

Adaptive and Maladaptive Maximizing: Identifying the Correlates, Processes, and Outcomes of  
Maximizing in Decision-Making

by

Jeffrey Hughes

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## **Examining Committee Membership**

The following served on the Examining Committee for this thesis. The decision of the Examining Committee is by majority vote.

External Examiner	Roger Buehler Professor, Department of Psychology
Supervisor	Abigail Scholer Associate Professor, Department of Psychology
Internal Member	Richard Eibach Associate Professor, Department of Psychology
Internal-external Member	Steven Mock Associate Professor, Department of Recreation and Leisure Studies
Other Member	Ian McGregor Professor, Department of Psychology

### Author's Declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

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## Abstract

Research on the affective outcomes of maximizing has been mixed, with some research indicating that people who seek the “best” option across decisions report lower happiness and life satisfaction, and greater depression and regret. However, other research has suggested the opposite, finding that maximizing is associated with higher life satisfaction, happiness, optimism, and self-efficacy. Part of the reason for these discrepant results is that researchers have often disagreed on how to define maximization, and as such previous measures of the construct have grouped together subscales that differ in their relationships with affective experiences. Drawing from motivation research, I distinguish between the goals (i.e., “high standards” or wanting the best), strategies (e.g., alternative search), and possible outcomes (e.g., decision difficulty) associated with maximizing. This distinction is used to argue that maximizing may be meaningfully divided into separate types: a more adaptive type of maximizing not associated with affective costs, and a more maladaptive type associated with greater affective costs. I also argue that the motivational orientations of promotion focus and assessment mode can reliably distinguish between these types. Six studies provide evidence for these distinct types, to gain insight into when maximizers do or do not experience affective costs when making decisions. In Study 1, I show that subscales of maximizing are differentially associated with various general motivational factors. Study 2 presents research to show that promotion focus and assessment are both associated with the goal of wanting the best, yet assessment (not promotion) is related to the use of alternative search strategies. In Study 3, I use latent class analysis to cluster participants into distinct groups based on maximizing subscales, and show that these predict affective costs on a discrete decision task. In Study 4, I pit high standards and alternative search against each other to demonstrate that it is the strategy used, not the high standards goal, that mediates the

relationship between assessment and frustration on a discrete decision task. In Study 5, I provide evidence that one reason why alternative search shows connections with affective costs may be particularly due to the reconsideration of previously dismissed options. Finally, Study 6 extends this research outside the domain of consumer decisions, demonstrating that these relationships hold in the context of participants' own important life decisions. After presenting these studies, I discuss the implications of this research for the maximizing and decision-making literatures, and for the literature on motivation and self-regulation.

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## Introduction

Throughout each day, people make innumerable decisions. While some of these decisions are relatively trivial—what to eat for breakfast—some decisions can have important consequences for people’s well-being—for example, who to marry, what house to buy, or whether to have children. For these big decisions especially, people often care about making a good and satisfying choice. Indeed, the choices individuals make about important decisions such as relationship partners and career options are strongly related to well-being (e.g., Dush & Amato, 2005; Judge & Watanabe, 1993). However, in addition to considering the importance of the decision outcome for well-being, it is also important to consider the *processes* that people use to make decisions. The way in which people make decisions can also have a meaningful impact on their health, happiness, and satisfaction (e.g., Arkes & Blumer, 1985; Hsee & Hastie, 2006; Ratner, Kahn, & Kahneman, 2014).

When making decisions, one approach that some people take is to maximize. Maximizing has commonly been defined as a comprehensive search to find the best option (Schwartz et al., 2002). The fundamental concept here is the notion of finding the “best” option, which is contrasted with satisficers, whose aim is to find an option that is “good enough” (Simon, 1955, 1956). Such a decision-making approach may have implications for decision quality—the outcome of the decision itself. Iyengar, Wells, and Schwartz (2006), for example, found that high maximizers seeking jobs were able to find jobs with 20% higher salaries than low maximizers. However, the bulk of research on maximizing has focused on its implications for emotional outcomes and chronic well-being. The same study by Iyengar et al. found that despite these better objective outcomes, high (vs. low) maximizers felt less satisfied with the jobs they secured, and experienced more negative affect and regret during and after the job search process.

Such a discrepancy between objective success and subjective defeat warrants further scrutiny. Below I outline the past research on the outcomes of maximizing and how these outcomes diverge depending on the definition of maximizing that researchers have used. I then provide a novel framework differentiating between goals and strategies to suggest that it is possible to meaningfully distinguish adaptive and maladaptive types of maximizing. Finally, I identify two broad, motivational orientations that may provide insight into the underlying goals and strategies of maximizers.

### **Past Research on Maximizing**

The origins of maximizing began with Simon's (1955, 1956) seminal work in behavioural economics and the notion of bounded rationality. Simon argued that the idea of "rational choice," involving complete information and stable preferences, was incompatible with the actual situations faced by people within their environments. Although optimizing to find the best option is perhaps the way people *should* make decisions, in reality people face limits in terms of time, the complexity of their environment, access to information about the possible options, and information about future outcomes that prevent them from true rational choice. Thus, Simon argued that organisms, including humans, were "satisficers," seeking an option that was suitable or "good enough." In other words, Simon theorized that maximizing in the economic sense was impossible due to constraints of time and ability.

More recent empirical work on the study of maximizing shifted from this global view of the satisficing organism to examine individual differences in people's approaches to decision-making. Schwartz et al. (2002) argued that although people may not be fully able to maximize in all situations at all times, there is still variability in terms of how much people seek to find the

best option. Thus, psychological research on maximizing has focused on these individual differences in the extent to which people maximize when making decisions.

This research, however, has provided an unclear picture of what the implications of maximizing are for subjective well-being. On the one hand, early research suggested that chronic maximizing was associated with negative outcomes such as lower happiness, lower self-esteem, and greater depression (Schwartz et al., 2002); greater regret (Faure, Joulain, & Osiurak, 2015; Huang & Zeelenberg, 2012; Iyengar et al., 2006; Moyano-Díaz, Cornejo, Carreño, & Muñoz, 2013; Nenkov, Morrin, Ward, Schwartz, & Hulland, 2008; Parker, Bruine de Bruin, & Fischhoff, 2007; Schwartz et al., 2002; Zeelenberg & Pieters, 2007); lower life satisfaction (Faure et al., 2015; Moyano-Díaz et al., 2013; Schwartz et al., 2002); less satisfaction with decisions (Iyengar et al., 2006; Leach & Patall, 2013; Sparks, Ehrlinger, & Eibach, 2012); greater perfectionism (Bergman, Nyland, & Burns, 2007; Chang et al., 2011; Schwartz et al., 2002); greater chronic negative affect, lower job and career satisfaction, and lower career decision self-efficacy (Dahling & Thompson, 2012); greater decision avoidance (Parker et al., 2007); greater indecisiveness (Spunt, Rassin, & Epstein, 2009); negative career-related thoughts (Dahling & Thompson, 2012; Paivandy, Bullock, Reardon, & Kelly, 2008); and greater decision-making confusion, commitment anxiety, and rumination (Paivandy et al., 2008). Maximizing has also been associated with greater use of upward and downward social comparisons (Schwartz et al., 2002; Weaver, Daniloski, Schwarz, & Cottone, 2012); greater upward counterfactual thinking (Leach & Patall, 2013; Schwartz et al., 2002); more fantasizing about other options and greater negative affect during a decision process (Iyengar et al., 2006); less commitment to decisions (Chowdhury, Ratneshwar, & Mohanty, 2009; Sparks et al., 2012); greater underestimation of the

time required for future decisions (Besharat, Ladik, & Carrillat, 2014); and less use of constructive behavioural coping strategies during negative life events (Parker et al., 2007).

However, as research into chronic maximizing has continued, it has cast doubts on this traditional narrative. Partly, these doubts were due to concerns about considering maximizing as a unitary construct. Examination of the first measure of maximizing as an individual difference, the Maximization Scale (MS; Schwartz et al., 2002), identified three factors: pursuit of the best option (generally referred to as “high standards”), extensive evaluation of options (“alternative search”), and experiencing the process of making decisions as difficult (“decision difficulty;” Nenkov et al., 2008). Research that has split the MS into these three subscales has found only moderate correlations between them (Nenkov et al., 2008; Purvis, Howell, & Iyer, 2011; Rim, Turner, Betz, & Nygren, 2011). In addition, many researchers have created a variety of other maximizing scales that are only loosely correlated with each other (Giacopelli, Simpson, Dalal, Randolph, & Holland, 2013; Rim et al., 2011; Weinhardt, Morse, Chimeli, & Fisher, 2012), in part because each emphasizes different combinations of these three factors (Diab, Gillespie, & Highhouse, 2008; Lai, 2010; Misuraca, Faraci, Gangemi, Carmeci, & Miceli, 2015; Richardson, Ye, Ege, Suh, & Rice, 2014; Turner, Rim, Betz, & Nygren, 2012; Weinhardt et al., 2012). Some research on these new scales have instead suggested that maximizing either shows no relation with the negative outcomes mentioned above (Diab et al., 2008; Nenkov et al., 2008), or has even observed associations with positive outcomes, such as higher optimism and self-efficacy (Lai, 2010); and higher life satisfaction, subjective happiness, and positive affect (Purvis et al., 2011).

Once these three factors are examined separately, then, some more general consistent patterns emerge. First, the alternative search and decision difficulty subscales are positively

correlated with one another, whereas high standards is generally not highly correlated with either alternative search or decision difficulty (Giacopelli et al., 2013; Purvis et al., 2011; Rim et al., 2011; Turner et al., 2012; Weinhardt et al., 2012). Second, the alternative search and decision difficulty subscales are almost universally associated with negative experiences. Both subscales have been associated with greater depression (Bruine de Bruin, Dombrowski, Parker, & Szanto, 2015; Nenkov et al., 2008); lower optimism (Nenkov et al., 2008); lower subjective happiness (Nenkov et al., 2008; Purvis et al., 2011); lower life satisfaction and greater psychological distress (Purvis et al., 2011); greater procrastination, lower self-efficacy, and lower self-regard (Rim et al., 2011); and greater indecisiveness and avoidant decision-making (Weinhardt et al., 2012).

In contrast, high standards has shown a very different pattern: it has shown either no association (Bruine de Bruin et al., 2015; Nenkov et al., 2008) or a negative association (Weinhardt et al., 2012) with depression; it has been linked with greater life satisfaction and subjective happiness (Purvis et al., 2011; Weinhardt et al., 2012); shown no relation with psychological distress (Purvis et al., 2011) or procrastination (Rim et al., 2011); has been positively related to positive affect (Purvis et al., 2011), self-efficacy, and self-regard (Rim et al., 2011); and has been negatively correlated with indecisiveness and avoidant decision-making (Weinhardt et al., 2012).<sup>1</sup>

The divergent patterns between these facets suggests two important implications. First, there is a need for greater clarity about what these facets mean to understand why they diverge.

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<sup>1</sup> Though there is very little cross-cultural research on maximizing, some research would suggest that these patterns may be in some respect limited to Western cultures. Roets, Schwartz, and Guan (2012) found that maximizing was unrelated to well-being in China, even though there was a positive relationship between maximizing and regret. Oishi, Tsutsui, Eggleston, and Galinha (2014) found that high standards had negative implications for well-being in a Japanese sample, but positive implications in a US sample. After accounting for measurement equivalence, however, the Japanese sample showed a positive relationship between high standards and well-being, though still smaller than the US sample.

Providing a more unified conceptualization of what maximizing is and how these facets interrelate is critical. Second, the patterns suggest that there may be considerable utility in differentiating between separate *types* of maximizing. If some facets of maximizing are positive yet other facets are strongly negative, it may reveal distinguishable types of maximizing in terms of the affective costs associated with the decision process. Specifically, I propose that there is a relatively more adaptive way of maximizing that is not associated with affective costs when making decisions, and a relatively maladaptive way of maximizing that makes individuals more prone to experiencing affective costs. I believe that these types can be uncovered by distinguishing between the goals and strategies of decision-makers.

### **Distinguishing Decision Goals and Strategies**

Researchers of maximization have made numerous arguments about which of the three facets identified above should be seen as part of the definition of maximization. In Schwartz et al.'s (2002) original paper, the authors argued for maximizing as a unitary construct. Although Schwartz and colleagues later subdivided the MS into three subscales and recommended they be calculated separately, they still maintained the importance of all three (Nenkov et al., 2008). Diab et al. (2008), however, argued for the primary importance of the optimization goal (i.e., high standards) as defining maximizing, and created the Maximizing Tendencies Scale (MTS) to measure this (see also Dalal, Diab, Zhu, & Hwang, 2015). Later research comparing the MS and MTS also made similar theoretical arguments for the primacy of high standards (Giacopelli et al., 2013; Weinhardt et al., 2012).

However, other researchers have used more empirical means to suggest which facets should be included. Lai (2010) developed her own scale of maximizing using items from the MS and MTS to produce a unidimensional scale, but found that decision difficulty items did not load



well with the rest of the items; thus, her scale reflected only high standards and alternative search. Rim and colleagues (2011) measured the correlations of the MTS and MS subscales with a number of outcome measures—such as optimism, self-efficacy, and self-regard—and found that high standards showed a different pattern of relationships than did alternative search and decision difficulty. They used these findings to suggest that high standards measured something different and should not be included in the measurement of maximizing, and later developed a scale, the Maximization Inventory (MI), to capture alternative search and decision difficulty (Turner et al., 2012).<sup>2</sup>

It is apparent that there are very divergent opinions about how maximizing should be defined and measured. However, one component that has been largely missing from all these arguments is a strong conceptual analysis of what these facets actually represent. Although researchers have at various times argued for each facet’s inclusion or exclusion, the arguments have largely focused on the psychometric properties of these facets rather than their theoretical role. This means that the facets have often been treated as conceptually equivalent—simply different subscales of an overall measure. In order to bring additional clarity to this situation as well as to identify types of maximizers, I argue for a conceptual distinction between goals and strategies, using the language of research in motivation.

High standards is, at its core, a goal to find the best option—contrasted with the goal of finding something that is “good enough.” Although the literature has labelled this facet “high standards,” this is a less informative label that could be better termed the “optimization goal,” i.e., not settling for anything other than the absolute best option. In the self-regulation literature,

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<sup>2</sup> The MI also included a subscale purporting to measure satisficing as a separate, orthogonal construct to maximizing. However, it is unclear exactly what this subscale measures (Cheek & Schwartz, 2016; Misuraca et al., 2015), and thus more research is needed to clarify its role both theoretically and empirically.

a goal is a mental representation of a desired or valued end state, and influences intentions and behaviour to achieve that end state (Carver & Scheier, 1982; Fishbach & Ferguson, 2007; Förster, Liberman, & Friedman, 2007; Gollwitzer, 1990). Thus, high standards can be defined as a goal to pursue an end state that is perceived to be the optimal choice in a given decision.

Alternative search, in contrast, can be seen as a decision strategy that maximizers may use to pursue their goal. Research on self-regulation has often provided a distinction between goals and strategies, with the latter serving as a means to pursue and achieve the former (Carver & Scheier, 1982; Gollwitzer, 1999; Kruglanski et al., 2002; Vallacher & Wegner, 1987). A common theme in hierarchical models of self-regulation is that goals and means operate on different, conceptually independent “levels.” For example, regulatory focus theory highlights a distinction between the system level and the strategic level (Higgins, 1997; Scholer & Higgins, 2011). In other words, two individuals with the same goal may nevertheless pursue it using very different strategic means.<sup>3</sup> The particular strategy an individual chooses may depend on dispositional motivations that encourage certain preferred means (Freitas & Higgins, 2002; Higgins, 2000), on other concurrently active goals (Köpetz, Faber, Fishbach, & Kruglanski, 2011), or on situational and environmental affordances (Kruglanski et al., 2002), among other influences. For maximizers, then, the strategy of alternative search involves seeking out and searching through information about the available options. I discuss more about the particulars of this strategy below. However, I also propose that this is only one of many possible decision

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<sup>3</sup> This research also identifies a third level, the tactical level, as another independent level that serves to fit a given strategy to the particular situational context. However, this level is less relevant for the current research, and as such I focus on the system and strategic levels.

strategies that one could use, and the extent to which it is preferred may depend on an individual's underlying motivations.<sup>4</sup>

Finally, decision difficulty is best seen as a possible affective experience of maximizing. It is little wonder that scales of maximizing that include “decision difficulty” as a component find maximizing to be associated with negative outcomes. Conceptually, this component measures an individual's general experience of difficulty or cognitive load when making decisions. Instead of being part of the definition of maximizing, then, I argue that decision difficulty is itself an outcome of particular ways of making decisions—some strategies may lead to a more positive decision-making experience, whereas others may leave an individual feeling exhausted or frustrated.

Identifying these three facets in this way facilitates a discussion of what is essential to the definition of maximizing and what may be associated with but not inherent to maximizing. Taking this approach, I agree with Diab et al. (2008) that high standards is most closely associated with the core definition of maximizing as a goal to find the best option. Simon's (1956) original definition of maximizing involved an objective to optimize a decision, and both his and Schwartz et al.'s (2002) distinction between maximizing and satisficing involve primarily the goal of finding the best versus settling for something that is good enough. However, unlike Diab et al., who discard alternative search and decision difficulty as irrelevant to the study of maximizing, I argue that these two facets still play a critical role in determining how the goal of wanting the best is pursued via particular strategies, and the experiences that can

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<sup>4</sup> Of course, strategies can also be conceptualized as subordinate goals serving a higher-order goal. As such, it is also possible that an individual could have a goal to seek out and examine options in and of itself, rather than pursuing it as a means to the optimization goal. Here, however, I am particularly interested in cases where individuals report having high standards (i.e., maximizers), and either pursue that goal using an alternative search strategy or other strategies. I am not trying to argue that only maximizers use alternative search.

result from that method. Retaining these facets allows for a better understanding of the behaviours and experiences of maximizers. In addition, the identification of strategies and experiences provides a way to identify adaptive and maladaptive types of maximizing.

It should be noted that Schwartz has very recently, and in parallel with my own work (Hughes & Scholer, 2017), acknowledged the importance of identifying goals and strategies in research on maximizing. In a theoretical paper, Cheek and Schwartz (2016) advanced a two-component model of maximizing that defines it as a combination of a goal (high standards) and a particular strategy (alternative search). They argue, just as I do, that decision difficulty is best seen as an outcome of maximizing. A critical difference between my approach and that of Cheek and Schwartz is our position on alternative search. Cheek and Schwartz state that “the goal of choosing the best is an important aspect of maximization; indeed, it may be the more central—almost definitional—component” (p. 135). However, at the same time they argue that maximizing is a specific goal-means pairing (high standards with alternative search). In contrast, my approach—that alternative search may not be the only strategy that serves a maximizing goal—better aligns with a long history in the self-regulation literature of arguing for the conceptual independence of goals and strategies. My approach also provides a possible explanation for why people can experience *different* outcomes as a result of their pursuit of an optimization goal. To state that maximizing must involve both high standards and alternative search does not provide a way to unpack these conflicting findings. The positive correlation between alternative search and decision difficulty, and the correlations between both these scales and negative outcomes, suggests something maladaptive about alternative search as a strategy that I will explore in my work.

## **Potentially Maladaptive Behavioural Components of Alternative Search**

Although alternative search has been discussed throughout the literature on maximizing, there is relatively little in the way of conceptual work to define what it is and how it operates. Because it was first identified by way of an exploratory factor analysis identifying subscales in the MS, this offered little theory behind it apart from the wording of the items used to identify it. When labelling the alternative search factor, Nenkov et al. (2008) suggested that this factor measured the “tendency to seek better options” (p. 374). At first glance, then, it is unclear what exactly would make such a tendency problematic. After all, seeking out and evaluating the options available to oneself would seem to be a critical component of rational decision-making. However, because there is little research that has examined how alternative search manifests in the context of discrete decisions—most of the literature focuses on assessing general, chronic tendencies—it is important to test empirically some of the specific behaviours associated with the alternative search strategy that might lead to negative affective experiences.

Examining the items in the MS and MI would suggest several possible behaviours associated with alternative search. Several items suggest behaviours that seem face valid and unlikely to be problematic: examination of many options (e.g., “I treat relationships like clothing: I expect to try a lot on before I get the perfect fit”); examination of options on multiple dimensions (e.g., “I will continue shopping for an item until it reaches all of my criteria”); or greater time spent evaluating options (e.g., “When shopping, I plan on spending a lot of time looking for something”). However, some items indirectly hint at a different flavour of alternative search: returning to re-evaluate options that one had previously eliminated (e.g., “When I am in the car listening to the radio, I often check other stations to see if something better is playing, even if I’m relatively satisfied with what I’m listening to”). Although the items in these scales do

not directly capture this behaviour, the process of an exhaustive search through options may predispose individuals to reconsider options that one had previously dismissed. I propose that this behaviour in particular could be especially problematic. Conceptually, it could be related to rumination and indecisiveness, which have often been linked to negative outcomes such as depression, obsessive-compulsive behaviour, and low sense of mastery (Frost & Shows, 1993; Nolen-Hoeksema, 2000; Nolen-Hoeksema, Larson, & Grayson, 1999). Thus, although I make general predictions about the broad “alternative search” construct as it has been measured and described in previous research, I will also explore the particular behaviours associated with this strategy that might be particularly maladaptive in any given decision.

### **Antecedent Factors Predicting Maximizing**

As noted above, one aim of the current research is to distinguish between the goals and strategies of decision-makers. Another related aim is to distinguish between types of maximizing in terms of the strategies and affective costs associated with decision-making. To this end, it may be possible to identify important motivational antecedents that predict adaptive or maladaptive types of maximizing based on the goals and strategies used. In keeping with the notion that the optimization goal is integral to what it means to be a maximizer, I sought to identify motivational orientations that would lead to similar predictions for the use of a maximizing goal. However, in order to differentiate between types of maximizing, I identified motivational orientations that would differ in predictions for the use of alternative search as a strategy used to pursue a maximizing goal and thus, presumably, the affective costs associated with that strategy. The intent here was not to be exhaustive, but illustrative.

With this aim in mind, I identified assessment mode (Higgins, Kruglanski, & Pierro, 2003) and promotion focus (Higgins, 1997) as two ideal motivational constructs for this purpose.

It is important to note that these orientations are theorized to be domain-general, and have been used to predict and explain broad patterns of behaviour from leadership styles (Benjamin & Flynn, 2006; Stam, Van Knippenberg, & Wisse, 2010) to consumer behaviours (Lin & Huang, 2011; Pierro et al., 2013) to health-related decisions and outcomes (Leder, Florack, & Keller, 2014; Ravis, Sheeran, & Armitage, 2010). Below I explain these constructs and make predictions about each in terms of their relations with maximizing.

**Assessment mode.** Assessment mode is a motivational orientation concerned with the comparison and evaluation of entities, such as goals and means (Higgins et al., 2003). In terms of goal regulation, high assessors prioritize the concerns typically associated with the deliberative phase of goal setting, where choices are evaluated and compared, over the concerns typically associated with the implementation phase, where one is committed to movement on a particular pursuit (Gollwitzer, 1990; Gollwitzer, Heckhausen, & Steller, 1990). As a result, assessors prioritize wanting to do the “right” thing, and prioritize value over expectancy when it comes to goal pursuit (Kruglanski et al., 2000). Assessment is a critical aspect of effective self-regulation; past research has shown that individuals high in *both* assessment and locomotion (a motivational orientation that prioritizes movement and implementation) have a higher GPA (Kruglanski et al., 2000), show better performance in a military training course (Kruglanski et al., 2000), and have the highest likelihood of attaining their goals compared to those high only in locomotion or assessment (Pierro, Kruglanski, & Higgins, 2006).

Part of the function of assessment is an emphasis on standards, which are not only applied to goals but also to the self and to others. Kruglanski et al. (2000) argued that assessors possess a particular focus on self-evaluation in comparison to their own personal standards as well as social comparison (i.e., comparing themselves to others, and others to others). Because of

assessment's emphasis on choosing the "right" action and its emphasis on comparisons to standards, I predicted that assessment would be positively associated with a high standards (optimization) goal.

In addition, assessment mode is characterized by an emphasis on careful and comprehensive evaluation. Assessors prefer full comparison decision strategies (Avnet & Higgins, 2003), generate a large number of means for a given goal (Kruglanski et al., 2000), and take time to measure and evaluate alternatives on their relative quality (Mauro, Pierro, Mannetti, Higgins, & Kruglanski, 2009). As a result, I predicted that assessment would also be associated with high use of alternative search strategies. In addition, prior work has shown that assessment is positively correlated with discomfort with ambiguity and indecisiveness (Kruglanski et al., 2000). Thus, in addition to the positive correlation between alternative search and decision difficulty in the literature, these results also may suggest that assessors should be more likely to experience high decision difficulty. Because of the adoption of this strategy and these likely outcomes, I therefore posited that assessors generally enact a less adaptive form of maximizing: They will be more likely to experience affective costs as they make decisions in their pursuit of the optimization goal.

**Promotion focus.** Promotion focus is a motivational orientation concerned with goals for advancement and growth (Higgins, 1997). Promotion-focused individuals strive to attain ideals and are particularly concerned with approaching gains and avoiding non-gains (Scholer & Higgins, 2011; Zou & Scholer, 2016). Because of this emphasis on advancement and gains, I predicted that, as with assessment, promotion focus would be positively associated with the optimization goal of wanting the best.



However, promotion focus is also associated with a preference for eager (vs. vigilant) strategies to achieve goals (Scholer & Higgins, 2011). Eager strategies are approach-oriented strategies such as the initiation of goals (Fuglestad, Rothman, & Jeffery, 2008), searching for matches vs. mismatches (Crowe & Higgins, 1997; Higgins et al., 2001), optimistic expectancies of goal success (Grant & Higgins, 2003), and prioritizing speed over accuracy (Förster, Higgins, & Bianco, 2003). Thus, although promotion focus has been associated with global processing (Förster & Higgins, 2005) and generating more alternatives (Liberman, Molden, Idson, & Higgins, 2001), eager strategies such as an emphasis on speed and searching for matches should help to balance the time and effort spent on searching for alternatives in a decision-making situation. Thus, I predicted that promotion focus would be unrelated to or even negatively associated with alternative search. As a consequence, I also predicted that promotion-focused individuals may enact an adaptive form of maximizing. In other words, promotion-focused individuals should be less likely to experience affective costs (i.e., a negative correlation with decision difficulty) in their pursuit of the optimization goal.

It should be noted that promotion focus and assessment mode are both part of broader motivational theories (regulatory focus and regulatory mode, respectively), and these theories include other distinct, orthogonal motivational constructs. Promotion focus is contrasted with prevention focus, which is concerned with security and safety goals, is sensitive to losses, and prefers vigilant strategies for goal pursuit (Higgins, 1997). Assessment is contrasted with locomotion, which is concerned with (psychological) movement and goal implementation (Higgins et al., 2003).<sup>5</sup> Taken together, these theories capture different levels of analysis in

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<sup>5</sup> Prevention focus and locomotion mode are not the focus of the current research because they do not offer clear predictions about differentiating the goals and strategies of maximizers. In this regard, they do not provide as clear a benefit in distinguishing adaptive and maladaptive types. However, it would certainly be worthwhile to examine these motivational orientations in future research on maximizing.

understanding self-regulation: regulatory focus theory primarily describes broader issues of goal systems, broad motivational concerns, and strategies, while regulatory mode theory generally describes concerns related to lower-level processes of goal regulation. These theories, each with their pair of motivational constructs, are usually researched independently from each other—in other words, most research either studies regulatory focus or regulatory mode, not both (for exceptions see Appelt, Zou, & Higgins, 2010; Struk, Scholer, & Danckert, 2016). One strength of the current research is that it makes comparisons across these two motivational theories, such that it can also offer some insight into the relations between them.

### **Present Research**

The current research is focused on examining the goals and strategies of maximizers, to use these underlying motivations to predict adaptive and maladaptive types of maximizing. The research presented in this dissertation can be roughly grouped into two sections. In the first section, Studies 1-3 explore how underlying motivational constructs can be used to classify maximizers into adaptive and maladaptive types. The second section, covering Studies 4-6, examines more closely how maximizing plays out in discrete decisions, exploring the behaviours and outcomes of maximizers on a single decision to provide greater detail about when and how maximizers experience affective costs when making decisions. See Table 1 for a summary of characteristics of each study.

In Section 1, Study 1 begins with an initial examination to situate the maximizing subscales within a broader context of motivation, personality, and clinical constructs in order to gain additional insight into the underlying constructs with which these facets are associated. Study 2 then focuses on how promotion and assessment predict these maximizing facets, offering evidence that it is possible to identify different types of maximizers based on their underlying

motivations. Study 3 follows this up closely by offering an alternative way to identify types, using latent class analysis to seek distinct clusters of participants, and then correlating these both with promotion and assessment, as well as affective outcomes on a decision task.

In Section 2, Study 4 provides two key benefits: First, it provides direct evidence linking assessment with affective costs on a discrete decision task. Second, it demonstrates evidence for alternative search strategies as a mechanism explaining this link. Study 5 then replicates these effects, and also provides a deeper look into the problematic (and non-problematic) decision behaviours associated with alternative search, comparing the evaluation of options and reconsideration of options in particular. Finally, Study 6 extends the previous studies beyond the consumer decision context, using an idiographic personal decision task to explore the pattern of associations between motivations, maximizing, and affective experiences in people’s real-world decisions.<sup>6</sup>

Table 1  
*Sample characteristics and measures for each study*

	<u>Sample</u>	<u>Maximizing Scales Used</u>	<u>Decision Task</u>
Study 1	UW undergraduates	MS	None
Study 2	Mechanical Turk	MS, MTS	None
Study 3	UW undergraduates	MTS, MI	Consumer choice task
Study 4	UW undergraduates	MS, MTS	Consumer choice task
Study 5	UW undergraduates	MS	Consumer choice task
Study 6	Mechanical Turk	MTS, MI	Personal decision task

*Note.* MS = Maximization Scale (Schwartz et al., 2002), MTS = Maximizing Tendencies Scale (Diab et al., 2008), MI = Maximization Inventory (Turner et al., 2012)

<sup>6</sup> Three studies in this dissertation (studies 2, 4, and 5) were previously published in Hughes and Scholer (2017).

## Study 1

Study 1 begins with a very broad analysis to assess how the three maximizing subscales—high standards, alternative search, and decision difficulty—are related to a wide variety of constructs related to motivation, emotion, and symptoms of mood disorders such as depression and anxiety. Given the relative dearth of theorizing specifically about these subscales in the literature, these analyses help to provide some context for understanding what the subscales measure, as well as the underlying constructs that may help to explain them. In particular, the analyses in this study will be instructive for identifying general psychological profiles that may suggest more adaptive or maladaptive types of maximizing. In addition, it is of particular interest to see how these subscales are clustered with promotion and assessment specifically.

### Method

Mass Testing data from the Fall 2013 term was used, capturing data from University of Waterloo undergraduate students on a variety of measures. Data from 2,805 participants was collected; however, 408 cases were removed due to missing data on one or more of the key scale composites used in the analyses below. This left a final sample size of 2,397 participants.

The scales used included a variety of constructs from the motivation, personality, and clinical literatures: Approach/Avoidance Temperament (AAT; Elliot & Thrash, 2010); Abbreviated Math Anxiety Scale (AMAS; Hopko, Mahadevan, Bare, & Hunt, 2003); Boredom Proneness Scale (BPS; Farmer & Sundberg, 1986); Brief Self-Control Scale (BSCS; Tangney, Baumeister, & Boone, 2004); Buss-Perry Aggression Questionnaire (BPAQ; Buss & Perry, 1992); Depression, Anxiety, and Stress Scales (DASS; Lovibond & Lovibond, 1995); Dimensional Obsessive-Compulsive Scale (DOCS; Abramowitz et al., 2010); Five Facet

Mindfulness Questionnaire (FFMQ; Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006); Maximization Scale (MS; Schwartz et al., 2002); Regulatory Focus Questionnaire (RFQ; Higgins et al., 2001); Regulatory Mode Scale (RMS; Kruglanski et al., 2000); Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965); Marlowe-Crowne Social Desirability Scale-Short (SDS; Fischer & Fick, 1993; Strahan & Gerbasi, 1972); State-Trait Inventory for Cognitive and Somatic Anxiety (STICSA; Ree, French, MacLeod, & Locke, 2008); Social Phobia Inventory (SPIN; Connor et al., 2000); and Ten-Item Personality Inventory (TIPI; Gosling, Rentfrow, & Swann, 2003). See Appendix A for brief descriptions and sample items for each scale. For each one, composite scales were calculated, with subscales created where indicated by the literature.

To examine possible underlying constructs connecting these scales, I conducted a factor analysis using the MinRes algorithm with the R “psych” package (Revelle, 2016). The optimal number of factors to extract was determined through a parallel analysis with the R “nFactors” package (Raiche, 2010), which calculates eigenvalues for random uncorrelated covariance matrices in order to compare the informational value of adding additional factors. The point at which an additional factor no longer provides information above random noise is an indication of the optimal number of factors (Horn, 1965). Based on this analysis, I extracted seven factors, which together explained 50.3% of the variance. These loadings were rotated with a varimax rotation to maximize the interpretability of the factors. The rotated factor loadings are provided in Table 2.

Table 2

*Varimax rotated factor loadings (Study 1)*

<u>Scale</u>	<u>F1</u>	<u>F2</u>	<u>F3</u>	<u>F4</u>	<u>F5</u>	<u>F6</u>	<u>F7</u>
AAT – Approach temperament		.521				.499	
AAT – Avoidance temperament	.301	-.339		.635		.318	
AMAS – Math Anxiety	.278			.262	.216		
BPAQ – Aggression	.269		-.327		.250		-.530
BPS – Boredom Proneness	.299	-.438	-.540				-.239
BSCS – Self-Control			.768				
DASS – Anxiety	.778				.290		
DASS – Depression	.691	-.333	-.286				
DASS – Stress	.776			.294	.203		
DOCS – Contamination					.708		
DOCS – Harm responsibility					.690		
DOCS – Symmetry					.621		
DOCS – Unacceptable thoughts	.370		-.202	.236	.477		
FFMQ – Act with awareness	-.286	.212	.567				
FFMQ – Describe		.407					
FFMQ – Nonjudge	-.329	.202	.256	-.295		-.282	
FFMQ – Nonreact				-.608			
FFMQ – Observe						.329	
MS – High standards			.212			.516	
MS – Alternative search			-.315			.351	
MS – Decision difficulty		-.440	-.206			.230	
RFQ – Promotion focus	-.208	.531	.406				
RFQ – Prevention focus			.449				.318
RMS – Locomotion		.538	.408			.405	
RMS – Assessment				.260		.490	-.299
RSES – Self-Esteem	-.356	.488	.348	-.315			
SDS – Social Desirability			.202	-.248			.358
SPIN – Social Phobia	.344	-.572		.269	.203	.218	
STICSA – Anxiety	.605	-.239	-.284	.315	.303	.205	
TIPI – Agreeableness							.651
TIPI – Conscientiousness			.602				
TIPI – Emotional stability	-.329			-.689			.202
TIPI – Extraversion		.689					
TIPI – Openness		.498					

*Note.* Factor loadings with an absolute value less than .200 have been suppressed. Labels for each factor are as follows: F1 = Distress, F2 = Positivity/Approach temperament, F3 = Self-control, F4 = Negativity/Avoidance temperament, F5 = Obsessive-compulsive thoughts, F6 = Goal implementation, F7 = Agreeableness. Scale abbreviations: AAT = Approach/Avoidance Temperament; AMAS = Abbreviated Math Anxiety Scale; BPAQ = Buss-Perry Aggression

Questionnaire; BPS = Boredom Proneness Scale; BSCS = Brief Self-Control Scale; DASS = Depression, Anxiety, and Stress Scales; DOCS = Dimensional Obsessive-Compulsive Scale; FFMQ = Five Facet Mindfulness Questionnaire; MS = Maximization Scale; RFQ = Regulatory Focus Questionnaire; RMS = Regulatory Mode Scale; RSES = Rosenberg Self-Esteem Scale; SDS = Social Desirability Scale; SPIN = Social Phobia Inventory; STICSA = State-Trait Inventory for Cognitive and Somatic Anxiety; TIPI = Ten-Item Personality Inventory

## **Results**

Examining the rotated factor loadings, the first factor appears to represent distress, with constructs such as stress, depression, anxiety, and cognitive and somatic anxiety all loading strongly positively. Factor 2 seems to represent a tendency toward positivity or approach temperament, including constructs like openness to experience, extraversion, self-esteem, promotion focus, locomotion, and a strong negative loading with social phobia. In contrast, factor 4 appears to represent negativity or avoidance temperament, with avoidance tendencies and neuroticism (reverse-coded emotional stability) loading strongly. This accords with research by Elliot and Thrash (2002, 2010) on approach and avoidance temperament, as they described approach temperament as a general sensitivity toward positive or desirable stimuli, and avoidance temperament as a general sensitivity away from negative or undesirable stimuli. In line with this, they found that approach temperament shared a common factor with extraversion and positive affect, while avoidance temperament shared a common factor with neuroticism and negative affect.

Factor 3 appears to represent self-control, with trait self-control and conscientiousness loading very strongly positively, and boredom proneness loading negatively. Factor 5 is strongly related with the four DOCS subscales, which measure different types of obsessive-compulsive thoughts. Factor 6 appears to be a general measure of goal implementation, with approach and

avoidance temperaments, maximizing high standards *and* alternative search, locomotion, and assessment loading positively. Locomotion and assessment represent general orientations toward goal pursuit and goal planning (respectively), two key processes involved in the implementation of goals. The fact that both these orientations, as well as both a goal (high standards) and strategy (alternative search) associated with maximizing, loaded on this factor suggests a general, relatively low-level measure of self-regulation. Finally, factor 7 seems to be a general agreeableness factor, with TIPI agreeableness and social desirability loading positively and aggressiveness loading negatively.

It is instructive to examine at this point the factors on which the maximizing subscales loaded most strongly. The high standards subscale, as noted above, loaded strongly on the general goal implementation factor, with an additional small loading on the self-control factor as well. Alternative search, on the other hand, loaded moderately strongly on the goal implementation factor as well, but also loaded negatively on the self-control and agreeableness factors, suggesting perhaps a less adaptive decision strategy. However, alternative search does not load on the distress or negativity factors (Factors 1 and 4). Finally, the decision difficulty subscale loaded most strongly on the approach factor in the negative direction, also showing similar patterns with alternative search with regard to the negative loading on the self-control factor. This would suggest that decision difficulty is characterized by a general state of low approach motivation, combined with some degree of a general inability to effectively pursue long-term goals by controlling short-term impulses (i.e., self-control).

Notably, the general factor loadings for the maximizing subscales were not particularly high on any of the factors. This may to some degree be a result of the wide swath of measures used in this particular analysis, leading to very general factors. However, it may also have



suffered from the middling reliability of the MS subscales (high standards  $\alpha = .65$ ; alternative search  $\alpha = .63$ ; decision difficulty  $\alpha = .62$ ).

Promotion focus showed high loadings on the approach/positivity factor and the self-control factor, as well as a smaller negative loading on the distress factor. This showed the most conceptual overlap with the high standards subscale, but a very opposite pattern to the decision difficulty subscale. Assessment, on the other hand, loaded on the goal implementation factor, which accords with the general idea that goal planning is an integral part of goal implementation. However, it also loaded on the negativity/avoidance factor, as well as negatively on the agreeableness factor, suggesting some potential downsides to a focus on assessment. The factor loadings for assessment show generally similar patterns as high standards and alternative search, particularly in terms of their loadings on the goal implementation factor.

## **Discussion**

Study 1 provides a broad, big-picture view of how the different maximizing subscales fit in with clusters of related cognitive and motivational constructs. High standards showed evidence of being associated with self-control and approach motivation, whereas alternative search and decision difficulty both showed negative patterns of association with self-control. Consistent with the arguments made in the introduction, this study provides initial support that the goal of high standards by itself may not be problematic, and indeed may even be associated with a more adaptive form of maximizing. The alternative search strategy, on the other hand, shows indications of being associated with a maladaptive form of maximizing.

In addition, the results of Study 1 provide interesting insights into promotion focus and assessment. Promotion focus showed a fairly strong association with approach temperament, which accords with research suggesting that promotion-focused individuals prefer to use eager,

approach-oriented means to pursue their goals (Förster et al., 2003; Higgins, 1997; Scholer & Higgins, 2011). The connection between promotion and the factors relating to self-control and low distress may be related to the particulars of the Regulatory Focus Questionnaire, which measures the subjective history of success with promotion-related eagerness and prevention-related vigilance (Higgins et al., 2001). Thus, a participant scoring high on promotion focus here indicates someone who has a history of successfully engaging with their ideals and aspirations—which may plausibly fit the profile of someone with high self-control and a lack of distress. This interpretation is bolstered by the fact that prevention focus also loads positively on the self-control factor.

The findings for assessment also align with research and theory on this construct. As mentioned, assessment is related to goal planning and comparison (Kruglanski et al., 2000), and as such its connection with the goal implementation factor is unsurprising. With regard to the connection to avoidance temperament, research by Gray and McNaughton (2000) into the behavioural inhibition system (BIS, which controls avoidance motivation) has suggested that the BIS is activated by conflict between competing goals, which then suspends active goal pursuit until the conflict can be resolved. Such theorizing is conceptually similar to other theories of self-regulation which suggest a distinction between goal planning/deliberation and goal pursuit (e.g., Gollwitzer, 1990). Assessment fits naturally into these theories as the orientation toward the comparison of alternate goals and means during goal planning or goal conflict. In terms of decision-making, high assessors prefer “full evaluation” strategies that allow them to fully assess the extent of the goals and means available to them (Avnet & Higgins, 2003).

In summary, Study 1 provides a broad overview of how maximizing fits into the wide scope of motivation and self-regulation, as well as how these motivational constructs can provide

a glimpse into the possibility of adaptive and maladaptive types of maximizing. However, in order to provide more evidence for these distinct types of maximizing, it would be useful to examine how the constructs of promotion focus and assessment mode directly predict different relationships with these three maximizing subscales, which Study 2 examines.

## Study 2

The goal of Study 2 was to determine the direct relationships of the three maximizing subscales with promotion and assessment. The pattern of these relationships can bolster the argument that it is possible to identify distinct types of chronic maximizers based on their underlying motivations—in other words, the goals they pursue and the strategies they use to pursue them. I hypothesized that both promotion and assessment should be positively related to the goal of high standards, but that assessment should also be positively related to alternative search strategies and decision difficulty. In contrast, promotion should be unrelated to or negatively related to alternative search, and negatively related to decision difficulty.

### Method

I recruited 681 participants (48.3% women;  $M_{\text{age}} = 33.49$ ,  $SD = 12.10$ ) from Amazon Mechanical Turk as part of two larger studies. Sample size was determined in advance, and I aimed for approximately 350 participants for each study. This would provide 80% power to detect effects of approximately  $r = .15$  ( $r = .11$  for the combined sample). All measures relevant for the current research occurred at the very beginning of the studies, before any other measures or manipulations.<sup>7</sup>

Participants completed four self-report questionnaires. First, participants were given the Regulatory Focus Questionnaire (RFQ; Higgins et al., 2001; promotion focus,  $\alpha = .69$ ), with six items assessing promotion focus on a 1–5 scale from “never or seldom” to “very often” (e.g., “I feel like I have made progress toward being successful in my life;” see Appendix B). Next was the Regulatory Mode Scale (RMS; Kruglanski et al., 2000; assessment,  $\alpha = .80$ ), with 12 items evaluating assessment on a 1–6 scale from “strongly disagree” to “strongly agree” (e.g., “I spend

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<sup>7</sup> Which study participants were in did not moderate any of the results; I include it as a covariate in the following analyses.

a great deal of time taking inventory of my positive and negative characteristics;” see Appendix C). Third, I included the Maximization Scale (MS; Schwartz et al., 2002; high standards,  $\alpha = .68$ ; alternative search,  $\alpha = .63$ ; decision difficulty,  $\alpha = .66$ ), with 13 items (three for high standards, six for alternative search, and four for decision difficulty) on a 1–7 scale from “strongly disagree” to “strongly agree” (e.g., “No matter what I do, I have the highest standards for myself;” see Appendix D). Finally, participants completed the Maximizing Tendency Scale (MTS; Diab et al., 2008;  $\alpha = .85$ ), with 9 items on a 1–7 scale from “strongly disagree” to “strongly agree” (e.g., “I don’t like having to settle for ‘good enough;” see Appendix E). The MTS has shown similar patterns to the high standards subscale of the MS in previous research (Giacopelli et al., 2013; Rim et al., 2011; Weinhardt et al., 2012); thus, I included this scale to ensure that promotion and assessment were both positively correlated with high standards, using a scale that has arguably better psychometric properties relative to the original scale (Diab et al., 2008).

## **Results**

Consistent with the previous research, the MTS was highly correlated with the high standards subscale of the Maximization Scale, and both the MTS and high standards subscale showed a moderate correlation with alternative search but were uncorrelated with decision difficulty (see Table 3). However, the alternative search subscale was moderately correlated with decision difficulty.

I regressed each component of maximizing and the MTS separately onto promotion and assessment. Using the *overall* maximizing score from the MS, it would appear that promotion focus is negatively associated and assessment positively associated with maximizing. However, as Table 4 shows, deconstructing this scale into its separate components of high standards,

alternative search, and decision difficulty provides greater insight into how these motivational constructs relate to maximizing. As predicted, both promotion and assessment showed a positive association with high standards. However, also as predicted, only assessment showed positive associations with alternative search and decision difficulty, while promotion showed a slight negative association with alternative search and a strong negative association with decision difficulty. The MTS showed similar patterns as high standards, as expected.

Table 3  
*Correlation table of scale measures (Study 2)*

	<u>M</u>	<u>SD</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>
1. Promotion Focus	4.50	.62	(.69)						
2. Assessment Mode	3.93	.75	-.09*	(.80)					
3. MS (Overall)	4.32	.78	-.14***	.38***	(.68)				
4. High Standards	4.97	1.12	.36***	.22***	.48***	(.68)			
5. Alternative Search	4.30	1.06	-.10*	.33***	.82***	.24***	(.63)		
6. Decision Difficulty	3.88	1.30	-.39***	.19***	.65***	.001	.23***	(.66)	
7. MTS (High Standards)	4.88	.96	.33***	.24***	.44***	.80***	.28***	.02	(.85)

*Note.* Values in parentheses are Cronbach's alpha. \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

Table 4

*Regressing maximizing components on motivational predictors (Studies 1-6)*

	<u>MS</u> (Overall)	<u>MS-HS</u>	<u>MS-AS</u>	<u>MS-DD</u>	<u>MTS (HS)</u>	<u>MI-AS</u>	<u>MI-DD</u>
<i>Study 1</i>							
Promotion	-.19***	.20***	-.17***	-.32***			
Assessment	.32***	.30***	.25***	.15***			
<i>Study 2</i>							
Promotion	-.10**	.38***	-.07 <sup>+</sup>	-.37***	.36***		
Assessment	.37***	.26***	.33***	.16***	.27***		
<i>Study 3</i>							
Promotion					.26***	-.12 <sup>+</sup>	-.21**
Assessment					.20**	.35***	.43***
<i>Study 4</i>							
Promotion	-.09	.28**	-.13	-.21*	.18 <sup>+</sup>		
Assessment	.33**	.22*	.28**	.21*	.20*		
<i>Study 5</i>							
Promotion	-.11	.28***	-.10	-.31***			
Assessment	.27***	.30***	.22**	.06			
<i>Study 6</i>							
Promotion					.40***	.15**	-.45***
Assessment					.23***	.21***	.32***

*Note.* Values are standardized coefficients ( $\beta$ ). MS = Maximization Scale (Schwartz et al., 2002); MTS = Maximizing Tendencies Scale (Diab et al., 2008); MI = Maximization Inventory (Turner et al., 2012); HS = high standards; AS = alternative search; DD = decision difficulty. <sup>+</sup>  $p < .10$ ; \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

## **Discussion**

I hypothesized that promotion and assessment would both be positively related to high standards, but that they would differ in their relationships with alternative search and decision difficulty. This is exactly what Study 2 showed, with promotion showing a (marginal) negative relationship with alternative search and a negative relationship with decision difficulty, while assessment showed a positive relationship with both. I have argued that high standards—the goal to find the “best” option—is the defining aspect of maximization, while alternative search is a measure of one possible strategy that maximizers could use, and decision difficulty is a measure of negative affective costs. Given this framework, both promotion-focused individuals and assessment-focused individuals can be classified as maximizers, but their different underlying motivations for pursuing the optimization goal appear to lead them toward different decision strategies: assessment toward alternative search, and promotion away from it. These motivations also predict differing experiences of affective costs when making decisions.

Study 2 thus provides evidence for the distinction between adaptive and maladaptive types of maximizing, with two motivational constructs that can differentiate between them. Study 3 tests this typology in a different way, to provide converging evidence for this distinction.



### Study 3

Instead of using promotion and assessment to predict the three maximizing subscales and using the divergent patterns of relationships to infer types, in Study 3 I used latent class analysis (LCA) to identify types of maximizers, based solely on their scores on the three subscales. Then I assessed how promotion and assessment differentially predicted these classes. In addition, I assessed how these classes can also be used to predict affective outcomes on a decision task. Although some research on maximizing has made use of discrete decision tasks (e.g., Dar-Nimrod, Rawn, Lehman, & Schwartz, 2009; Iyengar et al., 2006; Nenkov et al., 2008; Yang & Chiou, 2010), largely the literature has relied on chronic measures and global assessments of decision making (e.g., Diab et al., 2008; Schwartz et al., 2002; Turner et al., 2012). Thus, the current research provides additional insight into how maximizing manifests in individual decisions.

It should be noted that I do not wish to argue that these “types” of maximizers are discrete categories. Just as assessment, measured continuously, can predict greater or lesser degrees of the use of alternative search strategies, individuals could fall along a continuum between adaptive or maladaptive maximizing. Instead, my argument is that latent class analysis can be used to identify distinguishable clusters of participants displaying characteristics that are more similar to each other than to those in other clusters. The boundaries between these clusters need not be sharp; however, these analyses still provide evidence for a typology with somewhat fuzzy boundaries around the outside.

## Method

I recruited 189 undergraduate participants (66.8% women;  $M_{\text{age}} = 20.12$ ,  $SD = 3.38$ ) from the University of Waterloo to take part in an online study. Sample size was determined in advance; this sample size provides 80% power to detect effects of approximately  $r = .20$ .

Participants completed some of the same questionnaires as in Study 2: the RFQ (promotion focus,  $\alpha = .68$ ), RMS (assessment,  $\alpha = .81$ ), and MTS ( $\alpha = .84$ ). They also completed the alternative search ( $\alpha = .91$ ) and decision difficulty ( $\alpha = .91$ ) subscales of the Maximization Inventory (Turner et al., 2012). I used the MTS as a measure of high standards.<sup>8</sup> The MTS and MI were used in particular because in general they show better reliability than the MS; this is particularly important for LCA, as this analysis discretizes patterns of continuous measures into categories. Thus, high internal reliability is crucial to accommodate the loss of continuous information.

After completing these scales, participants were given a hypothetical product choice task (see Appendix G). They were asked to imagine that they were looking to purchase a vehicle, and were told to look at the available information and decide which one they would choose to buy for themselves. I chose vehicles as the product for this decision as vehicles offer numerous dimensions on which to evaluate, and constitute a relatively important decision for consumers. At the same time, it is a fairly prevalent consumer decision. Following the instructions, participants were given a table with 20 vehicles, along with a number of characteristics of each car (e.g., price, fuel efficiency). Participants could take as long as they wanted to make their decision.

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<sup>8</sup> Participants were also given a writing task intended to manipulate promotion focus or assessment mode, or a control condition in which no writing task was given. This manipulation did not show any significant effect on the DVs, and do not change the pattern of results; however, it is included as a covariate in the analyses below.

After they chose the car they preferred, participants were asked on a 1–7 scale how difficult it was to make the decision, how frustrated they felt when making the choice, how much they struggled to find the right option, and how confident they were that they made the best choice. This was combined into a composite score of task difficulty ( $\alpha = .80$ ). Participants were also given four items ( $\alpha = .82$ ) about the extent to which they reconsidered options after eliminating them (e.g., “I reconsidered an option that I had previously dismissed”), and five items ( $\alpha = .87$ ) about the regret they experienced (e.g., “I regret that I had to pass up other good options”). Finally, participants completed five items ( $\alpha = .87$ ) about their conviction that they had made the right decision (e.g., “How firmly do you believe in this decision?”).

## Results

The means and standard deviations for each scale, as well as their intercorrelations, are shown in Table 5.

Table 5  
*Correlation table of scale measures (Study 3)*

	<u>M</u>	<u>SD</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
1. Promotion Focus	3.38	.58	(.68)				
2. Assessment Mode	4.14	.70	-.07	(.81)			
3. MTS (High Standards)	4.54	1.07	.25***	.18*	(.84)		
4. Alternative Search	4.25	.85	-.15*	.36***	.39***	(.91)	
5. Decision Difficulty	4.00	.88	-.24***	.45***	.17*	.56***	(.91)

*Note.* Values in parentheses are Cronbach’s alpha. \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

**Motivational predictors.** To determine whether the results from Study 2 replicate conceptually, I regressed each maximizing subscale separately onto promotion and assessment.

As Table 4 shows, results were consistent with Study 2, with both promotion and assessment showing a positive association with high standards. However, only assessment

showed positive associations with alternative search and decision difficulty, while promotion showed a marginal negative association with alternative search and a significant negative association with decision difficulty. This provides evidence that these results are robust even when different maximizing scales are used to measure high standards, alternative search, and decision difficulty.

**Latent class analysis.** In order to identify distinct clusters of participants, I performed a latent class analysis in Mplus 6.12, beginning with the three maximizing subscales. I performed analyses testing one latent class up to six latent classes; to determine the best-fitting model, the Vuong-Lo-Mendell-Rubin (VLMR) likelihood ratio test was calculated, which tests a model with  $k$  classes against a model with  $(k-1)$  classes to assess whether adding an additional class results in a significant difference in the log likelihood. Each additional class up to four classes resulted in a significant increase in log likelihood ( $ps < .04$ ); adding a fifth class produced a non-significant but potentially still beneficial increase, VLMR test = 10.03,  $p = .12$ . Thus, for the final analysis I examined both four-class and five-class solutions. The class proportions and class means can be found in Table 6, and the means are plotted graphically in Figures 1 and 2.

Based on visual inspection of the means, Classes 1 to 3 all resemble the prototypical or “classic” maximizer profile that is represented in Schwartz et al. (2002), with relatively equivalent scores on all three subscales, but varying in strength. Thus, I labelled Class 1 as “mild Schwartz maximizers,” Class 2 as “moderate Schwartz maximizers,” and Class 3 as “strong Schwartz maximizers.” Class 4 was labelled “HS-only maximizers,” as this class had high standards (roughly equivalent to the strong Schwartz maximizer group) but was low in alternative search and decision difficulty. In the five-class solution, Class 5 was labelled the “low

HS” group, because they were low on the high standards subscale but high in alternative search and decision difficulty.

Table 6  
*Class means and proportions from latent class analysis (Study 3)*

	<b>Four-class solution</b>				<b>Five-class solution</b>			
	<u>Prop.</u>	<u>HS</u>	<u>AS</u>	<u>DD</u>	<u>Prop.</u>	<u>HS</u>	<u>AS</u>	<u>DD</u>
Class 1 <i>(mild Schwartz maximizers)</i>	.37	3.85	3.50	3.56	.39	3.82	3.53	3.57
Class 2 <i>(moderate Schwartz maximizers)</i>	.45	4.73	4.51	4.09	.38	4.98	4.51	4.01
Class 3 <i>(strong Schwartz maximizers)</i>	.15	5.45	5.48	5.12	.14	5.59	5.49	5.10
Class 4 <i>(HS-only maximizers)</i>	.03	5.89	2.83	2.01	.03	5.97	2.83	2.04
Class 5 <i>(low HS)</i>					.06	3.38	4.74	4.82

*Note.* HS = Mean of high standards subscale; AS = Mean of alternative search subscale; DD = Mean of decision difficulty subscale

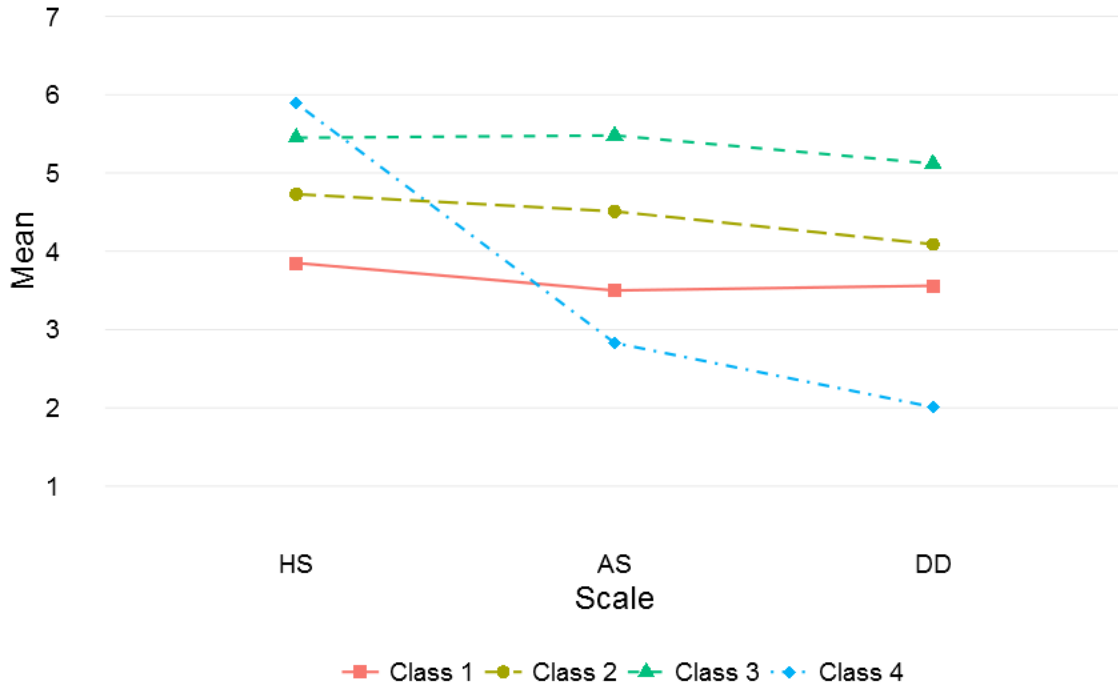


Figure 1. Maximizing subscale means for four-class analysis (Study 3). HS = high standards; AS = alternative search; DD = decision difficulty.

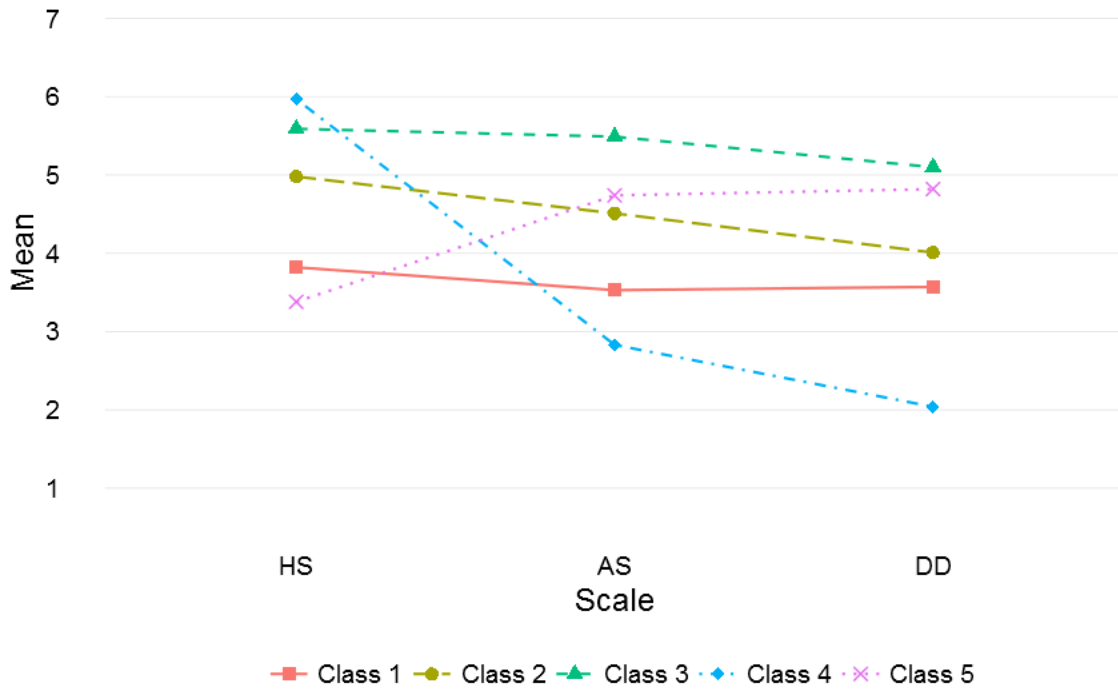


Figure 2. Maximizing subscale means for five-class analysis (Study 3). HS = high standards; AS = alternative search; DD = decision difficulty.

**Promotion and assessment as predictors.** After determining the number of classes, I added promotion and assessment as predictors of class membership in Mplus. Note that this change in the model can cause the classification of participants to change as well; however, inspecting the results showed only slight differences that do not change their interpretation.

The logistic regression analyses with promotion and assessment predicting class membership is presented in Table 7. The class identified as “strong Schwartz maximizers” was used as the comparison group in both sets of analyses. In the four-class solution, assessors were most likely to be in the strong Schwartz maximizers class compared to all three other groups: more likely than the moderate Schwartz maximizers, the mild Schwartz maximizers, or the HS-only maximizers classes. In contrast, promotion-focused individuals were more likely to be classified in the HS-only maximizers class compared to the strong Schwartz maximizers class; no other comparisons were significant.

The five-class solution painted a very similar picture to the four-class solution, with assessors again being more likely to be in the strong Schwartz maximizers class compared to the moderate or mild Schwartz maximizers, or the HS-only maximizers class. However, assessors were equally likely to be in the strong Schwartz maximizing class or the low-HS class, suggesting that assessors are particularly likely to be high in alternative search and decision difficulty. In comparison, promotion-focused individuals were again more likely to be classified in the HS-only maximizers class compared to the strong Schwartz maximizers class, but were also marginally more likely to be in the high maximizers class compared to the low-HS class. This suggests that promotion-focused individuals are particularly likely to have high standards. No other comparisons were significant for promotion focus.



Table 7

*Logistic regression analyses, promotion and assessment predicting class membership (Study 3)*

<u>DV</u>	<u>Predictor</u>	<u>B</u>	<u>Odds Ratio</u>	<u>z</u>
<i>Four-class solution</i>				
Mild vs. strong Schwartz maximizers	Promotion	.16	1.18	.23
	Assessment	-2.96	.05	-3.55***
Moderate vs. strong Schwartz maximizers	Promotion	-.19	.83	-.30
	Assessment	-2.34	.10	-3.53***
HS-only maximizers vs. strong Schwartz maximizers	Promotion	3.27	26.36	2.35*
	Assessment	-4.48	.01	-4.47***
<i>Five-class solution</i>				
Mild vs. strong Schwartz maximizers	Promotion	.78	2.18	.71
	Assessment	-3.73	.02	-3.74***
Moderate vs. strong Schwartz maximizers	Promotion	.72	2.05	.80
	Assessment	-2.96	.05	-3.24***
HS-only maximizers vs. strong Schwartz maximizers	Promotion	4.01	54.96	2.46**
	Assessment	-5.36	.01	-4.79***
Low HS vs. strong Schwartz maximizers	Promotion	-3.16	.04	-1.76 <sup>+</sup>
	Assessment	-1.55	.21	-1.12

Note. <sup>+</sup>  $p < .10$ ; \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

**Predicting decision outcomes.** After identifying the latent class structure in the data, I used a measure of the most probable class identification for each participant to predict outcomes from the decision task. This analysis must be performed separately from the classification stage when the latent classes are calculated to keep the outcome variables conceptually distinct from the indicators of the latent classes. Thus, class identification was dummy-coded, with the strong Schwartz maximizing group as the reference group. The analyses for both the four-class and five-class solutions are presented in Table 8.

Using the four-class solution, the HS-only maximizers class showed significantly lower task difficulty, lower reconsideration, lower regret, and greater conviction compared to the strong Schwartz maximizers group. In addition, the mild Schwartz maximizers group showed marginally lower task difficulty, and both the mild and moderate Schwartz maximizers groups showed lower reconsideration and regret.

The five-class solution showed very similar results. The HS-only maximizers class again showed significantly lower task difficulty, lower reconsideration, lower regret, and greater conviction compared to the strong Schwartz maximizers group. Both the mild and moderate Schwartz maximizers groups showed lower reconsideration and regret. The low-HS group did not show significant differences from the strong Schwartz maximizers group apart from marginally lower regret.

Table 8

*Regression analyses with class membership predicting decision outcomes (Study 3)*

	<u>Task Difficulty</u>	<u>Reconsideration</u>	<u>Regret</u>	<u>Conviction in Decision</u>
<i>Four-class solution</i>				
Mild vs. strong Schwartz maximizers	-.38 <sup>+</sup>	-1.01***	-.77***	-.19
Moderate vs. strong Schwartz maximizers	-.20	-.55**	-.53*	.02
HS-only maximizers vs. strong Schwartz maximizers	-1.85***	-1.99***	-2.09***	1.12*
<i>Five-class solution</i>				
Mild vs. strong Schwartz maximizers	-.21	-.81***	-.71**	-.18
Moderate vs. strong Schwartz maximizers	-.14	-.40 <sup>+</sup>	-.54*	-.05
HS-only maximizers vs. strong Schwartz maximizers	-1.74**	-1.85***	-2.08***	1.07*
Low HS vs. strong Schwartz maximizers	.10	-.40	-.59 <sup>+</sup>	-.33

*Notes.* Values for regression models are standardized coefficients ( $\beta$ ). <sup>+</sup>  $p < .10$ ; \*  $p < .05$ ;

\*\*  $p < .01$ ; \*\*\*  $p < .001$

## Discussion

Study 3 provides converging evidence for distinguishing between adaptive and maladaptive types of maximizing. While Study 2 provided evidence using diverging patterns of relationships with antecedent motivational constructs (promotion and assessment), Study 3 showed distinct clusters of individuals based solely on their scores on the three maximizing subscales. Despite differences in analytic approach, the results were strikingly parallel. Promotion and assessment still showed similar relationships with the maximizing subscales, with promotion focus more likely to be associated with a pattern of high HS and low AS and DD (i.e., HS-only maximizers) rather than being high on all three subscales (i.e., strong Schwartz maximizers); whereas assessment was much more strongly associated with being high on all three subscales. Thus, Studies 2 and 3 together suggest that distinct clusters of maximizers are evident, and that these clusters can be reliably predicted by promotion focus and assessment.

One possible limitation to note is the relatively small proportion of HS-only maximizers in the sample. This is not an inherent statistical limitation: even a small cluster of participants can show a distinct pattern of responses that can provide useful information. The LCA itself is unaffected by the size of the clusters, and the significant increase in model fit when adding the HS-only group suggests that this cluster does provide value in describing the underlying data. In terms of the logistic regression (with class as the criterion) and linear regression (with class as a predictor), the primary effect of unbalanced classes is that the statistical power may be decreased. This is not optimal, but does not pose an inherent challenge to the interpretation of the statistical analyses themselves.

However, the small proportion of HS-only maximizers may have implications for generalizability, in that the estimates provided from this class (from promotion and assessment to

class, and from class to task outcomes) may not be as stable when compared to other samples. Determining generalizability would require random sampling to ensure an appropriate distribution of maximizers in the population, a task that would be useful for future research to pursue.

The other contribution of Study 3 was the application of these classes to affective outcomes on a decision task. As mentioned, relatively few studies have examined maximizing in the context of discrete decisions. Here the results are quite clear: maximizers who were high on all three subscales showed the greatest amount of reconsideration of options and regret on a decision task, and also showed greater task difficulty than the HS-only group. The contrast between the strong Schwartz maximizers and the HS-only maximizers is striking: those who were high only on HS had lower task difficulty, lower reconsideration of options, lower regret, and higher conviction in their decision than those who were high on all three subscales. Decision difficulty, as I have argued, is best seen as a measure of negative affective experiences, so its relationship with other negative experiences is unsurprising. However, this also strongly suggests that alternative search is associated with affective costs. Thus, the combined evidence from Studies 1-3 suggest that alternative search may be a particularly maladaptive strategy. Study 4 examines this in more detail.

## Study 4

All three of the above studies provide evidence that alternative search in particular is a maladaptive strategy that some maximizers use when making decisions. In Study 1, alternative search loaded on a factor associated with low self-control; in Study 2, alternative search was correlated with both assessment mode and decision difficulty. Study 3 demonstrated that alternative search generally moved in tandem with decision difficulty, and that classes with higher alternative search were associated with greater reconsideration and regret compared to classes with lower alternative search.

Study 4, then, examines this in more detail in the context of a discrete decision task. In particular, Study 4 pits high standards and alternative search against each other to assess whether it is the goals maximizers have (high standards) or the strategies they use (alternative search) that predict frustration on a decision. In addition, I examined these two variables as possible mediators between promotion or assessment and frustration. This addresses the question of whether it is high standards or alternative search that provides a plausible mechanism connecting motivations to affective costs on a decision. In line with the previous studies, I predicted that alternative search would predict frustration, while high standards would not. I also predicted that alternative search (and not high standards) would mediate the link between promotion and lower frustration, and between assessment and higher frustration.

### Method

I recruited 108 undergraduate participants (67.3% women;  $M_{\text{age}} = 21.38$ ,  $SD = 3.94$ ) from the University of Waterloo to take part in an online study. Sample size was determined in advance; this sample size provides 80% power to detect effects of approximately  $r = .27$ .

Participants first completed the same four questionnaires as in Study 2: the RFQ (promotion focus,  $\alpha = .60$ ), RMS (assessment,  $\alpha = .78$ ), MS (high standards,  $\alpha = .61$ ; alternative search,  $\alpha = .63$ ; decision difficulty,  $\alpha = .69$ ), and MTS ( $\alpha = .85$ ).

After completing these scales, participants were given the same hypothetical product choice task as in Study 3 (see Appendix G). Participants were given a table with either 5 or 50 vehicles,<sup>9</sup> along with a number of characteristics of each car (e.g., price, fuel efficiency). Participants could take as long as they wanted to make their decision.

After they chose the car they preferred, participants were asked on a 1–7 scale how frustrated they felt when making the choice.<sup>10</sup>

## Results

The means and standard deviations for each scale, as well as their intercorrelations, are shown in Table 9.

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<sup>9</sup> This study was originally designed to also test whether maximizers (versus non-maximizers) would be more overwhelmed or frustrated by large choice sets. Although I found an association between decision difficulty and frustration,  $\beta = .30$ ,  $t(99) = 2.90$ ,  $p = .01$ , I did not find any main effect of the set size condition, or any interactions between condition and maximization. Condition also did not moderate the results of the mediation analyses. This is consistent with a meta-analysis suggesting no evidence for the choice overload effect (Scheibehenne, Greifeneder, & Todd, 2010). Thus, the results presented here collapse across condition.

<sup>10</sup> Following Iyengar and Lepper (2000), I also had items about how much they enjoyed making the choice and how difficult it was. Although I find similar patterns among these three variables (frustration, reverse-coded enjoyment, and difficulty), frustration emerged as the strongest variable. Conceptually, frustration has the strongest link with negative affect, whereas one can experience even a difficult task as engaging or enjoyable. Thus, I focus these analyses on frustration. I also included several other items intended as procedural checks to make possible adjustments for future studies. This included items about satisfaction with the choice, feeling as though the decision was well-informed, and comprehensiveness of the options. In addition, I had some exploratory items about the strategies used to make the decision. I had no specific hypotheses about any of these items. The items about strategies were later adapted into a measure of exhaustive search, which was included in Study 5 and receives more in-depth treatment there.

Table 9  
*Correlation table of scale measures (Study 4)*

	<u>M</u>	<u>SD</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>
1. Promotion Focus	4.35	.55	(.60)						
2. Assessment Mode	3.98	.64	-.22*	(.78)					
3. MS (Overall)	4.28	.78	-.17 <sup>+</sup>	.35***	(.73)				
4. High Standards	4.74	1.00	.23*	.16	.42***	(.61)			
5. Alternative Search	4.19	.98	-.19 <sup>+</sup>	.31**	.88***	.21*	(.63)		
6. Decision Difficulty	4.07	1.23	-.26**	.26**	.76***	.002	.48***	(.69)	
7. MTS (High Standards)	4.68	.90	.14	.16 <sup>+</sup>	.32**	.77***	.19 <sup>+</sup>	-.04	(.85)

*Note.* Values in parentheses are Cronbach's alpha. <sup>+</sup>  $p < .10$ ; \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

**Motivational predictors.** Given that I used the same maximizing scales as in Study 2, I first wanted to replicate the results from Study 2 on this university sample to ensure that the results were robust across populations. I regressed each component of maximizing and the MTS separately onto promotion and assessment.

As Table 4 shows, results were largely consistent with Study 2, with both promotion and assessment showing a positive association with high standards. Also consistent with Studies 1 and 2, only assessment showed positive associations with alternative search and decision difficulty, while promotion showed no association with alternative search and a negative association with decision difficulty.

**Alternative search as a mediator.** I next examined the association between promotion and assessment on task frustration, to determine the mediating factors underlying this association. I predicted that promotion should lead to lower frustration, and assessment should lead to higher frustration. I also predicted that these associations would be mediated by alternative search, but not by high standards.

Using the PROCESS macro by Hayes (2013), I used bias-corrected bootstrapping with 5000 samples to examine the indirect effects of these two mediators. I included both high

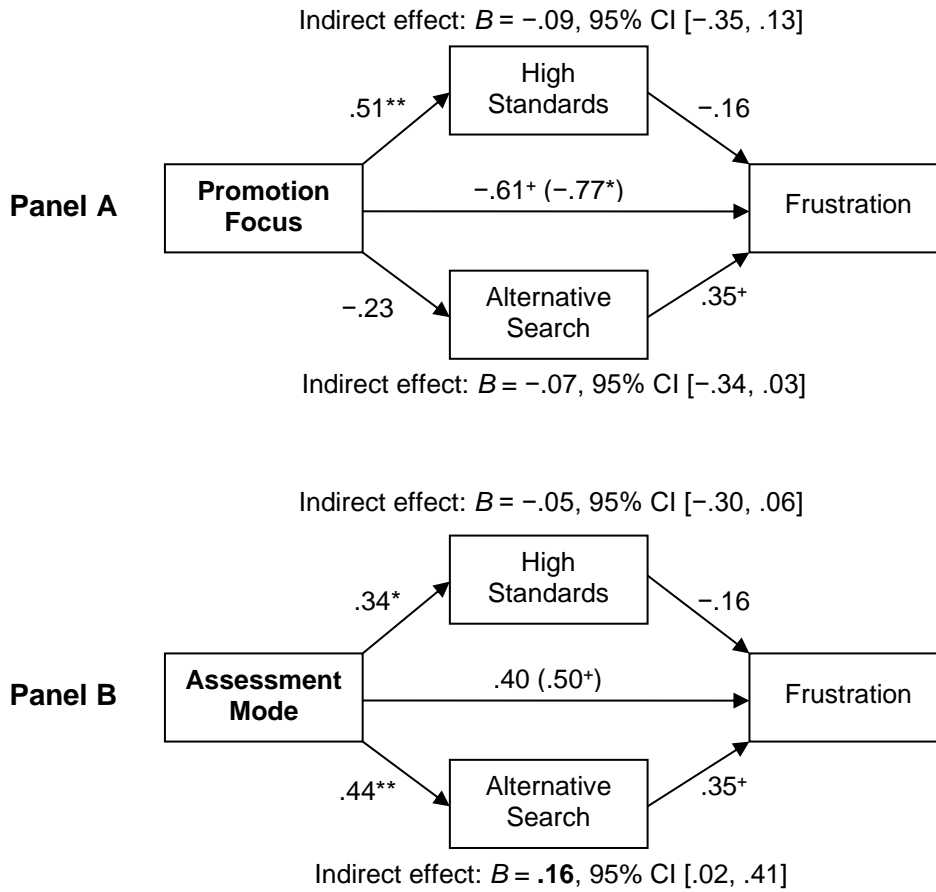


standards and alternative search as mediators in the model at the same time, and ran two separate analyses, one with promotion predicting task frustration (controlling for assessment), and another with assessment predicting task frustration (controlling for promotion).

Panels A and B in Figure 3 show that high standards did not show a significant indirect effect for either promotion or assessment. As predicted, for assessment, there was a significant indirect effect through alternative search to task frustration. This is consistent with the conclusion that individuals high in assessment experienced greater frustration as a result of greater use of alternative search strategies, rather than as a result of having higher standards. In contrast, alternative search did not show a significant indirect effect for promotion focus.<sup>11</sup>

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<sup>11</sup> As noted in Study 5, the same pattern of results was found with both frustration and regret in that study. I ran the same model in Studies 3 and 6, which used MTS as the measure of high standards and the alternative search subscale of the MI. The same pattern of results (i.e., a significant indirect effect from assessment through alternative search) was found in both of these studies: with frustration and regret as the DVs in Study 3, and with regret in Study 6.



*Figure 3.* Concurrent mediation models for promotion focus (Panel A) and assessment mode (Panel B) predicting task frustration, mediated by high standards and alternative search (Study 4). The analyses for promotion focus controlled for assessment mode, and the analyses for assessment mode controlled for promotion focus. All effects are unstandardized coefficients;  $^+ p < .10$ ;  $* p < .05$ ;  $** p < .01$ .

## **Discussion**

Study 4 provides two key contributions. First, it replicates the patterns of association between promotion and assessment with the three subscales of maximizing. Second, it directly pits the high standards goal against the alternative search strategy to determine whether it is the goal or the strategy that mediates the relationship between promotion and assessment to frustration on a decision. The results show that it is indeed alternative search that mediates the link between assessment and greater frustration. Although I did not find a similar pattern for promotion focus, the weaker (negative) association between promotion and alternative search, compared to assessment and alternative search, makes this mediated relationship less likely. Notably, however, in neither case does high standards mediate the link between motivation and frustration, despite both motivational constructs being fairly strongly associated with high standards. The fact that alternative search (and not high standards) mediates assessment with frustration suggests that alternative search can explain why assessors experience greater affective costs when making decisions.

## Study 5

Having established that alternative search is associated with affective costs on decisions, Study 5 attempts to provide a more complete explanation of why this might be the case. As discussed in the introduction, taking the time to seek out and evaluate all the options available in a decision would seem to be a critical component of rational decision-making. Because of this, it is important to better understand how alternative search (as measured in the original maximizing scale) actually manifests in the context of a discrete decision. To this end, this study measures several behaviours and cognitions that may possibly be related to alternative search, and then examines their associations with affective costs, namely, frustration and regret.

In particular, I compared exhaustive search (i.e., examination of multiple options), examination of options on multiple dimensions, time spent evaluating options, and returning to re-evaluate options that were previously eliminated (reconsideration). These behaviours were measured with self-report items after the task, as well as recording of actual behaviour during the task. Given relatively scant research on maximizing and discrete decisions, knowledge of which behaviours might best reflect the chronic tendency to engage in alternative search is extremely limited. Thus, I made tentative predictions that alternative search would be associated with all of these behaviours. Of these, however, as noted in the introduction, I predicted that reconsideration of options would be uniquely associated with affective costs on an actual decision task.

In addition to frustration, in Study 5 I also measured post-choice regret, an affective experience that has been strongly linked with maximizing—and alternative search in particular—in past research (e.g., Diab et al., 2008; Iyengar et al., 2006; Nenkov et al., 2008; Purvis et al., 2011; Rim et al., 2011; Schwartz et al., 2002; Turner et al., 2012; Weinhardt et al., 2012). In the maximizing literature, both alternative search and regret have primarily been studied at the

chronic, individual difference level. The attempt here was to provide evidence for these strategies and outcomes on a discrete decision task.

Finally, Study 5 provides a test of my complete theoretical model, from broad, chronic motivational orientations (promotion and assessment) to decision-making goals and strategies (high standards and alternative search) to actual behaviours during a decision (evaluation of options and reconsideration of options), and finally to affective outcomes (frustration and regret). I first replicate the results from Study 4, testing high standards and alternative search as competing mechanisms explaining affective costs. Then, I test sequential mediation models to provide evidence for reconsideration of options as a mechanism for why alternative search is associated with affective costs. Thus, Study 5 provides a robust test of when and why maximizing leads to affective costs.

## Method

I recruited 210 undergraduate participants (67.8% women;  $M_{\text{age}} = 20.29$ ,  $SD = 3.84$ ) from the University of Waterloo. Sample size was determined in advance; this sample size provides 80% power to detect effects of approximately  $r = .19$ . Participants first completed the same questionnaires as in the previous studies: the RFQ (promotion focus,  $\alpha = .62$ ), RMS (assessment,  $\alpha = .70$ ), and MS (high standards,  $\alpha = .73$ ; alternative search,  $\alpha = .54$ ; decision difficulty,  $\alpha = .58$ ).<sup>12</sup>

After completing these scales, participants were given a product choice task very similar to Studies 3 and 4 (see Appendix H). They were asked to imagine that they were looking to

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<sup>12</sup> In this study I also included the MTS (Diab et al., 2008) and MI (Turner et al., 2012) along with the MS. These scales show very similar patterns to their corresponding MS subscales. For consistency with Studies 2 and 4, I present the MS results here. See Appendix I for the results using the corresponding subscales of the MTS and MI instead.

purchase a vehicle, and were told to review the available information and decide which one they would choose to buy for themselves. Following this, all participants were given a table with 20 vehicles, along with a number of characteristics of each car (e.g., price, fuel efficiency). Participants could take as long as they wanted to make their decision, and I recorded how long they spent on the choice task.

After they chose the car they preferred, participants responded on a 1–7 scale to several items measuring self-reported behaviours on the task: four items ( $\alpha = .74$ ) regarding whether they reconsidered options after eliminating them (e.g., “I reconsidered an option that I had previously dismissed”), five items ( $\alpha = .81$ ) about the regret they experienced (e.g., “I regret that I had to pass up other good options”), and three items ( $\alpha = .86$ ) about the extent to which they based their decision solely on the price of the option (e.g., “If an option was outside my price range, I didn’t even look at it further”). They were also asked how frustrated they felt when making the choice on a 1–7 scale.<sup>13</sup>

Participants then responded to 10 items about the extent to which they engaged in exhaustive search (e.g., “I didn’t eliminate any options until the very end of the process”). An exploratory factor analysis of this scale showed two factors, corresponding to the extent to which they examined dimensions ( $\alpha = .71$ ), and the extent to which they examined options ( $\alpha = .67$ ; see Appendix J for details of this factor analysis).

In addition to self-reported behaviours, I set up the decision task itself in a way that could capture actual behavioural data. Beside each row and column were checkboxes that participants could use to show or hide the information in that row or column. All the information was visible by default, but participants could use these checkboxes to eliminate information from the screen

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<sup>13</sup> As in Study 4, I also had items about how much they enjoyed making the choice and how difficult it was, which showed similar patterns to frustration.

(or bring it back, if they chose to do so). I suggested in the instructions that these checkboxes could be used after eliminating an option or characteristic from consideration. Given the way the information was displayed, hiding a row was indicative of removing an option from one's choice set. Hiding a column, on the other hand, was indicative of removing a dimension upon which to evaluate options (e.g., price, fuel efficiency). In essence, hiding columns reduced the complexity of the choice, while hiding rows reduced the size of the choice set.

During this task, the computer was programmed to keep track of how long participants spent on the task, how many rows and columns they unchecked to hide, as well as how many rows and columns they selected to be displayed again, if any.

## Results

The means and standard deviations for each scale, as well as their intercorrelations, are shown in Table 10.

Table 10  
*Correlation table of scale measures (Study 5)*

	<u>M</u>	<u>SD</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>
1. Promotion Focus	3.41	.56	(.62)					
2. Assessment Mode	3.90	.57	-.11	(.70)				
3. MS (Overall)	4.34	.74	-.14*	.28***	(.66)			
4. High Standards	4.88	1.16	.25***	.27***	.55***	(.73)		
5. Alternative Search	4.26	.95	-.13 <sup>+</sup>	.23**	.79***	.18**	(.54)	
6. Decision Difficulty	4.04	1.17	-.31***	.10	.70***	.16*	.27***	(.58)

*Note.* Values in parentheses are Cronbach's alpha. <sup>+</sup>  $p < .10$ ; \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

**Motivational predictors.** As with the previous studies, I first regressed each component of maximizing and the MTS separately onto promotion and assessment. Table 4 shows the same pattern of relationships of promotion and assessment with maximizing. One exception is that

assessment showed no relationship with decision difficulty in this sample. This was an unexpected null finding; however, Table 4 shows that this is the only study in which this occurs.

In all other cases, the relationships were as predicted.

**Correlations and regressions on task behaviours and outcomes.** The zero-order correlations of each dependent variable with the MS subscales are displayed in Table 11. For each of the dependent variables I also examined a regression model including all three MS subscales as predictors, also displayed in Table 11. Given that there are small but significant correlations between the three subscales ( $r$ s from .16 to .27,  $p$ s < .02), both the zero-order correlations and the regression models are instructive.<sup>14</sup>

Table 11  
*Regressing task behaviours and outcomes on maximizing components (Study 5)*

	Self-report items			Behavioural items	Outcomes	
	<u>Evaluating Dimensions</u>	<u>Evaluating Options</u>	<u>Reconsidering Options</u>	<u>Cols. Hidden</u>	<u>Frustration</u>	<u>Regret</u>
<u>Zero-order correlations</u>						
HS	.19**	.13 <sup>+</sup>	.10	-.06	.03	.01
AS	.09	.15*	.17*	-.15*	.23***	.20***
DD	-.06	.15*	.30***	-.03	.27***	.32***
Promotion	.15*	-.05	-.11	.04	-.13 <sup>+</sup>	-.22***
Assessment	.13 <sup>+</sup>	.06	.16*	-.13 <sup>+</sup>	.09	.15*
<u>Regression models</u>						
<i>Model 1</i>						
HS	.20**	.09	.04	-.04	-.04	-.07
AS	.08	.10	.09	-.15*	.18*	.14*
DD	-.12 <sup>+</sup>	.11	.27***	.01	.23**	.29***
<i>Model 2</i>						
Promotion	.17*	-.04	-.10	.02	-.13 <sup>+</sup>	-.20**
Assessment	.15*	.06	.15*	-.13 <sup>+</sup>	.07	.13 <sup>+</sup>

*Notes.* Values for regression models are standardized coefficients ( $\beta$ ). Some behavioural items—number of rows hidden, time on task, reselecting rows, and reselecting columns—are not displayed here because they were not significantly predicted by any of the maximizing or motivational variables. HS = high standards; AS = alternative search; DD = decision difficulty.  
<sup>+</sup>  $p < .10$ ; \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ .

<sup>14</sup> See Appendix K for a comparison of task outcomes across Studies 3-6.



**Self-reported information selection.** Following the task, I asked participants about the extent to which they engaged in exhaustive search, including measures of their evaluation of dimensions (columns) and their evaluation of options (rows).

Interestingly, alternative search was not associated with greater self-reported evaluation of dimensions. High standards was positively associated with more evaluation of dimensions. In addition, decision difficulty, when included in a model with high standards and alternative search, was marginally associated with reduced evaluation of dimensions.

With regard to evaluating options, high standards, alternative search, and decision difficulty were all associated with more evaluation of options at the zero-order level. When included in the model together, however, none of these relationships emerged as significant.

**Self-reported reconsideration.** I asked participants to report how much they reconsidered options they had previously eliminated from consideration. At the zero-order level, both alternative search and decision difficulty were significantly associated with greater reported reconsideration of options. However, as simultaneous predictors, only decision difficulty was significantly associated with greater reconsideration of options.

Self-reported reconsideration was strongly correlated with regret,  $r(197) = .61, p < .001$ , which I analyze below. It was also correlated with the behavioural measure of the number of rows reselected,  $r(197) = .18, p = .01$ . It was not associated with the number of columns reselected,  $r(197) = .07, p = .30$ . However, as noted below, these behaviours were quite infrequent and thus these results should be interpreted with caution.

**Behavioural measures.** Alternative search significantly predicted hiding fewer columns, both at the zero-order level and when included simultaneously with the other subscales. This

may suggest one behavioural cue with which alternative search is associated: removing fewer dimensions from consideration when engaging in a choice task.

However, interpretation of some of the other behavioural measures was made difficult because some of the key behaviours were quite infrequent. For example, as my measure of reconsidering options or dimensions, I examined how many times participants selected a previously hidden column or row to make it visible again. On the whole, this was uncommon behaviour: participants reselected on average .57 columns ( $SD = 1.02$ ) and 1.16 rows ( $SD = 2.43$ ). As such, none of the maximizing subscales predicted the other behavioural items. The maximizing subscales also did not predict time spent on the task.

**Post-decision emotions.** Two key emotional outcomes were assessed with regard to the choice task: frustration and regret. High standards did not predict frustration or regret; however, alternative search and decision difficulty were both significantly associated with greater frustration and greater regret. This was true for both the zero-order correlations and when entered as simultaneous predictors.

**Promotion and assessment.** My theoretical model conceptualizes promotion and assessment as distal factors primarily influencing decision experiences through maximizing processes. However, as shown in Table 11, regression analyses did reveal some direct associations between these motivational orientations and the dependent variables. In particular, assessment marginally predicted hiding fewer columns, and both promotion and assessment were associated with greater self-reported evaluation of dimensions. In addition, assessment predicted greater self-reported reconsideration, and promotion marginally predicted less frustration on the task. Promotion also predicted less regret, while assessment predicted greater regret on the task.

**Replicating Study 4.** I again used bias-corrected bootstrapping with 5000 samples to examine the indirect effects of high standards and alternative search, as shown in Figure 3. I used these mediation models to predict task frustration and regret.

When predicting frustration, I found that there was no indirect effect through high standards either for promotion focus,  $B = .01$ , 95% CI [-.12, .14], or for assessment mode,  $B = .01$ , 95% CI [-.13, .15]. There was also no indirect effect through alternative search for promotion focus,  $B = -.06$ , 95% CI [-.21, .02]; however, alternative search significantly mediated the relationship between assessment and frustration,  $B = .13$ , 95% CI [.04, .28].

I found similar results when predicting regret. There was no indirect effect through high standards either for promotion focus,  $B = .003$ , 95% CI [-.09, .09], or for assessment mode,  $B = .003$ , 95% CI [-.09, .10]. There was also no indirect effect through alternative search for promotion focus,  $B = -.03$ , 95% CI [-.13, .01]; however, alternative search significantly mediated the relationship between assessment and regret,  $B = .08$ , 95% CI [.01, .19].

**Sequential mediation path analysis.** In order to test my complete model of the process from motivational orientations to affective costs, I developed a path model using Amos 20. Unfortunately, the behavioural measures I captured in this study did not correlate strongly with frustration and regret (with correlations ranging from -.08 to .10, and  $ps > .16$ ). This made them unlikely candidates for mediation between alternative search and decision outcomes. However, the self-reported evaluation of options was correlated with frustration,  $r(198) = .27$ ,  $p < .001$ , and with regret,  $r(197) = .30$ ,  $p < .001$ . Self-reported reconsideration was also correlated with frustration,  $r(196) = .47$ ,  $p < .001$ , and regret,  $r(197) = .61$ ,  $p < .001$ . Thus, I used these two variables in the model to determine the extent to which they mediated the relationships between alternative search and frustration or regret.

Using these variables, I created a dual sequential mediation model (see Figure 4) where promotion focus and assessment mode each predicted high standards and alternative search, which in turn each predicted evaluation of options and reconsideration of options. These two self-report measures then each predicted frustration and regret. Both variables at each stage in the model were allowed to covary, and I included all direct effects to create a fully saturated model. I was particularly interested in the indirect pathways from promotion and assessment through alternative search, then testing evaluation of options and reconsideration of options as competing mediators predicting the outcome measures. I also tested the mediation pathways going through high standards. I used 5000 bias-corrected bootstrapped samples to estimate the confidence intervals of the indirect effects. The complete model is shown in Figure 4, and the key direct and indirect effects are shown in Table 12.

As shown in Table 12, promotion focus did not have any significant indirect effects predicting frustration or regret. The associations between assessment mode predicting frustration and regret, however, were mediated through the sequential mediators of alternative search and reconsideration of options. Evaluation of options did not mediate these associations. This suggests that it was reconsideration of options (and not evaluation of options) that led assessment-focused individuals who chronically engage in alternative search to experience higher frustration on the task and greater post-decision regret.

Table 12

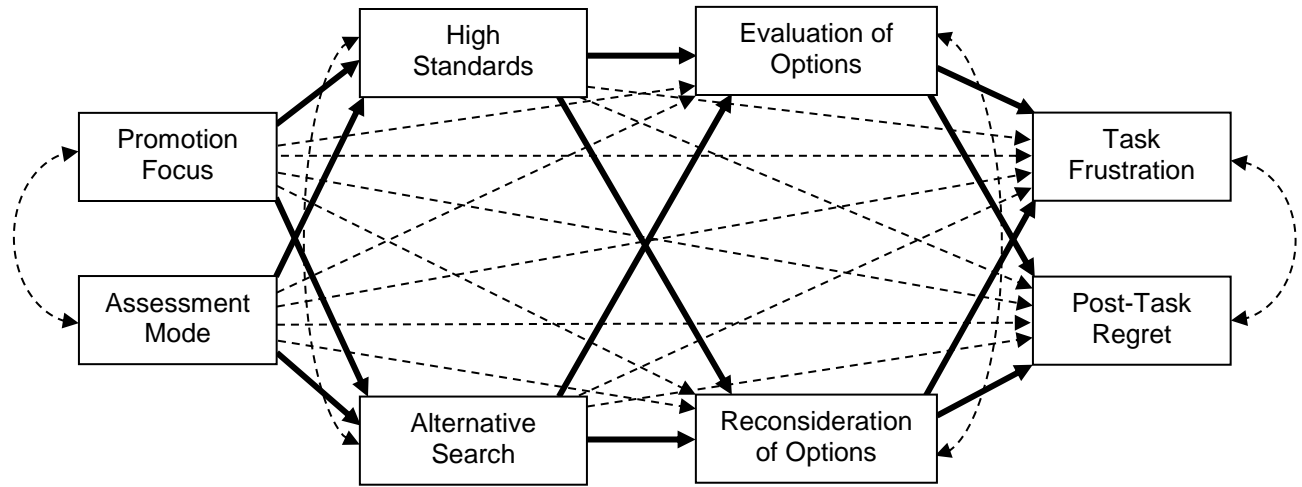
*Direct and indirect effects of motivation and maximizing on task outcomes (Study 5)*

<u>IV</u>	<u>Mediator 1</u>	<u>Mediator 2</u>	<u>DV</u>	<u>Estimate</u>	<u>95% CI</u>
<i>Direct effects</i>					
Promotion	–	–	High standards	.566***	[.312, .842]
Promotion	–	–	Alt. search	-.191	[-.478, .073]
Assessment	–	–	High standards	.613***	[.344, .910]
Assessment	–	–	Alt. search	.371**	[.138, .589]
High standards	–	–	Evaluation of options	.184*	[-.004, .365]
High standards	–	–	Reconsideration	.138	[-.032, .309]
Alt. search	–	–	Evaluation of options	.193 <sup>+</sup>	[-.007, .398]
Alt. search	–	–	Reconsideration	.192 <sup>+</sup>	[-.020, .402]
Evaluation of options	–	–	Frustration	.090	[-.068, .255]
Evaluation of options	–	–	Regret	.070	[-.052, .196]
Reconsideration	–	–	Frustration	.493***	[.331, .658]
Reconsideration	–	–	Regret	.514***	[.377, .629]
<i>Indirect effects</i>					
Promotion	High standards	Eval. options	Frustration	.009	[-.003, .042]
Promotion	High standards	Eval. options	Regret	.007	[-.002, .034]
Promotion	High standards	Reconsideration	Frustration	.038 <sup>+</sup>	[-.003, .117]
Promotion	High standards	Reconsideration	Regret	.040 <sup>+</sup>	[-.005, .118]
Promotion	Alt. search	Eval. options	Frustration	-.003	[-.029, .001]
Promotion	Alt. search	Eval. options	Regret	-.003	[-.022, .001]
Promotion	Alt. search	Reconsideration	Frustration	-.018 <sup>+</sup>	[-.075, .003]
Promotion	Alt. search	Reconsideration	Regret	-.019 <sup>+</sup>	[-.079, .003]
Assessment	High standards	Eval. options	Frustration	.010	[-.004, .045]
Assessment	High standards	Eval. options	Regret	.008	[-.003, .037]
Assessment	High standards	Reconsideration	Frustration	.042 <sup>+</sup>	[-.004, .118]
Assessment	High standards	Reconsideration	Regret	.043 <sup>+</sup>	[-.005, .129]
Assessment	Alt. search	Eval. options	Frustration	.006	[-.002, .037]
Assessment	Alt. search	Eval. options	Regret	.005	[-.001, .027]
Assessment	Alt. search	Reconsideration	Frustration	.035*	[.003, .098]
Assessment	Alt. search	Reconsideration	Regret	.037*	[.003, .095]

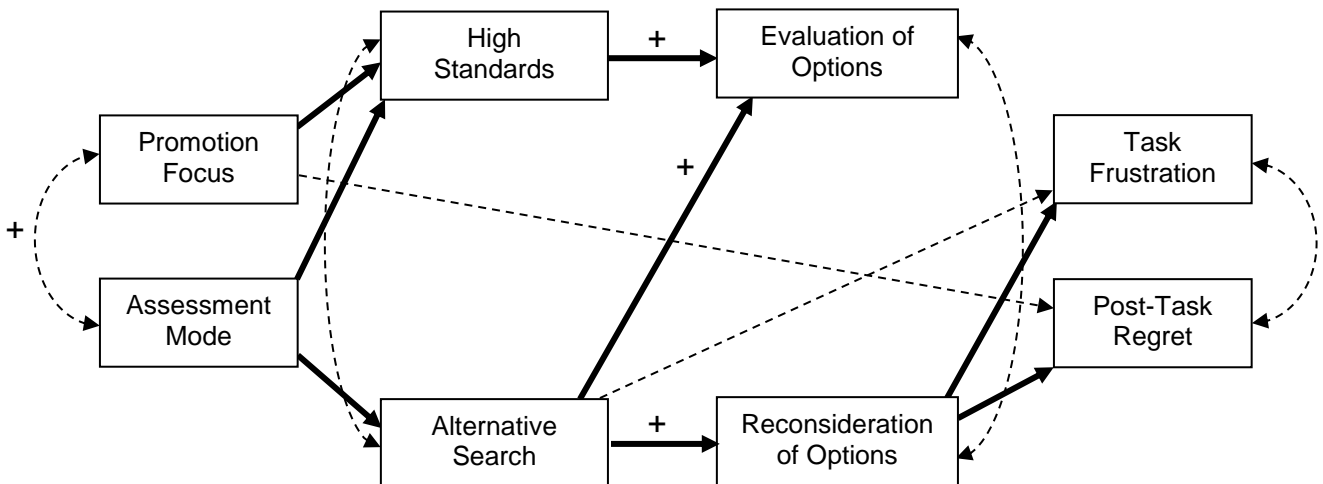
*Notes.* Estimates are unstandardized coefficients. Confidence intervals (CI) were estimated with 5000 bias-corrected bootstrapped samples. See Figure 4 for depiction of full model. <sup>+</sup>  $p < .10$ ;

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

**Panel A**



**Panel B**



*Figure 4.* Panel A: Path model for alternative search, evaluation of options and reconsideration of options mediating the effects of promotion and assessment on post-decision frustration and regret (Study 5). Disturbance terms have been removed for simplicity. Bolded pathways are paths for which mediation was tested; dashed lines are paths that were controlled for in all analyses. Panel B: The same model, showing only the direct effects that were significant or marginal (denoted with <sup>+</sup>). See Table 12 for estimates.

## **Discussion**

Study 5 provides a closer look at the behavioural processes involved with the alternative search strategy. Notably, although alternative search was associated with greater evaluation of options, this behaviour did not predict frustration or regret on the decision task. However, alternative search was also associated with reconsideration of previously dismissed options, which was in turn linked with greater frustration and regret. Thus, it appears that reconsideration in particular seems to be a key problematic behaviour involved with alternative search.

In addition, Study 5 provides the clearest picture of a comprehensive model, beginning with broad, domain-general motivational orientations, narrowing in to more specific decision styles, then zooming in even further to assess behaviours and outcomes on a discrete decision. This model provides evidence for a maladaptive, assessment-focused type of maximizing. It also shows evidence for a promotion-focused type of maximizing that is not associated with affective costs.

## Study 6

The above studies have provided robust evidence that the strategy of alternative search—and not the goal of high standards—is associated with affective costs after a decision. In addition, the process of reconsidering eliminated options seems to be at least one of the drivers of this effect. However, one limitation of this research so far is the reliance on a hypothetical consumer decision. The use of an individual discrete decision still provides an advantage over previous literature, which has largely relied on chronic measures and global assessments of decision-making (e.g., Diab et al., 2008; Schwartz et al., 2002; Turner et al., 2012). However, extending this work into other domains of decision-making, as well as using an actual rather than hypothetical decision would still offer great benefit. Thus, Study 6 addresses both of these extensions. In this study, I attempt to provide greater ecological validity of the relationships between motivations, maximizing, and decision outcomes, examining how they play out in a real, idiographic decision identified by participants.

The nature of this study was somewhat exploratory. There is reason to predict that this study might show similar relationships as the previous studies. After all, if alternative search and reconsideration of options lead individuals to think more about upward counterfactuals, for example, this process might hold both within and outside the consumer domain. On the other hand, many of the items in the maximizing scales are explicitly framed in terms of consumer decisions, so it is possible that these scales could show somewhat different patterns in a non-consumer decision. In addition, consumer decisions often provide numerous options from which to choose, whereas other decisions might provide only a few salient options for individuals. This might suggest that searching through “alternatives” is a relatively less important strategy outside the consumer context. Despite this, the motivational processes of promotion and assessment are



broad and domain-general—they are not explicitly defined even in terms of decision-making—and thus one might expect these broader motivational orientations to show similar processes within and outside the consumer domain.

Thus, for Study 6 I made tentative predictions that the maximizing subscales would show similar relationships as above with affective costs such as regret. I also made stronger predictions that assessment would show a positive relationship with regret, while promotion would show a negative relationship.

## **Method**

I recruited 403 participants (46.8% women;  $M_{\text{age}} = 34.83$ ,  $SD = 10.83$ ) from Amazon Mechanical Turk in two separate studies. Sample size was determined in advance, and I aimed for approximately 200 participants for each study. This would provide 80% power to detect effects of approximately  $r = .20$  ( $r = .14$  for the combined sample).<sup>15</sup> I excluded a priori seven participants who did not perform the central deliberation task (described below), and an additional five participants who showed clear patterns of unengaged responding (i.e., no variance in responses across the scale items). This left a final sample of 391 participants.

Participants were first given the RFQ (promotion focus,  $\alpha = .74$ ), RMS (assessment,  $\alpha = .78$ ), MTS ( $\alpha = .85$ ), and two subscales of the MI (alternative search,  $\alpha = .91$ ; decision difficulty,  $\alpha = .94$ ). After completing the scales, participants were given instructions to think about an unresolved personal dilemma characterized by uncertainty about whether to take action to make a change or not. The instructions asked them to identify a problem that was not easy to solve, but

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<sup>15</sup> Which study participants were in did not moderate any of the results; I include it as a covariate in the following analyses.

also not one for which a solution would likely never be reached. It also asked them for a decision that participants expected would be resolved within the next few months (see Appendix L).

After identifying a decision of this nature, participants completed several items about how long and how thoroughly they had been contemplating the problem, and how close they were to making a decision (on a 0-100 scale). Then, participants were asked to write about their current thoughts regarding the decision, and about how they could identify a solution to the problem.

Following this, I had three items about task difficulty: how difficult it was to think through the decision, how frustrated they felt when writing about it, and how much they struggled to think of possible solutions ( $\alpha = .78$ ). Then, in one version of the study I had two items that I created as a situational measure of high standards (e.g., “When thinking about this decision, I care about finding the *best* option;” Spearman-Brown corrected  $\alpha = .68$ ) and two items as a situational measure of alternative search (e.g., “I will carefully consider all of my options in this decision;” Spearman-Brown corrected  $\alpha = .91$ ). Due to an unexpectedly high correlation between these two scales ( $r(197) = .58, p < .001$ ), these items were not included in the second version of the study, and will not be discussed further.

I also included a post-deliberation measure of how close participants felt to making the decision (again, on a 0-100 scale). They were also asked what they would decide if they had to choose right now, and how confident they were with this decision. Following this, I had five items about reconsideration ( $\alpha = .69$ ) and six items about regret ( $\alpha = .76$ ), modified from the previous studies using the consumer decision task. Given that participants were not necessarily making their final decision for their personal dilemma during the study itself, I also included four

items about anticipated regret (e.g., “If I decided to make a change, I would regret it,” “If I decided to leave things the way they are, I would regret it”;  $\alpha = .64$ ).

## Results

The means and standard deviations for each scale, as well as their intercorrelations, are shown in Table 13.

**Motivational predictors.** As in the previous studies, I first regressed each component of maximizing and the MTS separately onto promotion and assessment. Table 4 shows that results were once again largely consistent with the previous studies, and in particular the results replicate the findings from Study 3. One notable exception was that promotion focus showed a small positive correlation with alternative search, whereas in all other cases it showed no correlation or a negative correlation with alternative search. It is possible that there are additional nuances to the MI alternative search subscale that may need further work to uncover.

Table 13  
*Correlation table of scale measures (Study 6)*

	<u>M</u>	<u>SD</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
1. Promotion Focus	3.48	.71	(.74)				
2. Assessment Mode	3.71	.75	-.23***	(.78)			
3. MTS (High Standards)	4.55	1.18	.35***	.14**	(.85)		
4. Alternative Search	4.26	.89	.10*	.17**	.34***	(.91)	
5. Decision Difficulty	3.18	1.14	-.52***	.43***	-.17**	.21***	(.94)

*Note.* Values in parentheses are Cronbach’s alpha. \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

**Maximizing subscales as predictors.** To analyze changes in closeness to making a decision as a result of deliberation, I used a random slopes and intercepts multilevel model with time (0 for pre-deliberation, 1 for post-deliberation) interacting with high standards, alternative search, and decision difficulty. This revealed a main effect of time,  $B = 1.27$ ,  $t(386) = 2.06$ ,  $p =$

.04, such that participants tended to report being closer to making a decision after deliberating. The model also revealed a marginal interaction between alternative search and time,  $B = 1.45$ ,  $t(386) = 1.88$ ,  $p = .06$ , with individuals high (+1 SD) vs. low (-1 SD) in alternative search reporting being slightly further away from making a decision pre-deliberation, but equally close as those low in alternative search post-deliberation.

The results for the rest of the dependent variables are shown in Table 14. When examining the zero-order correlations, both alternative search and decision difficulty were associated with negative outcomes, including greater task difficulty and reconsideration, and greater regret and anticipated regret. Decision difficulty was also negatively correlated with confidence in the decision participants would make if they had to decide at that moment. High standards, on the other hand, was not correlated with any of these negative outcomes apart from an unexpected marginal correlation with reconsideration; however, it was significantly correlated with greater confidence in the decision.

Examining the regression models, where these three subscales were included together, decision difficulty subscale showed the strongest results, predicting greater task difficulty, reconsideration of options, regret, and anticipated regret. Alternative search was no longer associated with the same pattern of problematic results; it predicted greater reconsideration, but not greater difficulty, regret, or anticipated regret.<sup>16</sup> Interestingly, even when included together in a model with alternative search and decision difficulty, high standards in this study still predicted greater reconsideration, and was also marginally associated with greater regret. However, at the

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<sup>16</sup> Follow-up analyses indicate that decision difficulty significantly mediated the relationships between alternative search and each of these task outcomes except for confidence. This may suggest that part of the relationship between alternative search and negative task outcomes is shared at the chronic level with difficulty making decisions in general. What is less clear is whether the decision difficulty measure can serve in an explanatory role to describe why alternative search is associated with these negative outcomes at all.

same time high standards predicted greater confidence in the decision if participants had to decide at that moment.

Table 14  
*Regression models with maximization, promotion, and assessment predicting task outcomes (Study 6)*

	<u>Task Difficulty</u>	<u>Reconsideration</u>	<u>Regret</u>	<u>Anticipated Regret</u>	<u>Confidence</u>
<u>Zero-order correlations</u>					
High standards	-.05	.09 <sup>+</sup>	.03	-.06	.19***
Alt. search	.09 <sup>+</sup>	.22***	.14**	.09 <sup>+</sup>	-.01
Decision diff.	.36***	.34***	.43***	.33***	-.11*
Promotion	-.23***	-.13*	-.29***	-.29***	.13*
Assessment	.13*	.17**	.17**	.16**	-.01
<u>Regression models</u>					
<i>Model 1</i>					
High standards	.01	.11*	.10 <sup>+</sup>	-.02	.20***
Alt. search	.01	.11*	.02	.03	-.07
Decision diff.	.36***	.33***	.44***	.32***	-.06
<i>Model 2</i>					
Promotion	-.21***	-.10 <sup>+</sup>	-.26***	-.27***	.13*
Assessment	.08	.15**	.11*	.10*	.03

*Notes.* Values for regression models are standardized coefficients ( $\beta$ ). <sup>+</sup>  $p < .10$ ; \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ .

**Promotion and assessment as predictors.** Similar to the maximizing analyses, to analyze changes in closeness to making a decision, I used a random slopes and intercepts multilevel model with time interacting with promotion and assessment. This revealed only a main effect of time,  $B = 1.28$ ,  $t(387) = 2.06$ ,  $p = .04$ , such that participants tended to report being closer to making a decision after deliberating; and a main effect of promotion,  $B = 4.14$ ,  $t(386) = 2.71$ ,  $p = .01$ , with individuals high (vs. low) in promotion focus reporting being closer to making a decision independent of time.

The results for the rest of the dependent variables are shown in Table 10. Promotion focus predicted lower task difficulty, marginally lower reconsideration, lower regret, lower anticipated regret, and higher confidence in the decision. Assessment, on the other hand, predicted greater reconsideration, greater regret, and greater anticipated regret. These relationships generally held at the zero-order level as well, with assessment additionally being positively correlated with task difficulty.

## **Discussion**

Study 6 extends the previous studies with a novel paradigm, using participants' own personal decisions instead of a given consumer decision. Interestingly, the maximizing subscales showed somewhat different patterns in this study than in the previous studies: while alternative search and decision difficulty were both still associated with greater reconsideration and regret, high standards now showed a weak positive correlation with reconsideration, and was uncorrelated with task difficulty and regret. (Indeed, it showed a marginal positive relationship with regret when all three subscales were included in the model.)

Given that the main change in this study was the use of the personal decision task, one possible reason for these differences is that the maximizing subscales may lean more heavily toward measurement of maximizing within consumer decisions. This is, of course, speculative, but it is possible that individuals who generally have high standards may be more prone to place higher importance on their personal decisions and thus be more likely to engage in greater reconsideration of options in this domain. However, it is important that the results are not overinterpreted, especially given that high standards was also associated with greater confidence in the decision participants would make if they had to make it immediately.

Despite this somewhat different pattern of results for maximizing, promotion and assessment show the typical pattern in this domain as well, with promotion associated with less difficulty, reconsideration, and regret, and assessment positively related to all these outcomes. In general, then, it seems that these domain-general motivational constructs may be better able to predict adaptive and maladaptive decision-making outside the consumer domain, given that they provide insight into the underlying reasons why individuals use particular goals and strategies.

## General Discussion

The current research provides evidence for several important insights into maximizing. First, Studies 1-3 provide evidence that it is possible to distinguish between different types of maximizers, one represented by an adaptive profile that is not associated with affective costs when making decisions, and another with a more maladaptive profile that is prone to experiencing negative affective outcomes such as frustration and regret. Although both types of maximizers may be pursuing the same optimization goal, the strategies they use to pursue this goal differ, leading to divergent outcomes. Second, Studies 3-5 demonstrate with several converging lines of evidence that alternative search, as measured as a chronic individual difference, is a strategy that is particularly associated with a maladaptive type of maximizing. Latent classes with high alternative search predicted greater reconsideration and regret; alternative search mediated the link between assessment and frustration on a decision task; and alternative search, together with reconsideration of options, helped to explain greater frustration and regret. Third, Studies 2-4 identify key motivational orientations—promotion focus and assessment mode—that are both associated with the optimization goal of maximizers but differentially predict use of alternative search strategies. Fourth, Study 5 investigates one key behaviour, reconsideration of options, that explains why alternative search is maladaptive.<sup>17</sup> Finally, Study 6 demonstrates that these relationships between motivations, decision-making approaches, and affective costs hold true in personal (non-consumer) decisions as well.

In sum, by differentiating between goals and strategies, the current research provides a much more nuanced picture of when and why maximizing goals may or may not be problematic. In this model, alternative search is not an inherent part of maximizing, but one that depends on

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<sup>17</sup> See Appendix M for an extended discussion and additional analyses of the alternative search and assessment scales to address their conceptual distinction from negative affect, neuroticism, and anxiety.



the particular underlying motivations a decision-maker holds. In this way, my research helps to integrate the disparate findings from previous literature—which disagreed about whether maximizing was associated with affective costs or not—and at the same time provides a connection with the broader motivational literature on promotion focus and assessment mode.

Identifying such antecedent motivational orientations is an important benefit, as it can help to explain both *why* people maximize and also *how* they choose to pursue such goals. Promotion-focused maximizers are oriented toward the pursuit of gains, and generally pursue these gains using eager, approach-oriented strategies that help them to avoid affective costs. Assessment-focused maximizers, on the other hand, are oriented toward making careful, thoroughly-evaluated decisions to find the right option, and as such tend to use strategies such as alternative search. In and of itself, this comprehensive evaluation may not be problematic. Indeed, taking the time to evaluate one's options is a critical component of successful self-regulation through goal planning and deliberation. However, the present research shows that individuals high in assessment seem to have a particular vulnerability to *continuing* to deliberate in ways that become problematic. In particular, this research shows that assessors are more likely to reconsider options they had previously dismissed, which in turn leads to frustration and regret. By laying out these profiles of maximizers, this research benefits from the rich theoretical frameworks of these broad, domain-general motivations.

### **Implications for the Decision-Making Literature**

The present research is an investigation of decision-making processes built upon a motivational framework. In particular, I have suggested that the phenomenon of maximizing may be divided into an investigation of goals and strategies. This distinction has been made in the literature on motivation, suggesting that these two processes of goals and strategies operate on

different, conceptually independent “levels” (e.g., Kruglanski et al., 2002; Scholer & Higgins, 2011, 2013). Within the regulatory focus literature, for example, at the goal level promotion and prevention are distinguished by the way in which each conceptualizes its goals (ideals versus duties, respectively), whereas at the strategic level they are distinguished by the preferred means they use to pursue those goals (eagerness versus vigilance; Higgins, 1997; Scholer & Higgins, 2011). Distinguishing between the goal level and strategic level is generative for providing nuanced predictions regarding how different levels in the hierarchy interact (e.g., predictions about the experiences of promotion- or prevention-focused individuals when pursuing goals using their preferred vs. non-preferred means; Freitas & Higgins, 2002). This distinction between levels is quite general and could reasonably be applied to many areas of research to disentangle the circumstances under which a phenomenon’s affective consequences could be positive or negative.

The current work provides further evidence that one level may lead to problematic behaviours or outcomes while another level does not, again making it important to distinguish between them. It underscores that the vulnerability in maximizing appears to be the use of a problematic strategy, not a problematic goal. This insight is important not only for understanding what it means to maximize, but for developing effective interventions. For example, drawing on work within goal systems theory (Kruglanski et al., 2002), it suggests that helping individuals identify other effective equifinal means (i.e., strategies that can also serve the goal of wanting the best) would be one possible approach.

Certainly, motivational frameworks such as these have been present in some areas within the decision-making literature (e.g., Higgins & Cornwell, 2016; Otto, Clarkson, & Kardes, 2016; Roets & Van Hiel, 2011; Tyszka, 1998; Zeelenberg, Nelissen, & Pieters, 2008). However, in the

maximizing literature in particular, maximization has been largely treated as a chronic individual difference, a decision-making style that is largely stable from one context to the next and that binds a goal to a particular strategy (Cheek & Schwartz, 2016). The literature has thus largely focused on downstream consequences of this chronic style rather than investigating the antecedent causes or the ways in which this style plays out in actual decisions. This is where I believe a motivational framework is valuable, providing a dynamic structure that focuses on how and why such decision-making styles are adopted by individuals. Describing the underlying goals of maximizing can provide an explanatory role, and investigating the strategic behaviours of maximizers provides more insight into the phenomenological details of how it manifests.

I believe this motivational framework may also provide insight into how to conceptualize satisficing, a construct typically defined as the opposite of maximizing (Schwartz et al., 2002), but which some have instead argued to be orthogonal to maximizing (Turner et al., 2012; Weinhardt et al., 2012). Satisficing has typically been described as involving *both* the goal of finding a “good enough” option and the strategy of less intensive search. However, I propose that, as I have argued with maximizing, it is possible to differentiate between the goals and strategies of satisficers. Thus, maximizers and satisficers have different goals (“best” versus “good enough”), but their strategies could potentially overlap. Without this differentiation, whether satisficing is orthogonal or not could be a function of how it is measured. In addition, as with maximizing, there may be more or less adaptive forms of satisficing revealed by the strategies people use.

The present research also provides empirical insights that may help to inform other areas of the decision-making literature. For example, there are many studies that have examined the role of counterfactual thinking in decisions (e.g., Hafner, White, & Handley, 2012; Markman,

Gavanski, Sherman, & McMullen, 1993; Summerville, 2011; Walchli & Landman, 2003). Counterfactuals are mental simulations of how reality *could have been* if different choices been made, and are thus typically oriented toward the past (Markman et al., 1993; Roese, 1997). Counterfactual thinking has often been studied in relation to regret and disappointment (e.g., Huang & Zeelenberg, 2012; Zeelenberg et al., 1998). Maximizing has also been associated with a greater tendency to engage in counterfactual thinking (Iyengar et al., 2006; Leach & Patall, 2013; Schwartz et al., 2002), though this research did not distinguish between the individual maximizing subscales.

However, people's use of counterfactuals is complex, and in some cases individuals selectively choose to avoid counterfactual information to the extent they anticipate they will feel regret (Summerville, 2011). The current research provides additional insight into these complex processes by highlighting the role of re-evaluating options that were previously dismissed. This behaviour has many conceptual similarities with counterfactuals, because individuals are not able to fully let go of an option they have already decided is not sufficient. Instead, they keep returning to a decision they made (to eliminate the option) to re-assess it. Such behaviour is plausibly driven by anticipated regret, where individuals generate counterfactuals about how the decision outcome could end up different if the given option had not been eliminated. In this sense, I would argue that reconsideration of options can form the "seeds" of counterfactual thinking when looking back at the decision as a whole once it is made. To the extent that individuals continually remind themselves of all their options (even the ones they have dismissed), these choices may remain active after the decision is made. The glimpse into this particular behavioural process offers exciting avenues for studying how and when individuals generate counterfactuals during and after decisions. However, more fine-tuned measures are

needed to determine exactly what drives this reconsideration of options to provide further insight into how it relates to counterfactual thinking.

### **Implications for Regulatory Focus and Mode**

Numerous studies have applied regulatory focus theory to the context of decision-making, including the investigation of risk (Scholer, Zou, Fujita, Stroessner, & Higgins, 2010; Zou & Scholer, 2016; Zou, Scholer, & Higgins, 2014), implications for making decisions for others versus the self (Polman, 2012), and the propensity to make decisions that enact change versus maintain the status quo (Lieberman, Idson, Camacho, & Higgins, 1999; Spanjol & Tam, 2010). The literature on regulatory mode is comparatively smaller, but research has examined the propensity for counterfactual thinking (Pierro et al., 2008), preferences for risk-taking (Panno, Lauriola, & Pierro, 2015; Panno, Pierro, & Lauriola, 2014), commitment to change after making a decision (Scholer & Higgins, 2012), preferences for positive or negative consumer reviews (Lee & Koo, 2015), preferences for means serving one goal or multiple goals (Orehek, Mauro, Kruglanski, & van der Bles, 2012), and inter-temporal choices (Mannetti et al., 2009).

The implications of the present research go beyond simply linking regulatory focus and regulatory mode to a novel phenomenon, maximizing. First, this research provides insight into how these motivational orientations play out in decisions at the strategic level. Studies 2, 4, and 5 provide evidence that one key strategic difference between promotion and assessment is the use of alternative search. Study 5 in particular provides deeper insight into how this strategy is enacted, through the use of both evaluation and reconsideration of options, the latter of which is linked with negative affective outcomes. Although there is some research demonstrating a link between assessment, counterfactual thinking, and regret (Panno et al., 2015; Pierro et al., 2008), the current research provides a clearer picture of how the particular strategy of searching through

options is associated with this particular form of counterfactuals—the reconsideration of options that one had previously dismissed.

Second, the present research is fairly unique in terms of focusing on promotion and assessment. Most research has typically focused on promotion and prevention focus (regulatory focus), or on locomotion and assessment (regulatory mode; for exceptions see Appelt et al., 2010; Struk, Scholer, & Danckert, 2016). Although regulatory focus theory posits promotion and prevention to be orthogonal to each other, and regulatory mode theory posits that locomotion and assessment are orthogonal, in much of the research they are treated like “opposites” where their effects are contrasted. This can certainly be a sound approach, and these contrasts can produce meaningful insights into how these motivational orientations operate. However, it has meant that there is very little work that measures both sets of constructs in the same study; the two literatures are largely separate.

In the current research I chose to concentrate particularly on promotion focus and assessment mode for the insights they could provide on maximizing, given that they generated fruitful hypotheses. In particular, I was able to demonstrate that one similarity between promotion focus and assessment mode is the type of goals they pursue (toward optimization). Despite the fact that these orientations have many different characteristics, and have been associated with very different outcomes, by integrating these literatures I was able to demonstrate a key point of similarity between them that might otherwise have been missed, and provide rich detail about how these motivations play out in the context of decision-making. My hope is that future work on regulatory focus and mode can continue to integrate these literatures to generate novel questions. For example, how might locomotion and assessment impact the way in which individuals choose and pursue their ideals (promotion) or duties (prevention)? How do

the eager or vigilant strategic approaches of promotion and prevention interact with locomotion's concern for "movement" and assessment's concern for "evaluation"? These questions can only be answered with further examination of the connections between these two literatures.

### **High Standards and Adaptive Decision-Making**

Throughout the current research, there was little evidence that high standards were associated with negative outcomes. Study 6 did provide some slight evidence that high standards may be associated with reconsideration of options and regret, in at least one type of decision task. However, in Study 5 it was related to being more thorough (greater evaluation of dimensions and options), and Studies 3 and 6 indicated a relationship between high standards and greater conviction and confidence. Given these findings, it is natural to ask why high standards could lead to being more thorough without much in the way of negative consequences.

I have conceptualized high standards as the goal of wanting the best. In line with the goal-setting literature, setting difficult and specific goals generally leads to better performance, through greater effort and persistence (Locke & Latham, 1990, 2002, 2006). This effect is strongest when individuals are committed to their goals. Thus, being committed to the goal of wanting the best may lead individuals to enact different cognitive and motivational strategies than individuals who are less committed.

In Heckhausen and Gollwitzer's (1987) "Rubicon model" of goal regulation, there is a distinction made between the "predecisional" phase and the implementation or "action" phase (Gollwitzer, 1990; Gollwitzer et al., 1990). Individuals in the predecisional phase deliberate over possible courses of action, where accurate evaluations of value are desired in order to establish which goal to pursue. Once that decision is made, however, individuals move to the action phase where cognitive and motivational processes serve to amplify an individual's focus on

implementing the current goal, pushing aside reflections over other goals. These processes may include goal shielding by reducing the salience of competing goals (Shah, Friedman, & Kruglanski, 2002), the reduction of cognitive dissonance by amplifying the value of the current goal (Brehm, 1956; Harmon-Jones, Amodio, & Harmon-Jones, 2009; Nenkov & Gollwitzer, 2012), and a focus on implementation intentions—plans that serve to anticipate and overcome barriers to goal attainment (Gollwitzer, 1999; Gollwitzer et al., 1990; Sheeran, Webb, & Gollwitzer, 2005).

This two-stage model of goal setting and goal striving was part of the inspiration for regulatory mode theory, which contends that individuals and situations can emphasize assessment or locomotion concerns, regardless of goal stage. Specifically, assessors emphasize the concerns typically associated with the goal-setting (predecisional) stage and locomotors emphasize the concerns typically associated with the goal-striving (action) stage (Kruglanski et al., 2000). As such, high assessors may be hesitant to close off deliberation over other options, leading to a reduction of the motivational processes leading to successful implementation of goals. In conjunction with this, there is evidence that high (vs. low) maximizers do not experience the same level of cognitive dissonance reduction after making a decision, which in turn reduces their satisfaction with the decision they made (Shiner, 2015; Sparks et al., 2012). This research unfortunately did not distinguish between high standards and alternative search. However, it stands to reason, given the current research, that alternative search in particular may be driving continued reconsideration of options, leading to less dissonance reduction.

In the absence of alternative-search-focused exploration for additional options and assessment-focused deliberation over these options, however, it stands to reason that high standards could lead to strong processes that serve to protect goal implementation. First, focusing



on implementation intentions may help decision-makers to anticipate potential obstacles to making a final decision and develop plans for dealing with them. Second, goal shielding may reduce the salience of options that have already been dismissed, leading to lower reconsideration of options. Finally, after the decision has been made, dissonance may “kick in” to increase the perceived value of the chosen option over others. Such processes, of course, may not always be adaptive: for example, if a poor decision is selected, dissonance reduction may actively serve to favourably skew the perceptions of its quality. However, within the context of high standards, setting that high and specific goal may help to motivate effort toward ensuring that a reasonably good option (even if ultimately not the “best”) is selected in the first place. After the decision has been reached, motivational processes then serve to allow the decision-maker to feel satisfied with the outcome.

### **Limitations and Future Directions**

One of the key advantages of the current research is the measurement of maximizing and affective costs on discrete decision tasks, rather than relying on broad, chronic measures of general decision-making. Although such tasks have been employed in some of the previous research on maximizing (e.g., Iyengar, Wells, & Schwartz, 2006; Nenkov, Morrin, Ward, Schwartz, & Hurland, 2008; Yang & Chiou, 2010), it is relatively rare. However, the attempt to measure behaviours associated with alternative search in Study 5 was unfortunately more difficult than anticipated. Although I was able to get some reasonable measures of behaviour, the attempt to measure reconsideration *behaviourally* was unsuccessful—likely because participants were more likely to reconsider options in their minds than they were to actually click the checkbox to have the option displayed on the screen again. As such, self-report turned out to be a more useful measure than observation of these infrequent behaviours. However, it is still

important for future research to work on developing better ways to capture decision-makers' actual behaviour on decisions—what they look at, what they dismiss, and how they sort through options as they go. Eye-tracking and mouse-tracking software may be possible avenues for such efforts. Accurately measuring these behaviours can provide a much clearer picture about what maximizers are actually *doing* as they make their decisions.

A second limitation of this research was the emphasis on correlational studies. While this provides an examination of the processes in question across the range of natural variation in these motivational orientations and decision styles, it does limit the inferences that can be made regarding causality. There are strong reasons to believe that broad, domain-general motivational processes should exert causal influence on context-specific decision goals, strategies, and behaviours rather than the other way around. However, on a longer timeline it may be the case that the individual decisions one makes “feed upward” to strengthen particular goal orientations that then exert their influence on future decisions. Testing such bidirectional effects is beyond the scope of the current research. However, it is important for future research to test the causality of these effects in the short- and medium-term.

A further limitation of this research was the focus on a single decision-making strategy, alternative search. Despite my theoretical framework suggesting that alternative search is one of many possible strategies that maximizers could use when making decisions, I focused on alternative search because this is the construct that has received the most attention in the literature to date. Indeed, many researchers have suggested that it is part of the definition of what it means to be a maximizer (Bergman et al., 2007; Cheek & Schwartz, 2016; Nenkov et al., 2008; Rim et al., 2011; Schwartz et al., 2002). As such, clarification on this point in particular was important for my research. However, it is also critical for future research to understand what

strategies promotion-focused maximizers are using when they make decisions, and whether adopting such strategies might similarly help assessors to avoid affective costs when making decisions. For example, it is possible that promotion-focused maximizers are able to use strategies such as relying on expert reviews of products, or setting time limits for themselves when making decisions. One recent article has suggested that satisficers are more likely to consider the *feasibility* of taking the time to examine their options thoroughly (Luan & Li, 2017); although this article contrasted such considerations with maximizers, it is possible that promotion-focused maximizers use similar considerations to provide a better balance between the search for the best option and the efficient use of time. While such a connection is speculative, the distinction between goals and strategies outlined here can ensure that future research pays more attention to other strategies that maximizers can employ, without conflating alternative search as a fundamental aspect of maximizing.

Another avenue for future research is the prospect of interventions to reduce the affective costs experienced by some maximizers. The current research has focused on elucidating the motivations and behaviours on a theoretical level, but application of this research is necessary as well. In particular, my research identified reconsideration of options as a maladaptive behaviour during decisions, and I believe this may make a particularly good target for intervention. It may be possible to provide manipulations that adjust the mindset of the decision-maker to reduce such counterfactual thinking, or to structure the decision task itself for a similar end. It may be possible to structure information about the available options in a way that reduces the inclination to think about the options previously dismissed. Such interventions are an exciting direction for future research.

In summary, the research presented here has provided a valuable framework for understanding what maximizing is and how it operates. This framework helps to integrate the previous research on maximizing, but I believe it offers many promising directions for future research to tackle. By distinguishing between the goals and strategies of decision-makers, it is possible to provide a clearer picture of when and why some decision-makers experience negative emotional outcomes during and after a decision. Such research, I hope, provides new insight that can help people to make decisions in better ways.

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## Appendix A

### Descriptions of Scales Used in Factor Analysis (Study 1)

<u>Scale Title</u>	<u>Description</u>	<u>Sample Items</u>
Approach/Avoidance Temperament (AAT)	Tendency to pursue approach- or avoidance-oriented goals	<p>“I’m always on the lookout for positive opportunities and experiences.”</p> <p>“I feel anxiety and fear very deeply.”</p>
Abbreviated Math Anxiety Scale (AMAS)	Anxiety about mathematics	<p>“I feel anxious when...thinking about an upcoming math test one day before.”</p> <p>“I feel anxious when...listening to a lecture in math class.”</p>
Buss-Perry Aggression Questionnaire (BPAQ)	Physical and verbal aggressive tendencies, anger, and hostility	<p>“I have become so mad that I have broken things.”</p> <p>“I can’t help getting into arguments when people disagree with me.”</p>
Boredom Proneness Scale (BPS)	Tendency to experience boredom	<p>“I find it hard to entertain myself.”</p> <p>“Much of the time I just sit around doing nothing.”</p>
Brief Self-Control Scale (BSCS)	Ability to control impulses and pursue long-term goals	<p>“I am good at resisting temptation.”</p> <p>“People would say that I have iron self-discipline.”</p>
Depression, Anxiety, and Stress Scales (DASS)	Experience of depression, anxiety, and stress over past week	<p>“I found it difficult to work up the initiative to do things.”</p> <p>“I found myself getting agitated.”</p>
Dimensional Obsessive-Compulsive Scale (DOCS)	Concerns about germs and contamination, responsibility for harm, unacceptable thoughts, symmetry and completeness	<p>“To what extent have you avoided situations in order to prevent concerns with contamination or having to spend time washing, cleaning, or showering?”</p> <p>“To what extent have you been avoiding situations, places, objects and other reminders (e.g., numbers, people) that trigger unwanted or unpleasant thoughts?”</p>
Five Facet Mindfulness Questionnaire (FFMQ)	Nonreactivity to inner experience, observing and attending to sensations and thoughts, acting with awareness, describing feelings, and nonjudging of experience	<p>“I perceive my feelings and emotions without having to react to them.”</p> <p>“I pay attention to sensations, such as the wind in my hair or sun on my face.”</p>

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Maximization Scale (MS)	Pursuit of high standards, seeking alternatives in decisions, difficulty making decisions	“I never settle for second best.” “I treat relationships like clothing: I expect to try a lot on before I get the perfect fit.”
Regulatory Focus Questionnaire (RFQ)	Development of orientation toward ideals (promotion) or obligations (prevention) from childhood	“I feel like I have made progress toward being successful in my life.” “How often did you obey rules and regulations that were established by your parents?”
Regulatory Mode Scale (RMS)	Tendency to initiate goal pursuit (locomotion) or critically evaluate alternatives (assessment)	“When I decide to do something, I can’t wait to get started.” “I often critique work done by myself and others.”
Rosenberg Self-Esteem Scale (RSES)	Feelings of self-worth and positive self-image	“On the whole I am satisfied with myself.” “At times I think I am no good at all.” (R)
Marlowe-Crowne Social Desirability Scale–Short (SDS)	Tendency to endorse socially desirable answers	“I have never intensely disliked anyone.” “There have been times when I was quite jealous of the good fortune of others.” (R)
Social Phobia Inventory (SPIN)	Fear of social interactions and embarrassment	“Parties and social events scare me.” “Being embarrassed or looking stupid are among my worst fears.”
State-Trait Inventory for Cognitive and Somatic Anxiety (STICSA)	Frequency of anxious thoughts and bodily sensations	“I can’t get some thoughts out of my mind.” “My palms feel clammy.”
Ten-Item Personality Inventory (TIPI)	Extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience	“I see myself as...dependable, self-disciplined.” “I see myself as...extraverted, enthusiastic.”

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## Appendix B

### Regulatory Focus Questionnaire (Higgins et al., 2001); (Studies 1-6)

*Note:* Items used to measure promotion focus are provided in bold. Reverse-coded items are denoted with (R).

This set of questions asks you about specific events in your life. Please indicate your answer to each question by selecting the appropriate number on the scale below it.

1	2	3	4	5
never or seldom		sometimes		very often

- 1. Compared to most people, are you typically unable to get what you want out of life? (R)**
2. Growing up, would you ever “cross the line” by doing things that your parents would not tolerate? (R)
- 3. How often have you accomplished things that got you “psyched” to work even harder?**
4. Did you get on your parents’ nerves often when you were growing up? (R)
5. How often did you obey rules and regulations that were established by your parents?
6. Growing up, did you ever act in ways that your parents thought were objectionable? (R)
- 7. Do you often do well at different things that you try?**
8. Not being careful enough has gotten me into trouble at times. (R)
- 9. When it comes to achieving things that are important to me, I find that I don’t perform as well as I ideally would like to do. (R)**
- 10. I feel like I have made progress toward being successful in my life.**
- 11. I have found very few hobbies or activities in my life that capture my interest or motivate me to put effort into them. (R)**

## Appendix C

### Regulatory Mode Scale (Kruglanski et al., 2000); (Studies 1-6)

*Note:* Items used to measure assessment mode are provided in bold. Reverse-coded items are denoted with (R).

Read each of the following statements and decide how much you agree with each according to your beliefs and experiences. Please respond according to the following scale:

1	2	3	4	5	6
Strongly disagree	Moderately disagree	Slightly disagree	Slightly agree	Moderately agree	Strongly agree

1. I don't mind doing things even if they involve extra effort.
- 2. I never evaluate my social interactions with others after they occur. (R)**
3. I am a "workaholic."
4. I feel excited just before I am about to reach a goal.
5. I enjoy actively doing things, more than just watching and observing.
- 6. I spend a great deal of time taking inventory of my positive and negative characteristics.**
- 7. I like evaluating other people's plans.**
8. I am a "doer."
- 9. I often compare myself with other people.**
- 10. I don't spend much time thinking about ways others could improve themselves. (R)**
- 11. I often critique work done by myself and others.**
12. When I finish one project, I often wait awhile before getting started on a new one. (R)
- 13. I often feel that I am being evaluated by others.**
14. When I decide to do something, I can't wait to get started.
- 15. I am a critical person.**
- 16. I am very self-critical and self-conscious about what I am saying.**

17. By the time I accomplish a task, I already have the next one in mind.
- 18. I often think that other people's choices and decisions are wrong.**
19. I am a "low energy" person. (R)
20. Most of the time my thoughts are occupied with the task that I wish to accomplish.
- 21. I rarely analyze the conversations I have had with others after they occur. (R)**
22. When I get started on something, I usually persevere until I finish it.
23. I am a "go-getter."
- 24. When I meet a new person I usually evaluate how well he or she is doing on various dimensions (e.g., looks, achievements, social status, clothes).**

## Appendix D

Maximization Scale (Schwartz et al., 2002); (Studies 1, 2, 4, and 5)

*Note:* HS = High Standards; AS = Alternative Search; DD = Decision Difficulty.

1                      2                      3                      4                      5                      6                      7  
Strongly disagree                      Neutral                      Strongly agree

1. When I watch TV, I channel surf, often scanning through the available options even while attempting to watch one program. (AS)
2. When I am in the car listening to the radio, I often check other stations to see if something better is playing, even if I'm relatively satisfied with what I'm listening to. (AS)
3. I treat relationships like clothing: I expect to try a lot on before I get the perfect fit. (AS)
4. No matter how satisfied I am with my job, it's only right for me to be on the lookout for better opportunities. (AS)
5. I often fantasize about living in ways that are quite different from my actual life. (AS)
6. I'm a big fan of lists that attempt to rank things (the best movies, the best singers, the best athletes, the best novels, etc.). (AS)
7. I often find it difficult to shop for a gift for a friend. (DD)
8. When shopping, I have a hard time finding clothing that I really love. (DD)
9. Renting videos is really difficult. I'm always struggling to pick the best one. (DD)
10. I find that writing is very difficult, even if it's just writing a letter to a friend, because it's so hard to word things just right. I often do several drafts of even simple things. (DD)
11. No matter what I do, I have the highest standards for myself. (HS)
12. I never settle for second best. (HS)
13. Whenever I'm faced with a choice, I try to imagine what all the other possibilities are, even ones that aren't present at the moment. (HS)

## Appendix E

### Maximizing Tendencies Scale (Diab et al., 2008); (Studies 2, 3, 4, and 6)

1                      2                      3                      4                      5                      6                      7  
Strongly disagree                      Neutral                      Strongly agree

1. No matter what it takes, I always try to choose the best thing.
2. I don't like having to settle for "good enough."
3. I am a maximizer.
4. No matter what I do, I have the highest standards for myself.
5. I will wait for the best option, no matter how long it takes.
6. I never settle for second best.
7. I am uncomfortable making decisions before I know all of my options.
8. Whenever I'm faced with a choice, I try to imagine what all the other possibilities are, even ones that aren't present at the moment.
9. I never settle.

## Appendix F

### Maximization Inventory (Turner et al., 2012); (Studies 3 and 6)

*Note:* SA = Satisficing; AS = Alternative Search; DD = Decision Difficulty. Reverse-coded items are denoted with (R).

1	2	3	4	5	6
Strongly disagree	Moderately disagree	Slightly disagree	Slightly agree	Moderately agree	Strongly agree

1. I usually try to find a couple of good options and then choose between them. (SA)
2. At some point you need to make a decision about things. (SA)
3. In life I try to make the most of whatever path I take. (SA)
4. There are usually several good options in a decision situation. (SA)
5. I try to gain plenty of information before I make a decision, but then I go ahead and make it. (SA)
6. Good things can happen even when things don't go right at first. (SA)
7. I can't possibly know everything before making a decision. (SA)
8. All decisions have pros and cons. (SA)
9. I know that if I make a mistake in a decision that I can go "back to the drawing board." (SA)
10. I accept that life often has uncertainty. (SA)
11. I usually have a hard time making even simple decisions. (DD)
12. I am usually worried about making a wrong decision. (DD)
13. I often wonder why decisions can't be more easy. (DD)
14. I often put off making a difficult decision until a deadline. (DD)
15. I often experience buyer's remorse. (DD)
16. I often think about changing my mind after I have already made my decision. (DD)
17. The hardest part of making a decision is knowing I will have to leave the item I didn't choose behind. (DD)

18. I often change my mind several times before making a decision. (DD)
19. It's hard for me to choose between two good alternatives. (DD)
20. Sometimes I procrastinate in deciding even if I have a good idea of what decision I will make. (DD)
21. I find myself often faced with difficult decisions. (DD)
22. I do not agonize over decisions. (DD; R)
23. I can't come to a decision unless I have carefully considered all of my options. (AS)
24. I take time to read the whole menu when dining out. (AS)
25. I will continue shopping for an item until it reaches all of my criteria. (AS)
26. I usually continue to search for an item until it reaches my expectations. (AS)
27. When shopping, I plan on spending a lot of time looking for something. (AS)
28. When shopping, if I can't find exactly what I'm looking for, I will continue to search for it. (AS)
29. I find myself going to many different stores before finding the thing I want. (AS)
30. When shopping for something, I don't mind spending several hours looking for it. (AS)
31. I take the time to consider all alternatives before making a decision. (AS)
32. When I see something that I want, I always try to find the best deal before purchasing it. (AS)
33. If a store doesn't have exactly what I'm shopping for, then I will go somewhere else. (AS)
34. I just won't make a decision until I am comfortable with the process. (AS)

## Appendix G

### Consumer Decision Task (Study 3-4)

For this next task, we want to examine how individuals make decisions about consumer products. On the next page, we will present you with information about different varieties of vehicles. These vehicles were rated by Consumer Reports Canada as some of the top-rated in their respective categories.

Imagine that you are looking to purchase a vehicle. Please look at the information for the different vehicles and decide which one you would choose to buy for yourself.

Please look at the information below to make your choice. How many options you consider is up to you. You may consider as many or as few choices as you wish before making your decision. When you are ready to make your decision, please click the button at the bottom of the page and then select the car you wish to choose.

<b>Make</b>	<b>Model</b>	<b>Type</b>	<b>Price</b>	<b>Fuel Efficiency (city)</b>	<b>Max. Cargo</b>	<b>Horse-power</b>	<b>Seating</b>	<b>Fuel Tank</b>
Chevrolet	Sonic	Compact	\$13,665	37 mpg	422 L	138	5	46 L
Honda	Civic	Sedan	\$15,440	39 mpg	353 L	140	5	50 L
Kia	Sportage	SUV	\$21,995	27 mpg	740 L	176	5	58 L
Nissan	Frontier	Truck	\$20,898	26 mpg	--	152	5	80 L
Volkswagen	Jetta	Hybrid	\$27,875	63 mpg	320 L	150	5	45 L
Ford	Fiesta	Compact	\$12,749	41 mpg	436 L	120	5	50 L
Hyundai	Elantra	Sedan	\$15,949	40 mpg	419 L	148	5	48 L
Mitsubishi	RVR	SUV	\$19,998	--	614 L	148	5	63L
Toyota	Tacoma	Truck	\$22,335	29 mpg	--	159	4	80 L
Volvo	C30	Hybrid	\$29,500	28 mpg	233 L	227	4	60 L
Honda	Fit	Compact	\$14,580	40 mpg	585 L	117	5	40 L
Kia	Forte	Sedan	\$15,995	50 mpg	415 L	156	5	52 L
Nissan	Pathfinder	SUV	\$29,998	27 mpg	1201 L	260	7	73 L
Volkswagen	Tiguan	SUV	\$24,990	24 mpg	674 L	200	5	64 L



<b>Make</b>	<b>Model</b>	<b>Type</b>	<b>Price</b>	<b>Fuel Efficiency (city)</b>	<b>Max. Cargo</b>	<b>Horse-power</b>	<b>Seating</b>	<b>Fuel Tank</b>
Chevrolet	Volt	Hybrid	\$42,000	42 mpg	300 L	63	4	35 L
Hyundai	Accent	Compact	\$13,749	40 mpg	388 L	138	5	43 L
Mitsubishi	Lancer	Sedan	\$15,498	34 mpg	348 L	148	5	59 L
Toyota	Rav4	SUV	\$23,790	32 mpg	1087 L	176	5	60 L
Volvo	XC90	SUV	\$50,400	21 mpg	615 L	240	7	80 L
Ford	Fusion	Hybrid	\$29,999	22 mpg	453 L	170	5	62 L

## Appendix H

### Screenshot of Consumer Decision Task (Study 5)

Please look at the information below to make your choice. The checkboxes by each row and column will show/hide the information for that row or column. When you eliminate an option or characteristic from your consideration, you can uncheck the checkbox for that row or column to hide the information. How many options you consider is up to you. You may consider as many or as few choices as you wish before making your decision.

When you are ready to make your decision, please click the button at the bottom of the page and then select the car you wish to choose.

<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	<b>Make</b>	<b>Model</b>	<b>Type</b>	<b>Price</b>	<b>Fuel Efficiency (city)</b>	<b>Max. Cargo</b>	<b>Horse-power</b>	<b>Seating</b>	<b>Fuel Tank</b>
<input checked="" type="checkbox"/>	Chevrolet	Sonic	Compact	\$13,665	37 mpg	422 L	138	5	46 L
<input checked="" type="checkbox"/>	Honda	Civic	Sedan	\$15,440	39 mpg	353 L	140	5	50 L
<input checked="" type="checkbox"/>	Kia	Sportage	SUV	\$21,995	27 mpg	740 L	176	5	58 L
<input checked="" type="checkbox"/>	Nissan	Frontier	Truck	\$20,898	26 mpg	--	152	5	80 L
<input checked="" type="checkbox"/>	Volkswagen	Jetta	Hybrid	\$27,875	63 mpg	320 L	150	5	45 L
<input checked="" type="checkbox"/>	Ford	Fiesta	Compact	\$12,749	41 mpg	436 L	120	5	50 L
<input checked="" type="checkbox"/>	Hyundai	Elantra	Sedan	\$15,949	40 mpg	419 L	148	5	48 L
<input checked="" type="checkbox"/>	Mitsubishi	RVR	SUV	\$19,998	--	614 L	148	5	63L
<input checked="" type="checkbox"/>	Toyota	Tacoma	Truck	\$22,335	29 mpg	--	159	4	80 L
<input checked="" type="checkbox"/>	Volvo	C30	Hybrid	\$29,500	28 mpg	233 L	227	4	60 L
<input checked="" type="checkbox"/>	Honda	Fit	Compact	\$14,580	40 mpg	585 L	117	5	40 L
<input checked="" type="checkbox"/>	Kia	Forte	Sedan	\$15,995	50 mpg	415 L	156	5	52 L
<input checked="" type="checkbox"/>	Nissan	Pathfinder	SUV	\$29,998	27 mpg	1201 L	260	7	73 L

## Appendix I

### Analyses Using the Maximizing Tendencies Scale and Maximization Inventory (Study 5)

For these analysis, I used alternative measures of high standards, alternative search, and decision difficulty using the Maximizing Tendencies Scale (MTS), Maximization Inventory–Alternative Search subscale (MI-AS), and the Maximization Inventory–Decision Difficulty subscale (MI-DD), respectively.

The zero-order correlations of each dependent variable with the subscales are displayed in Table II. For each of the dependent variables I also examined a regression model including all three subscales as predictors, also displayed in Table II. Given that all the subscales are moderately correlated with each other ( $r$ s from .26 to .56,  $p$ s < .001), both the zero-order correlations and the regression models are instructive.

Table II  
*Regressing task behaviors and outcomes on maximizing components*

	Self-report items			Behavioral items		Outcomes	
	<u>Evaluating Dimensions</u>	<u>Evaluating Options</u>	<u>Reconsidering Options</u>	<u>Cols. Hidden</u>	<u>Task Time</u>	<u>Frustration</u>	<u>Regret</u>
<u>Zero-order correlations</u>							
MTS (high standards)	.22**	.21**	.17*	-.06	-.03	.10	.05
MI-AS	.27***	.33***	.26***	-.15*	.17*	.18*	.23**
MI-DD	.01	.26***	.47***	-.19**	.14 <sup>+</sup>	.33***	.47***
<u>Regression model</u>							
MTS (high standards)	.10	.03	.03	.02	-.18*	-.02	-.14 <sup>+</sup>
MI-AS	.27**	.25**	.05	-.09	.24**	.06	.11
MI-DD	-.13 <sup>+</sup>	.14 <sup>+</sup>	.44***	-.15 <sup>+</sup>	.08	.31***	.45***

*Notes.* Values for regression models are standardized coefficients ( $\beta$ ). Some behavioral items—number of rows hidden, reselecting rows, and reselecting columns—are not displayed here because they were not significantly predicted by any of the maximizing measures. <sup>+</sup>  $p < .10$ ; \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

**Replicating Study 4.** I again used bias-corrected bootstrapping with 5000 samples to examine the indirect effects of high standards and alternative search. For high standards, I used the MTS, and for alternative search, we used the MI-AS. I used these mediation models to predict task frustration and regret.

When predicting frustration, I found that there was no indirect effect through high standards either for promotion focus,  $B = .03$ , 95% CI [-.12, .20], or for assessment mode,  $B = .03$ , 95% CI [-.14, .21]. There was also no indirect effect through alternative search for promotion focus,  $B = .01$ , 95% CI [-.05, .10]; however, the indirect effect for assessment through alternative search was very close to significance,  $B = .13$ , 95% CI [-.006, .31]. The 90% confidence interval did not include zero, 90% CI [.01, .28], indicating an effect equivalent to a marginally significant  $p$ -value.

I found similar results when predicting regret. There was no indirect effect through high standards either for promotion focus,  $B = -.05$ , 95% CI [-.18, .05], or for assessment mode,  $B = -.05$ , 95% CI [-.18, .07]. There was also no indirect effect through alternative search for promotion focus,  $B = .02$ , 95% CI [-.06, .11]; however, alternative search significantly mediated the relationship between assessment and regret,  $B = .16$ , 95% CI [.05, .33].

**Sequential mediation path analysis.** This analysis used a dual sequential mediation model where promotion focus and assessment mode each predicted high standards (MTS) and alternative search (MI-AS), which in turn each predicted evaluation of options and reconsideration of options. These two self-report measures then each predicted frustration and regret. Both variables at each stage in the model were allowed to covary, and I included all direct effects to create a fully saturated model. The complete model is shown in Figure 4 in the paper, and the key direct and indirect effects are shown below in Table I2.

Table I2

*Direct and indirect effects of motivation and maximizing on task outcomes*

<u>IV</u>	<u>Mediator 1</u>	<u>Mediator 2</u>	<u>DV</u>	<u>Estimate</u>	<u>95% CI</u>
<i>Direct effects</i>					
Promotion	–	–	High standards	.520**	[.272, .757]
Promotion	–	–	Alt. search	.037	[-.179, .263]
Assessment	–	–	High standards	.599***	[.341, .853]
Assessment	–	–	Alt. search	.455**	[.240, .668]
High standards	–	–	Evaluation of options	.104	[-.100, .334]
High standards	–	–	Reconsideration	.100	[-.110, .328]
Alt. search	–	–	Evaluation of options	.454**	[.167, .725]
Alt. search	–	–	Reconsideration	.285*	[.007, .556]
Evaluation of options	–	–	Frustration	.091	[-.069, .252]
Evaluation of options	–	–	Regret	.050	[-.074, .172]
Reconsideration	–	–	Frustration	.502***	[.328, .660]
Reconsideration	–	–	Regret	.507***	[.370, .622]
<i>Indirect effects</i>					
Promotion	High standards	Eval. options	Frustration	.005	[-.003, .039]
Promotion	High standards	Eval. options	Regret	.003	[-.003, .026]
Promotion	High standards	Reconsideration	Frustration	.026	[-.023, .107]
Promotion	High standards	Reconsideration	Regret	.026	[-.023, .108]
Promotion	Alt. search	Eval. options	Frustration	.002	[-.006, .025]
Promotion	Alt. search	Eval. options	Regret	.001	[-.004, .018]
Promotion	Alt. search	Reconsideration	Frustration	.005	[-.025, .053]
Promotion	Alt. search	Reconsideration	Regret	.005	[-.026, .049]
Assessment	High standards	Eval. options	Frustration	.006	[-.004, .044]
Assessment	High standards	Eval. options	Regret	.003	[-.003, .028]
Assessment	High standards	Reconsideration	Frustration	.030	[-.028, .113]
Assessment	High standards	Reconsideration	Regret	.030	[-.030, .114]
Assessment	Alt. search	Eval. options	Frustration	.019	[-.009, .079]
Assessment	Alt. search	Eval. options	Regret	.010	[-.012, .051]
Assessment	Alt. search	Reconsideration	Frustration	.065*	[.007, .164]
Assessment	Alt. search	Reconsideration	Regret	.066*	[.007, .158]

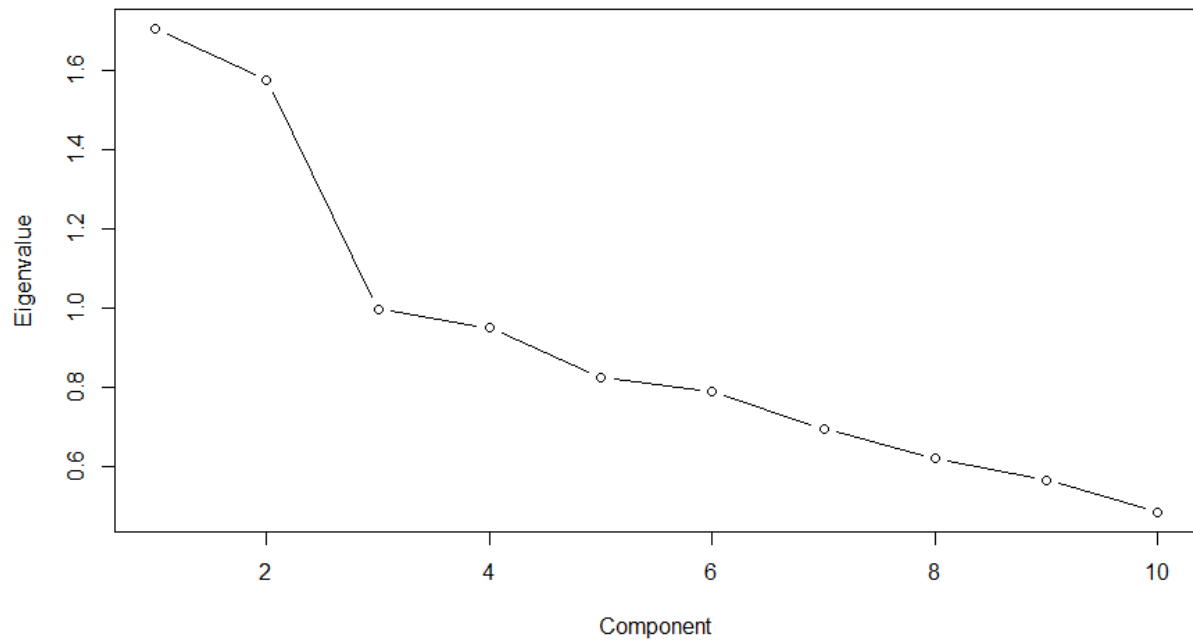
*Notes.* Estimates are unstandardized coefficients. Confidence intervals (CI) were estimated with 5000 bias-corrected bootstrapped samples; \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

## Appendix J

### Factor Analysis (Study 5)

I undertook an exploratory factor analysis of the self-reported measures of exhaustive search through options. This scale included ten items, including items asking to what extent participants examined the various dimensions (columns) and the various options (rows).

Examination of the scree plot revealed two factors, together explaining 54% of the variance (see Figure J1).



*Figure J1.* Scree plot for exhaustive search items.

I applied a varimax rotation to the item loadings. See Table J1 for the factor loadings and final selection of items.

Table J1  
*Factor loadings for exhaustive search items*

	Factor 1	Factor 2
I didn't eliminate any options until near the very end of the process.	-.22	<b>.44</b>
I used information from multiple dimensions (e.g., price, fuel efficiency) to evaluate the different options.	<b>.66</b>	-.07
I only considered one or two dimensions to make my decision.	<b>.37</b>	.05
I spent time and effort making this decision.	<b>.74</b>	.07
I eliminated some of the options very early on in the process.	.48	-.38
I evaluated all of the options in detail.	.52	.66
I kept all options in consideration until the very end.	-.03	<b>.74</b>
I closely examined each option on all dimensions.	.30	<b>.73</b>
I only gave limited consideration to some of the options.	-.32	.37
I took this task seriously.	<b>.71</b>	-.05

*Note:* Bolded factor loadings indicate which factor the item was categorized under. Items with no bolded factor loading were dropped due to substantial cross-loadings.

## Appendix K

### Comparison of Task Outcomes (Studies 3-6)

Tables K1 and K2 provide a comparison of all the task outcomes for each study with a decision task. Note that Studies 3-5 used a consumer decision task, while Study 6 used a personal decision task. In addition, the maximizing scales used differ across the studies. Table K1 provides the zero-order correlations of the maximizing scales, promotion, and assessment with each outcome; Table K2 provides regression models where the maximizing scales were entered together; and where promotion and assessment were entered together. The values for Studies 5 and 6 are presented in-text, but are reproduced here for convenience.

In general, the results are fairly consistent across studies, with alternative search and decision difficulty correlated with most negative outcomes, whether measured by the MS or MI. High standards (via the MS or MTS) is generally not associated with negative outcomes, although the MTS does show a slight association with reconsideration of options in Studies 3 and 6. This may be due at least in part to the moderate correlation that MTS has with alternative search. When all three maximizing scales are put into a regression model together, the results are fairly consistent that decision difficulty comes out as the strongest predictor of negative outcomes, as one might expect. However, alternative search still retains some positive associations in some cases.

Results are also generally consistent that promotion is negatively correlated with negative outcomes, while assessment is positively correlated. However, assessment's effects seem strongest in Study 6, where the dynamics of the personal decision task may have led to greater assessment-relevant considerations (e.g., self-evaluation, social comparison) than in the consumer decision task.



Table K1

*Correlations of task outcomes with maximizing components and motivations*

	<u>Reconsidering</u> <u>Options</u>	<u>Task</u> <u>Difficulty</u>	<u>Frustration</u>	<u>Regret</u>	<u>Anticipated</u> <u>Regret</u>	<u>Conviction</u>	<u>Confidence</u>
<u>Study 3</u>							
MTS (HS)	.15*	-.04		.03		.23**	
MI-AS	.33**	.11		.23**		.07	
MI-DD	.41***	.40***		.45***		-.19*	
Promotion	-.15*	-.17*		-.32***		.18*	
Assessment	.17*	.10		.13 <sup>+</sup>		-.04	
<u>Study 4</u>							
MS-HS			-.08				
MS-AS			.25**				
MS-DD			.37**				
Promotion			-.28**				
Assessment			.23*				
<u>Study 5</u>							
MS-HS	.10		.03	.01			
MS-AS	.17*		.23***	.20***			
MS-DD	.30***		.27***	.32***			
Promotion	-.11		-.13 <sup>+</sup>	-.22***			
Assessment	.16*		.09	.15*			
<u>Study 6</u>							
MTS (HS)	.09 <sup>+</sup>	-.05		.03	-.06		.19***
MI-AS	.22***	.09 <sup>+</sup>		.14**	.09 <sup>+</sup>		-.01
MI-DD	.34***	.36***		.43***	.33***		-.11*
Promotion	-.13*	-.23***		-.29***	-.29***		.13*
Assessment	.17**	.13*		.17**	.16**		-.01

*Notes.* MS = Maximization Scale (Schwartz et al., 2002); MTS = Maximizing Tendencies Scale (Diab et al., 2008); MI = Maximization Inventory (Turner et al., 2012); HS = high standards; AS = alternative search; DD = decision difficulty. <sup>+</sup>  $p < .10$ ; \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ .

Table K2

*Regressing task outcomes on maximizing components and motivations*

	<u>Reconsidering</u> <u>Options</u>	<u>Task</u> <u>Difficulty</u>	<u>Frustration</u>	<u>Regret</u>	<u>Anticipated</u> <u>Regret</u>	<u>Conviction</u>	<u>Confidence</u>
<u>Study 3</u>							
<i>Model 1</i>							
MTS (HS)	.05	-.07		-.03		.21**	
MI-AS	.13	-.14		-.02		.18 <sup>+</sup>	
MI-DD	.33***	.49***		.46***		-.32***	
<i>Model 2</i>							
Promotion	-.14 <sup>+</sup>	-.17*		-.31***		.17*	
Assessment	.15*	.09		.11		-.03	
<u>Study 4</u>							
<i>Model 1</i>							
MS-HS			-.09				
MS-AS			.13				
MS-DD			.30**				
<i>Model 2</i>							
Promotion			-.23*				
Assessment			.17 <sup>+</sup>				
<u>Study 5</u>							
<i>Model 1</i>							
MS-HS	.04		-.04	-.07			
MS-AS	.09		.18*	.14*			
MS-DD	.27***		.23**	.29***			
<i>Model 2</i>							
Promotion	-.10		-.13 <sup>+</sup>	-.20**			
Assessment	.15*		.07	.13 <sup>+</sup>			
<u>Study 6</u>							
<i>Model 1</i>							
MTS (HS)	.11*	.01		.10 <sup>+</sup>	-.02		.20***
MI-AS	.11*	.01		.02	.03		-.07
MI-DD	.33***	.36***		.44***	.32***		-.06
<i>Model 2</i>							
Promotion	-.10 <sup>+</sup>	-.21***		-.26***	-.27***		.13*
Assessment	.15**	.08		.11*	.10*		.03

*Notes.* Values for regression models are standardized coefficients ( $\beta$ ). MS = Maximization Scale (Schwartz et al., 2002); MTS = Maximizing Tendencies Scale (Diab et al., 2008); MI = Maximization Inventory (Turner et al., 2012); HS = high standards; AS = alternative search; DD = decision difficulty. <sup>+</sup>  $p < .10$ ; \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ .

Appendix L

Personal Decision Task (Study 6)

Please try to think of an unresolved personal dilemma in your life. Such predicaments are characterized by the fact that you are not yet sure whether to take action in order to change things. You feel very uncertain and you ask yourself whether it might not be better to leave things as they are. In other words, you haven't decided to take action, but you haven't decided against it either. Please do not select a problem that is easy to solve, or that you have already made your mind up about. On the other hand, do not select one for which a solution will likely never be reached. Please choose a problem that you expect will be resolved within the next few months.

The problem should be complex and should take the form of "Do I make a change or not?"

Please briefly identify the dilemma: \_\_\_\_\_  
\_\_\_\_\_

Please take a few minutes to write about your thoughts regarding the above dilemma. Think about how you could identify a solution to your problem and write about it below.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## Appendix M

### Factor Analysis of Alternative Search and Assessment Scales

In the studies above, I have shown that assessment and alternative search both predict negative outcomes (either directly or indirectly). However, it is possible that these scales predict negative outcomes because the items in the scale themselves tap into negativity and/or other negative personality characteristics such as neuroticism or anxiety.

### **Theory and Past Research on Assessment**

It is important to note that the original conceptualization of assessment mode included self-evaluative concerns as an integral part of the construct (Higgins et al., 2003; Kruglanski et al., 2000). Assessment is an orientation toward the goal deliberation phase of goal regulation, and many goals are either directly associated with or have implications for one's self-concept. Thus, careful deliberation of what the "right" goal is to pursue entails consideration of each goal's implications for the self. It also entails consideration of standards: one's own internal standards, as well as standards external to the self (e.g., social comparison, social norms, social appraisal). Thus, the construct of assessment itself has an inherent focus on self-evaluation and comparisons with social norms. Such evaluative concerns need not be linked with characteristics like neuroticism and anxiety, but this association may exist when such concerns are chronically activated (Kruglanski et al., 2000).

Nevertheless, as briefly mentioned in the introduction, past research has shown evidence of a complementarity effect between locomotion and assessment: individuals high in *both* locomotion and assessment have a higher GPA (Kruglanski et al., 2000), show better performance in a military training course (Kruglanski et al., 2000), and have the highest likelihood of attaining their goals compared to those high only in locomotion or assessment

(Pierro et al., 2006). Teams with a mix of locomotors and assessors also show performance that is as fast as a locomotor-only team, and also as accurate as an assessment-only team (Mauro et al., 2009). In addition, complementarity in teams predicts performance at the individual level as well: assessors within a predominantly locomotor team, and locomotors within a predominantly assessor team, show higher performance compared to those with the same predominant regulatory mode (Pierro, Presaghi, Higgins, Klein, & Kruglanski, 2012). These locomotion × assessment interactions would be unlikely to lead to positive outcomes if assessment were essentially adding only neuroticism or anxiety into the mix.

### **Theory and Past Research on Alternative Search**

The alternative search subscale attempts to capture a particular method of comparing alternatives, using an exhaustive (or at least extensive) search through options. However, as mentioned in the introduction, it is possible that alternative search could be associated with different types of behaviours: for example, examining a greater number of options, spending more time to evaluate options, or reconsidering previously dismissed options. Some of these behaviours may be more strongly than others associated with neuroticism or anxiety; some may also have more negative social implications (e.g., hopping from relationship to relationship to seek the best may have more social ramifications than hopping from store to store when shopping). However, the alternative search subscale of both the MS and MI are intended to capture searching behaviour across a variety of domains (hence asking about radio stations, relationships, shopping, job opportunities, etc.). It is the combined score that captures cross-domain alternative search, even if one domain may have more negative implications than another.

There is some evidence from past research that alternative search is not reducible to neuroticism in particular. Both Purvis et al. (2011) and Dalal et al. (2015) found small, though significant, correlations with neuroticism ( $r = .27$  and  $r = .18$ , respectively). This would suggest that the two constructs are related, but not at all reducible to one another. Purvis et al. (2011) also found a small relationship with negative affect ( $r = .15$ ). Unfortunately, research on other negative chronic individual differences that isolate the alternative search subscale in particular is limited. However, the research to date would suggest a conceptual distinction between alternative search and negativity.

### **Analysis of Alternative Search and Assessment**

**Exploratory and confirmatory factor analysis.** In order to assess empirically whether there is reason to believe that alternative search and assessment are distinct from measures of negative affect, neuroticism, and anxiety, I used the data from Study 1 to examine the factor structure of these two scales. If any set of items are particularly influenced by a latent variable associated with negativity or negative characteristics, this should come out as a separate factor representing this cluster of items. I first randomly split the data into two halves of  $n = 1,348$  each (after removing participants who had missing data for the items in question, the total sample was  $N = 2,696$ ). I then conducted an exploratory factor analysis (EFA) on one half, using parallel analysis (described in Study 1) to determine the appropriate number of factors to extract. A varimax rotation was used to maximize the interpretability of the factors. Then, using these rotated factor loadings from the EFA, I conducted a confirmatory factor analysis (CFA) on the other half of the sample, using the R “lavaan” package (Rosseel, 2012).

The EFA for alternative search showed evidence for two factors, explaining 32.1% of the variance. The rotated factor loadings are shown below in Table M1, with the bolded loadings

indicating the factor with which each item was grouped for the CFA. (See Appendix D for item wording.)

Table M1  
*Factor loadings for alternative search items (Study 1)*

	F1	F2
Item 1	<b>.67</b>	.16
Item 2	<b>.68</b>	.19
Item 3	.19	<b>.39</b>
Item 4	.13	<b>.62</b>
Item 5	.09	<b>.46</b>
Item 6	.11	<b>.36</b>

The CFA revealed good fit. Although the chi-square test was significant,  $\chi^2(8) = 36.79, p < .001$ ; this is typical for models with large sample sizes and should not be relied upon as a strong indicator of model fit (Bentler, 1990; Schermelleh-Engel, Moosbrugger, & Müller, 2003). The CFI and RMSEA both indicated good fit,  $CFI = .97, RMSEA = .05, p_{close} = .40$ .

The EFA for assessment showed evidence for three factors, explaining 39.3% of the variance. The rotated factor loadings are shown in Table M2. (See Appendix C for item wording.)



Table M2  
*Factor loadings for assessment mode items (Study 1)*

	F1	F2	F3
Item 2	.19	<b>.69</b>	.04
Item 6	<b>.37</b>	.13	.28
Item 7	.28	.07	<b>.47</b>
Item 9	<b>.66</b>	.11	.18
Item 10	-.03	.22	<b>.30</b>
Item 11	.42	.08	.44
Item 13	<b>.77</b>	.17	.12
Item 15	.33	.09	.58
Item 16	<b>.57</b>	.19	.29
Item 18	.10	.01	<b>.58</b>
Item 21	.17	<b>.70</b>	.09
Item 24	.27	.03	<b>.42</b>

The CFA for assessment, however, was not well-fitting. The chi-square test was significant,  $\chi^2(32) = 264.72, p < .001$ ; and while the CFI was good,  $CFI = .91$ ; the RMSEA did not show good fit,  $RMSEA = .07, p_{\text{close}} < .001$ . To improve the fit, I tried dropping items 6 and 10, as these had the lowest factor loadings (.42 and .22, respectively). After removing these items, the model fit much better,  $\chi^2(17) = 62.71, p < .001$ ;  $CFI = .98, RMSEA = .05, p_{\text{close}} = .75$ .

Based on the item wordings for the alternative search and assessment scales, I named the alternative search factors as “Everyday Search” and “Search for Life Opportunities,” respectively, as the first factor includes items about searching through radio and TV stations, while the second factor includes items about job opportunities, relationships, and general fantasizing about life changes. For assessment, the first factor includes items about being self-critical and comparing oneself with other people; thus, I named this factor “Self-Focused Evaluation.” The second factor included two of the three reverse-scored items, which may suggest this represents little more than shared variance with respect to item valence. However, provided that it does capture theoretically relevant information, the items both deal with

evaluating social interactions after the fact; thus, I named this factor “Evaluation of Social Interactions.” Finally, the third factor included items about evaluating other people’s plans, decisions, and other various dimensions. As such, I named this “Other-Focused Evaluation.”

Judging from the above factors, it does not seem to be the case that there is any clear latent negativity factor leading to shared variance among the alternative search or assessment scales. Both scales seem to be broken down by the target of evaluation rather than a focus on negative affect or emotional instability. However, it is possible that the Self-Focused Evaluation factor of assessment in particular could be associated with greater anxiety or neurotic characteristics, as this might represent a more negative, critical view of the self. Thus, I next examine relationships with two key scales to evaluate this possibility.

**Correlations with DAS and neuroticism.** After conducting the EFAs and CFAs, I created composite scores for each factor by averaging scores on the items for that factor. I then examined the correlations of each of these factors with a composite score for the DAS (Depression, Anxiety, and Stress) Scale, as this seemed to be the scale in Study 1 most representative of negative affect. I also examined correlations with neuroticism (i.e., emotional stability) in the TIPI. The correlations are presented in Table M3.

Table M3

*Correlation table for factor subscales with DAS and neuroticism (Study 1)*

	1	2	3	4	5	6	7
1. Everyday Search	(.65)						
2. Search for Life Opportunities	.33	(.53)					
3. Self-Focused Evaluation	.11	.24	(.74)				
4. Evaluation of Social Interactions	-.02 <sup>†</sup>	.08	.34	(.70)			
5. Other-Focused Evaluation	.13	.31	.37	.15	(.57)		
6. DAS	.15	.27	.36	.09	.23	(.89)	
7. Neuroticism	.11	.15	.39	.18	.14	.53	(.67)

*Note.* All correlations were significant at the  $p < .001$  level, with the exception of the correlation marked with the dagger (<sup>†</sup>).

Examining the correlations, it is clear that all five factors significantly correlated with both DAS and neuroticism. All the correlations are small to moderate, with the Self-Focused Evaluation scale correlating the strongest with both DAS and neuroticism, and Evaluation of Social Interactions correlating the weakest. Notably, however, all correlations were in the positive direction, suggesting that regardless of which cluster of items one selects, there is a positive correlation between alternative search and these negative characteristics, and between assessment and these negative characteristics. This is true also if one examines the correlation of each item in the alternative search and assessment scales with DAS and neuroticism.

**Associations with decision task outcomes.** The key issue to resolve is whether these subscales would predict task outcomes differently than the overall scales (i.e., alternative search and assessment). Thus, I recreated the same subscales from the data in Study 5, as this study offered the greatest number of measured task outcomes. The correlations are presented in Table M4.

Table M4

*Correlation of factor subscales with maximizing subscales and task outcomes (Study 5)*

	<u>MS- HS</u>	<u>MS- DD</u>	<u>Eval. Dimensions</u>	<u>Eval. Options</u>	<u>Reconsidering Options</u>	<u>Frustration</u>	<u>Regret</u>
<i>Alternative Search</i>							
Everyday Search	.09 <sup>a</sup>	.16 <sup>a</sup>	.03 <sup>a</sup>	.15 <sup>a</sup>	.16 <sup>a</sup>	.09 <sup>a</sup>	.10 <sup>a</sup>
Search for Life Opportunities	.10 <sup>a</sup>	.24 <sup>a</sup>	.10 <sup>a</sup>	.05 <sup>a</sup>	.08 <sup>a</sup>	.16 <sup>a</sup>	.14 <sup>a</sup>
<i>Assessment</i>							
Self-Focused Evaluation	.19 <sup>a</sup>	.27 <sup>a</sup>	.15 <sup>a</sup>	.07 <sup>a</sup>	.20 <sup>a</sup>	.13 <sup>a</sup>	.12 <sup>a</sup>
Evaluation of Social Interactions	.18 <sup>a</sup>	-.01 <sup>b</sup>	.12 <sup>a</sup>	-.14 <sup>b</sup>	-.03 <sup>b</sup>	-.09 <sup>b</sup>	-.07 <sup>b</sup>
Other-Focused Evaluation	.25 <sup>a</sup>	.05 <sup>b</sup>	.17 <sup>a</sup>	.20 <sup>a</sup>	.18 <sup>a</sup>	.10 <sup>a</sup>	.17 <sup>a</sup>

*Notes.* Different superscripts indicate a significant difference between the correlations for that column. Differences in correlations *between* the alternative search and assessment scales were not tested. MS-HS = Maximization Scale–High Standards, MS-DD = Maximization Scale–Decision Difficulty

For each set of correlations, I compared the alternative search correlations with each other, and the assessment correlations with each other, using Fisher's *r*-to-*z* transformation and *z*-tests. The alternative search factors showed no difference in any of the correlations with high standards, decision difficulty, or task outcomes. The assessment factor showed no difference in the correlations with high standards or the evaluation of dimensions in the task; however, the Evaluation of Social Interactions factor did show a different pattern than the other two factors in its correlations with decision difficulty, evaluation of options, reconsideration of options, frustration, and regret. Note that although this factor showed negative correlations with most of these task outcomes, none of these correlations was significantly different from zero.

**Discussion.** In summary, the alternative search and assessment scales can be broken down into subscales representing distinct latent factors. Some of these show evidence of being

more self-focused or self-critical; however, when examining the relationships between these factors and outcomes on the decision task in Study 5, there was little evidence that items associated with negativity or other negative personality characteristics showed a different pattern of results. The one exception to this was the assessment mode factor associated with social interactions, which showed essentially no relationship with task outcomes. Because this factor was primarily associated with social interactions, it is possible that these items have little conceptual overlap with consumer decisions. However, there was no evidence to suggest that the self-evaluation or other-focused evaluation factors showed different patterns of results, which suggests that the results for assessment presented in Study 5 are relatively robust to the target of evaluation that participants report evaluating in the assessment scale. Note also that the relationships of alternative search with task outcomes is generally robust whether using the MS or MI (see Appendix K), suggesting also that the results are not simply due to particular items present in only one scale.

In general, then, my own research supports the theory and existing work on alternative search and assessment, which would suggest that these constructs are distinct from being simply measures of neuroticism or anxiety. While they may be related due to chronic activation of self-evaluative concerns, for example, they show only limited shared variance, suggesting they are indeed still quite distinct. Moreover, factor analyses of these scales did not show a clear factor associated with negative affect, nor did the self-focused evaluation factor of assessment show particularly negative outcomes on the decision task. These results converge to the conclusion that the negative outcomes presented in-text are not simply a function of the particularities of the scale items used to measure alternative search or assessment, and are indeed a result of these constructs themselves.