at Time 2, following week one study habits.

***Guiding factors for week 2 study habits.*** Finally, participants answered questions regarding their Future Intentions and Future Anticipated Regret regarding studying habits for the upcoming week (e.g., *If I do not practice strong study habits in the next week I will feel regret*). Appendix A<sup>4</sup> contains the complete list of items collected at Time 2. After the second in-lab visit, participants were asked to complete five daily email questionnaires, comprised of exactly the same questions as Behavior 1.

## RESULTS

### Missing Data and Data Cleaning Procedures

After the completion of data collection, the data were evaluated for missing cases and prepared for analysis. Of the initial 163 participants recruited at visit 1, three were excluded because they were missing information for more than 50% of the study variables. Only one participant did not complete at least two days of daily emails—that participant was subsequently dropped (they did not show up for in-lab visit 2, either) leaving 159 participants with both complete data from in-lab visit 1 and daily email questions. On day 3 of the first round of daily emails—13 duplicate emails were sent out due to a computer scheduling error. Because this produced a redundancy in responses, a unilateral decision was made to delete the *second* response from each participant that completed two emails in one day. Of the 159 participants who remained, 154 participated in the second in-lab visit and were subsequently scheduled for a second round of daily emails. At the conclusion of the second round of daily emails, 130 participants remained. Participants with *at least two days* of daily emails per week were retained in the dataset for analysis, leaving a final sample of 151 participants. Because day-to-day fluctuations in study habits were not germane to the present hypotheses, daily email reports of Study Habit Quality and Study Habit Quantity were averaged in order to create Week 1 and Week 2 estimates. Table 1 presents the proportion of missing data for all key variables, as well as the day-by-day completeness for the email questionnaires.

Table 1.

Missing data and percentage of complete data for all study variables

Variable of Interest	N	Missing	Percent
1. Anticipated Regret	160	0	100.0%
2. Anticipated Inconsistency	160	0	100.0%
3. Study Habit Quality 1	159	1	99.4%
3a. Day 1	158	2	98.8%
3b. Day 2	158	2	98.8%
3c. Day 3	159	1	99.4%
3d. Day 4	159	1	99.4%
3e. Day 5	158	2	98.8%
4. Study Habit Quantity 1	159	1	99.4%
4a. Day 1	155	5	96.9%
4b. Day 2	149	11	93.1%
4c. Day 3	150	10	93.8%
4d. Day 4	150	10	93.8%
4e. Day 5	151	9	94.4%
5. Retrospective Regret	154	6	96.3%
6. Behavior-Goal Inconsistency	154	6	96.3%
7. Future Anticipated Regret	154	6	96.3%
8. Desire to change future behavior	154	6	96.3%
9. Study Habit Quality 2	151	9	94.4%
9a. Day 6	149	11	93.1%
9b. Day 7	149	11	93.1%
9c. Day 8	151	9	94.4%
9d. Day 9	150	10	93.8%
9e. Day 10	149	11	93.1%
10. Study Habit Quantity 2	151	9	94.4%
10a. Day 6	145	15	90.6%
10b. Day 7	144	16	90.0%
10c. Day 8	144	16	90.0%
10d. Day 9	133	27	83.1%
10e. Day 10	130	30	81.3%
11. Conscientiousness	160	0	100.0%
12. Total Valid Listwise N	151	9	94.4%

For each variable of interest, scale scores were created by taking the arithmetic mean of all the items detailed above. As can be seen in Table 2, all scale scores (with the exception of Study Habit Quantity during week 2) were deemed to have satisfactory reliability, each with Cronbach's alphas above 0.750.

Table 2.

Cronbach's alpha for all study variables with more than one item.

Variable of Interest	No. of Items	Cronbach's Alpha
1. Anticipated Regret	2	0.803
2. Anticipated Inconsistency	3	0.749
3. Study Habit Quality 1	10	0.862
4. Study Quantity 1	5	0.798
5. Retrospective Regret	5	0.911
6. Behavior-Goal Inconsistency	3	0.775
7. Future Anticipated Regret	2	0.911
8. Desire to change future behavior	4	0.791
9. Study Habit Quality 2	10	0.844
10. Study Habit Quantity 2	5	0.668
11. Conscientiousness	8	0.822

### **Descriptive Statistics**

Table 3 presents a complete list of study variable correlations, means, and standard deviations.

Of note, participants reported studying, on average, 3.94 (week 1) and 3.95 (week 2) hours per

day, and these daily estimates varied by approximately 1.69 hours per day for both week 1 and week 2. Participants also rated themselves as having practiced fairly strong Study Habit Quality on average ( $M_{\text{week1}} = 5.94$ ,  $SD_{\text{week1}} = 1.54$ ;  $M_{\text{week2}} = 5.90$ ;  $SD_{\text{week2}} = 1.63$ ). In fact, reports of Study Habit Quality were significantly higher than the midpoint of the scale, for both week 1,  $t(158) = 7.67$ ,  $p < 0.001$ , as well as for week 2,  $t(150) = 6.78$ ,  $p < 0.001$ . Participants' reported levels of Anticipated Regret were fairly high during the first week ( $M = 7.60$ ,  $SD = 1.88$ ) and were descriptively somewhat lower during the second week ( $M = 7.41$ ,  $SD = 2.11$ ). However, participants' levels of Anticipated Regret were not significantly different in week 1 ( $M = 7.60$ ,  $SD = 1.88$ ) compared to week two ( $M = 7.41$ ,  $SD = 2.11$ ),  $t(153) = -1.12$ ,  $p = 0.267$ . Ratings of Retrospective Regret after the first week of study habits ( $M = 4.73$ ,  $SD = 1.95$ ) were significantly lower than ratings of Anticipated Regret at week 1 ( $M = 7.60$ ,  $SD = 1.88$ ),  $t(153) = -12.36$ ,  $p < 0.001$ . Reported levels of Anticipated Inconsistency prior to the first week of study habits ( $M = 7.19$ ,  $SD = 1.64$ ) were significantly higher than reported levels of Behavior-Goal Inconsistency after the first week of study habits ( $M = 4.54$ ,  $SD = 1.89$ ),  $t(153) = -11.36$ ,  $p < 0.001$ .

### **Analyses**

This study addressed four research hypotheses: Conscientiousness will moderate the relationship between Anticipated Regret and Study Habit Quality, such that higher levels of Conscientiousness would be associated with better Study Habit Quality when Anticipated Regret is low, but not a significant predictor when Anticipated Regret is high (Hypothesis 1). Anticipated Regret will positively predict study habits (where higher Anticipated Regret predicted higher Study Habit Quality), mediated positively through Anticipated Inconsistency (Hypothesis 2). Study habits will negatively predict

Table 3.

Correlations and descriptive statistics for all relevant study variables

Variable of Interest	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	M	SD
1. Anticipated Regret	1.00	.66***	.28**	.09	-.15	-.25**	.41**	-.11	.23**	.13	7.60	1.88
2. Anticipated Inconsistency	.66***	1.00	.38**	.12	-.22**	-.32**	.38**	-.21**	.29**	.07	7.19	1.64
3. Study Habit Quality 1	.28**	.38**	1.00	.41**	-.50**	-.51**	.14	-.30**	.51**	.27**	5.94	1.54
4. Study Habit Quantity 1	.09	.12	.41**	1.00	-.11	.15	.18*	-.09	.27**	.60**	3.95	1.69
5. Retrospective Regret	-.15	-.22**	-.50**	-.11	1.00	.71**	-.07	.47**	-.36**	-.06	4.73	1.95
6. Behavior-Goal Inconsistency	-.25**	-.32**	-.51**	-.15	.70**	1.00	-.23**	.40**	-.37**	-.19**	4.54	1.89
7. Future Anticipated Regret	.41**	.38**	.14	.18*	-.07	-.23**	1.00	-.14	.23**	.33**	7.41	2.11
8. Desire to Change Future Behavior	-.11	-.21**	-.30**	-.09	.47**	.40**	-.14	1.00	-.20*	-.01	5.37	1.72
9. Study Habit Quality 2	.23**	.29**	.51**	.27**	-.36**	-.37**	.23**	-.20**	1.00	.53**	5.90	1.63
10. Study Habit Quantity 2	.13	.07	.27**	0.6**	-.06	-.19*	.33**	-.01	.53**	1.00	3.94	1.69
11. Conscientiousness	.31**	.50**	.33**	.02	-.28**	-.29**	.21**	-.24**	.23**	.03	6.53	1.11

Note. \*\*\*  $p < 0.001$ , \*\*  $p < 0.01$ , \* $p < 0.05$ ;

Retrospective Regret, (i.e., poorer study habits will be associated with higher levels of regret) mediated through behavior-goal inconsistency (Hypothesis 3).

Retrospective Regret will positively predict Future Anticipated Regret (i.e., higher levels of retrospective regret regarding week one will be associated with higher levels of anticipated regret when thinking about week two), mediated through Desire to Change Future Behavior (Hypothesis 4).

**Hypothesis 1: Conscientiousness as a moderator.** Hypothesis 1 proposed that Conscientiousness would moderate the relationship between Anticipated Regret and Study Habit Quality. To test hypothesis 1, I used a moderated multiple regression technique using the SPSS macro PROCESS to test the interaction of conscientiousness and anticipated regret on study habits at week one (Preacher, 2012). Following the recommendations of Aiken, West, and Reno (1991), I decided to mean-center Conscientiousness and Anticipated Regret in order to better interpret the interaction term. First, Anticipated Regret and Conscientiousness were both entered into the first step of the regression analysis. Anticipated Regret positively predicted Study Habit Quality, such that more Anticipated Regret predicted better Study Habit Quality,  $\beta = .154$ ,  $SE = 0.065$ ,  $p = 0.02$ . Conscientiousness also positively predicted Study Habit Quality, such that more conscientious participants reported better study habits,  $\beta = .382$ ,  $SE = .101$ ,  $p < 0.001$ . When the product of Anticipated Regret and Conscientiousness (the interaction term) was entered into the second step of the regression analysis, the interaction did not predict study habits,  $\beta = -.049$ ,  $SE = .055$ ,  $p = .380$ , and did not add a significant amount of variance accounted for in study habits,  $\Delta R^2 = .004$ ,  $F(1, 155) = 0.776$ ,  $p = .380$ . Thus, contrary to hypothesis 1 we found that Conscientiousness does not moderate the

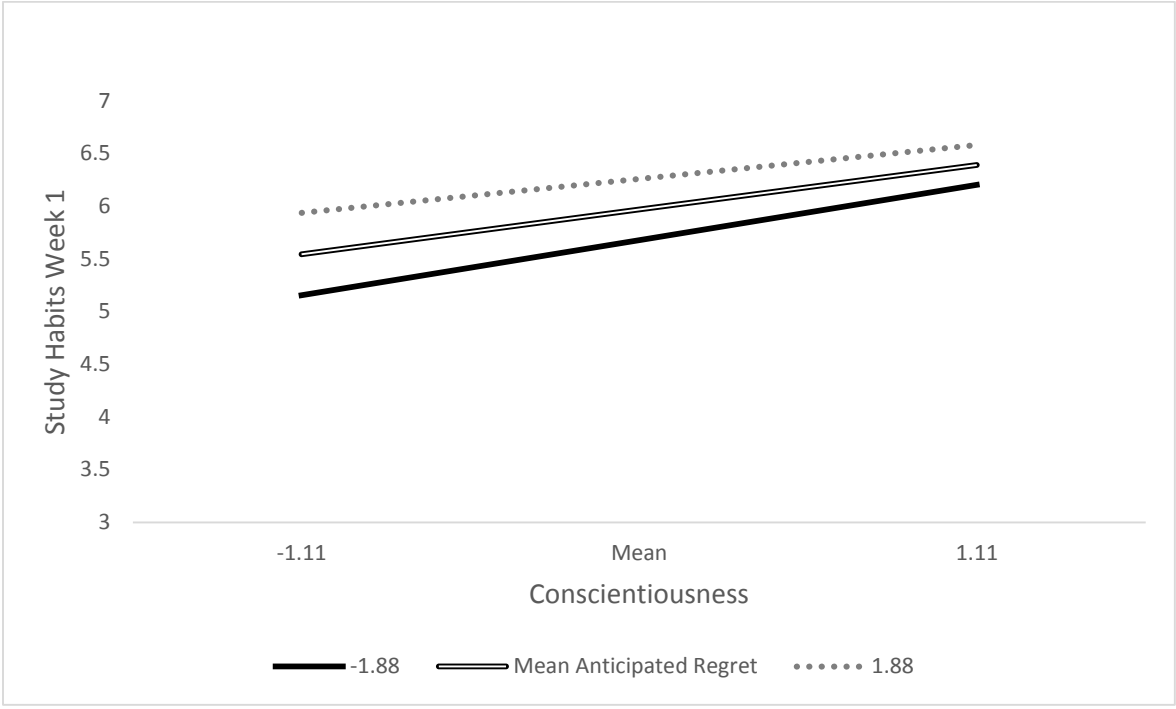
relationship between Study Habit Quality and Anticipated Regret. Despite this non-significant interaction and because of our *a priori* predictions, I conducted a closer examination of the conditional effect of Anticipated Regret on Study Habit Quality at varying levels of Conscientiousness to assess whether there were any descriptive patterns that might be of interest. For participants who were one standard deviation below the mean level of Conscientiousness, Anticipated Regret positively predicted Study Habit Quality,  $\beta = .208$ ,  $SE = .082$ ,  $p = .013$ . Similarly, for participants who were at the mean level of Conscientiousness, Anticipated Regret positively predicted Study Habit Quality,  $\beta = .154$ ,  $SE = .065$ ,  $p = .018$ . However, for participants who were one standard deviation above the mean level of Conscientiousness, Anticipated Regret did not predict Study Habit Quality,  $\beta = .100$ ,  $SE = .095$ ,  $p = .295$ . Figure 2 presents the simple slope for participants 1 standard deviation above and below ( $SD = 1.11$ ) the mean level of Conscientiousness, as well as 1 standard deviation above and below ( $SD = 1.88$ ) the mean level of Anticipated Regret.

Recall that this study involved two weeks of data collection. Following the first week of data collection, participants returned to the research lab to again answer questions about their levels of anticipated regret for the upcoming week. For this reason, I examined hypothesis 1 for the both the second week of study habits, as well as the first week of study habits. I followed the same analytic procedure for week two as for week one. Future Anticipated Regret and Conscientiousness were both entered into the first step of the regression analysis. Future Anticipated Regret positively predicted Study Habit Quality, such that more Future Anticipated Regret predicted higher Study Habit Quality,  $\beta = .154$ ,  $SE = 0.065$ ,  $p = 0.019$ . Conscientiousness also positively predicted



Figure 2.

Conscientiousness and Anticipated Regret positively predict Study Habit Quality in the first week



Note. The range presented above was restricted for clarity. Study Habit Quality scores ranged from 1 to 10, where higher scores indicated better study habit quality.

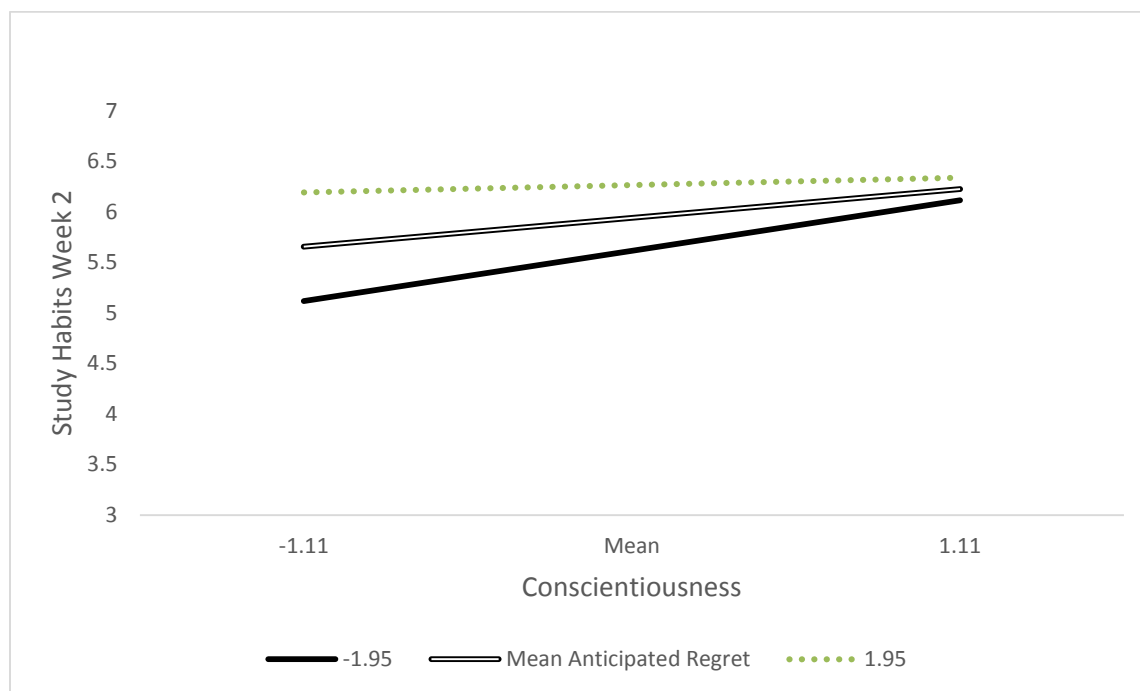
Study Habit Quality, such that more conscientious participants reported better Study Habit Quality,  $\beta = .263$ ,  $SE = .119$ ,  $p = .029$ . When the product of Future Anticipated Regret and Conscientiousness (the interaction term) was entered into the second step of the regression analysis, the interaction positively predicted Study Habit Quality,  $\beta = -.093$ ,  $SE = .052$ ,  $p = .074$ , and accounted for a marginally significant increase in the amount of variance explained in Study Habit Quality,  $\Delta R^2 = .020$ ,  $F(1, 147) = 3.24$ ,  $p = .074$ . Thus, hypothesis 1 was partially supported during the second week of study habits—the interaction between of Conscientiousness and Future Anticipated

Regret was marginally significant. Given the *a priori* predictions I made, I examined the conditional effect of Future Anticipated Regret on Study Habit Quality and different levels of Conscientiousness. For participants who were one standard deviation below the mean level of Conscientiousness, Future Anticipated Regret positively predicted Study Habit Quality,  $\beta = .255$ ,  $SE = .084$ ,  $p = .003$ . Similarly, for participants who were at the mean level of Conscientiousness, Anticipated Regret positively predicted Study Habit Quality,  $\beta = .153$ ,  $SE = .061$ ,  $p = .013$ . However, for participants who were one standard deviation above the mean level of Conscientiousness, Anticipated Regret did not predict Study Habit Quality,  $\beta = .052$ ,  $SE = .082$ ,  $p = .524$ . Figure 3 presents the simple slope for participants 1 standard deviation above and below ( $SD = 1.11$ ) mean Conscientiousness, as well as 1 standard deviation above and below ( $SD = 1.95$ ) the mean of Future Anticipated Regret.

**Hypothesis 2: Anticipated Inconsistency as a mediator.** Hypothesis 2 stated that Anticipated Regret would predict Study Habit Quality, mediated through Anticipated Inconsistency. Specifically, higher levels of Anticipated Regret were expected to be positively associated with better Study Habit Quality. To test hypothesis 2, we followed the approach to test a mediational model using bias-corrected confidence intervals, as detailed by Preacher and Hayes (2004; 2008). To test our mediational hypotheses, we used a bootstrap estimation of 1000 random samples with replacement from the full sample. This method tests whether or not the size of an indirect effect differs significantly from zero (Shrout & Bolger, 2002). The obtained pattern of results was consistent with our hypothesis: Anticipated Regret predicted Study Habit Quality, positively mediated

Figure 3.

Conscientiousness and Future Anticipated Regret positively predict study habits in the second week. The interaction term is marginally significant.



*Note.* The range presented above was restricted for clarity. Study Habit Quality scores ranged from 1 to 10, where higher scores indicated better study habit quality.

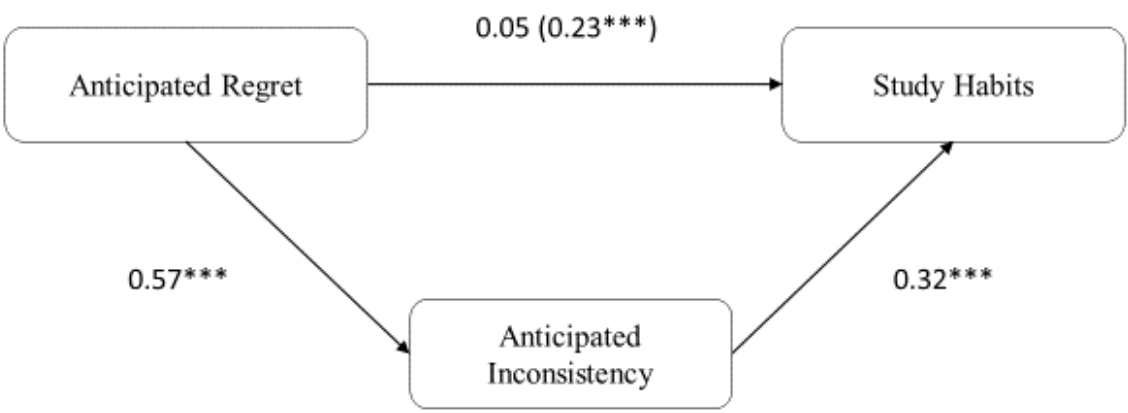
through Anticipated Consistency. The regression of Study Habit Quality on Anticipated Regret was significant  $\beta = .232$ ,  $SE = .063$ ,  $p < .001$ , and the regression of Anticipated Inconsistency on Anticipated Regret was also significant,  $\beta = .573$ ,  $SE = .052$ ,  $p < .001$ , such that the relationship between Anticipated Regret and Study Habit Quality was positive. The regression of Study Habit Quality on Anticipated Inconsistency, controlling for Anticipated Regret, was significant  $\beta = .321$ ,  $SE = .092$ ,  $p < 0.001$ . Consistent with the mediational hypothesis, Anticipated Regret is no longer a significant predictor of Study Habit Quality after controlling for the proposed mediator, Anticipated

Inconsistency,  $\beta = .048$ ,  $SE = .080$ ,  $p = .549$ , suggesting a full mediation. The indirect effect of Anticipated Regret was tested and found to be significant,  $\beta = .184$ ,  $SE = .080$ , and the 95% confidence interval of this indirect effect did not include zero, 95% CI [0.060, 0.307]. Figure 4 displays the pattern of results for this mediational model.

**Hypothesis 3: Behavior-Goal Inconsistency as a mediator.** Hypothesis 3 suggested that Study Habit Quality would negatively predict Retrospective Regret (i.e., worse study habits would predict higher levels of retrospective regret), mediated through

Figure 4.

Anticipated Inconsistency mediates the relationship between Anticipated Regret and Study Habit Quality.

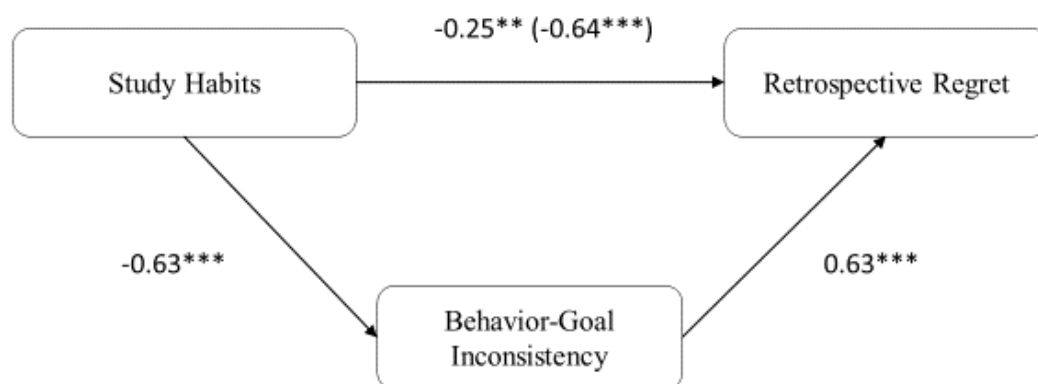


Behavior-Goal Inconsistency. In order to investigate hypothesis 3, we tested a mediational model in the same way as in hypothesis 2 (Preacher & Hayes, 2004, 2008; Shrout & Bolger, 2002). The regression of Retrospective Regret on Study Habit Quality was significant,  $\beta = -.638$ ,  $SE = .090$ ,  $p < .001$ , and the regression of Behavior-Goal Inconsistency on Study Habit Quality was also significant,  $\beta = -.629$ ,  $SE = .087$ ,  $p < .001$ . The regression of Retrospective Regret on Behavior-Goal Inconsistency, controlling for Study Habit Quality, was also significant  $\beta = .628$ ,  $SE = .067$ ,  $p < 0.001$ . These results support the mediational hypothesis—Study Habit Quality was a weaker (but still significant) predictor of Retrospective Regret after controlling for the proposed mediator, Behavior-Goal Inconsistency,  $\beta = -.243$ ,  $SE = .083$ ,  $p = .004$ , suggesting partial mediation. The indirect effect of study habits was tested using a bootstrap estimation with 1000 samples and was found to be significant,  $\beta = .619$ ,  $SE = .069$ . The 95% confidence interval of this indirect effect did not include zero, 95% CI [0.392, 0.873]. Figure 5 displays the pattern of results for this mediational model.

**Hypothesis 4: Desire to Change Future Behavior as a mediator?** In order to examine the last portion of the regret modulatory system, we tested hypothesis 4. Hypothesis 4 stated that Retrospective Regret after week one would predict Future Anticipated Regret about week two (whereby more retrospective regret was associated with more anticipated regret), mediated through a Desire to Change Future Behavior. However, the pattern of results did not suggest that the Desire to Change Future Behavior was a mediating variable. Although Retrospective Regret does significantly predict Desire to Change Future Behavior,  $\beta = .417$ ,  $SE = .063$ ,  $p < .001$ , it does not mediate the

Figure 5.

Behavior-Goal Inconsistency mediates the relationship between Study Habit Quality and Retrospective Regret.



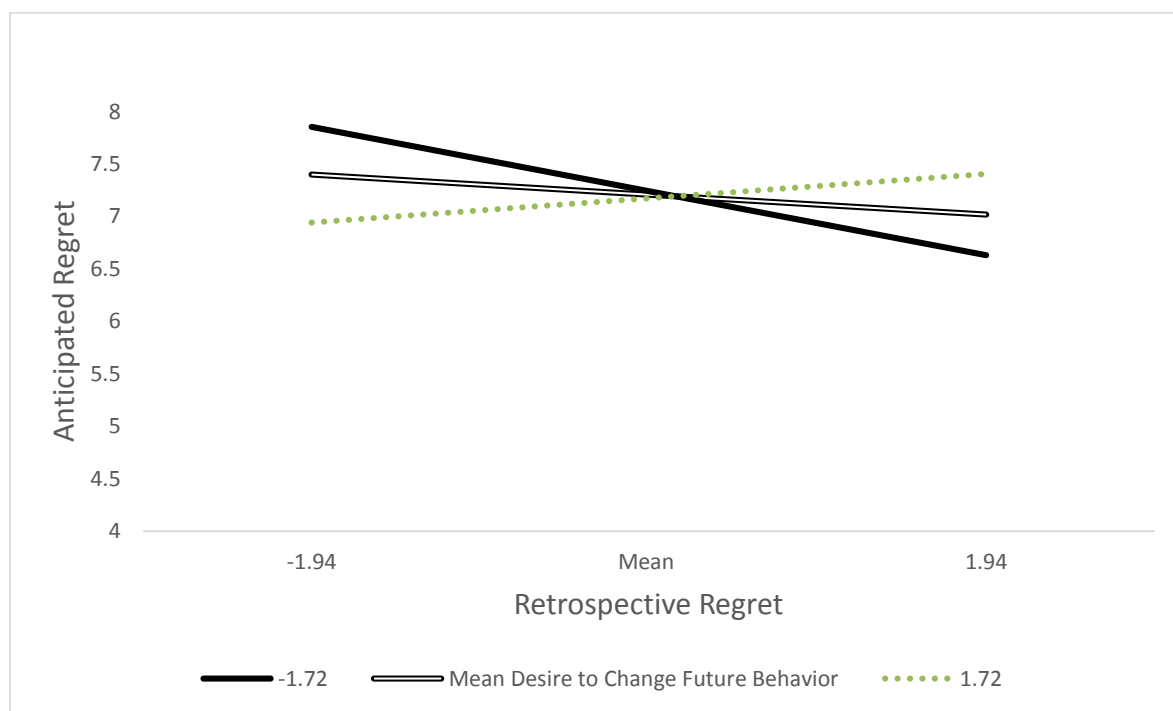
relationship Retrospective Regret and Future Anticipated Regret. After failing to demonstrate mediation, as predicted in hypothesis, I decided to test for moderation as per the recommendations put forth by Hayes (2012). I predicted that Desire to Change Future Behavior may be moderating the relationship between Retrospective Regret and Future Anticipated Regret, which may help explain why Retrospective Regret did not predict Future Anticipated Regret,  $\beta = -.075$ ,  $SE = .089$ ,  $p = .396$ . Similar to the procedure detailed in hypothesis 1, we used a moderated multiple regression technique using the SPSS macro PROCESS to test the interaction of Retrospective regret and the Desire to Change Future Behavior on Future Anticipated Regret (Preacher, 2012). Although not as predicted, we found that Desire to Change Future Behavior moderated the relationship

between Retrospective Regret and Future Anticipated Regret. Retrospective Regret and Desire to Change Future Behavior were both entered into the first step of the regression analysis. Alone, Retrospective Regret did not significantly predict Future Anticipated Regret,  $\beta = -.111$ ,  $SE = .113$ ,  $p = .325$ . Similarly, Desire to Change Future Behavior did not predict Future Anticipated Regret,  $\beta = -.018$ ,  $SE = .097$ ,  $p = .855$ . However, when the interaction between Retrospective Regret and Desire to Change Future Behavior was entered into the second step of the regression analysis, it significantly predicted Future Anticipated Regret,  $\beta = .126$ ,  $SE = .048$ ,  $p = .009$ . This interaction explained a significant increase in the variance in Future Anticipated Regret,  $\Delta R^2 = .044$ ,  $F(1, 150) = 6.99$ ,  $p < .001$ . Thus, Desire to Change Future Behavior was a significant moderator of the relationship between Retrospective Regret and Future Anticipated Regret. More specifically, we found that when the Desire to Change Future Behavior was high, Retrospective Regret was a marginally significant, positive predictor, whereby more Retrospective Regret predicted increased levels of Future Anticipated Regret,  $\beta = .199$ ,  $SE = .123$ ,  $p = .076$ . On the other hand, when the Desire to Change Future Behavior was low, Retrospective Regret was a marginally significant, negative predictor, whereby more Retrospective Regret predicted less Future Anticipated Regret,  $\beta = -.234$ ,  $SE = .131$ ,  $p = .101$ . Figure 6 presents the simple slopes for participants 1 standard deviation above and below the mean of Desire to Change Future Behavior ( $SD = 1.72$ ), as well as 1 standard deviation above and below the mean of Retrospective Regret ( $SD = 1.94$ ). Despite the fact that the Desire to Change Future Behavior did not mediate the relationship between Retrospective Regret and Anticipated Regret, Anticipated Regret was uniquely predictive of future self-reported Study Habit Quality. As per the pattern of

results found in hypothesis 2, Anticipated Regret positively predicted Study Habit Quality for the upcoming week (such that high anticipated regret predicted higher self-reported study habit quality), even when controlling for self-reported Study Habit Quality from the week prior,  $\beta = .129$ ,  $SE = 0.054$ ,  $p = 0.018$ .

Figure 6.

Desire to Change Future Behavior moderates the relationship between Retrospective Regret and Future Anticipated Regret.



*Note.* The range presented above was restricted for clarity. Future Anticipated Regret scores ranged from 1 to 10, where higher scores indicated more anticipated regret.

As a final note, the results presented from each of the four hypotheses above are based on participants' self-report of Study Habit Quality each day, but not self-reported Study Habit Quantity. None of these four hypotheses are significant when predicting the



amount of hours studied per day. Nevertheless, the degree to which participants felt that they had practiced strong study habits (Study Habit Quality) positively predicted self-reported hours studied per day (Study Habit Quantity) both for week 1,  $\beta = 0.453$ ,  $SE = 0.08$ ,  $p < 0.001$ , as well for week 2,  $\beta = 0.553$ ,  $SE = 0.072$ ,  $p < 0.001$ , such that the higher the quality of study habits participants reported, the more hours per day participants reported studying.

## DISCUSSION

The results detailed above make several contributions to contemporary understandings of goal-setting and decision-making processes, as well as current understandings of study habits amongst undergraduate students. First and foremost, this pattern of results lends preliminary empirical support for a functional model of behavioral regulation that considers the roles of anticipated regret, retrospective regret, and personality in goal-related behavior. Each of the four research hypotheses proposed map onto a different component of the regret modulatory system. In the following sections, I describe each hypothesis in turn, along with how the obtained results related to the predicted results. Given the complexity of the results, I will discuss these implications and future directions in terms of each specific hypothesis. Finally, I will review the theoretical implications of these results more generally, as well as the potential directions for future research that may fruitfully follow.

To review, hypothesis 1 dealt with personality factors (i.e., conscientiousness) as they pertain to the regret modulatory system. Conscientiousness moderated the relationship between anticipated regret and study habits, such that when anticipated regret is low conscientiousness predicts study habits, but when anticipated regret is high, conscientiousness does not predict study habits. Hypothesis 2 addressed the *guiding factors* phase of the proposed regret modulatory system by suggesting that anticipated regret functions as a regulatory process that engenders behavioral decision-making (in this case choosing to enact good study behavior or not). Next, hypothesis 3 concerned itself with the *evaluation* period—study habits negatively predicted retrospective regret, mediated through behavior-goal inconsistency. Lastly, hypothesis 4 dealt with bridging

the *evaluation* period and the *guiding factors* phase and suggested that retrospective regret would predict future anticipated regret, but only when considering participants' desire to change future behavior. That is, high levels of retrospective regret only predict future anticipated regret when desire to change future behavior is high, and low levels of retrospective regret only predict future anticipated regret when the desire to change future behavior is also low. Below I recount each hypothesis separately and in more detail, and discuss the implications of each as well as how they pertain more specifically to each phase of the regret modulatory system.

### **Hypothesis 1: The Not-So-Simple Role of Personality**

Hypothesis 1 proposed that conscientiousness levels would moderate the relationship between anticipated regret and study habits. Recall the consistency-fit model's definition of regret: regret follows from a negative outcome and the level of regret experienced is dependent upon the how that negative outcome relates to the decision-maker's orientations and pre-dispositions. What I found regarding anticipated regret in the context of study behavior mirrors the relationship that Valshtein and Seta (2015) identified in the context of retrospective regret for class attendance and conscientiousness levels. This research found that conscientiousness predicted feelings of retrospective regret following failures to meet academic goal-related behaviors to attend class. More specifically, participants high in conscientiousness report more regret, regardless of the severity of outcomes resulting from either their own self-regulatory failures or those they read about in a vignette, whereas participants with lower levels of conscientiousness showed increased levels of regret only when the negative outcomes of a decision were relatively serious. The present study, at least in part, builds upon this

prior work by showing that students' levels personality orientations also predict levels of anticipated regret when imagining the negative outcomes of self-regulation failures. Importantly, the present study demonstrates this in the context of participants' own decisions and study-related behaviors across a span of two weeks, rather than in a scenario or momentary retrospection paradigm.

The present work also demonstrates that, just as descriptively similar decisions can be consistent for some people and not others, so can the *anticipation* of some decisions and not others. When participants in the present study reported how much regret they thought they might experience if they did not study in the upcoming week, I found a similar effect of personality, whereby people higher in conscientiousness were more likely to report higher study habit quality. Not surprisingly, conscientious students studied on average more than did students low in conscientiousness, even when controlling for how much regret they anticipated experiencing in the upcoming week.

Anticipated regret was also a strong predictor of future study habits quality. These findings were true for both week one and week two of study habit data. But the more interesting—or at least more puzzling—finding here may lie in the potential interaction between conscientiousness and anticipated regret. Here, I found no significant interaction in week one and a marginally significant interaction in week. In both weeks, the descriptive pattern of results looked similar; at relatively low levels of conscientiousness, anticipated regret was predictive of reported study habit quality, yet a higher levels of conscientiousness anticipated regret was less predictive.

Due to the finding of a nonsignificant interaction in week one and the finding of a marginally significant interaction in week two, it remains unclear whether this is a “real”

interaction effect or not. If it is a real effect, it is likely a small one, or at least one that was not well-captured by the present study due to a lack of power. Nevertheless, research does exist that would suggest the occurrence of an interaction like the one that was obtained in the present research. Solberg Nes and colleagues (2011) suggested that there may be a particularly unique constellation of characteristics of highly conscientious people that enables them to have good self-regulatory skills. This seems even more pronounced in the domain of academic achievement, wherein students with high conscientiousness exhibit higher self-regulated learning strategies including social, motivational, and cognitive skills (Chamorro-Premuzic & Furnham, 2003; Eilam, Zeidner, & Aharon, 2009). Given this, the results of the present study suggest that domain general conscientiousness is not necessary for good study habits, although it may act as a buffer for when other more learning-specific self-regulatory skills are not present. That is, students high in conscientiousness typically have good study habits (or at least better study habits than those low in conscientiousness), which would seem to be because they have the self-regulatory and goal-setting skills in place to succeed (Eilam, Zeidner, & Aharon, 2009). The reverse may be also true—people low in conscientiousness may still be motivated to practice good study habits if they have the requisite self-regulatory and goal-setting skills (in this case, anticipated regret) in lieu of domain-general conscientiousness (Gollwitzer & Sheeran, 2006). Future research should continue to unpack the relationship between personality variables, self-regulatory and goal-setting skills, and goal achievement in order to more fully understand the mechanisms at play.

## **Hypothesis 2: The Role of Anticipated Regret in the Context of Study Habits**

Hypothesis 2 stated that anticipated regret would predict study habits, whereby more anticipated regret would result in self-reported higher quality of study habits. This relationship was expected to be mediated through anticipated inconsistency. This research extended the consistency-fit model into the realm of anticipated regret and is the first attempt to empirically test how consistency-fit is implicated in behavioral regulation, more generally. Moreover, it also provided a novel approach to some of the same questions asked (but not answered) by the theory of planned behavior; providing room for further development and theorizing (Abraham, 2014; Conner, 2014; Rhodes, 2014; Sniehotta, Pesseau, & Araújo-Soares, 2014). The regret modulatory system (which builds on the consistency-fit perspective) proposes solutions to some of the concerns raised in a recent review detailing the limitations of theory of planned behavior. Despite the widespread implementation of the theory of planned behavior, Sniehotta and colleagues (2014) recently argued that it may be time to set aside the theory of planned behavior and begin developing new, more fruitful theories. While the theory of planned behavior is undoubtedly beginning to show its age, it may not be time to retire it just yet. Rather, the theory of planned behavior offered a useful set of consulting principles in the development of the regret modulatory system. Recall that the theory of planned behavior rests on the assumption that intentions are the strongest predictors of behavior and that there are a number of integral constructs that predict those intentions to behave: attitudes, subjective norms, perceived behavioral control, and past behavior. A behavioral regulation system focusing specifically on regret—based on the tenets of the consistency-

fit perspective as well as the theory of planned behavior—has proven to be an especially worthwhile area to continue investigating empirically.

Given the results I found in this study, there are two main reasons why the regret modulatory system may be useful over and above the theory of planned behavior. First, Sniehotta et al. (2014) critiqued the theory of planned behavior for growing too cumbersome and monolithic. Understanding how anticipated and retrospective regret function together system from a consistency-fit perspective would address this concern by focusing on only the processes directly related to the regret pathway of planned behavior. Rather than attempting to simply tack on consistency-fit and anticipated regret among the already cumbersome canon of planned behavior constructs, this approach focused on only the interrelations of regret prior to and after a decision to act or not act—without all of the extra heft of the theory of planned behavior variables.

Second, consistency-fit may provide both implicit and explicit cues that people can both feel “in the gut” and something they can describe through effortful evaluation. Because it straddles the line between explicit and implicit processes, consistency makes an ideal construct to begin bridging the gap between intentional behavioral planning and nonconscious processes. Although the need to explore this gap has been called for previously (Fazio & Olson, 2003; Rhodes, 2014; Sniehotta et al., 2014), few studies have attempted to look at consistency and consistency-seeking behavior (Fishbach, Ratner, & Zhang, 2011). Likewise, the theory of planned behavior is often critiqued for failing to address and explain the underlying mechanisms through which intentions operate. Because this perspective offers consistency-fit as an underlying mechanism driving the relationship between behavior and subsequent regret, it may be especially useful in

rectifying that lack of an explanation for planned behavior. In sum, although no research to date has examined this relationship, there looks to be some preliminary evidence suggesting consistency may be one mechanism implicated in anticipated regret processes.

**Hypothesis 3: Retrospective Regret is About Consistency (Or Rather Inconsistency)**

Hypothesis 3 was related to the evaluation of goal-related decisions and stated that failures to practice strong study habits in week one would predict higher levels of retrospective regret, mediated through inconsistency. In support of this prediction, our results confirmed the expected pattern of results and conceptually replicated the underpinnings of the consistency-fit perspective (e.g., Seta et al., 2001). This finding is the first to demonstrate that consistency-fit was of importance in the context of naturalistic goal-related decision evaluations, and the first time that the consistency-fit findings were tested using actual study habits in a naturalistic setting. Because hypothesis 3 found that inconsistency mediated the relationship between week one study habits and retrospective regret, these findings suggests that not only does consistency (or a good “fit”) supply information about minimized amounts of regret experienced after a negative outcome, but asking about inconsistencies (or a bad “fit”), provides information about the amount of regret experienced after a negative outcome.

It should be noted that the consistency-fit model is most definitely not the first or sole theoretical analysis resting on the assumption that inconsistency produces negative affect. For example, the seminal work of Festinger and his colleagues (1962) on cognitive dissonance similarly assumed that inconsistency produced negative affect, although it should be noted that cognitive dissonance theory was designed to account for



how people *reduce* post-decisional regret through the generation of consistent cognitions between behaviors and attitudes.

Other perspectives also assume that negative affect can follow from inconsistent behavior. For example, Strauman and Higgins (1987) discuss incongruences of actual self, ideal self, and ought self as motivators of behavior. Camacho and his colleagues (2003) put forth the notion of regulatory fit as being an important determinant of behavior and discuss the similarities between their perspective and that of the consistency-fit model. Moreover, from the perspective of classic control theory, test phases involve comparisons of an actual state to some more abstract standards (Carver & Scheier, 1981). Comparisons between actual and the standard to be compared to, indicates a poor decision outcome. Hence, discrepancies between actual states and comparison standard, as denoted by the test phase of a feedback loop, can be interpreted in terms of a relative lack of consistency-fit, as suggested by Seta and colleagues (2001). The theoretical construct of consistency and the notion that consistency serves as a motivating factor for goal-setting and decision-making can be seen from many other theories as well, including appraisal theory (Roseman, Spindel, & Jose, 1990), and the affect-as-information approach (Clore, Gasper, & Garvin, 2001), among others (Feldman, 2013). Even in the context of pedagogy, some social psychology textbooks even introduce consistency-seeking as one of the basic motivators of human behavior (Baumeister & Finkel, 2010). Thus, the finding related to hypothesis 3 are not necessarily unique to the consistency-fit model or the regret modulatory system analysis, but these results do build upon its assumptions.

**Hypothesis 4: Anticipated and Retrospective Regret: It *Should* Predict, but *Will* it?**

Contrary to the predictions initially made in hypothesis 4, retrospective and anticipated regret do not function in a straight-forward manner. I predicted that retrospective regret would positively predict anticipated regret and that this relationship would be mediated through a desire to change future behavior. However, the pattern of results obtained suggests that the desire to change future behavior moderates the relationship between retrospective regret and anticipated regret. Although this finding offers some initial evidence that retrospective regret and anticipated regret are, in fact, related, their precise connection remains unclear. The crux of this question centers on why retrospective regret does not predict anticipated regret in a more straight-forward manner.

Inman (2007) suggested that when understanding how regret relates to behavioral regulation, we must consider the difference between self-reproach and learning. Identifying the mechanism through which some regret is beneficial and some is not, is perhaps one of the keys to more fully understanding what differentiates functional regret from the experience of regret as purely destructive. My hope was that by measuring participants' desire to change future behavior, I would be measuring the degree to which participants were learning from their regrets. As the results suggest, desire to change future behavior is not the mechanism through which participants learn from their regrets. The regret modulatory system needs to incorporate a way to successfully decouple self-reproach from learning. Perhaps some inspiration can be taken directly from Inman's (2007) theorizing about *should* expectations. Inman (2007) calls on the dynamic model of service quality and satisfaction (Boulding, Kalra, Staelin, & Zeithaml, 1993) to devise a

way to separate self-reproach from learning. Self-reproach in this case represent the purely negative and/or maladaptive element of regret, and learning represents the functional component of regret. *Should* expectations, from this perspective, represent the customer service level that a consumer feels they deserve. From a more domain general perspective, this may reflect metaphysical beliefs and concerns about how the world should work. *Should* expectations ought to change what decision-makers believe should happen on the next service encounter; in other words, consumers should learn from their recent customer service interactions and update their expectations accordingly. Boulding and colleagues (1993) contrast the concept of *should* expectations with the idea of *will* expectations. *Will* expectations are similar to *should expectations* insofar as they also deal with beliefs about the world works, the difference here being that *will* expectations only deal with the how satisfied a consumer expects to be in subsequent interactions. Inman calls this kind of destructive negative expectation self-reproach and essentially equates this with upward counterfactuals. *Should* expectations, in the context of regret is about more the self-regulatory capacity to learn from one's mistakes, and *will* expectations are merely predictions about how an outcome will turn out based on past behavior. Inman describes the following very useful example:

if a person chooses to go to an auto race over going to a movie and the auto race is rained out, the person will probably not adjust her should expectations for auto races, but she may well even worse about her choice if she thinks about the forgone movie experience and kicks herself.

(Inman, 2007; p. 21).

From Inman's (2007) discussion, I attempted to create a construct, which I called "the desire to change future behavior", in order to tap into the updating of *should* expectations. It seemed as though this approach would better delineate the way in which regret operates in a functional manner. As can be seen from the results presented in hypothesis 4, this did not work as expected. There a number of possibilities that explain what may have occurred to produce this discrepancy. One possibility is that the updating of *should* expectations does not adequately capture learning in the way that Inman proposes. It may simply be impossible to disentangle self-reproach from learning. Alternatively, the construct I used to capture "learning" need further psychometric revision to more adequately measure the latent variable driving the relationship between the retrospective and anticipated regret. Either way, further work must be done to better understand this link. This examination of the dynamic process model, while providing a future direction to build upon the results obtained in hypothesis 4, does not answer the more perplexing question. It remains unclear why the results I found suggest that a desire to learn from future behaviors moderates but does not mediate the relationship between retrospective regret and future anticipated regret. Obviously, I was unable to demonstrate that retrospective regrets predicted future regrets.

Nevertheless, the desire to change future behavior does reveal a remarkable pattern of results. People who are high in both a desire to change their future behavior and high in the amount of retrospective regret tend to anticipate more regret in the future. This finding is perhaps the most straightforward—when people regret their past failures and also really want to change those behaviors, it seems obvious that they would anticipate regret in the future. Retrospective regret predicts anticipated regret when the

desire to change future behavior is high; this strand of hypothesis 4 resembles most closely the system that Inman (2007) described. On the other hand, for people who have a lot of retrospective regret, but not a strong desire to change future behavior, subsequent levels of anticipated regret may be low because decision-makers are displaying what seems to be a pattern of rumination (Nolan-Hoeksema, 1991). That is, people who are “stuck in the past” never get the chance to adequately evaluate the future.

For people who have very little retrospective regret, but also a weak desire to change future behavior, anticipated regret is subsequently high. This piece of hypothesis 4 also makes sense—there is no desire to change future behavior because past behavior doesn’t seem to have gone awry. People who have little regret and little desire to change their future behaviors prefer—or at least operate under—a locomotive regulatory style (Higgins, Kruglanski, & Pierro, 2003). People in this camp tend to move from one behavior to the next, without very much evaluation in between.

The last case requires a little bit more thinking to explain. Finally, for people high in the desire to change their future behaviors and low in the amount of retrospective regret they experienced, anticipated regret is subsequently low. One potential explanation for why this may be the case is due to biases in affective forecasting. Affective forecasting is the prediction of one’s own future emotional state, and can be divided down into four kinds of predictions: a) about the valence of the affect, b) the specific emotion, c) the strength of the emotion, and d) the duration of a particular emotion. Most importantly, Wilson and Gilbert (2003) suggest that people can be **inaccurate** in predicting each of these facets of emotional experience (Wilson & Gilbert, 2003). In particular, participants may be misconstruing the future affective experience.

Misconstruals of future situations can produce massive errors in affective forecast because emotional memories are not stored in the same way they are experienced—this discrepancy allows for people to store very inaccurate construals of what a situation was like (Loewenstein, Weber, Hsee, & Welch, 2001; Robinson & Clore, 2002). When the memory is retrieved later, it comes back in the form of a distorted, gestalt theory. That is to say, it turns out people rely more on homebrewed theories about how the future will make them feel, rather than on the details of the actual experience (Robinson & Clore, 2002). So, the participants who want to change their behavior but don't rely very much on the details of past failures (via retrospective regret) are simply operating on bad theories that underestimate how much regret they will experience if they do not study adequately.

### **Summary, Conclusions, and Limitations**

This research project is the first empirical study to look at planned behavior, consistency-fit and both anticipated and retrospective regret as it unfolds over time. This study followed participants at the outset of a behavioral window by investigating study goals prior to studying, actual daily study behavior (both quantity and quality), the evaluation of those behaviors, subsequent changes in regret processes following evaluation, and finally how those changes reflect changes in behavior. This study demonstrates that people—“in the real world” and not just in the lab—regularly think about regret, both before they act and after. However, what this naturalistic paradigm earns in ecological validity it loses in experimental control. Regret, despite being omnipresent in self-regulatory processes is reported with far less severity compared to research using experimental manipulations. Because I did not induce regret or ask

participants to retrospect on prior regrettable decisions, reports of regret were moderately low. In experimental and lab-contrived paradigms the effects of these constructs would likely be even stronger.

In addition to being a non-experimental study, this research project relied purely on self-report. Granted, regret is a cognitive-affective state suggesting that self-report is most logically a necessity, other variables of interest—particularly the measures used to capture study behavior—would have benefitted from other modalities of data collection. Numerous studies suggest that participants are simply not very good at reporting how much time they spend doing a number of activities including: usage of the internet and other social media (Junco, 2013), health activity and exercise (Sallis & Saelens, 2000), working at a job (Jacobs, 1998; Robinson & Bostrom, 1994) and daily sleep quantity (Taylor et al., 1984). Daily diary studies like the present study, despite their many upsides are prone to self-report biases, inaccurate reporting (both over- and under-reporting), and response biases. As such, future work looking at regret, planned behavior, goal-setting, and self-regulation should strive to obtain more robust measures of dependent variables—including direct measures and informant report, where possible.

Due to the scope of this research project, I could not measure all of the relevant variables from the theory of planned behaviors. As such, further research must be conducted in order to understand how the regret modulatory system fits within the larger context of planned behavior by considering additional factors like intentions, attitudes, and norms. Before the regret modulatory system can evolve as a theory—both separate from and in tandem with the theory of planned behavior—research must be conducted to differentiate the two theories empirically. Although past research has demonstrated that

anticipated affect and more specifically anticipated regret—are both statistically and theoretically unique constructs, the analyses presented here did not test that demarcation (Richard et al., 1996a). Also, in opposition with much empirical evidence suggesting that past behavior is one of the strongest predictors of future behaviors (Ajzen, 1991; Fishbein & Ajzen, 1975; Ouellette & Wood, 1995), the results I found suggest that GPA and last exam grade (the measures I used as indicators of past behavior) did not predict study habits. Additional theoretical constructs should be examined in the context of the regret modulatory system in order to provide convergent and discriminant validity for the novel theoretical position that the regret modulatory system occupies.

***Behavioral regulation or regret regulation?*** The regret modulatory system encapsulates the totality of regret's role in goal-setting and decision-making, and it defines this role in a different way from past research. For example, Zeelenberg and Pieters (2007) define a theory of regret regulation. The core idea in Zeelenberg and Pieters (2007) approach is that decision-makers are regret averse and are in a constant state trying to regulate the experience of regret. Although not discussed by these theorists, this perspective is similar to that of cognitive dissonance theory. From their view, decision-makers avoid regret and are motivated to prevent its occurrence and minimize or undo the consequences of its presence (*a la* dissonance theory) While the regret modulatory system might agree that people are often motivated to avoid the negative affective state of regret, the regret modulatory system builds on the consistency-fit notion that regret serves a functional role in behavioral regulation. That is, the regret modulatory system is a behavioral regulation model and not a regret regulation model. As



such, the regret modulatory system fits within the context of other behavioral self-regulatory models.

*Change and maintenance goals.* Subsequent research investigating differences in change and maintenance goals would be fruitful, as these types of goals have been previously shown to be important for understanding regret in goal-setting contexts (e.g., Seta & Seta, 2013). The regret modulatory system suggests that regret does not occur in isolation—as regret, in conjunction with behavior, serves the purpose of moving towards achieving a goal (Gollwitzer & Sheeran, 2006). Like control theory (Carver & Scheier, 1981), the regret modulatory system suggests that self-regulation is a continuous process that involves evaluating past behavior and comparing it to relevant goals and standard. That desired standard is kept in mind when adjusting future behavior according to those comparisons. Standards of comparison come from the hierarchical structure of a decision-makers' most important goals (Webb & Sheeran, 2006). Thus, when comparing current performance people often set intentions to change their behavior or switch to a different goal, in light of the new feedback. According to the theory of planned behavior, intentions serve as the reference value, such that when intentions change, behavior will subsequently change, (Webb & Sheeran 2006). However, the regret modulatory system purports that a reference value for performance standards need not be intentional in order to be a determinant of behavioral change. Regret, in this case, may function as an automatically elicited response to past behavior that signals the necessity for behavioral change. From this perspective, goals to change behavior versus goals to maintain behavior may be different only insofar as how they are defined within the context that dictates a decision-maker's consistent behavior.

***Regret and gender.*** Gender is another area worth examining that was not considered in the present research paradigm. While this dataset does contain information about the gender of our participants, this research project does not address questions of gender. Nevertheless, this dataset contains meaningful gender differences in regret process and this should be expected. Women experience disproportionately higher levels of regret as compared to men. This is in keeping with the extant literature on rumination. Rumination is defined as “engaging in a passive focus on one’s symptoms of distress and on the possible causes and consequences of these symptoms” (Nolan-Hoeksema & Jackson, 2001, p. 37). Further, women are more likely than men to engage in this type of ruminative (Nolan-Hoeksema, 1991). Examined more closely, underlying this difference in rumination are more broad gender differences in beliefs about the control of one’s own emotions, a feeling of personal responsibility for the “emotional tone” of social interactions, and perceived mastery (or lack thereof) over negative events (Nolan-Hoeksema & Jackson, 2001). Despite these well-validated findings associated with rumination and gender, little to no research in regret and gender differences exist. Given the potential similarity between regret and rumination, future research should examine the mechanisms that drive gender differences in rumination, but in the context of regret.

***Understanding reports of study habits more generally.*** One other question worth entertaining is related to why the mean level of study habit quality was so high in this study’s sample. There are two possible explanations: this could be due to a better-than-average effect, whereby participants respond in a biased manner, such that on average everyone reports studying slightly better than average. The other explanation is one of sampling error—because I recruited students from Wake Forest University, a well-

regarded, private, four-year institution, I may have picked up on meaningful differences in study habits? Extending these findings to other samples may disambiguate this issue: a state university sample in order to rule out differences in private versus public institutions, a community college sample to take the type of institution out of the equation, and a vocation school sample to see if these results hold in the context of professional training. Further, the analyses presented in this paper do not address the discrepancy between study habit quality and study habit quantity. However, there is reason to suspect that the differences in reports of quality and quantity may be meaningful. Indeed, past research has shown that reports of study quality and study quantity provide different information about learning outcomes and student grades (Biggs, 1979; Dickinson & O'Connell, 1990). Dickinson and O'Connell (1990) found a weak relationship total amount of time spent studying for a test and scores on that test, but a stronger relationship was found when considering only the time spent organizing the course content, suggesting the high quality studying is more important than high quantity studying. Not only does the type of reported study behavior matter, but understanding how students' study habits change, improve, and—in some cases—get worse over time is another important element that remains unexamined. Recall that in the analyses I presented above, daily study habits were averaged into week one and week two weekly scores. However, the variability that was lost by creating weekly study habit averages may offer meaningful insights into how study habit consistency and variability may affect academic performance. In a more domain general sense, variability in behavior from day to day may be indicative of deficits in self-regulatory skills or at least may describe different decision-maker preferences in consistency.

*The Regret Modulatory System, goal-setting, and psychopathology.*

Understanding the differential ways in which regret and consistency affect behavior and downstream goal-setting and decision-making processes could prove to be a fruitful endeavor in the context of psychopathology. At present, there is a dearth of research that synthesizes social psychological perspectives of goal-setting and self-regulation in the context of psychopathology, despite recent calls for more interdisciplinary research of this type (Kreuger & Markon, 2006). The regret modulatory system may be able to elucidate new insights by providing a transdiagnostic framework to examine potentially maladaptive patterns of goal-setting and self-regulatory behavior. Similar to what has been discussed previously from the consistency-fit perspective (Mack, 2008), the regret modulatory system may have implications in the context of psychopathology and cognitive therapy. Researchers and clinicians of the cognitive therapy orientation posit that the majority of psychopathology is rooted in maladaptive schemas, misinterpretations of the self, distortions of how the self interacts with others (Beck, 1979). As such, cognitive therapy works to uproot these thought patterns and replace them with more adaptive strategies and functional forms of automatic thoughts. The regret modulatory system suggests—in the same way as the consistency-fit perspective—that feelings of regret are contingent upon the various contextually-relevant personality orientations, moods, and goals.

Building upon some of these suppositions, the regret modulatory system then offers a unique framework through which the etiology of many forms of psychopathology can be viewed. Beyond just a descriptive model, the regret modulatory system provides a theoretical roadmap for understanding the pathways of maladaptive goal-setting

processes and self-regulatory failures, as well as for the development of novel treatment plans. For example, perhaps an insufficient amount of anticipated regret may be a useful conceptualization of psychopathology that features high levels of impulsivity or risk-seeking. Alternatively, too much retrospective regret may translate to symptomology that looks like depression or other ruminative disorders. Finally, when both anticipated regret and retrospective regret are high—in other words, when people experience too much regret—this may look similar to obsessive compulsive disorder. While an entire research program could be generated on the propositions I just made, preliminary support from this research project would suggest that the regret modulatory system may be a good avenue to begin investigating social psychological principles in the context of psychopathology.

*In sum.* The analyses presented in this project are the first steps towards validating and developing a regret modulatory system. This model builds on the theory and research related to the consistency-fit theory of regret and suggests that: conscientiousness and other personality variables play a key role in moderating goal-setting and decision-making processes, anticipated regret and anticipated inconsistency are important determinants of goal-setting before a decision to behave, retrospective regret and experienced consistency (as per the consistency-fit perspective) are implicated in the evaluation of past decisions, and a desire to change future behavior is integral in translating evaluating into future guiding factors. Ultimately, the regret modulatory system suggests, not that regret is an isolated assessment of the past or a paranoid premonition of a decision gone awry, but rather that it is the supportive co-pilot who continuously helps us navigate the sometimes treacherous path towards achieving our

goals. Playwright Arthur Miller spoke to his audience on the matter of regret through Lynman Felt, protagonist of *The Ride Down Mt. Morgan*, by suggesting that “maybe all one can do [in life] is hope to end up with the right regrets.” Regret is both necessary and inevitable, but as Lynman Felt—as well as the empirical evidence provided in this research project—would argue, what matters most is how that regret affects our goals and decisions.

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## APPENDIX A<sup>1</sup>

### Description of Strong Study Habits

As a student at Wake Forest, studying is likely a very important part of your day-to-day experience. The better the **study habits** you practice, the better you will do in school. As you progress as a student, your study habits will also become more refined.

There are a number of things you can do to practice **strong study habits**:

1. Maintain a positive study mindset and remind yourself of your many skills and abilities.
2. Avoid catastrophic thinking.
3. Find an ideal study place: a place with a lot of distractions makes for a poor study area; rather look for somewhere quiet and comfortable.
4. Plan and manage your work load efficiently. Don't attempt to cram all of your studying into one session.
5. Review your notes regularly, but especially before starting an assignment or project.
6. Use study groups effectively—collaborate with classmates, but don't get too distracted.

When answering any questions about your **study habits**, try to keep in mind some of these characteristics of **strong study habits**.

1. Based on what you read above, do you understand what constitutes strong study habits? [yes—no]

## APPENDIX A<sup>2</sup>

### Time 1 Measures

Are you currently satisfied with your study habits? [Yes—No]

How important are is it for you to change/maintain your study habits? [1-10; Not at all important—Very important]

Briefly describe your academic goals for this upcoming semester. [open-ended]

How much school work do you have this upcoming week? [1-10; Nothing at all—A lot of work]

### Past Behavior

1. What was your last semester's GPA?
2. How well did you perform on your most recent exam or large assignment? [1-10; Worst—Best]
3. How successful have you been in practicing strong study habits over the **past** semester? [1-10; not at all—very successful]
4. How much have you practiced strong study habits over the past semester? [1-10; Never—Always]
5. Are you satisfied with your current study habits? [Yes/No]
  - a. How important is it for you to maintain your current study habits? [1-10; Not at all important—Extremely important]
  - b. How important is it for you to change your current study habits? [1-10; Not at all important—Extremely important]
6. I have a good work ethic [1-10; Strongly agree – Strongly disagree]



### Anticipated Inconsistency

1. If I do not practice strong study habits in the next week, it would feel as though I acted inconsistently with my goals and values [1-10; Strongly agree – Strongly disagree]
2. Failing to practice strong study habits would not accurately reflect who I am as a person [1-10; Strongly agree – Strongly disagree]
3. Practicing strong study habits is consistent with who I am as a person [1-10; Not at all – Very much]

### Anticipated Regret

1. If I do not practice strong study habits in the next week, I would feel upset [1-10; Strongly agree – Strongly disagree]
2. If I do not practice strong study habits in the next week, I would feel regret [1-10; Strongly agree – Strongly disagree]

### Intentions

1. I intend to practice strong study habits in the next week [1-10; definitely do not–definitely do]
2. I will try to practice strong study habits in the next week [1-10; very unlikely–very likely]
3. I want to practice strong study habits in the next week [1-10; Strongly disagree – Strongly agree]
4. Practicing strong study habits in the next week is not a top priority [1-10; Strongly disagree – Strongly agree]
5. I expect to practice strong study habits in the next week [1-10; unlikely–likely]

6. How likely is it that you will practice strong study habits in the next week? [1-10; unlikely–likely]

**APPENDIX A<sup>3</sup>****Daily Study Habits (Time 1 & Time 2)**

1. How successful have you been in practicing strong study habits in the past 24 hours? [1-10; not at all–very successful]
2. I practiced strong study habits in the past 24 hours [1-10; Strongly agree – Strongly disagree]
3. Which best describes your current academic goal [My goal is to study more; My goal is to study the same; My goal is to study less]
4. Approximately how many hours have you spent studying in the past 24 hours?

**APPENDIX A<sup>4</sup>****Time 2 Measures**

## Retrospective Regret

1. When I think about my study habits the past week, I feel upset [1-10; Strongly disagree – Strongly agree]
2. When I think about my study habits the past week, I feel regret [1-10; Strongly disagree – Strongly agree]
3. When I think about my study habits the past week, I am disappointed in myself [1-10; Strongly disagree – Strongly agree]
4. I should have studied better this past week [1-10; Strongly disagree – Strongly agree].
5. I could have practiced stronger study habits [1-10; Strongly disagree – Strong agree]

## Behavior-Goal Inconsistency

1. When I think about my study habits this past week, I feel as though acted consistently with my goals and values [1-10; Strongly disagree – Strongly agree]
2. My study habits over the past week do not accurately reflect who I am as a person [1-10; Strongly disagree – Strongly agree]
3. With regards to only my study habits, this past week has not been consistent with who I am as a person [1-10; Not at all Accurate – Very Accurate]

### Desire to Change Future Behavior

1. My expectations about how to practice strong study habits have changed [1-10  
Strongly agree – Strongly disagree]
2. Over the past week, I have learned something new about my own study habits [1-  
10; Strongly disagree – Strongly agree]
3. I intend to practice study habits in the same way I have in the past [1-10; Strongly  
disagree – Strongly agree]
4. Based on my study habits this past week I will probably [1-10; make no changes  
at all – make a lot of changes]

### Future Anticipated Regret

1. If I do not practice strong study habits in the next week, I will feel upset. [1-10;  
Strongly disagree – Strongly agree]
2. If I do not practice strong study habits in the next week I will feel regret. [1-10;  
Strongly disagree – Strongly agree]

### Future Intentions

1. I intend to practice strong study habits in the next week [1-10; definitely do not–  
definitely do]
2. I will try to practice strong study habits in the next week [1-10; very unlikely–  
very likely]
3. I want to practice strong study habits in the next week [1-10; Strongly agree–  
Strongly disagree]
3. Practicing strong study habits in the next week is not a top priority [1-10; Strongly  
disagree – Strongly agree]

4. I expect to practice strong study habits in the next week” [1-7; unlikely–likely]
5. How likely is it that you will practice strong study habits in the next week?” [1-7; unlikely–likely]



## CURRICULUM VITA

### Timothy J. Valshtein

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E: valstj14@wfu.edu

### Education

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#### Wake Forest University, Winston-Salem, NC

August 2014 to May 2016 (Expected)

Master of Arts, Psychology

**Cumulative GPA:** 3.92

#### Temple University, Philadelphia, PA

August 2010 to May 2014

Bachelor of Arts, Psychology (Honors), distinction in major, *Summa Cum Laude*

**Cumulative GPA:** 3.94

**Minors:** Jewish Studies and Hebrew

**Awards:** Dean's List: Spring 2011-Spring 2014; Honors Director's List: Spring 2011-Spring 2014

### Work Experience

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#### Research Experience

##### **The Character Project**, Wake Forest University, Winston-Salem, NC

*Research enterprise examining questions regarding character, morality, and virtue in the areas of psychology, philosophy, and theology*

Associated Faculty: William Fleeson; R. Michael Furr

Graduate Research Assistant, May 2015 – August 2015

- Collaborated with primary investigator, research coordinator, and other members of the research team in order to implement and execute a large, longitudinal research project examining honesty in over 100 participants.
- Recruited participants using diverse tactics and maintained a scheduling system for the entire eight-week study.
- Administered a battery of complex psychological tasks to measure participants' dishonesty/honesty.

##### **The Porch Light Initiative**, Yale School of Medicine, Mural Arts Program, Philadelphia, PA

*A groundbreaking public art approach to achieving health and wellness in Philadelphia.*

Associated Faculty: Jacob Kraemer Tebes

Research Assistant Interviewer, 10/2013 to 4/2014

- Administered structured interviews to participants at several community behavioral health centers in the North Philadelphia area.
- Conducted structured interviews to community members in the North Philadelphia area utilizing random sampling procedures.
- Cataloged, recorded, and managed interview materials under the advisement of research coordinators and post-doctoral fellow.



**Family and Children's Research Collaborative**, Temple University, Philadelphia, PA*Research laboratory examining personality, social, and emotional development in children*Associated Faculty: Marsha Weinraub

Research Assistant, 4/2013 to 5/2014

- Examined the various experiences that affect children's personality and social development through careful statistical analysis and scholarly dialogue.

**Mechanisms of Affective Dysregulation Lab**, Temple University, Philadelphia, PA*Research laboratory aiming to understand the etiological underpinnings of affect regulation*Associated Faculty: Michael McCloskey

Research Assistant, 2/2013 to 5/2014

- Implemented clinical judgment via phone screens in order to determine eligibility of potential participants.
- Prepared and briefed participants for fMRI lab visits at Temple University Hospital.
- Drug tested and breathalyzed participants, and administered neurocognitive tasks.

**The Brain Behavior Lab**, Hospital of the University of Pennsylvania, Philadelphia, PA*Research hospital and facility devoted to the study of brain and behavior in health and disease*Associated Faculty: Raquel Gur, Ruben Gur

Student Research Assistant, 10/2012 to 8/2013

- Executed a comprehensive data entry process for Clinical Assessments.
- Administered the Computerized Neurocognitive Battery test to participants.
- Communicated with participants, and maintained constant contact with clinical assessors and research coordinators.

## Teaching Experience

**Graduate Teaching Assistant:** Wake Forest University, Winston-Salem, NC

Research Methods, 8/2014 –

Instructors: Dr. Eric Stone and Dr. Wayne Pratt

- Taught research methodology course content as well as relevant SPSS techniques, twice weekly.
- Graded weekly homework assignments, writing assignments, lab reports, and exams.
- Assisted in the organization of course content, as well as aided in creating test questions

## Service and Other Work Experience

**Society for Southeastern Social Psychologists**, Wake Forest University, Winston-Salem, NC*2015 annual meeting of Society for Southeastern Social Psychologists*

Graduate Student Planning Committee Member

- Assisted with the planning of conference agenda and details.
- Helped with registration, setup, breakdown, and other responsibilities associated with the flow of the conference.

**Seminar in Self-Regulation**, Wake Forest University, Winston-Salem, NC*Weekly departmental speaker series featuring invited talks from local North Carolina academics*

Student Coordinator, Spring 2015 –

- Prepared light refreshments, including curated snacks and wine pairings.
- Communicated with the faculty SiSR coordinator to ensure weekly preparation.

**Service Immersion Program: El Paso, TX**, Temple University, Philadelphia, PA*Student Activities facilitated service-learning trip*

Student Leader, 2013-2014

- Collaborated with other members of the trip facilitating staff to plan and execute a service-learning trip about immigration policy and border life.
- Coordinated meetings, fundraisers, and discussions in the semester leading up to and during the weeklong trip.

**Willowglen Academy**, Andover, NJ*Residential treatment facility helping children with mental illness and developmental disability live healthy and independent lives*

Child Care Worker, 5/2012 to 8/2012

- Carried out a token economy and level system to meet Individual Service Plans for 52 male and female adolescent residents with clinically diagnosed behavioral problems and developmental disabilities.
- Documented various aspects of clients' well-being including nutrition, medication, psychosocial skills, and interpersonal communication.
- Communicated with supervisors, clinicians, and the on-call psychiatrist.
- Awarded July Staff Member of the Month

**University Housing and Residential Life**, Temple University, Philadelphia, PA*Serving the on-campus university population with the intention of engaging, developing, and retaining its residents*

Resident Assistant, 11/2011 to 5/2014

- Nurtured a healthy transition into college life for approximately 46 first and second year students by developing programs that emphasized community development, academic success, self-exploration, and diversity/inclusivity.
- Collaborated effectively within a team of 12 staff members, in a department of approximately 150 employees.
- Nominated for First Year Resident Assistant of the Year.
- Served on the Advisory Board, Fall 2012-Spring 2013.

Summer Conference Assistant, 5/2013-8/2013; 5/2014-8/2014

- Assisted with daily front office duties and facilitated complex move-in and move-out procedures for numerous conference guests and large groups.
- Worked collaboratively with a staff of 8 other conference assistants and a building manager.

## Publications

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- Valshtein, T., Foley, J., Sorhagen, N., Stull, J., & Weinraub, M. (2015). *What a nightmare! Not all sleep disturbances are created equal*. Manuscript submitted for publication.
- Valshtein, T. & Seta, C.E. (2015). *Regret for some, regret for all: consistency, outcome severity, and feelings of regret*. Manuscript in preparation.
- Valshtein, T. & Seta, C.E. (2015). *After you read this, how will I feel? New perspectives on anticipated and retrospective regret*. Manuscript in preparation.

## Presentations & Posters

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- Valshtein, T.J. & Seta, C.E. (January, 2016) *Regret for some, regret for all: consistency, outcome severity, and feelings of regret*. Society for Social and Personality Psychology; San Diego, CA.
- Valshtein, T.J. & Seta, C.E. (October, 2015) *Regret for some, regret for all: consistency, outcome severity, and feelings of regret*. Southeastern Society for Social Psychologists Annual Meeting; Winston-Salem, NC.
- Valshtein, T.J. (October, 2015) *Gnostic or neurotic: Artists as affect regulators*. Paper presented at Wake Forest University Department of Psychology's Seminar in Self-Regulation; Winston-Salem, NC.
- Valshtein, T.J. & Seta, C.E. (April, 2015) *Regret for some, regret for all: consistency, outcome severity, and feelings of regret*. NC Psychology Graduate/Undergraduate Poster Session; Chapel Hill, NC.
- Valshtein, T.J. & Seta, C.E. (April, 2015) *Regret for some, regret for all: consistency, outcome severity, and feelings of regret*. Carolina Research in Social Psychology, Duke University; Durham, NC.
- Valshtein, T.J. & Seta, C.E. (April, 2015) *Regret for some, regret for all: consistency, outcome severity, and feelings of regret*. Annual First Year Graduate Students Colloquium, Wake Forest University, Winston-Salem, NC.
- Valshtein, T.J., Foley, J., Sorhagen, N., Stull, J., & Weinraub, M. (2014). *What a nightmare! Not all sleep disturbances are created equal*. Psi Chi Research Day; Philadelphia Region.
- Valshtein, T., Foley, J., Sorhagen, N., Stull, J., & Weinraub, M. (April, 2014). *What a nightmare! Not all sleep disturbances are created equal*. Paper presented at Temple Undergraduate Research Forum – Creative Works Symposium; Philadelphia, PA.
- Valshtein, T.J., Foley, J., Sorhagen, N., Stull, J., & Weinraub, M. (April 2014). *What a nightmare! Not all sleep disturbances are created equal*. Philadelphia School District's Research to Policy (R2P) Conference; Philadelphia, PA.
- Valshtein, T.J., Foley, J., Sorhagen, N., Stull, J., & Weinraub, M. (March, 2014). *What a nightmare! Not all sleep disturbances are created equal*. Eastern Psychological Association Regional Conference; Boston, MA.

## Memberships

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- Wake Forest University Feminist Collective, Joined 2015
- Society for Personality and Social Psychology, Joined 2015
- Society for Southeastern Social Psychology, Joined 2015
- Phi Beta Kappa Honors Society, Inducted Spring 2013
- LGBTQ Safe Zone Certified, Winter 2012
- Psi Chi Honors Society, Inducted Winter 2011

## Honors & Awards

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<b>Fall 2015</b>	Selected as Psychology department's nominee for the Melson Graduate Student Excellence Award.
<b>2015</b>	Awarded Wake Forest University Graduate Student Alumni Travel Award, \$300.00
<b>2015-2016</b>	Awarded Wake Forest University Graduate School of Arts and Sciences Graduate Teaching Assistantship full tuition scholarship and stipend, \$46,545.00.
<b>Summer 2015</b>	Awarded Wake Forest University Summer Research Support, \$1,000.00.
<b>2014-2015</b>	Awarded Wake Forest University Graduate School of Arts and Sciences Graduate Teaching Assistantship full tuition scholarship and stipend, \$44,364.00.
<b>Spring 2014</b>	Graduated from Temple University Honors Program.
<b>2014</b>	Temple University Diamond Award Recipient.
<b>2014</b>	Psychology and Social Justice College of Liberal Arts Departmental Award Recipient.
<b>2014</b>	Samuel and Esther Goldin Award in Jewish Studies Recipient.
<b>2014</b>	Awarded 3 <sup>rd</sup> place prize in Eastern Psychological Association Graduate Student poster competition; Boston, MA.
<b>2013</b>	Completed Temple University Emerging Leaders Seminar and Office of Leadership Student Leadership Challenge
<b>2012, 2013</b>	Elie Wiesel Prize in Ethics Essay Contest Semi-finalist.