

Varieties of Indecisive Experience:
Explaining the Tendency to Not Make Timely and Stable Decisions

by

Georges A. Potworowski

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Doctoral Committee:

Professor J. Frank Yates, Chair
Professor Jacquelynn S. Eccles
Associate Professor Edward C. Chang
Associate Professor Kai Schnabel Cortina

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Abstract

In this dissertation, the aim was to explain why some people are indecisive, in the broadest sense of the term. To do so first required synthesizing a behavioral definition of indecisiveness that was both informed by the variety of explicit and implicit definitions of indecision and indecisiveness found across different disciplines and sensitive to the common uses of the term. Indecisive behaviors were then derived from the synthesized definition and used to develop a multi-dimensional behavioral scale of indecisiveness. The aim of the scale was to capture the breadth of indecisive behaviors, but not *a priori* attribute to them any particular causes. In three studies, the scale was developed, refined, validated, and used to test distinct mechanisms underlying indecisiveness.

In Study 1 ($N = 369$), the behavioral indecisiveness scale was developed and used to test the multi-dimensionality of indecisiveness in an undergraduate population. Specifically, distinct types of indecisiveness were hypothesized to occur at four phases in the decision-making process: 1) before commitment, 2) before enacting the commitment, 3) before completing the commitment, and 4) after the commitment had been fulfilled. Factor analysis suggested that indecisiveness consisted of four dimensions different from those hypothesized: 1) decision evasion, 2) prolonged latency, 3) waiting, and 4) changing commitments. Based on these results, indecisiveness was conceptually and operationally refined. The result was that indecisiveness manifested itself in three core behaviors: 1) prolonged latency, 2) not-deciding, and 3) changing decisions. Other

behaviors associated with indecisiveness, such as decision evasion and waiting, were considered to be proximal behavioral contributors to one or more of the three core behaviors.

In Study 2 ($N = 169$), the refined scale was used to test both the multi-dimensionality and multi-determination of indecisiveness in an undergraduate population. The three core indecisiveness behaviors were found to be predicted by specific patterns of proximal behavioral contributors and four of the Big Five personality traits. The refined scale's validity was further established using a measure of information processing style, performance on a double-disjunct task, and two measures of indecisiveness.

In Study 3 ($N = 390$), the scale was further refined, and administered to a larger and demographically broader sample to test its generalizability. To elucidate the relationship between distal contributors, proximal behavioral contributors, and indecisiveness with greater precision, the HEXACO model of personality (Ashton & Lee, 2007) was used at the facet-level. Evidence was again found for the multi-dimensionality and multi-determination of indecisiveness. Facets from five of the six HEXACO dimensions contributed to indecisiveness through seven mechanisms: 1) worry, 2) low self-confidence, 3) dependence, 4) high standards, 5) escapist impulsivity, 6) careless impulsivity, and 7) concern for others. The scale's validity was also further established using peer report, a status quo bias task, and an optimistic bias task.

Chapter 1: Introduction

Imagine that Maya was chosen to plan her family's four-day reunion. Many of her planning decisions (e.g., budget, location, accommodations) will be based on how many people attend, and everyone knows that the sooner Maya has a list of confirmed attendees, the better. Her aunt Diane promptly lets her know she will be there, shows up, and stays for the whole event. Cousin Sam waits right until the RSVP deadline, and then lets Maya know he will attend. Cousin Pat avoids responding until eventually, well past the RSVP date, she is told that she cannot attend if she does not reply immediately. Maya's nephew Mark says he will attend, changes his mind and says he will not attend, and then changes it again and shows up.

In contrast to Diane, who behaved decisively, each of the other family members in some way exhibited indecision: Sam waited as long as possible before committing; Pat did not commit one way or the other and probably would not have unless pressured to; Mark made a commitment and then changed it. Although most people behave indecisively in one or more of these ways at some points in their lives, Diane, Sam, Pat, and Mark routinely make and carry out their personal and professional decisions in the manners described. Thus, Diane would be considered decisive, whereas the others, who experience *chronic* indecision—or indecisiveness—would be considered indecisive.

The central aim of this dissertation was to explain why some people are indecisive, in the broadest sense of the term. To do so required a measure of

indecisiveness that captured the breadth of indecisive behaviors, but did not *a priori* attribute to them any particular causes. Because no such measure existed, an important secondary aim of this dissertation project was to develop a new measure of indecisiveness.

It is not difficult to call to mind how a case of indecision resulted in lost time and money, a missed opportunity, or even an accident. Indecisiveness is costlier still. Indecisive individuals (hereafter “indecisives”) and the intended beneficiaries and stakeholders of their decisions all pay the psychological costs of indecisiveness, typically in the forms of anxiety and frustration. Research bears this out. Indecisives are bothered by their indecisiveness, claim that it interferes with the quality of everyday functioning, and report greater difficulty in academic, social, and family decision making (Frost & Shows, 1993). Given these costs, it is perhaps not surprising that indecisives report lower life satisfaction (Rassin & Muris, 2005a). Indecisiveness has also been found to be painful and frustrating for the people who have to constantly deal with indecisives, such as family, friends, clients, and employers (Ferrari, 1994; Ferrari, Harriott, & Zimmerman, 1999). These costs, it should be noted, are present beyond where one might expect them.

The costs incurred by indecision on relatively big decisions (e.g., whether to marry the person you have been dating for three years) are highly salient because they are familiar enough to be easy to call to mind and hard to forget. In other words, indecision is not always undesirable (Grites, 1981; Krumboltz, 1992; Milgram & Tenne, 2000; Tykocinski & Ruffle, 2003), and can even be rational when there are no preferences (Eliaz & Ok, 2006). If the benefit of waiting for, gathering more, or carefully processing

information relevant to a decision outweighs the costs of the time spent doing so, it is sensible to not commit prematurely to a choice.

In contrast, the potentially greater aggregate costs of indecisiveness on the myriad trivial decisions on which indecisives spend undue time and effort (e.g., what toothpaste or pens to buy) can slip under the radar. However, as Milgram and Tenne (2000) point out, it is prudent to make minor decisions quickly because “these kinds of decisions must be made frequently, almost automatically, and there is a low cost for making ‘wrong’ decisions” (p. 142). Yet indecisives, who are on average no less intelligent than are more decisive people (Effert & Ferrari, 1989), are reluctant to commit to these and other equally mundane decisions—decisions that most people do not think twice about.

Unfortunately, the extant research on indecisiveness is fragmented across different, unconnected literatures. Despite the converging evidence on the costliness of indecisiveness, there is considerable variation in how, how clearly (Rassin, 2007), and even whether indecisiveness is explicitly defined and operationalized. For example, in the procrastination literature, indecisiveness is defined by some as putting off deciding (e.g., Effert & Ferrari, 1989). In the vocational literature, it is often conceived as having difficulty with decisions in general (e.g., Cooper, Fuqua, & Hartman, 1984). In the clinical psychology literature, indecisiveness is characteristic of several disorders, though nowhere in the *Diagnostic and Statistical Manual of Mental Disorders* (American Psychiatric Association [DSM-IV-TR], 2000) is it ever explicitly defined.¹ In economics, indecisiveness is taken to mean the inability to state a preference for an alternative, but

¹ The *DSM-IV-TR* also lists criteria for some disorders as difficulty making everyday decisions, as is the case with dependent personality disorder.

not conceding that they are equally desirable (e.g., von Neumann & Morgenstern, 1944). Perhaps most surprisingly, indecisiveness *per se* has received little conceptual or empirical attention in the mainstream judgment and decision-making literature.

On the one hand, these conceptualizations of indecisiveness, while nominally alike, are operationally quite diverse (see Bargh & Chartrand's, 1999, treatment of an analogous problem with "automaticity"). On the other, relevant constructs that might shed light on the mechanisms of indecisiveness are often left unexplored (e.g., ambivalence, impulsivity, strategic waiting). This has meant that studies of indecisiveness have used disparate measures of indecisiveness that may have only nominal or surface similarities. No scholarly effort has yet been made to understand how the different concepts and measures themselves compare. Trying to integrate and generalize empirical findings about indecisiveness without first considering the diversity of conceptions and operationalizations of the phenomenon can only muddy our understanding. Still, each of these conceptions, operationalizations, lines of research, and literatures captures some aspect(s) of, or is related to, indecisiveness. Ultimately, each has both something to contribute to and something to gain from a more comprehensive and integrated conceptualization and understanding of indecisiveness.

The central tenet of this dissertation was that indecisiveness is most meaningfully conceived of as a behavior that manifests itself in a limited number of ways and for different reasons. Three main hypotheses were tested: 1) indecisiveness is multi-dimensional; 2) the dimensions of indecisiveness are multi-determined; and 3) there are distinct mechanisms that contribute to indecisiveness. The three main hypotheses are explained in more detailed below.

Hypothesis 1: Multi-dimensionality of Indecisiveness

The first core hypothesis was that, contrary to what most researchers suggest (e.g., Chartrand, Robbins, Morill, & Boggs, 1990; Crites, 1969; Effert & Ferrari, 1989; Elyadi, 2006; Cooper, Fuqua, & Hartman, 1983; Gati, Krausz, & Osipow, 1996; Goostein, 1972; Milgram & Tenne, 2000; Reed, 1985; Wanberg & Muchinsky 1992), indecisiveness is multi-dimensional. The hypothesis has some face validity by virtue of the very variety in scholars' conceptions, several of which were illustrated by recognizable indecisive behaviors in the opening vignette. One might object that the dimensionality of indecisiveness is contingent on the definition(s) one chooses—and one is free to opportunistically mix and match from the range of existing definitions. The first point was taken. The fact remains, however, that the variety of extant conceptions, both scholarly and in lay usage, constitutes one type of evidence that indecisiveness is a phenomenon with conceptually distinct dimensions. This, in turn, suggests that one might gain a clearer understanding of indecisiveness by not collapsing its distinct dimensions when investigating its (or their) contributors.

Because no scholarly attempt has yet been made to take stock of the variety of conceptions of indecisiveness, or to distill from it a comprehensive definition, a key preliminary step in this dissertation was to do both these things. This effort speaks to the second point, that one can opportunistically select from extant definitions to test one's hypothesis. The synthesized definition that will shortly be presented was informed by and sensitive to the range of both scholars' conceptualizations and ways the term is popularly used (i.e., as reflected in dictionary definitions). These are the twin sources of the synthesized definition's validity.

The multi-dimensionality hypothesis was not novel. Some researchers have acknowledged that indecisiveness has multiple dimensions, though there is considerable variety in, and no consensus on, what those dimensions are. For instance, Germeijs and De Boeck (2002) include a broad range of phenomena in their scale. They first list seven “descriptors” of difficulty making decisions (pp. 114–115), then base their scale on 11 “features” of indecisiveness (p. 116, which consists of the list of aforementioned descriptors plus four additional items), but ultimately treat their scale as unidimensional. Like Germeijs and De Boeck’s scale, the Frost and Shows (1993) Indecisiveness Scale (IS) measures a variety of phenomena, but was treated as unidimensional. Results from recent studies testing the dimensionality of the IS, however, are inconsistent. Swami et al. (2008) found that the IS was unidimensional in Chinese and Malay samples. Patalano and Wengrovitz (2006) found that their Chinese sample had three dimensions on the IS, with high cross loadings: anxiety, checking, and planning. In contrast, their American sample had only two dimensions—general indecisiveness and planning. More recently, Spent, Rassin, and Epstein (2009) found the IS also had two dimensions, but two different ones: aversive and avoidant indecisiveness. Ultimately, the dimensionality of the IS has not been consistently replicated. The only researcher who proposed *a priori* that indecisiveness was a two-dimensional construct, and measured it as such, was Bacanli (2000, 2005, 2006). However, the 20 items she used in her two scales tap more than two distinct concepts. Consider, for example, the following item: “I decide quickly because of my impatience to search and collect data on it [sic] and then I give it up.” The item includes three distinct concepts: 1) rapid deciding, 2) attributed to impatience (specifically impatience with information search), and 3) changing the decision.

On closer inspection, most indecisiveness scales appear to measure a cluster of related constructs. These measures often include items so similar to those on a dependent variable of interest, that their correlation is much less informative than is believed. The result is that many of the findings using these broad spectrum measures of indecisiveness need to be interpreted with care.

In the three studies in this dissertation, the multi-dimensionality of indecisiveness was tested in two ways. First, the presence of stable, distinct factors in a factor analysis was taken as evidence. Because the indecisive behaviors were predicted to be related to each other, the factors (and scales based on them) were expected to be moderately correlated. The second test of multi-dimensionality was the distinctness of the pattern of contributors for each factor or dimension (see Whiteside & Lynam, 2001, who used the same argument to establish types of impulsivity). Thus, the multi-dimensionality hypothesis was supported to the extent that contributor variables were not related to each of the three indecisive behaviors to the same degree.

Hypothesis 2: Multi-determination of Indecisiveness

The second core hypothesis was that each dimension (or type) of indecisive behavior is brought about by multiple mechanisms, that is, it is multi-determined. That a given indecisive behavior could be exhibited for different reasons also has face validity. A case in point is Sam and Pat from the vignette, who both took a long time to commit (i.e., prolonged latency), but for different reasons. The former took long because she was waiting to see if something better might come up (i.e., “strategic waiting”), and the latter because he procrastinates. Although researchers have found that decision latency is related to high neuroticism and low conscientiousness (e.g., Frost & Shows, 1993;

Milgram & Tenne, 2000), these distal contributors explain only part of the mechanisms of indecisiveness: Missing are accounts of how they contribute through more proximal phenomena. Ferrari and colleagues, for example, found that (Pat's) decisional procrastination can come about for a number of reasons, including compulsions and obsessions (Ferrari & Emmons, 1994), public self-consciousness and social anxiety (Ferrari, 1991), distraction (Harriott, Ferrari, & Dovidio, 1996), and forgetfulness (Effert & Ferrari, 1989). On their own, these too are only parts of the mechanism. The objective in this dissertation was to understand indecisiveness by integrating the effects of distal contributors and proximal ones on the indecisive behaviors (cf. Rassin, 2007).

The multi-determination hypothesis was tested using a path model showing the relationships between distal contributors (e.g., neuroticism), and the indecisive behaviors mediated by proximal behaviors. The hypothesis would be supported if more than one path of contributors were related to each core indecisive behavior.

Hypothesis 3: Distinct Mechanisms for Indecisiveness

The third core hypothesis was a refinement of the second: There are distinct mechanisms that explain indecisiveness. If indecisiveness is multi-determined, then it is plausible that it has distinct mechanisms that do not necessarily co-occur. Scholars who either proposed (e.g., Bacanli, 2000) or discovered (e.g., Spunt, Rassin, & Epstein, 2009) the multi-dimensionality of indecisiveness explicitly or implicitly endorse the distinct mechanisms hypothesis. In addition, a broader variety of research collectively offers compelling support for the distinct mechanisms hypothesis.

A key source of evidence is in clinical psychology, where the DSM-IV-TR (2000) lists indecisiveness (sometimes referred to as difficulty deciding) as a diagnostic

criterion or associated feature of several psychological disorders, chief among them depression, obsessive-compulsive personality disorder (OCPD), and dependent personality disorder (DPD). Although others noted this before (Frost & Gross, 1993; Frost & Shows, 1993), none has suggested that it was evidence for multi-determination, let alone sought to compare the drivers underlying indecisiveness in each disorder. Despite high rates of comorbidity among the disorders and a debate surrounding how to categorize them, the mechanisms underlying indecisiveness in each of these three disorders appear quite distinct.

Interestingly, some of the mechanisms underlying indecisiveness suggested in the DSM-IV-TR (2000) are remarkably compatible with those in the decision-making styles literature. Decision-making styles are generally thought of as learned propensities to behavioral response patterns, such as information gathering and processing, when faced with decisions (Scott & Bruce, 1995). Although the styles literature does not address indecisiveness explicitly, some of the styles are good candidates for contributors. Based on a synthesis of decision styles literature, and verified through a series of studies, Scott and Bruce identified five decision styles: 1) rational, 2) intuitive, 3) dependent, 4) avoidant, and 5) spontaneous. Note that Scott and Bruce found evidence that styles were not mutually exclusive, and suggested that individuals might use a combination of styles when faced with important decisions.

Though at the end of the day there may be several types of indecisive people and different ways to categorize them, the evidence for only a limited number were sought in this dissertation, and their existence was contingent on evidence for the multi-determination of indecisiveness. To test the distinct mechanisms hypothesis, indecisive

individuals should neither all exhibit the same indecisive behaviors, nor do so for the same reasons. Although a person-centered approach was taken to test this hypothesis, and the discussion of “types” of indecisive implies actual groups of individuals, “type” should be thought of in terms of patterns of interacting variables, or mechanisms. Note that although these mechanisms are distinct, their occurrence is probabilistic and they are not necessarily mutually exclusive. Despite one’s behavioral tendencies, one can be indecisive in a number of ways and for a variety of reasons.

Developing the Indecisiveness Scale

To properly and validly test these three main hypotheses requires a measure of indecisiveness with three characteristics. First, it needs to be grounded in a clear, conceptual definition that draws its legitimacy from being informed by how indecision and indecisiveness are conceived across scholarly literatures and how the terms are commonly used. Second, the measure needs to be tied to an observable phenomena (cf. Danan, 2004, who considered indecisiveness to be “a subjective, unobservable phenomenon,” p. 8). Third, the measure can have no items that *a priori* include or preclude potential contributors (e.g., scale items that include a causal attribution). Because no published measure of indecisiveness was found to meet all three of these criteria, a new scale needed to be developed.

This dissertation has six chapters that describe how the indecisiveness measure was developed, and how with that measure a clearer understanding of the phenomenon was achieved by testing the three main hypotheses. Chapter 2 offers a brief overview of the extant notions and measures of indecision and indecisiveness and their shortcomings. A behavioral definition of indecisiveness was then synthesized from researchers’

conceptions and shown to be consistent with common usages of the terms “indecision” and “indecisiveness.” The chapter concludes by describing how from this new definition a typology of indecisive behaviors was derived, which then directly guided the development of the behavioral indecisiveness scale.

Chapter 3 describes Study 1, in which the initial indecisiveness scale was developed. The scale was used to test the multi-dimensionality hypothesis. This resulted in an important theoretical shift from considering indecisiveness mainly in terms of when it occurs during the decision making process, to focusing on types of indecisive behaviors. The theoretical shift led to the refinement of the indecisiveness scale.

Chapter 4 describes Study 2, in which the multi-dimensionality hypothesis was re-tested using the refined indecisiveness scale. Study 2 also tested the multi-determination hypothesis by showing how proximal and distal contributing variables had multiple, and distinct, relationships with each of the indecisive behaviors. More importantly, the substance of the multi-determination hypothesis, that is, the specifics of those relationships, led to a clearer understanding of why different types of indecisive behavior occur.

Chapter 5 describes Study 3, which tested all three hypotheses on a larger and demographically broader sample, and included additional validation of the scale. Study 3 used a more refined set of distal contributors, which resulted in a clearer understanding of the mechanisms underlying indecisiveness. Finally, Chapter 6 offers a general discussion of the results of the three studies, including their limitations, the contribution to our understanding of indecisiveness, and directions for future studies.

Chapter 2: Overview of Indecisiveness Research

Existing Definitions of Indecision and Indecisiveness

Indecision, indecisiveness, and related concepts (e.g., ambivalence, indifference, fear of commitment) have been discussed and studied across several disciplines, from clinical psychology, to vocational choice, marketing, and management. Many scholars' conceptions of indecision and indecisiveness are implicit, often ambiguous, and appear to compound and confound distinct concepts. Appendix A offers a brief overview of the range of conceptual and operational definitions of indecision and indecisiveness used by scholars across these literatures. Where authors have not provided explicit conceptual definitions, I have inferred them from either their operational definitions or from their use of the terms *indecision* or *indecisiveness*. I also included notes where I felt clarification was needed.

The fact that many authors do not explicitly define the concepts of indecision or indecisiveness, as indicated in Appendix A, might suggest that they think the concepts are self-evident. Yet despite a few pockets of consensus, there is no underlying conceptual or operational thread that ties them together. What exactly is meant by the terms “indecision” and “indecisiveness” is, in short, not self-evident. Taken at face value, at least ten notions can be distilled from Appendix A:

1. Prolonged decision latency (in deciding or implementing decisions)
2. Putting off decisions (e.g., decisional procrastination, strategic waiting)

3. Aversion to decision responsibility (e.g., buck-passing)
4. Inability to decide
5. Difficulty deciding
6. Decision impasse while experiencing negative affect
7. Experience of negative decision-related emotions before, during, and after deciding (e.g., anxiety, doubt, stress, frustration, confusion)
8. Fear of commitment
9. Decisional regret
10. Unstable/changing commitments

In addition to these, an eleventh conception of indecisiveness, that of chronic irresolution (e.g., failing or refusing to decide), is not represented. Note that the inability to decide is conceptually distinct from irresolution: The former is a difficult-to-measure causal attribution inferred from an unspecified behavior, and the latter is an unattributed observed behavior.

Problems with extant definitions. At least four problems arose in trying to find a common thread that connects this variety of conceptions. First, the definitions in Appendix A are not all at the same level of specificity. Some definitions are broader than are others (e.g., 7 is broader than are 8 or 9), others overlap (e.g., 6 and 7), and some seem to be contributors to others (e.g., 7 or 8 plausibly contribute to 1 through 5). The latter observation was also made by Germeijs and De Boeck (2000).

The second problem with the extant definitions of indecisiveness—taken collectively—is that some of them conflict with one another. Most notably, Ferrari and colleagues define indecisiveness as chronic decisional procrastination, but seem to mean

the phenomenon includes related behaviors (e.g., greater distractibility) when they point out that “indecision is more than not making timely decisions” (Ferrari & Dovidio, 2001, p. 1113; cf. Rassin, Muris, Franken, Smit, & Wong 2007, for a different interpretation of this quotation). Their definition is in direct contrast to many other conceptions of indecisiveness in Appendix A, but particularly to those of prolonged decision latency (e.g., Bacanli, 2006; Chartrand, Robbins, Morrill, & Boggs, 1990; Frost & Shows, 1993; Milgram & Tenne, 2000) and multidimensional definitions (e.g., Bacanli, 2006; Germeijs & DeBoeck, 2002).

A second example of conflicting conceptions of indecisiveness centers on the role of negative decision affect. On the one hand, several scholars hold negative affect to be integral to indecisiveness (Callanan & Greenhaus, 1990; Elaydi, 2006; Frost & Shows, 1993; Germeijs & De Boeck, 2002; Haraburda, 1999). On the other hand, others make no mention of affect (e.g., Chartrand, Robbins, Morrill, & Boggs, 1990; Danan & Ziegelmeyer, 2006; Gati, Krausz, & Osipow, 1996; Goodstein, 1972; Jones, 1989; Mann, Burnett, Radford, & Ford, 1997; von Neumann & Morgenstern, 1944; Wanberg & Muchinsky, 1992). Milgram and Tenne (2000) consider indecisiveness and tension (i.e., the “affective response that accompanies the decision making process,” p.146) to be associated, but distinct, parameters of the decision-making process.

A third problem in trying to integrate the conceptual definitions of indecision or indecisiveness is that they are often not completely congruent with their own operationalizations, thus calling into question the validity of the measures. For example, although Ferrari and Dovidio (2001) define indecisiveness as decisional procrastination, they also argue that it is “more than not making timely decisions” (Ferrari & Dovidio,

2001, p. 1113). As Milgram and Tenne (2000) pointed out, the five items that make up the measure Ferrari and colleagues use (i.e., Mann's Decisional Procrastination Scale; Janis & Mann, 1977) actually tap reluctance to decide, decision delay, distraction, decisional procrastination, and failure to follow through on a decision. Their measure, then, seems broader than their definition on the one hand, but consistent with their claim that indecision is more than not making timely decisions, on the other. (For more criticisms of the validity of indecisiveness measures see Germeijs & DeBoeck, 2002; Lewis & Savickas, 1995.)

The fourth, and most serious, problem with extant conceptions of indecisiveness is that they vary in the kind of construct they hold the phenomenon to be. This variety is evident across definitions, but also, as Rassin (2007) points out, within certain definitions of indecisiveness. In trying to be comprehensive, some definitions seem so broad that they undermine attempts to understand how indecisiveness relates to relevant, but distinct, concepts. Germeijs and De Boeck (2002) make a similar observation, when they point out that items in measures of indecisiveness either refer to the decision-making process, such as prolonged latency, or to correlates or causal factors, such as frustration. Consider, for example, the following item from Bacanli's (2005) scale: "I decide quickly for fear that I might miss the opportunities, and then I give my decision up [sic]."

Appendix A suggests that indecisiveness is characterized as everything from an affective or emotional state (notions 7, 8, 9), inability (notion 4), and difficulty (notions 5, 6), to behavior (notions 1, 2, 3, 10, 11). Before explaining why a behavioral definition was adopted in the present research, the problems of indecisiveness as decision-related affective or emotional state, inability, and difficulty are briefly explained.

Indecisiveness as decision-related stress, anxiety, regret or other negative emotion has face validity to the extent that these emotions are thought to commonly accompany indecisive behavior, if not contribute it. On closer examination, however, it becomes harder to accept that negative decision-related emotions are themselves indecisiveness for two reasons. For one, if an individual were to consistently experience such negative emotions when deciding, yet make timely and stable decisions, one could call that person conflicted, but hardly indecisive. Conversely, if someone did not experience negative emotions when deciding, but consistently failed to make timely and stable decisions, we would be inclined to call that person indecisive. Milgram and Tenne (2000) say as much when they distinguish decision latency from decision tension. Their distinction yields a 2 (swift/slow) x 2 (tense/relaxed) matrix based on median splits, which results in four types of deciders. The swift-tense deciders experience negative decision-related affect, but make decisions (relatively) quickly, and so they are not considered indecisive. Of the two types of indecisive, tense and relaxed, tense ones are the more common; Milgram and Tenne found that only one in four indecisives are relaxed. One way to characterize relaxed indecisives is that they are calm and collected, but take longer than average to make decisions because they are systematic and very thoughtful, much like Janis and Mann's (1977) vigilant decider (e.g., "I take a lot of care before deciding" and "I consider how best to carry out a decision," from Vigilance scale).

Next, indecisiveness defined as an "inability" is problematic because the concept of (in)ability itself is broad. Is the ability to decide a singular capacity, a collection of capacities, or the coordination of a collection? Is it learned or not? Is it absolute (i.e., you can or you cannot) or continuous? Even if one were to specify the characteristics of the

inability to decide, measuring it directly would prove exceedingly difficult.

Indecisiveness as an inability in the strong sense is a binary concept—one either has the ability and decides, or one does not and never decides. Inability in the strong sense would restrict indecisiveness to characterize someone who always fails to decide, which is so limited as to have no face validity. In contrast, indecisiveness as inability in the weak sense is continuous, where indecisiveness would denote a lower degree of ability. How to validly measure the degree of decision ability (i.e., the ability to come to a decision, regardless of the quality of that decision) would be contingent on how the degree of ability to decide would manifest so that it can be observed and measured. Two possibilities are 1) the frequency of failing to decide, and 2) the average time it takes one to decide. Though face valid, these are both behaviors, and one cannot infer from them that they are caused by a lack of ability, as opposed, say, to a lack of motivation. Unlike ability, one can argue that difficulty is a phenomenological experience. As such, self-reported difficulty is more valid than is self-reported (in)ability. Still, measuring indecisiveness as a difficulty is analogous to measuring it as an ability if one does not want to limit measurement to self-reports. Milgram and Tenne (2000) address the issue thus: “One parameter of difficulty is the time and/or the effort expended in reaching a given decision. A decision that requires a great deal of time and/or effort is *usually* regarded as more difficult than one reached quickly and with little effort” [my italics] (p. 146).

Finally, if one did infer inability or difficulty from an observed behavior (e.g., because of one’s definition), one would be assuming *a priori* a causal attribution. Such an assumption would limit one’s endeavor to understand indecisiveness to searching for

explanations for an inability and thus prematurely preclude the search for a broader range of possible mechanisms.

Behavioral Definition of Indecisiveness

I propose that indecisiveness is most fruitfully characterized as a well-defined class of observable chronic *behaviors*. The four advantages of defining indecisiveness as a behavior are that 1) the operationalization is congruent with the definition, requiring no questionable inferential steps; 2) the phenomenon is easier to investigate empirically; 3) it is *a priori* the least restrictive phenomenon of the four mentioned in terms of admitting other phenomena into explanatory mechanisms; and 4) it offers one a rich research agenda to account for the various non-behavioral conceptions in Appendix A as possible contributors to, or epiphenomena of, indecisiveness.

Despite the problems with and inconsistencies among existing conceptions of indecision and indecisiveness, the synthesized behavioral definition proposed below was surprisingly capable of addressing most of the conceptions in Appendix A. The definition aims to a) account at some level for as much of the range of what scholars consider to be indecisiveness as possible, b) encompass as few, albeit specific, behaviors as possible, c) attribute only behavioral characteristics to indecisiveness, and d) entail no *a priori* assumptions about why indecisiveness occurs. The definition of indecisiveness builds off definitions of “indecision” and “undecided,” which, in turn, are based on Yates’s (2003) definition of “decision.”

Yates (2003) defines a “decision” as a commitment to a course of action intended to satisfy particular people, i.e., “beneficiaries” (see also Langley, Mintzberg, Pitcher, Posada, & Saint-Macary, 1995; Mintzberg, Raisinghani, & Théorêt, 1976). In this

definition, a decision involves both a commitment to action and the fulfillment of that commitment. To decide, in other words, is to make a commitment and (at least try to) carry it out. To be decided is to have made a commitment, and so, conversely, being undecided means to have not (yet) made a commitment. Accordingly, “indecision” is here defined as *the state of not having made a timely and stable commitment to a course of action while the need for such a commitment is acknowledged.*

In this definition, a necessary condition for indecision is that *someone* (e.g., decider, beneficiary, stakeholder) acknowledges that a commitment to course of action (i.e., decision) needs to be made. From the moment the need to decide is acknowledged, the decision in question has either been made or it has not. Though it may seem obvious that making a given decision extinguishes that need to decide, in some cases it may not (e.g., if it insufficiently addresses what provoked the initial need), and in other cases the need passes without a decision having been made (e.g., lost opportunity). Thus, so long as there continues to be an acknowledged need for a given decision, the decider remains “undecided.” When a decider remains undecided for too long, she is considered to be in a state of “indecision.” What exactly counts as “too long” is context dependent—one would be expected to take less time on simpler, routine, and low stakes decisions.

The second part of “not having committed” is based on the tacit expectation—inherent in the notion of commitment—that a commitment will be honored. An unjustified (or poorly justified) failure to follow through on a commitment can indicate that the decider had weak or unstable conviction in her commitment (e.g., was not really decided). Such failure to *remain* committed to the same course of action, then, is a second form of “not committing” and thus qualifies as indecision. If deciders who remain

undecided for too long are in a state of “indecision,” then those who tend to chronically experience indecision are “indecisive.” In other words, the chronic experience of indecision is called “indecisiveness” and is defined as the *tendency to not make a timely and stable commitment to a course of action when the need for such a commitment is acknowledged.*

Common Definitions of Indecisiveness

Indecisiveness as a chronic failure to commit and stay committed to a course of action was consistent with some of the common usages of the terms “indecision,” “indecisive,” and “indecisiveness” (when explicitly distinguished). Seven sources of English usage were consulted as descriptions of popular usage, and the most common thread was that indecisiveness meant “chronic indecision.” However, as was the case with scholars’ conceptions, there was considerable variation in the dictionary definitions of indecision (see Appendix B).

There were nine distinct conceptions of indecision in the dictionaries, several of which were similar or identical to those of researchers in Appendix A:

1. Inability to decide or make up one’s mind
2. Reluctance to decide or make up one’s mind
3. The state of not being able to decide
4. Inability to make decisions quickly and effectively
5. Hesitation
6. Vacillation or wavering between courses of action
7. Tendency to change one’s mind
8. Lack or want of decision

9. Irresolution or not producing a clear decision

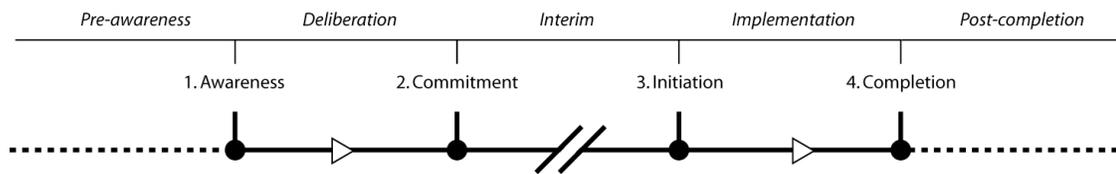
Like researchers' definitions, the dictionaries characterized indecision and indecisiveness as belonging to a variety of phenomena, including an inability (definitions 1, 3, 4), motivation (definition 2), behavior (definitions 5, 6, 7), and state (definitions 3, 8, 9). Conspicuously absent were definitions of indecision as affective state or difficulty. The behavioral definition of indecision proposed earlier included key features from definitions 3 (a state), 4 (timeliness), 6 and 7 (instability of commitment), and 8 and 9 (non-decision), indicating that it was consistent with common usage.

Operationalizing the behavioral definition of indecisiveness involved identifying distinct indecisive behaviors within a "decision episode" framework. The framework served to characterize the "what" and "when" of different indecisive behaviors, and also served as a guide for generating items for the initial indecisiveness scale.

When in the Decision Process Indecisiveness Occurs

A 'decision episode' is the sequence of events entailed in making and carrying out a decision, and consists of three phases, each of which begins and ends with a specific act (see Figure 1). A decision episode begins with the act of "awareness," or becoming cognizant that a possible opportunity or calamity might affect the satisfaction of one's intended beneficiaries. For example, Jim's girlfriend Kyla might remind him that the longer he waits to rent an apartment for the coming year, the fewer "good" apartments there will be from which to choose. Being made aware of the potential apartment calamity (or opportunity) presents Jim with a meta-decision: Does he need to make a decision about renting an apartment soon?

Figure 1. Phases and Points in a Decision Episode



Once Jim acknowledges the need to decide (Yates, 2003) on an apartment, he enters the “deliberation” phase of the decision episode (Putsis & Srinivasan, 1994). During the deliberation phase, Jim engages in the bulk of decision-related sub-procedures, such as generating options, considering possible outcomes, making trade-offs, and considering how acceptable the options are to one’s intended beneficiaries and stakeholders (see Yates, 2003). In short, it is during this phase that Jim gathers information about different apartments and ponders which to choose. It is important to note that although the term “deliberation phase” strongly implies that the decider is engaging in conscious analysis, it is not meant to. The decider may reach the point of commitment intuitively, automatically (Yates, 2003), and even unconsciously before being aware of doing so (Galdi, Arcuri, & Gawronski, 2008).

In signing a lease, Jim makes a commitment, which ends the deliberation phase. The act of “commitment” does not mean that all deliberation (conscious or otherwise) about the decision problem ends, however. It is simply the point at which one feels sufficiently compelled (for any number of reasons, conscious or otherwise) to make a commitment. The commitment is a pledge to do something to satisfy beneficiaries, such that if the pledge is broken, one experiences significant adverse affects. (In many cultures, for example, breaking a promise can incur a loss of face, credibility, and in some cases, even lead to punishment.) If, after signing his lease for one apartment, Jim were to subsequently find a much better apartment, he might well be tempted to

reconsider honoring his existing lease (i.e., break the first lease and sign a different one). Though he would likely not lose face or credibility for breaking his first lease, he would almost certainly face financial repercussions for doing so.

After one has made a commitment to a course of action, one eventually implements the actions to fulfill that commitment. The “interim” phase between the act of commitment (e.g., Jim’s signing the lease) and the act of initiating the fulfillment of the commitment (e.g., Jim’s taking possession of the apartment) can vary in duration depending on the decision situation. For instance, the interim between Jim’s lease signing and moving is three months, but the interim between his marriage proposal to his girlfriend (i.e., act of commitment) and their wedding day (i.e., act of initiating the implementation of that commitment) is 15 months. In contrast, when Jim plays hockey in the local recreational league, he frequently makes split-second decisions on the ice about whether to shoot or pass the puck. Split-second decisions are one type of decision with virtually no interim between commitment and initiation, so that the commitment to act is almost indistinguishable from the act itself.

The interim phase ends with the initiation of the implementation phase, during which one fulfills one’s commitment by acting on it. The fulfillment of a commitment can involve the completion of a discrete action (e.g., pass or shoot) or an extended activity (e.g., lease or marriage) for some explicit or implied period of time. Thus, the nature of the commitment defines the duration of the implementation phase of the decision. In many cases, the commitment is not perpetual, and the implementation ends once the commitment is fulfilled. The act of actually passing the puck or of having

fulfilled one's wedding vows until one's spouse has died are two examples of fulfilled commitments.

The nature of some commitments, however, can be such that even after the commitment ends, there is an implicit understanding and even social pressure that one should not make subsequent commitments that are inconsistent with the first. This seems particularly true when a commitment to a position on an issue is presumed to be based on deeper, unchanging values (e.g., "protected values," Baron & Spranca, 1997). For example, once one has committed to a position on the death penalty, the right of women to vote, or what side of a civil war to fight on, most people would expect it to be an enduring commitment, and one that would be reflected in subsequent decisions based on the same underlying values. This is evident in accusations of "flip-flopping" by politicians for having made apparently inconsistent decisions (i.e., supported different positions) on principle-based issues. The insinuation is that a decider who changes is untrustworthy because such a change (in voting pattern) happens when there is 1) a failure to conduct due diligence prior to committing, 2) a lack of real convictions and vision, or 3) dishonest, opportunistic, political expediency (Chait, 2004). Even ostensibly legitimate changes in commitments are often interpreted to mean a lack of vision and resoluteness: Staw and Ross (1980) found that people most admired leaders who stay the course even when new evidence clearly suggests changing it, but only if they are right in the end.

Types of Indecisiveness

Indecision and indecisiveness were considered within the framework of decision episodes, and thus were thought of as occurring on either side of the point of

commitment. This yielded a distinction between “commitment indecision” and “action indecision,” which correspond to the states of not making a commitment, and not honoring a commitment one has made, respectively. Commitment indecision occurs during the deliberation phase, whereas action indecision occurs during the interim phase, implementation phase, or even after completion (e.g., “flip-flopping”). Jim hemming and hawing for years about whether to propose to his girlfriend is an example of commitment indecision, whereas his postponement of the wedding date for the third time (e.g., because he has doubts about the marriage) is an example of action indecision.

The commitment vs. action distinction applied to indecisiveness as well. Thus, individuals could be commitment indecisive or action indecisive. This distinction echoes the one that Bacanli (2000) made between “exploratory indecision” (e.g., “I think for hours even when I make simple decisions”) and “impetuous indecision” (e.g., “I decide quickly and give it [the commitment] up quickly”). The commitment vs. action distinction is also captured in Mann, Burnett, Radford, and Ford’s (1998) measure of decisional procrastination (e.g., “Even after I have made a decision, I delay acting on it”), and is supported and complemented by at least two related distinctions. First, it seems plausible that individuals who are commitment indecisive are so because they experience (for any number of reasons) “pre-decisional conflict,” or are action indecisive because they experience “post-decisional conflict” (Janis & Mann, 1977). Second, one way that commitment and action indecision can manifest themselves behaviorally is in “decisional procrastination” and “task avoidant procrastination,” respectively (Ferrari & Dovidio, 2000).

By further specifying when action indecisiveness occurs during the decision episode, we were left with a total of four types of indecisiveness, one for each phase of the decision episode: 1) “commitment indecisiveness,” 2) “initiation indecisiveness,” 3) “completion indecisiveness,” and 4) “post-completion indecisiveness.” These four types of indecisiveness served as the conceptual basis for the four subscales of the behavioral indecisiveness scale (see Appendix B).

Again, the multi-dimensionality hypothesis held that indecisiveness consists of distinct behaviors. Specifically, one kind of indecisiveness was predicted to occur before the point of commitment, and three others after the point of commitment. Those after the point of commitment were distinguished by occurring before, during and after enacting a decision.

Chapter 3: Study 1—Initial Indecisiveness Scale Development

Aims

The principal aim of Study 1 was to validate the behavioral indecisiveness scale, and in so doing test the multi-dimensionality hypothesis. The 62-item behavioral indecisiveness scale was rationally derived based on the four aforementioned types of temporally distinct indecisiveness. One item was borrowed from Frost and Shows' (1993) Indecisiveness Scale, ("It seems that deciding on the most trivial things takes me a long time"), and two additional items were modifications of items from the same scale ("I come to a decision quickly" and "When ordering from an unfamiliar menu, I'm the first in my party to select a meal").

Method

Participants. Participants were undergraduate students at a large Midwestern university enrolled in an introductory psychology course, and who received course credit for participating in the study ($N=369$, mean age $M=18.7$ years, 46.6% female).

Procedure. Participants completed a self-report questionnaire in groups of six to 10 on computer terminals in the laboratory. The study was presented using Medialab software. Due to the low percentage of missing data (0.32%), all analyses were conducted using pairwise deletion (i.e., each analysis excluded cases that were missing data for variables in that analysis).

Measures.

Behavioral Indecisiveness Scale. The four sub-scales of the 62-item Behavioral Indecisiveness Scale (hereafter BIS; Appendix B) were administered with the items presented in randomized order by the computer. The commitment indecisiveness scale (20 items, nine reverse-scored) measured failure to decide, decision delay, or long decision latency (e.g., the reverse-scored “I commit to a course of action well before the deadline”). The initiation indecisiveness scale (20 items, eight reverse-scored) measured delay in beginning implementation or decision change before implementation has begun (e.g., “When it comes time to act on a choice, I change my mind and choose a different option”). The completion indecisiveness scale (12 items, five reverse-scored) measured decision change before implementation completion or delay in implementation completion (e.g., “I wait until the deadline before bringing a project to a close”). Finally, the post-completion indecisiveness scale (10 items, two reverse-scored) measured decision change or making an incompatible decision after implementation was complete (e.g., “Soon after deciding, I find myself making a second decision that reverses the effects of the first”). Responses on the behavioral indecisiveness scale used a six-point Likert-type frequency scale developed for the study.

Three of the best-known measures of indecisiveness use a Likert response scale from “strongly disagree” to “strongly agree” (Frost & Shows, 1993; Mann, 1982) or seven-point Likert-type scale from “strongly disagree” to “strongly agree” (Germeijs & De Boeck, 2002) to measure the degree to which decision-making statements are true of the respondent. These response scales have two problems that weaken the validity of their

respective scales: 1) they rely on an ambiguous metric, and 2) they include a mid-point response.

First, most of the statements in these three scales are about feelings, experiences, and behaviors (e.g., “I make decisions quickly,” Germeijs & De Boeck, 2002).

Psychologically, respondents can evaluate the truth of these statements on the basis of degree (i.e., *how* quickly do I make decisions?), frequency (i.e., how *often* do I make decisions quickly?), or both. By including items that either do not admit an evaluation of degree (e.g., “I delay making decisions *until it is too late*,” [my italics] Mann, 1982) or explicitly include frequency terms (e.g., “I *usually* make decisions quickly,” [my italics] Frost & Shows, 1993), all three scales are biased towards frequency based evaluation. Nevertheless, some items may still be evaluated in terms of degree, which means one cannot be sure that all respondents consistently use the same metric.

Second, the use of response scales with mid-points to measure indecisiveness—a *phenomenon characterized by uncertainty and equivocation*—is inappropriate if not ironic. Although there are arguments for and against providing respondents with a midpoint response option, the meaning of midpoint responses has long been recognized in the survey methodology literature as being ambiguous. A mid-point response could, for example, mean 1) the neutral value on the scale, 2) discomfort or unwillingness to answer, 3) no opinion, 4) lack of response certainty, 5) not understanding the question, or 6) contextual variability (Velez & Ashworth, 2007).

To avoid both metric ambiguity and midpoint response ambiguity, the behavioral indecisiveness scale uses a six-point Likert-type frequency response scale. Since no such response scale was found to exist, one was constructed. To make the points on the scale

as continuous as possible (i.e., equidistant), frequency terms for the six labels were chosen based on Rohrmann's (2003) study of verbal qualifiers for rating scales.

Rohrmann had participants comparatively rate 12 frequency terms (e.g., usually, occasionally, sometimes) from lowest to highest on a scale from 0 to 10, and then rate the familiarity of each term. The six most equidistant terms with high familiarity scores were adopted for the present scale, namely: 1 = Never, 2 = Seldom, 3 = Sometimes, 4 = Often, 5 = Very Often, and 6 = Always.

Results

Because the four subscales of the behavioral indecisiveness scale were rationally derived based on theory, there were clear *a priori* predictions about the factor structure. This justified the use of confirmatory rather than exploratory factor analysis. Two factor analyses were conducted on the 62 scale items using LISREL 8.5 (Jöreskog & Sörbom, 2003): The first was on the null model, a one-factor solution, and the second on the hypothesized four-factor model. In all three studies, the standards for good model fit were based on Hu and Bentler's (1999) recommendations: RMSEA < 0.06, GFI > .95, and NNFI \geq .95.

The null model failed to converge, χ^2 (1891, $N=369$) = 9799.51, $p < .01$ and had very poor fit indices: RMSEA = 0.23, NNFI = 0.00, GFI = 0.23. Although the hypothesized model had substantially better fit, it too failed to converge: χ^2 (1823, $N=369$) = 4808.31, $p < .01$, RMSEA = 0.093, NNFI = 0.61, GFI = 0.60. Examination of the loadings and correlation matrix suggested that items were related based on four indecisive behaviors, regardless of when in the decision episode they occurred: 1) decision evasion, 2) prolonged latency, 3) waiting, and 4) changing commitments.

Consequently, a third factor analysis was conducted on the 35 items that loaded highly on one factor, but had low cross-loadings. Four factors were predicted: Evasion, prolonged latency, waiting, and changing. It is important to note that items measuring these hypothesized factors were part of the original 62-item scale, but their wording varied by when in the decision episode they occurred. The 35-item, four-factor model had relatively poor fit, with a significant chi-square $\chi^2(554, N=369) = 1368.98, p < .01$. The fit indices, though more promising than the first two models, still indicated inadequate fit: RMSEA = 0.073, NNFI = 0.81, GFI = 0.80.

The beta modification indices, which are estimates of the decreases in chi-square for given changes to the beta parameters of the path model (Jöreskog & Sörbom, 2003), indicated that a better fitting four-factor model could be obtained by eliminating items that had cross-loadings. A fourth model was tested with 18 of the 35 items selected based on the strength of the primary loading and lack of cross-loading. Though the chi-square was still significant $\chi^2(129, N=369) = 257.81, p < .01$, the fit indices were at the threshold between acceptable and good fit: RMSEA = 0.052, NNFI = 0.91, GFI = 0.93. To re-confirm that the fit of the model was superior to that of a unidimensional model (though items had been retained based on their high loadings and low cross-loadings), a unidimensional model was tested using the 18 variables. As expected, the unidimensional model did not converge, having a significant chi-square of $\chi^2(153, N=369) = 1916.90, p < .01$, and poor fit indices RMSEA = 0.24, NNFI = 0.0, GFI = 0.48. Table 1 shows factor correlations, scale means, standard deviations, reliabilities, and correlations for the behavioral indecisiveness scale, and Table 2 shows the final 18 items and their factor loadings.

Table 1
BIS Factor Correlations, Scale Correlations, and Scale Reliabilities

<i>N</i> = 369	Latency	Waiting	Evasion	Changing
Latency (3 items)	.74	.27	.36	.42
Waiting (6 items)	.31	.77	.37	.20
Evasion (3 items)	.49	.48	.65	.35
Changing (6 items)	.54	.18	.46	.80

Factor correlations below diagonal; Cronbach's α s on diagonal; Scale correlations above diagonal
All correlations significant, $p < .01$ (two-tailed)

Table 2
Factor Structure and Loadings of the BIS

Item	<i>Latency</i>	<i>Waiting</i>	<i>Evasion</i>	<i>Changing</i>
	Factor Loadings			
I come to a decision quickly. (R)	.50			
I take "forever" to make up my mind.	.87			
It seems that deciding on the most trivial things takes me a long time.	.74			
I commit to a course of action well before the deadline. (R)		.70		
I implement my plans at the first opportunity. (R)		.58		
I waste no time starting on something I said I would do. (R)		.60		
I complete a task I have agreed to do without delay. (R)		.49		
I wait until the deadline before bringing a project to a close.		.58		
I finish something ahead of schedule. (R)		.68		
I avoid making definite plans until I have to.			.57	
When I have to take a position on some matter, I do. (R)			.63	
When asked when I will do what I said I would do, I answer something non-committal, like "I'll see," "Soon," or "I'm not sure."			.68	
I back out of a decision I have made.				.51
When it comes time to act on a choice, I change my mind and choose a different option.				.61
I abandon a plan before I have seen it through to the end.				.56
Before I finish acting on my decision, I abruptly stop and reverse that decision.				.73
After I do something, I promptly change my mind and undo it.				.74
I have a sudden change of heart and switch my stand on an issue.				.63

Only factor loadings $\geq .30$ are shown

Discussion

The results of the factor analyses suggested that indecisiveness is made up of four distinct behaviors: 1) prolonged latency, 2) waiting, 3) evasion, and 4) changing. This lent support to the multi-dimensionality hypothesis, although contrary to what was predicted, the items loaded onto their respective factors regardless of where in the decision episode the behavior occurred (e.g., all decision change behaviors loaded together). Though one could not conclude that specifying when in a decision episode an indecisive behavior occurs was not meaningful, the data did suggest that it may be less meaningful than specifying the kind of behavior itself. Furthermore, the results highlighted the possibility that the etiology of a given behavior is similar regardless of when it occurs. Although the scales had low to moderate reliability, this was to be expected for scales with so few items.

A notable shortcoming of the scale items was that they were developed with an emphasis on measuring when indecisiveness occurred, and so were not worded to focus on the behaviors that they appear to measure. This was one reason why over 70% of the items were ultimately eliminated to get a theoretically and empirically coherent model. The items had additional shortcomings. For one, the correlation between the waiting and latency scales ($r = .27$) was far lower than would be expected, as those who wait by definition take longer to make a final commitment. One explanation might be that individuals who tend to wait may have interpreted some latency items to mean unjustified delay. For example, "I take 'forever' to make up my mind" captures some of the exasperation indecisives report feeling about taking too long to decide (Frost & Shows, 1993). Individuals who tend to wait make up their minds without much delay, and then

purposefully delay commitment. As such, such waiters could be expected to distinguish between the time it takes them to make up their minds and the time it takes them to commit (a pre-commitment interim phase of sorts). In addition, it seems reasonable that such individuals would consider their delayed commitment to be strategic and not procrastinatory, and thus justified. For these two reasons it seems unlikely that “waiters” would see themselves as taking “forever” to make up their minds.

More generally, the items did not adequately cover the conceptual space of several of the empirically derived sub-scales. For example, two of only three evasion items are social in nature (e.g., “When asked to commit to something, I answer something non-committal, like ‘Maybe,’ ‘I’ll see,’ or ‘I’ll think about it.’”). This lack of coverage impoverished the scope and validity of the sub-scales, which, in turn, weakened the validity of the final factor analysis. These results pointed not simply to the need to refine the existing scales, but rather suggested a reconsideration of how to classify indecisive behaviors and better distinguish them from related behaviors. The results also highlighted the possibility that there may be more classes of indecisive behavior that were not captured by the scale items.

Chapter 4: Study 2—Correlates of a Refined Measure of Indecisiveness

Indecisiveness Reconsidered

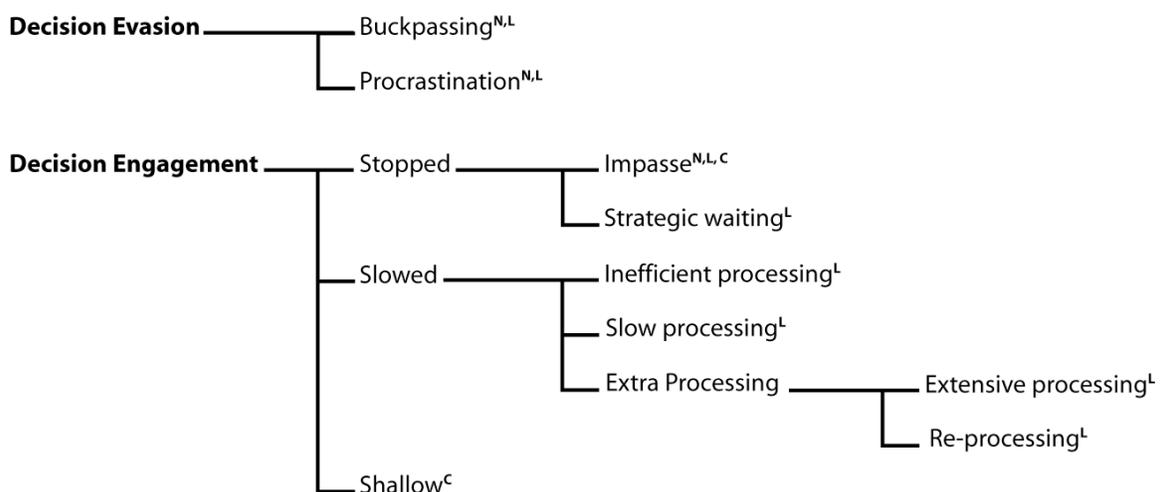
In light of the results of Study 1, indecisiveness was re-operationalized strictly in terms of the (chronic) behaviors that would constitute proof of the state of not-deciding, assuming that the need to decide had been acknowledged. This yielded three core indecisive behaviors—behaviors that had already been part of the behavioral indecisiveness scale, namely, chronically 1) taking relatively long to decide, 2) not-deciding, and 3) changing one’s decision after having committed. Each of these behaviors, when chronic, indicates indecisiveness. These and no other behaviors were henceforth considered “core indecisive behaviors,” and so the scale was renamed the “Core Indecisiveness Scale” (hereafter CIS).

Two of the four factors from Study 1 were considered core indecisiveness behaviors—prolonged decision latency and changing decisions. The other two factors from Study 1, waiting and evasion, were now considered to be contributors to the core behaviors. For instance, waiting is one potential cause of prolonged decision latency, and could result also in not-deciding. The recasting of waiting and evasion as contributors to indecisiveness led to the question of what other behaviors might contribute directly to the core indecisive behaviors. A list of plausible, immediate antecedent behaviors was generated and labeled “proximal behavioral contributors.” Rassin (2007) followed a similar generative process when he asked: “What exactly happens during the prolonged

decision times” (p. 5), and then proposed three behaviors similar to the proximal behavioral contributors (i.e., procrastination, avoiding making decision, gathering more information).

The proximal behavioral contributors included the evasion and waiting factors from Study 1, in addition to several other conceptions of indecisiveness from Appendix A. For example, decisional procrastination was one of the more obvious of several potential contributors to prolonged decision latency, but it is actually taking long to decide that is the core indecisive behavior. Proximal behavioral contributors fell into two broad classes of behavior—decision evasion and prolonged decision engagement—resulting in the typology depicted in Figure 2. The engagement-evasion distinction echoed the well-established approach-avoidance distinction, which has been used to describe deciders by a variety of scholars (e.g., Beattie, Baron, Hershey, & Spranca, 1994).

Figure 2. Typology of Proximal Behavioral Contributors



Note: Superscript indicates type of resultant indecisiveness hypothesized: Not deciding (N), long decision latency (L), and changed decision (C).

Note that according to the multi-determination hypothesis, some behaviors in the typology were expected to contribute to more than one type of core indecisive behavior. For instance, decisional procrastination was hypothesized to contribute to prolonged latency and not-deciding.

Each of the proximal behavioral contributors was hypothesized to mediate the effects of one or more distal contributors on the core indecisive behaviors. Of the different possible distal contributors that were plausibly at the root of individual differences in indecisiveness (e.g., cognitive, clinical, developmental), personality traits were chosen as the focus of study because of their prevalence in indecision and indecisiveness research (e.g., Bacanli, 2006; Milgram & Tenne, 2000; Newman, Gray, & Fuqua, 1999). The specific distal contributors chosen were the Big Five personality traits (see John & Srivastava, 1999, for a review): openness to experience (conventionality, daringness, creativity), conscientiousness (goal striving, impulse control, carefulness), extroversion (sociability, assertiveness, spontaneity), agreeableness (altruism, good-naturedness, competitiveness), and neuroticism (negative affect, emotional reactivity, insecurity).

Proximal behavioral contributors. Decisional procrastination and buck-passing are the two proximal contributors that fall under decision evasion, and they have been found to correlate ($r = .64$, Harriot, Ferrari & Dovidio, 1996; $r = .72$, Mann et al., 1997). Decisional procrastination, as mentioned earlier, denotes putting off engaging in the deliberation process (Ferrari, 1994; Janis & Mann, 1977). It is negatively related to openness, conscientiousness, and extroversion (Di Fabio, 2006). Decisional procrastination is also positively related to neuroticism directly (Di Fabio, 2006), and

through low self-esteem (Di Fabio, 2006; Effert & Ferrari, 1989). By definition, putting off deciding means, all things being equal, the decision will take more time. If one puts off the decision too long, one might forget about it (e.g., returning RSVPs). Alternately, one may reach a point so close to a deadline that, despite panicked deciding (e.g., hypervigilance, Janis & Mann, 1977), one fails to decide. One of the items in Janis and Mann's (1977) decisional procrastination scale captures the idea of waiting too long: "I delay making decisions until it is too late." Thus, decisional procrastination was expected to mediate the effects of high neuroticism, low conscientiousness, and low extroversion on both latency and not-deciding.

Buck-passing, from the expression "passing the buck," means avoiding one's responsibility (to decide) by shifting it to another person (Janis & Mann, 1977; Rosen, Grandison, & Stewart, 1974). Buck-passing was expected to mediate the effects of high neuroticism and low conscientiousness on prolonged latency. It seems reasonable that some individuals simply will not bring themselves to make a decision if they fail to pass the responsibility to someone else. One reason why might be a lack of self-confidence. Buck-passing was thus also predicted to mediate the effects of high neuroticism and low conscientiousness and extroversion on not-deciding.

The second group of proximal behavioral contributors were thought to lead to prolonged decision engagement because the decider (unintentionally or intentionally) either stops or slows deliberation. The first and most obvious of these, judging from its prevalence in definitions of indecisiveness in Appendix A, was "impasse." Impasse is the state of having unintentionally stopped progress toward the point of commitment. It was thought to be the result of difficulty with a decision, occurring when something in the

decision process (e.g., strong decider ambivalence, envisioning too many possibilities, too much information to integrate, conflicting opinions, trying to please everyone) leaves the decider unwilling (even feeling unable) to move forward. Despite the range of potential causes of impasse, high neuroticism was predicted to be related because worry or concern was thought to underlie many of those causes. Low conscientiousness was also predicted to be related to impasse as it would impede its timely resolution. Impasse was thought to contribute most to prolonged latency and not-deciding.

An intentional stop in the decision process, in contrast, is often characterized as “strategic waiting,” which involves the deliberate withholding of commitment by the decider for one of at least two reasons: 1) The decider is waiting for a specific piece of information that she thinks will affect her choice (e.g., an important beneficiary’s opinion; cf. Tversky & Shafir, 1992 on irrational choice deferral), or 2) the decider has made a tentative choice (e.g., to buy a particular television), but waits a while in case conditions change in some relevant way (e.g., a clearance sale; Anderson & Wilson, 2003). Strategic waiting is a calculated behavior, characterized as the prudent suspension of impulses (e.g., to buy the television now). As such, strategic waiting was hypothesized to be positively related to conscientiousness and prolonged latency, though no research was found that has tested either hypothesis.

Deciders can be chronically slow or slowed in at least three ways: by inefficient processing, slow processing, or by extra processing. Inefficient processing can be due to a lack of decision-making expertise (Yates & Tschirhart, 2006), though again, no study has tested this link. Inefficient processing can also be due to cognitive characteristics such as distractibility or absent-mindedness, which are related to lack of impulse control, low

conscientiousness, and decisional procrastination (Ferrari & Dovidio, 2001). Finally, slow processing speed can result from unintentional factors, such as cognitive impairments (e.g., low IQ). (Effert and Ferrari's (1989) finding that verbal or abstract reasoning was unrelated to decisional procrastination did not address the point that low intelligence is a plausible contributor to slow processing, and thus to prolonged latency and possibly not-deciding.

Slow processing can also result from more intentional factors, such as very careful processing, which is characteristic of vigilant deciding (e.g., "I take a lot of care before choosing," Janis & Mann, 1977), high conscientiousness, and at least moderate neuroticism. Interestingly, vigilant deciding is negatively related to buck-passing, decisional procrastination, and hypervigilance (Mann et al., 1997). This suggests that there may be competing mechanisms that contribute to indecisiveness. Slow processing was expected to be positively related to latency and negatively related to changing.

As indicated in Figure 2, there are at least two distinct ways in which one can process more information: by extensive information processing or by re-checking the information one has. Extensive information processing refers to how much information one gathers and considers when deciding, and the evidence on whether indecisives process extensively appears to be mixed. In studies using an information board task (see Payne, 1976 for a description of the task), Ferrari and Dovidio (2000) found that decisional procrastinators searched for more information, Rassin, Muris, Booster, and Kolsloot (2008) found indecisives searched for more information in one study, but not in another, and Patalano et al. (2009) found that indecisives did not search for more

information. Interestingly, Rassin et al. (2007) found that indecisives did ask for more information before making a judgment in a well-structured probability task.

Patalano et al. (2009) suggested that one explanation for these mixed findings is that indecisives, motivated to find the “best” or “right” option because of their maximization (Spunt, Rassin, & Epstein, 2009) or perfectionism (Frost & Shows, 1993), initially consider information across options. They then have a modest shift away from comparing options to focusing on features of one option as a result of the tension between wanting to consider as much as possible, and the cognitive demands of doing so. A related account is the contingent information search strategy, which holds that indecisives search for more information when they perceive that additional information will help them make a more certain decision or judgment. In contrast, indecisives turn their focus on information about their chosen option when they perceive additional comparative information would only complicate their task or decrease the likelihood of finding a dominating option (and lead to impasse or “paralysis by analysis”).²

This second explanation is the more consistent with Reed’s (1985) proposal that indecisiveness in obsessionals is a result of a failed attempt to structure problems (and decisions). It also better accounts for why, compared to more decisive individuals, indecisives seek more information in well-structured tasks, such as Rassin et al.’s (2007)

² When focusing on their eventually chosen option, indecisives may “bolster” (Janis & Mann, 1977) that option to make it more appealing by “spreading the alternatives”—increasing the value of its desirable characteristics and decreasing the value of its undesirable characteristics. Patalano et al. (2009) observed that when focused on the information in their option of choice, indecisives spent more time on its attributes that differed from other options, than on the attributes that mattered most to deciders. Patalano et al. took this to mean that indecisives were in fact comparing options and deliberating, arguing that had indecisives indeed been “verifying the quality” of their selected option, they “should” have spent more attention to the most important dimensions. However, one could also argue that if indecisives were indeed bolstering they would not spend more time on attributes that were merely more important, but rather on where they thought they could most spread the alternatives. In other words, they would focus on attributes that had some value that they perceived could either be diminished or increased to make the leading option more attractive.

probability task, but spend more time re-processing information about one option in messier decisions such as those in Ferrari and Dovidio's (2001) and Patalano et al.'s (2009) information board tasks. The upshot is that the contingent information search strategy described above suggests an important qualification to Rassin, Muris, Booster, and Kolsloot's (2008) proposal that indecisives have "informational tunnel-vision." Moreover, given that the driver underlying contingent search behavior is anxiety about choosing the right or best option, the mechanism was not expected to hold across all three types of indecisive behavior.

Thus far, the accounts of information search and processing have described and presumed one type of neuroticism-driven indecisive. Some evidence on what drives extensive information search points to a second mechanism that is quite distinct from the first. Need for cognition, defined as "the tendency for an individual to engage in and enjoy thinking" (Cacioppo & Petty, 1982, p. 116), is positively related to the amount of information searched before deciding (Verplanken, 1993; Verplanken, Hazenberg, & Palenewen, 1992). Need for cognition, in turn, is related to openness to experience and conscientiousness (Sadowski & Gulgoz, 1992). This is consistent with Heinström's (2003) finding that the amount of effort put into searching for information is predicted by openness to experience (e.g., because of curiosity) and conscientiousness (e.g., because of thoroughness). Yet openness to experience and conscientiousness are negatively related to neuroticism (Costa & McCrae, 1992) and indecisiveness (Milgram & Tenne, 2000).

One account of how higher openness and conscientiousness might contribute to indecisiveness—specifically prolonged latency—might involve Milgram and Tenne's

(2000) “slow-relaxed” indecisives. This group would take longer to decide because they are adaptively perfectionistic (e.g., Johnson & Slaney, 1996) and vigilant (Janis & Mann, 1977; e.g., “When making decisions I like to collect lots of information” and “I like to consider all of the alternatives”). It would be difficult to identify this type of indecisive with conventional measures of indecisiveness because of their broad spectrum of items tapping more neurotic behaviors, such as decision-related anxiety and decision difficulty. However, the more vigilant type of indecisive may be detectable with a causally agnostic behavioral measure of indecisiveness.

The second manner in which one can process more information, by re-checking it, has also been found to correlate with indecisiveness (Ferrari & Dovidio, 2000; Frost & Shows, 1993; Gayton et al., 1994; Rassin & Muris, 2005a). Some evidence suggests, however, that checking behavior has qualitatively different contributors at different levels. Specifically, engaging in moderate checking is typical of thorough and careful deliberation, which is driven by higher conscientiousness and is characteristic of the aforementioned vigilant type of indecisiveness. In contrast, excessively checking is a more compulsive behavior (e.g., typical of obsessive-compulsive personality disorder, or OCPD), and driven by high neuroticism. The potentially qualitative difference in checking behaviors not only reinforces the earlier suggestion that there is more than one mechanism at play, but also exemplifies how the relationship between drivers and indecisive behaviors is complex. In the end, both moderate and excessive checking take time, and so checking was predicted to relate to latency.

Distal contributors. Because high neuroticism and low conscientiousness have consistently been found to be associated with indecision and indecisiveness (e.g., Frost &

Shows, 1993; Jackson, Furnham, & Lawty-Jones, 1999; Holland & Holland, 1977; Milgram & Tenne, 2000, Neuberg, Judice, & West, 1997) they were predicted to drive all three behaviors in the CIS. That said, they were not predicted to do so equally. Milgram and Tenne's (2000) decision speed is the only extant indecisiveness measure that is directly comparable to any of the three core indecisive behaviors. They found that low conscientiousness, low extroversion, and high neuroticism predicted speed on minor decisions. As such these three distal contributors were predicted to be related to latency.

One can argue that of the three core indecisive behaviors, not-deciding is the most extreme form, as decisions remain unmade rather than eventually made. Though high neuroticism likely drives not-deciding, the failure to actually make commitments, especially in the face of deadlines, seems more characteristic of a lack of conscientiousness. Both high neuroticism and low conscientiousness were therefore predicted to contribute to not-deciding.

Change is perhaps the most complex of the three core indecisiveness behaviors, involving deciding relatively quickly, and then changing one's mind. Even though it is the changing itself that is the more central behavior to indecisiveness, deciding too quickly can precipitate the consideration of change. One can think of changing decisions as consisting of three parts. First a decision, possibly an impulsive one, is made. Second, doubting and post- decisional regret lead to reconsideration. Third, there is actually going through with the change for any number of reasons, such as a need to satisfy others, lack of concern for conventions, or obliviousness to the costs of breaking the commitment.

Low conscientiousness would account for the quick and careless decision, whereas neuroticism is the most obvious driver of the post-decisional doubt and regret,

both of which have been shown to be related to indecisiveness (e.g., Frost & Shows, 1993). Finally, overcoming the barrier to break a commitment might also result from low conscientiousness (e.g., low duty or low perseverance) or low agreeableness (e.g., a selfish indifference to others).

Validation of the CIS

The validity of the CIS was tested with three measures of indecisiveness: one pair of scales and two behavioral measures. First, Milgram and Tenne's (2000) scales for decision speed and decision tension in minor decisions was used to measure convergent and discriminant validity. Specifically, convergent validity was sought by predicting that deciders with higher scores on the speed scale (i.e., fast-relaxed and fast-tense deciders) will have lower scores on the CIS latency subscale. The reasoning was that the decision speed scale measures self-reported decision latency on a set of concrete, trivial, everyday decisions, whereas the CIS subscale does not refer to specific types of decisions. As such they are similar, though not equal, measures of decision latency.

In contrast, decision tension was predicted to be more closely related to not-deciding and changing. Decision tension is almost synonymous with decision-related anxiety. Thus, if the two tense groups (fast-tense and slow-tense) had significantly higher not-deciding and changing decisions scores than would the relaxed groups, it would provide discriminant validity for the CIS sub-scales. If the relationships between Milgram and Tenne's (2000) four groups and the CIS subscales were distinct, it would serve both as validation for the scale, and as added support for the multidimensionality hypothesis.

Validity was also tested using a version of the Hawaii Problem (Tversky & Shafir, 1992) modified for Study 2. The original Hawaii problem was developed to test the non-

rational behavior called the “disjunction effect.” Briefly, the disjunction effect is a systematic violation of Savage’s (1954) sure-thing principle (STP) by an apparent failure to reason disjunctively through all logical decision outcomes. The STP states that if an individual would chose A over B if event X obtained, and if $\sim X$ obtained, then that individual should chose A over B regardless of what she knows about X.

Tversky and Shafir (1992) created a scenario in which the participant is told that she has just finished a very difficult exam at the end of the semester and is presented with a limited-time offer for a vacation package to Hawaii for an exceptionally low price. The catch is that by the time the exam results will be in, the offer will have expired. The participant is thus faced with a choice under uncertainty, and is offered three options: 1) buy the vacation package, 2) do not buy the package, or 3) pay money to extend the deal until after exam results are in. Participants are subsequently asked whether they would go if they knew they passed the exam and if they knew they failed the exam.

The group of interest in the study consisted of those who indicated that they would go rather than stay (i.e., preferred A over B) regardless of whether they passed (i.e., X) or failed the exam (i.e., $\sim X$). Individuals in this group were expected to buy the vacation package, but many chose to pay to extend the deal. In paying for information about whether they passed or failed—information that would not affect their choice to buy the vacation package (A)—they violated the STP. Tversky and Shafir (1992) called this pattern of deciding the “disjunctive effect,” and explained that it can occur when there are mutually exclusive reasons for choosing a given course of action A that are contingent on the outcome of an event X. What is less clear are the motivations underlying reason-based decisions.

Consider the following account: A major reason why individuals put off making decisions is that they are not able to clearly justify picking one option over another (to themselves or others), leaving them in doubt. Given that feelings of doubt are related to indecisiveness (Frost & Shows, 1993), indecisives have to quell that doubt more frequently. This was Reed's (1985) intuition: Obsessive indecisives have a lower threshold for what counts as an important decision, which means they feel the need to decide (Yates, 2003) more frequently. Moreover, indecisives experience greater doubt, and may have a higher threshold for certainty. That is, they need a greater "spread" between the chosen option and the next best option to feel confident enough to choose. Taken together, higher decision frequency, greater doubt, and higher certainty threshold would mean that indecisives have more doubt to quell. One way indecisives might reduce their decisional doubt is by reducing the uncertainty in the reason for deciding (recall that indecisives interpret ambiguous situations as threatening). Following this logic, indecisives would be more drawn to making reason-based choices rather than consequentialist ones (i.e., deciding based on a comparison of the expected outcomes of the different choices). In a sense the "right choice" seems to them "more right" when it is chosen for known (and thus unequivocal) reasons.

Though there was a deadline for choosing in the Hawaii task, there was also certainty in the choice itself, at least for individuals who claimed they "would go" regardless. The rational choice for these individuals, following the STP, was to buy the package without knowing the definite reason. The key question, then, was which mechanisms would predict paying to be able to make a reason-based decision. As argued earlier, of the three indecisive behaviors, not-deciding is the most extreme. If there were

no option to defer choice in the Hawaii task, those who both claim they “would go” and are prone to not-deciding would be the least likely to make a definite choice, one way or the other. The upshot is that because not-deciding is the most extreme form of indecisiveness, those prone to it require the greatest amount of certainty before committing. Therefore, not-deciding was predicted to be related to making reason-based decisions (i.e., the purchase of a deferral option).

In contrast, changing decisions was expected to be unrelated to the purchase of a deferral option—in essence a form of paid strategic waiting—because impulsivity was predicted to contribute to changing decisions. Since impulsivity and strategic waiting are antithetical, changing decisions should not predict choice of either deferral option. Finally, of the three indecisive behaviors, latency has the most complicated relationship with choice deferral because at least two significantly different mechanisms were thought to contribute to latency. On the one hand, a significant proportion of slow deciders (i.e., those with high latency scores) might choose to pay for the added certainty of a reason-based choice. At least some portion of slow deciders, however, would not. Specifically, the sub-group of slow deciders earlier identified with Milgram and Tenne’s (2000) relaxed-indecisives would not. Because relaxed-indecisives are thought to engage in the decision process by gathering more information and processing it vigilantly, they would see that the only additional information to gather and process in the Hawaii task is the pass/fail information. Given their high need for cognition, which has some association with a greater propensity to reason disjunctively (Toplak & Stanovich, 2002), relaxed-indecisives would also be more likely to realize that the pass/fail information has no bearing on a rational choice. That is, they were thought to be more likely to reason

consequentially, especially if there was a cost (i.e., \$10) associated with further information acquisition.

Finally, the criterion validity of the scale was tested using the Fundamental Attitudes Scale (FAS; Rassin & Muris, 2005a). Rassin and Muris consider the FAS to be a behavioral measure of indecisiveness, one that is different from the decision latency task used by Frost and Shows (1993). The FAS measures the extent to which respondents are decided about socio-political issues. Individuals are presented statements about controversial issues worded in such a way as to make complete disagreement or endorsement difficult (e.g., “Western society is obliged to interfere in third world countries”). For each statement, individuals are asked to indicate whether they agree, disagree, or “do not know.” Agreement and disagreement are considered to be decided responses, whereas “do not know” responses are considered undecided. The number of “do not know” responses is an indication of the frequency of being undecided, and hence of indecisiveness. In the present study, it was expected that all three subscales of the CIS would correlate with the FAS, but given the nature of the task, not-deciding was expected to have the highest correlation.

There were several aims in Study 2. The first aim was to replicate the multi-dimensionality of indecisiveness using the refined version of the CIS. The second aim was to test the multi-determination hypothesis. The third aim was to test predicted contributors underlying indecisiveness using a model with two levels of predictors (i.e., a mediated path model). The fourth and final aim of Study 2 was to test the convergent, discriminant, and criterion validity of the refined CIS.

Method

Participants. Participants ($N=182$) were undergraduate students at a large Midwestern university enrolled in an introductory psychology course and who received study for course credit for participating. They completed either a paper-and-pencil version of the task in the lab ($n=47$), or one of two online versions on their own time outside the lab ($n=61$ and $n=74$). The two online versions differed only in that the second ($n=74$) included the FAS. Completion time was only measured in the online versions and had a mean of $M=19.36$ minutes and a range from 5 to 57 minutes. Given that the shortest versions of the online study consisted of over 130 questions, three decision tasks, and various instructions, responders who took less than 10 minutes to respond ($n=13$, 7.7%) were dropped from the analyses, leaving $N=169$.

Mean age of the final sample was $M=18.78$ years with participants as young as 18 and as old as 25. Female participants ($n=72$) made up 42.6% of the final sample, which was 74.0% white non-Hispanic, 4.7% Hispanic or Latino, 6.5% African-American or black, 7.1% Asian, 7.1% bi-racial or multiracial, and 0.6% “difficult to classify.”

Procedure. All versions of the study were randomized, though not in the same manner. The paper-and-pencil packet consisted of basic instructions, followed by all the tasks and scales in random order, followed by demographic questions and final instructions. All scale and task sheets were assembled in random order. In addition, there were five versions of the CIS with items randomized, seven versions of the proximal behavioral contributors sheet with items randomized, and five versions of the REI with items randomized. Randomization on the computer consisted of a CIS and proximal behavioral contributors in random order, followed by the BFI in random order, REI in set

order, Milgram and Tenne decision speed in random order, computer, vacation, Hawaii, Milgram and Tenne decision tension in random order, demographic information, and then in one condition, the FAS in random order. Analyses were conducted using pairwise deletion because the risk of biasing the results was minimal given the extremely low percentage (0.38%) of missing data (Schafer & Graham, 2002).

Measures.

Core indecisiveness scale. A refined 10-item Core Indecisiveness Scale (Appendix B) was used that was based largely on the latency and changing decisions scales from the final factor analysis in Study 1. The refined CIS scale had three subscales, each reflecting one of the three core indecisiveness behaviors: 1) prolonged latency, 2) not-deciding, and 3) changing one's decision after having committed. The prolonged latency subscale had four items (e.g., "I am slow to decide"), the not-deciding subscale had three items (e.g., "I intend to make a decision, but wait so long that the opportunity to decide passes"), and the changing decisions subscale also had 3 items (e.g., "I change my mind after I choose something"). The response scale was the same six-point Likert-type frequency scale used in Study 1.

Proximal behavioral contributors. Seven scales measuring the proximal behavioral contributors in Figure 1 were used (Appendix C), two of which were established scales: Mann's (Mann, Burnett, Radford, & Ford, 1997) five-item decisional procrastination scale—used extensively by Ferrari and colleagues—and six-item buck-passing scale. The other five scales were created for this study. A five-item impasse scale measured getting stuck (e.g., "When trying to make decisions, I get so overwhelmed that I feel paralyzed"). The five-item strategic waiting scale measured delaying commitment

after one had decided in one's mind (e.g., "After making a tentative selection, I wait for a while before committing to it in case I discover something that might change my mind"). The five-item slow processing scale focused on measuring deliberate slowness (e.g., "I slowly examine the relevant information in a decision"). Other reasons why processing can be slow were not measured by this scale or in this study, such as chronic cognitive impairment (e.g., due to alcoholism), permanent cognitive impairment (e.g., due to brain damage), and low cognitive ability (e.g., IQ or working memory). The seven-item extra processing scale measured the search for more information (e.g., "When making a decision I like to collect lots of facts"). Finally, the six-item re-processing scale measured the reconsideration of information, principally through checking (e.g., "I triple-check everything before making my final commitment").

Milgram and Tenne minor decision speed and minor decision tension scales.

Milgram and Tenne's (2000) minor decision speed and minor decision tension scales (Appendix D) were used to test convergent and divergent validity with the CIS. Both scales consist of the same 15 everyday, minor decisions items (e.g., which restaurant to go to). Participants completed the speed scale first, and after several interim tasks, completed the tension scale. Each scale has its own four-point response scale. The response scale for speed was: 1 = "immediately or fairly quickly" to 4 = "after a great deal of time." The response scale for tension is: 1 = "little or no tension" to 4 = "a great deal of tension." Cronbach alphas for the scales in Milgram and Tenne's two studies were $\alpha = .60$ and $.75$ for speed, and $\alpha = .76$ and $.80$ for tension. Speed and tension were related ($r = .48$).

Big Five Inventory. The Big Five Inventory (BFI; John, Donahue, & Kentle, 1991) is a 44-item measure of the well-established Big Five personality factors: openness to experience, conscientiousness, extroversion, agreeableness, and neuroticism (Appendix E). The items consist of the stem “I see myself as someone who...” completed by short phrases with key adjectives (e.g., “I see myself as someone who is curious about many different things”). Participants rate the degree to which they agree with the items on a Likert scale (1 = “Disagree strongly” to 5 = “Agree strongly”). Cronbach’s alpha for the BFI scales typically range from $\alpha = .75$ to $.90$, and average above $.80$, and three-month test-retest reliabilities range from $\alpha = .80$ to $.90$, with a mean of $.85$. (John & Srivastava, 1999).

Rational-Experiential Inventory. The Rational-Experiential Inventory (REI; Epstein, Pacini, Denes-Raj, & Heier, 1996) measures differences in two thinking styles: intuitive-experiential and analytical-rational (Appendix F). The intuitive-experiential items measure the tendency to trust one’s intuitions, whereas the analytical-rational thinking items—all taken from the Need for Cognition scale (Cacioppo & Petty, 1982)—measure one’s enjoyment of complex thinking. Participants are asked to rate how true the statements are about them using the following Likert scale: 1 = Definitely False, 2 = Mostly False, 3 = Undecided or Equally True and False, 4 = Mostly True, 5 = Definitely True. The original REI is 40 items long, but because of space limitations we used the shorter 10-item version (i.e., two 5-item scales) used by Epstein, Pacini, Denes-Raj, and Heier (1996). The reliability of the two 5-item versions of the intuitive-experiential and analytical-rational scales range from $\alpha = .72$ to $.77$ and $\alpha = .68$ to $.73$, respectively (Epstein, Pacini, Denes-Raj, & Heier, 1996; Wolfradt, Oubaid, Straube, Bischoff, &

Mischo, 1999). Epstein et al. found that the two scales were barely correlated ($r = .08$, $p < .01$), and so considered them orthogonal.

Fundamental Attitudes Scale. The FAS (Rassin & Muris, 2005a) contains 15 statements about controversial socio-political topics, each phrased to make it difficult to completely disagree with or endorse it (Appendix G). Participants are asked to indicate their agreement with each statement, and can “agree,” “disagree,” or choose “do not know,” and the number of “do not know” scores is an indicator of one’s indecisiveness. The measure was based on Jackson, Furnham, and Lawty-Jones’s (1999) procedure that used the number of “do not know” responses on a personality questionnaire as a measure of indecisiveness. Following Rassin and Muris’s procedure, “do not know” responses were coded 1, and “agree” or “disagree” responses (i.e., definite responses) were coded 0. The response values were summed for the RAS score, where a higher score indicated greater indecisiveness. Rassin and Muris found the FAS had a Cronbach’s $\alpha = .62$ and correlated ($r = .23$) with Frost and Show’s (1993) Indecisiveness Scale.

Modified Hawaii Task. The Hawaii task (Tversky & Shafir, 1992) was modified for this study (Appendix H). The original version consisted of a scenario wherein the participant is told she has just finished a difficult qualifying exam, and for a limited time can buy a vacation package to Hawaii at an exceptionally low price. Unfortunately, the promotion will expire before she will know the result of her exam. The participant is then presented with three options: buy, not buy, and pay \$5 to extend the promotional price long enough to know the results of her exam. The next question participants are asked is whether they would go if they knew they had failed, and if they knew they had passed. Those who indicated they would go regardless yet chose to pay \$5 for pass/fail

information that would not affect their answer violated Savage's (1954) sure thing principle.

Several changes were made in the answer options of the Hawaii task in the present study. First, the buy option was specified as “non-refundable” to emphasize the irrevocability of the commitment. Second, the third option—to defer the decision for a cost—was slightly reworded, and the \$5 cost (in 1991-1992 dollars) was adjusted to \$10 (in 2008 dollars) based on a GDP per capita index that estimates relative purchasing power (Williamson, 2008). Finally, a fourth option was added that allowed the participant to purchase a refundable package for an additional, non-refundable \$10 fee. The third and fourth options both charged a non-refundable \$10 fee, but the former charged it for a future option to buy, whereas the latter charged it for the future option to change one's mind. After choosing one of the four options, participants were then asked whether they would go if they knew they had passed the exam, and if they would go if they knew they had failed the exam (counterbalanced).

Results

Multi-dimensionality of the CIS. The 10 CIS items were twice factor analyzed using LISREL: The uni-dimensional null hypothesis model was compared to the predicted three-factor model. The null hypothesis model had a significant chi-square $\chi^2(35, N=168) = 74.56, p < .01$, indicating poor fit, though the fit indices suggested an almost acceptable fit: RMSEA = 0.085, NNFI = 0.91, GFI = 0.92. In contrast, the predicted three-factor model fit had a non-significant chi-square, indicating good fit $\chi^2(32, N=168) = 42.65, p = .099$. The fit indices also indicated good fit (RMSEA = 0.044, NNFI = 0.97, GFI = 0.95). The chi-square difference between the null and predicted

models was significant ($\chi^2_{\text{difference}}(3, N=168) = 20.92, p < 0.001$), signifying that the latter was a significantly better fitting model. It is worth noting that Core7 (“I am undecided about where I stand on a social issue”) loaded poorly on not-deciding (.22) and lowered the not-deciding scale reliability to an unacceptably low level. Although removing the Core7 worsened model fit ($\chi^2(24, N=182) = 39.98, p = .022$, RMSEA = 0.059, NNFI = 0.96, GFI = 0.95), the decrement in fit was not significant ($\chi^2_{\text{difference}}(8, N=168) = 2.67, p > .10$). Core7 was thus discarded. Table 3 shows the factor correlations, sub-scale reliabilities, and sub-scale correlations of the CIS.

Table 3
CIS Factor Correlations, Sub-scale Reliabilities, and Sub-scale Correlations in Study 2

<i>N</i> = 169	Latency	Not-Deciding	Changing
Latency (4 items)	.79	.56	.62
Not-Deciding (2 items)	.76	.67	.60
Changing (3 items)	.80	.84	.77

Factor correlations below diagonal; Cronbach's α s on diagonal; Scale correlations above diagonal
All correlations significant, $p < .01$ (two-tailed)

Table 4 shows the factor loadings of the final nine items of the CIS.

Table 4
Factor Structure and Loadings of the Core Indecisiveness Scale in Study 2

Item	<i>Latency</i>	<i>Not- Deciding</i>	<i>Changing</i>
	Factor Loadings		
When I am in a group that is deciding something, I take longer to make decision than do other people.	.67		
I need more time than I actually have when I am faced with making a choice.	.69		
It seems that deciding on the most trivial things takes me a long time.	.70		
I am slow to decide.	.74		
I miss the deadline for making a relatively straightforward decision.		.66	
I intend to make a decision, but wait so long that the opportunity to decide passes.		.76	
I change my mind after I choose something.			.78
I try to undo the effects of a previous decision I made.			.68
I have a change of heart about a commitment I made.			.70

Factor analysis of the proximal behavioral contributors. A confirmatory factor analysis of the 39 items of the seven Proximal Behavioral Contributor scales was conducted. Chi-square was not significant, and although the RMSEA suggested adequate fit, the other two indices indicated poor fit: $\chi^2 (681, N= 168) = 1220.10, p < .01$, RMSEA = 0.063, NNFI = 0.76, GFI = 0.74. Based on the modification indices, three changes were made. First, one slow deciding (S) item (S4: “I am not fast at comparing my alternatives”) was eliminated. It had a low, though significant factor loading (.17, $p < .05$), but the variance explained by the factor was a mere 3%. The modification index suggested that it would have loaded equally well or better on decisional procrastination, buck-passing, strategic waiting, or impasse, meaning that S4 does not discriminate among them.

One possible explanation is that of the five slow processing items, S4 was the most likely to be interpreted as unintentional slowness. In other words, it was interpreted to mean that the decider was not deliberately slowing herself to decide. If so, this could explain why S4 is associated with difficulty deciding, and consequently with impasse and avoidant decision behaviors.

Second, the strategic waiting (SW) items did not form a sufficiently coherent factor, and so all SW items were eliminated. Although SW1 (“After making a tentative selection, I wait for a while before committing to it in case I discover something that may change my mind”) and SW4 (“When I know exactly what I want and there is pressure to decide, I still do not make my final decision until I have to”) loaded highly on the strategic waiting factor (.61 and .64 respectively), and correlated with each other ($r = .37$), the three remaining SW items had relatively weaker loadings (SW2 = .38, SW3 =

.32, and SW5 = .22, respectively). The variance explained by the SW factor for the three weaker items was 14%, 10%, and 5%. SW2 (“As soon as I decide something, I immediately go with that decision” reverse-scored) and SW3 (“Once I make a choice, I sleep on it before actually going through with it”) were most highly correlated with each other ($r = .37$), and no correlational pattern with any of the other proximal behavioral contributors items was evident. SW5 (“I make a decision without much delay, but then wait for the right moment before actually committing to that decision”) had low correlations with all items, though slightly higher ones with decisional procrastination (DP) items.

Ironically, the wording of SW5 arguably best captures the sense of strategic waiting as having made a tentative decision and purposefully delaying commitment: Note that although SW5 implies that the “right moment” is not always right away, it does not imply that there is always (much of) a wait. Because the reliability of the five-item strategic waiting scale was low ($\alpha = .55$), and could only be marginally improved when SW5 was eliminated ($\alpha = .59$), strategic waiting was not used in subsequent analyses. Still, there seems to be some coherence to the two SW pairs that merits future study.

Perhaps the most significant change involved regrouping the remaining slow processing items (S), extensive processing (E) and re-processing (R) items because several items had cross-loadings that were higher than the predicted main loadings. A re-examination of the correlation matrix revealed a weak, positive manifold with many items that had strong correlations with items from conceptually distinct constructs. As such, these items did not discriminate well between the hypothesized constructs. Nevertheless, two factors emerged that were based partly on behaviors, as predicted, but

also partly on the severity of the behaviors. More specifically, the first factor consisted mostly of extensive and re-processing items that were more extreme, many of which had a distinct obsessive-compulsive and perfectionistic quality. The factor was called *concerned processing*, and included items tapping excessive information gathering (e.g., “When I am presented with two good options, I look for a third option”), checking behavior (e.g., “I triple-check things before deciding”), and an item suggestive of bolstering (e.g., “I re-examine the benefits of an option until I am convinced it is better than other options”).

In contrast, the second factor contained slow and extensive processing items that suggested thorough and thoughtful deliberation, and so was called *prudent processing*. Items from this factor included intentionally slowing the deliberation process (e.g., “I slowly examine the relevant information in a decision”), searching for more information (e.g., “I research my options before deciding”), and consideration of contingencies, (e.g., “When I plan something, I make sure I have a backup”).

A confirmatory factor analysis on the second model was run, and it showed reasonably good fit, $\chi^2(367, N=168) = 612.84, p < .01$, RMSEA = 0.058, NNFI = 0.95, GFI = 0.81. The 29-item, five factor model had a significantly better fit than the predicted 39-item seven factor model: $\chi^2_{\text{difference}}(314, N=168) = 607.26, p < .01$. Table 5 shows the factor loadings of the 29 items on the five proximal behavioral contributors.

Table 6 shows the factor correlations, scale reliabilities, and scale correlations of the proximal behavioral contributors.

Table 5
Factor Structure and Loadings of the Proximal Behavioral Contributor Scales in Study 2

Item	DP	B	I	CP	PP
	Factor Loadings				
I waste a lot of time on trivial matters before getting to the final decision.	.61				
When I have to make a decision, I wait a long time before starting to think about it.	.65				
I delay making a decision until it is too late.	.65				
I put off making a decision.	.75				
I avoid thinking about a decision even though I know I will eventually have to make it.	.66				
Once I know I have a choice to make, I do not put off thinking about it. (R)	.50				
I leave a decision to someone else.		.84			
I avoid taking the responsibility to make a decision.		.58			
If a decision can be made by me or by another person, I let the other person make it.		.70			
I let someone who is better informed decide for me.		.68			
I try to get out of having to make a decision.		.78			
I ask others to decide for me when I know that I should be deciding.		.65			
I get stuck for a while when making a decision.			.66		
When I am thinking about what to choose, there reaches a point where I don't know how to proceed.			.62		
I end up thinking in circles when deciding something.			.71		
When trying to make a decision, I get so overwhelmed that I feel paralyzed.			.61		
Even after I think that I have made up my mind about something, I have trouble getting myself to "bite the bullet" and actually commit to that decision.			.74		
I try to consider several factors when making a simple decision.				.70	
When I am presented with two good options, I look for a third option.				.46	
I triple-check things before deciding.				.66	
I re-examine the benefits of an option until I am convinced it is better than other options.				.66	
I reconsider my alternatives one last time just before I go through with a decision.				.58	
When faced with a decision, I consider each fact one at a time.					.69
I slowly examine the relevant information in a decision.					.51
I take my time thinking about my choices before going ahead with one of them.					.62
When faced with a choice, I make the effort to look for more information than is normally given.					.62
I research my options before deciding.					.63
When I plan something, I make sure I have a backup.					.52
I go over the relevant information as often as necessary for the best option to emerge.					.55

DP = Decisional procrastination, B = Buck-passing, I = Impasse, CP = Concerned processing, PP = Prudent processing.

Table 6
Factor Correlations, Scale Reliabilities, and Scale Correlations for the Proximal Behavioral Contributor Scales in Study 2

<i>N</i> = 169	DP	B	I	CP	PP
Decisional procrastination (6 items)	.80	.57	.69	.34	.05
Buck-passing (6 items)	.69	.85	.57	.30	.04
Impasse (5 items)	.85	.69	.80	.49	.22
Concerned processing (5 items)	.41	.35	.61	.75	.60
Prudent processing (7 items)	.05	.02	.29	.77	.79

DP = Decisional procrastination, B = Buck-passing, I = Impasse, CP = Concerned processing, PP = Prudent processing.

*Factor correlations on lower diagonal; Cronbach's α s on diagonal; Scale correlations on upper diagonal. All correlations in **bold** significant, $p < .01$ (two-tailed)*

Relationships among predictor variables. Table 7 shows the means, standard deviations, scale reliabilities, and correlations for the BFI, Proximal Behavioral Contributors, and the CIS subscales. Six of the eight correlations among BFI factors in the present study were in the same direction and of similar magnitude as the six reported by John and Srivastava (1999). The two additional ones were a very modest correlation between openness and agreeableness ($r = .16$) that may be an anomaly, and a small correlation between extraversion and agreeableness ($r = .27$). The latter might be explained by the fact that adjectives of warmth used in the BFI were found to cross-load on agreeableness and extraversion (John, 1990), though ultimately included in the agreeableness factor.

Decisional procrastination and buck-passing have not been directly correlated to the BFI. Of the two, decisional procrastination has been studied far more often and has been associated with the low perseverance subscale of the BFQ (Di Fabio, 2006), low competitiveness (Effert & Ferrari, 1989), high neuroticism (Di Fabio, 2006), and with high scores on behaviors strongly associated with neuroticism, such as low self-esteem (Di Fabio, 2006; Effert & Ferrari, 1989), public self-consciousness, and social anxiety

(Ferrari, 1991). The correlations in the present study between decisional procrastination and conscientiousness ($r = -.42$), agreeableness ($r = -.17$), and neuroticism ($r = .31$) are consistent with these findings.

Table 7

Means, Standard Deviations, Scale Reliabilities and Correlations for the BFI, Proximal Behavioral Contributors, and the CIS

			BFI					Proximal Behavioral Contributors					CIS		
	<i>M</i>	<i>SD</i>	O	C	E	A	N	DP	B	I	PP	CP	L	ND	Δ
O	3.63	.62	.78												
C	3.48	.66	.14	.86											
E	3.44	.74	.34	.29	.87										
A	3.84	.62	.16	.33	.27	.80									
N	2.67	.79	.05	-.20	-.33	-.42	.86								
DP	3.00	.75	.02	-.42	-.12	-.17	.31	.80							
B	2.80	.84	-.09	-.32	-.18	-.18	.36	.57	.85						
I	2.84	.80	.02	-.24	-.10	-.14	.38	.69	.57	.80					
PP	3.69	.69	.08	.09	.01	-.03	-.03	.05	.04	.22	.79				
CP	3.41	.79	.07	-.02	-.03	-.15	.20	.34	.30	.49	.60	.75			
L	3.01	.86	.08	-.29	-.12	-.03	.42	.46	.44	.63	.19	.38	.79		
ND	2.43	.69	.02	-.46	-.20	-.24	.32	.38	.32	.45	.12	.21	.56	.67	
Δ	2.89	.80	.06	-.23	-.07	-.24	.40	.38	.30	.51	.11	.26	.62	.60	.77

O = Openness, *C* = Conscientiousness, *E* = Extroversion, *A* = Agreeableness, *N* = Neuroticism,

DP = Decisional procrastination, *B* = Buck-passing, *I* = Impasse, *CP* = Concerned processing,

PP = Prudent processing, *L* = Latency, *ND* = Not-Deciding, *Δ* = Changing

Cronbach's *α*s are on the diagonal

All correlations in **bold** significant, $p < .05$ (two-tailed), and in **bold italic** significant, $p < .10$ (two-tailed)

Impasse was in line with the prediction that it would be positively correlated with neuroticism and negatively with conscientiousness. The reasoning behind the predictions was not tested in the study, namely that neuroticism contributes to the conditions (e.g., perfectionistic standards) that are more likely to lead one to impasse, and low conscientiousness contributes to keeping one from pulling out of impasse.

The distinction between slow, extensive and re-processing was not confirmed in the factor analysis. However, the items from these three predicted constructs did form

two related factors: concerned processing and prudent processing. Concerned processing (i.e., obsessive-compulsive and perfectionistic re-processing and extensive processing of information) was positively correlated with neuroticism and negatively with conscientiousness, whereas the opposite was true for prudent processing (i.e., thorough and thoughtful deliberation). Although only one of the four correlations was significant, the trends were consistent with the neurotic vs. vigilant indecisiveness distinction. The different correlational pattern further supported the distinctiveness of concerned and prudent processing, and was consistent with their characterization as obsessive and perfectionistic thinking on the one hand, and thoughtful deliberation on the other.

Multi-dimensionality and multi-determination. The factor analysis already lent important support to the multi-dimensionality hypothesis. Additional support piggybacks on the evidence for multi-determination. The correlation matrix shows that each of the three core indecisive behaviors is related to multiple contributors. This finding alone supports only the multi-determination hypothesis. That each core indecisive behavior has a unique pattern of relations with contributors, however, supports the multi-dimensionality hypothesis. As predicted, latency has its root in low conscientiousness ($r = -.29, p < .01$), high neuroticism ($r = .42, p < .01$), and low extroversion ($r = -.12, p > .10$). Moreover, latency was related to all five proximal behavioral contributors, including the only Core Indecisive Behavior to be significantly related to prudent processing ($r = .19, p < .05$). The strongest contributor to latency was impasse ($r = .63, p < .01$).

Not-deciding was related to all distal contributors except openness. As predicted, not-deciding was most strongly rooted in low conscientiousness ($r = -.46, p < .01$), which is consistent with task procrastination (e.g., Milgram & Tenne, 2000). Not-deciding is

less strongly related to the proximal behavioral predictors than is latency, and is not significantly related to prudent processing. Finally, changing decisions was related to low conscientiousness ($r = -.23, p < .01$), low agreeableness ($r = -.24, p < .01$) and high neuroticism ($r = .40, p < .01$).

Path analysis of indecisiveness. Path analysis is an extension of regression, and is used to test various models of relationships among variables. The relationships are assumed to be linear, additive, and causal, and the variables are either exogenous, endogenous, or both endogenous and exogenous. The models of relationships differ principally in their configurations of the endogeneity and exogeneity of the variables (see Land, 1966). A three-level path analysis was conducted using LISREL with distal contributors as exogenous variables, proximal behavioral contributors as mediating variables, and the three core behaviors as endogenous variables. Distal predictor variables were allowed to correlate with one another, as were their residuals. Proximal contributing behaviors were also allowed to correlate with one another, as were their residuals.

The null model was a fully mediated model that was not expected to have good fit for the simple reason that the proximal behavioral contributors were never presumed to be exhaustive mediators of the effect of personality on indecisive behaviors. The null model did show poor fit, $\chi^2_{\text{full mediation}}(15, N = 168) = 69.04, p < .01$, RMSEA = 0.14, NNFI = 0.80, GFI = 0.95). Based on the predictions, Model 2 was modified to allow five direct effects between distal contributors and core indecisiveness behaviors. The five direct effects were between low conscientiousness and not-deciding, high agreeableness and slow deciding, and high neuroticism and all three core indecisive behaviors. In addition, examination of the beta weights in the null model indicated that of the proximal

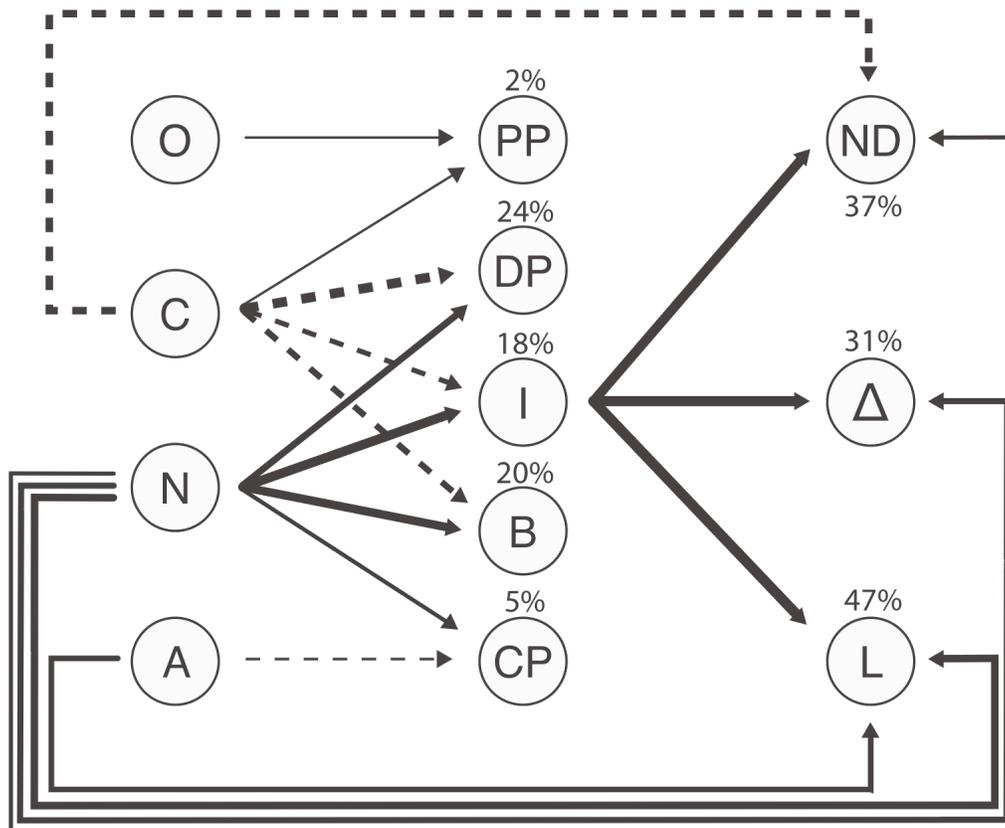
behavioral contributors, impasse was accounting for virtually all of the variance. For this reason, two versions of Model 2 were run, one with impasse (Model 2a), and one without (Model 2b).

Two out of three fit indices showed that Model 2a (Figure 3) had adequate fit, though chi-square was significant: $\chi^2_{2a}(10, N=168) = 20.21, p = 0.027$, RMSEA = 0.075, NNFI = 0.90, GFI = 0.98). Model 2b (Figure 4), however, had good fit and chi-square was non-significant: $\chi^2_{2b}(10, N=168) = 15.09, p = 0.13$, RMSEA = 0.053, NNFI = 0.94, GFI = 0.99). Model 2b had significantly better fit than model 2a, $\chi^2_{\Delta}(0, N=168) = 5.12, p < 0.01$. Figure 3 shows the path model with line thickness representing relative Beta weight, and a table of beta weights for Model 2a. Figure 4 shows the path model and a table of beta weights for Model 2b.

Validity of the CIS. The validity of the CIS was tested using the REI, Milgram and Tenne's speed and tension scales, the FAS, and the Hawaii task.

Rational-Experiential Inventory. The 10-item version of the REI was submitted to a principal components analysis with Varimax rotation and pairwise deletion. Four components were extracted with two Eigenvalues greater than one (1.50, 1.06). The elbow in the scree plot suggested four components: one comprised of all the intuitive items, and the other three composed of analytic items. It is possible that the analytic items did not converge onto one factor as a result of artifact of the valence of item wording. Although the reliability of the intuitive scale ($M = 3.01, SD = .45$) was good ($\alpha = .81$) that of the analytic scale was low ($\alpha = .60$). One item from the analytic scale ($M = 2.59, SD = .57$) was eliminated to improve the reliability to $\alpha = .63$.

Figure 3. Path Model and Table of Predictor Beta Weights for Indecisiveness Model 2a



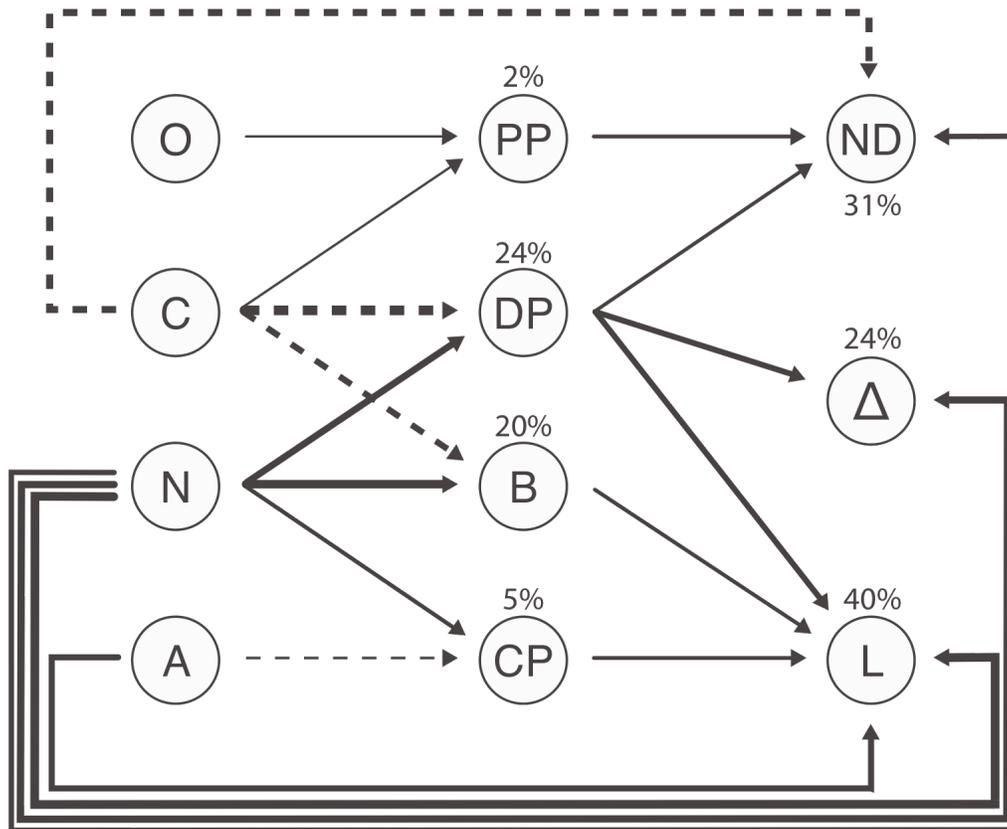
Line thickness indicates relative Beta weight; Only weights $\geq .10$ are shown
 Solid lines = negative Beta weights, dotted lines = positive Beta weights; Percentages = R^2

O = Openness, C = Conscientiousness, N = Neuroticism, A = Agreeableness,
 PP = Prudent processing, DP = Decisional procrastination, B = Buckpassing,
 CP = Concerned processing, ND = Not deciding, Δ = Changing, L = Latency

	O	C	E	A	N	DP	B	I	CP	PP
DP	.04	-.40	.06	.06	.28					
B	-.09	-.26	.02	.06	.35					
I	-.01	-.21	.08	.07	.39					
CP	.06	.03	.03	-.11	.17					
PP	.10	.10	-.05	-.09	-.06					
L				.23	.31	.04	.08	.43	.07	.06
ND		-.31			.17	-.05	-.07	.40	-.07	.13
Δ					.25	.04	-.05	.42	-.02	.03

Beta weights in **bold** are significant at $p < .05$; Beta weights in **bold italic** are significant at $p < .10$

Figure 4. Path Model and Table of Predictor Beta weights for Indecisiveness Model 2b



Line thickness indicates relative Beta weight; Only weights $\geq .10$ are shown
Solid lines = negative Beta weights, dotted lines = positive Beta weights; Percentages = R^2

O = Openness, *C* = Conscientiousness, *N* = Neuroticism, *A* = Agreeableness,
PP = Prudent processing, *DP* = Decisional procrastination, *B* = Buckpassing,
CP = Concerned processing, *ND* = Not deciding, Δ = Changing, *L* = Latency

	O	C	E	A	N	DP	B	CP	PP
DP	.04	-.40	.06	.06	.28				
B	-.09	-.26	.02	.06	.35				
CP	.06	.03	.03	-.11	.17				
PP	.10	.10	-.05	-.09	-.06				
L				.26	.37	.24	.16	.15	.09
ND		-.28			.22	.15	.01	.01	.15
Δ					.30	.24	.03	.07	.06

Beta weights in **bold** are significant at $p < .05$; Beta weights in **bold italic** are significant at $p < .10$

To compare intuitive and analytic styles, median splits on both scores (medians = 3.0 and 2.5, respectively) were combined into four groups: Low intuitive/Low analytic ($n = 59$, 34.9 %), Low intuitive/High analytic ($n = 48$, 28.8%), High intuitive/Low analytic ($n = 35$, 20.7%), and High intuitive/High analytic ($n = 26$, 15.4%). Table 8 shows the means and standard deviations for the three core indecisive behaviors for each REI group.

Three one-way ANOVAs were conducted to test differences in scores on each of the core indecisive behaviors across the four REI groups. Each ANOVA contrasted the low intuitive/high analytic group (i/A) with the high intuitive/low analytic group (I/a). The i/A group was predicted to have higher scores across all core indecisive behaviors than would the I/a group. In the latency ANOVA, Levene's statistic was not significant $F(3,164) 1.67, p = .175$, so equality of variance was assumed and the degrees of freedom did not need to be adjusted to compensate (Levene, 1960). The ANOVA was not significant, $F(3,164) = 0.69, p = .56$, nor was the contrast between the i/A and I/a groups, $t(164) = 1.04, p < .30$, indicating that individuals with a predominantly analytic thinking style do not take significantly longer to decide than do individuals with a predominantly intuitive thinking style.

Table 8
Rational-Experiential Inventory Median Split Group Means and Standard Deviations on the Core Indecisiveness Behaviors

	<i>n</i>	Latency		Not-Deciding		Changing	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Low Intuition/Low Analytic	59	2.93	.71	2.41	.60	2.84	.62
Low Intuition/High Analytic	48	3.12	.94	2.61	.63	2.99	.85
High Intuition/Low Analytic	35	2.94	.85	2.11	.46	2.65	.55
High Intuition/High Analytic	26	3.14	1.05	2.59	1.04	3.12	1.22

NOTE: REI scale response: 1 = Definitely False to 5 = Definitely True.

In the not-deciding ANOVA, Levene's statistic was significant $F(3,164) = 4.80, p = .003$, so equality of variance was not assumed and degrees of freedom were adjusted to compensate (Levene, 1960). The ANOVA was significant, $F(3,164) = 4.24, p = .006$, as was the contrast between the i/A and I/a groups (with df adjusted for not assuming equality of variance) $t(80.98) = -4.15, p < 0.001$. The contrast result indicates that individuals with a predominantly analytic thinking style report taking significantly longer to decide than do individuals with a predominantly intuitive thinking style.

Finally, in the changing decisions ANOVA, Levene's statistic was significant $F(3,164) = 6.63, p < .001$, so equality of variance was again not assumed. The ANOVA was marginally significant, $F(3,164) = 2.46, p = .065$, and the contrast between the i/A and I/a groups was significant (with df adjusted for not assuming equality of variance) $t(79.94) = -2.20, p = .031$. This again indicates that individuals with a predominantly analytic thinking style report taking significantly longer to decide than do individuals with a predominantly intuitive thinking style.

Decision speed and tension. Convergent validity was also tested using Milgram and Tenne's (2000) speed and tension on minor decisions. The speed scale was subjected to a principal components analysis with Varimax rotation and pairwise deletion. Five components were extracted, but only two had Eigenvalues greater than one (2.51 and 1.04). The elbow in the scree plot suggested one component. The two items that did not load well on the principal factor were decisions about what to wear in the morning and whether to leave a tip for a bad waiter. Because the scree plot suggested one component and to keep the scale comparable to Milgram and Tenne's findings, all items were retained and compiled into a 15-item decision speed scale ($M = 2.16, SD = .40$), which

had a reliability of $\alpha = .76$. The tension items were also subjected to the same analysis. Four components were extracted, but only one had an Eigenvalue greater than one (1.71), and the elbow in the scree plot again suggested one component. The 15 items were compiled into a decision tension scale ($M = 1.61$, $SD = .33$), which had a reliability of $\alpha = .80$. The correlation between the decision speed and tension scales was $r = .50$, $p < .01$. The scale reliabilities and correlation are remarkably close to those reported by Milgram and Tenne.

Following Milgram and Tenne's (2000) procedure, median splits of speed (swift/slow) and tension (tense/relaxed) were combined into four groups: swift-relaxed ($n = 62$, 36.7%), slow-relaxed ($n = 29$, 17.1%), swift-tense ($n = 31$, 18.3%), and slow-tense ($n = 47$, 27.8%). Although the predominance of swift-relaxed and slow-tense groups is consistent with the pattern found by Milgram and Tenne, the proportion of slow-tense to slow-relaxed in the present sample was less than 2:1 and not the 3:1 ratio that Milgram and Tenne found. Nevertheless, this still confirms that the majority of indecisives are tense as opposed to relaxed. Table 9 shows the means and standard deviations for the three core indecisive behaviors for each Milgram group.

Table 9
Milgram Group Means and Standard Deviations on the Core Indecisiveness Behaviors

	<i>n</i>	Latency		Not-Deciding		Changing	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Fast-relaxed	62	2.64	.63	2.02	.59	2.62	.56
Slow-relaxed	29	3.01	.90	2.22	.65	2.74	.61
Fast-tense	31	2.95	.66	2.34	.70	2.94	.68
Slow-tense	46	3.56	.97	2.71	1.18	3.31	1.06

CIS Scale response: 1 = Never, 2 = Seldom, 3 = Sometimes, 4 = Often, 5 = Very Often, and 6 = Always.

Three stepwise regressions were conducted, each with a core indecisiveness behavior regressed on decision speed and tension. In the first regression, decision tension

significantly predicted latency scores, $\beta = .34$, $t(165) = 4.39$, $p < .01$, as did decision speed $\beta = .26$, $t(165) = 3.40$, $p < .01$. Decision tension also explained a significant proportion of variance in latency scores, $R^2 = .22$, $F(1, 167) = 46.25$, $p < .01$, as did decision speed, $R^2 = .27$, $F(2, 166) = 30.37$, $p < .01$. In the second regression, decision tension significantly predicted not-deciding scores, $\beta = .37$, $t(166) = 5.06$, $p < .01$, though decision speed did not $\beta = .09$, $t(165) = 1.03$, $p = .31$. Decision tension also explained a significant proportion of variance in latency scores, $R^2 = .13$, $F(1, 167) = 25.59$, $p < .01$.

In the third regression, decision tension significantly predicted changing decisions scores, $\beta = .45$, $t(166) = 6.56$, $p < .01$, though decision speed did not $\beta = .08$, $t(165) = 1.05$, $p = .30$. Decision tension also explained a significant proportion of variance in changing decisions scores, $R^2 = .21$, $F(1, 167) = 42.99$, $p < .01$.

Three one-way ANOVAs were conducted to test differences in scores on each of the core indecisive behaviors across the four Milgram and Tenne (2000) groups. Each ANOVA had one contrast. In the latency ANOVA, fast deciders (made up of fast-tense and fast-relaxed deciders) were predicted to have significantly lower CIS latency subscale scores than were slow deciders (made up of slow-tense and slow-relaxed deciders). Levene's statistic was significant $F(3, 165) = 4.12$, $p = .008$, so equality of variance was not assumed. The ANOVA was significant, $F(3, 165) = 12.27$, $p < .001$, as was the contrast between fast and slow groups (with df adjusted for not assuming equality of variance) $t(106.30) = 3.75$, $p < .001$. The contrast result indicates that slow deciders reported having prolonged decision latencies significantly more often than did fast deciders.

In the not-deciding ANOVA, tense deciders (made up of slow-tense and fast-tense deciders) were predicted to have significantly higher CIS not-deciding sub-scale scores than were relaxed deciders (made up of slow-relaxed and fast-relaxed deciders). Levene's statistic was significant $F(3,165) 7.68, p < .001$, so equality of variance was again not assumed. The ANOVA was significant, $F(3,165) = 6.53, p < .001$, as was the contrast between tense and relaxed groups (with df adjusted for not assuming equality of variance) $t(121.11) = 3.06, p = 0.002$. The contrast result confirmed that tense deciders reported not-deciding significantly more often than did relaxed deciders.

Finally, in the changing decisions ANOVA, tense deciders were predicted to have significantly higher CIS changing decisions scores than were relaxed deciders. Levene's statistic was significant $F(3,165) 5.91, p < .001$, so equality of variance was again not assumed. The ANOVA was significant, $F(3,165) = 8.76, p < .001$, as was the contrast between tense and relaxed groups (with df adjusted for not assuming equality of variance) $t(122.90) = 3.70, p < .001$. The contrast result confirmed that tense deciders reported changing their decisions significantly more often than did relaxed deciders.

Fundamental Attitudes Scale. The FAS had a reverse-J shaped distribution, with a mean of 3.03, median of 3.00, and mode of 0 ($n = 14$, 18.9% of respondents). The FAS had acceptable reliability (Cronbach's $\alpha = .74$). As predicted, the FAS was correlated with not-deciding $r(74) = .19, p = .101$, but also with latency $r(74) = .20, p = .086$, and changing decisions $r(74) = .19, p = .108$. The correlations were all in the expected direction, though not significant at the .05 level. Given the expected correlation of .20 to .25 based on Rassin and Muris' (2005a) findings, the current sample size ($n = 74$) lacked sufficient power for the aforementioned correlations to reach significance. Interestingly,

the FAS was significantly correlated $r(74) = .23, p = .049$ with item Core7 (“I am undecided about where I stand on a social issue”), which had been removed from the not-deciding sub-scale.

Hawaii Task. A majority ($n = 92, 54.8\%$) of participants indicated that they would go on the Hawaii vacation regardless of whether they passed or failed, whereas rest said it would depend on if they passed or failed (two groups compiled; $n = 70$), or would not go ($n = 6$). Of those who claimed they would go regardless of their exam outcome, a small number indicated that they would not buy the vacation package ($n = 2$), just over 20% ($n = 19$) said they would buy the non-refundable package, over half said they would pay the \$10 non-refundable premium to buy the refundable package ($n = 49$), and just under 24% ($n = 22$), would pay \$10 to have the option to buy the package for the same price once they knew their exam scores.

As predicted, CIS not-deciding sub-scale scores for the buy group ($M = 2.09, SD = .54$) were lower than those of the refundable buy group ($M = 2.37, SD = .67$) and option to buy group ($M = 2.50, SD = .70$). A Kruskal-Wallis one-way ANOVA was conducted on not-deciding with one contrast: non-refundable buy vs. refundable buy and option to buy grouped (i.e., -2, 1, 1). The ANOVA was marginally significant, $F(3,165) = 2.37, p = .072$. Levene’s statistic was not significant, $F(3, 165) = 0.74, p = .53$, indicating equality of variances could be assumed. The contrast was marginally significant $t(165) = 1.95, p = .053$. The result of the contrast indicates that individuals who bought the non-refundable vacation package reported significantly less not-deciding than did those who either bought a refundable option or paid for the option to defer the purchase.

Discussion

In line with expectations, the CIS fit significantly better as a three-factor model than it did as a unidimensional model, which supports the multi-dimensionality hypothesis. The three factors were all moderately correlated with each other, which lends empirical support to the conceptual claim that the three core behaviors are distinct dimensions of the same construct. The multi-dimensionality hypothesis is further supported by the fact that the distal and proximal contributors did not load onto each core behavior to the same degree, as illustrated in the path model. Finally, paying for reason-based decisions on the Hawaii task was only predicted by not-deciding scores, which supports the discriminant validity of the three sub-scales, and as such supports the multi-dimensionality hypothesis.

That each core indecisiveness behavior had multiple predictors, both in terms of zero-order correlations and in the path model where shared variance was accounted for, lends strong support to the multi-determination hypothesis.

The CIS was validated in four ways. First, individuals who had strong analytic and weak intuitive processing tendencies differed significantly from those with strong intuitive and weak analytic processing tendencies on two of three core indecisiveness behaviors. Specifically, those with strong analytic tendencies were more likely to not decide and more likely to change their decisions. It is unclear why they did not have significantly higher decision latencies. Second, the only core indecisive behavior predicted by Milgram and Tenne's (2000) decision speed when decision tension was controlled for was latency. This supports both the convergent and discriminant validity of the latency sub-scale. Third, paying for reason-based decisions on the Hawaii task was

only related to not-deciding scores, which supports the convergent and discriminant validity of the not-deciding sub-scale.

Finally, the FAS provided some additional convergent validity for the CIS insofar as the FAS is a behavioral measure of not-deciding, at least at the moment participants were asked (i.e., they may eventually decide about the social dilemmas). Although the FAS did not discriminate between the CIS subscales as was predicted, it did correlate most highly with an item that tapped decidedness on social issues. One account for why the FAS may have been equally related to all three core indecisive behaviors is the wording of FAS items. Although the substance of most of the FAS items was likely familiar to most participants, the actual wording on the items was intentionally written to make them difficult to completely endorse or reject (Rassin & Muris, 2005a). Thus, even if participants had positions on the topics themselves (e.g., being against suicide), the novel, sometimes extreme, and somewhat contentious wording of the items (e.g., “Suicide is *never a rational* option” my italics) might have required reconsideration in some cases.

Limitations. There were important conceptual, operational, and methodological limitations in this study. First, at least three conceptual issues were identified. Although some of the strategic waiting items were moderately correlated, they did not form a coherent factor. It appears that strategic waiting may be more multifaceted than previously thought. There are several possible ways to distinguish different kinds of strategic waiting. For example, there may exist a psychological difference between waiting before commitment as opposed to waiting before enactment of a commitment. In the first case, the commitment itself remains contingent (e.g., watchfully waiting to see if

a tumor becomes malignant), in the second case the only contingency is the condition under which the enactment occurs (e.g., a SWAT sniper cleared to shoot a hostage-taker at the first opportune moment).

Strategic waiting is related to “watchful waiting” in medical contexts, a process in which treatment is withheld and symptoms are monitored to see if they change. In addition, even strategic waiting on commitment may admit a distinction between waiting without specific expectations (e.g., in case anything changes) on the one hand, and waiting for a specific piece of expected information (e.g., the outcome of a test or a beneficiary’s opinion). Waiting without specific expectations of decision-relevant information may be a sign of caution or lack of confidence (i.e., to give oneself a chance to rethink by “sleeping on it”), and distinguishing the two may prove difficult.

The core indecisiveness behavior of not-deciding may also have been operationalized too narrowly. Not-deciding was intended to mean not making any commitment when the need to make a commitment is acknowledged. This was meant to include missing opportunities and deadlines one was aware of, not making a decision when there is no deadline, and refusing to decide. Actively deciding not to decide is an interesting case, as it can indicate status quo bias (Samuelson & Zeckhauser, 1988) or strategic abstention (formal or otherwise). That said, if either is chronic then the need to decide is not being fulfilled. Thus, consistently deciding not to decide is a form of indecisiveness.

Finally, the fact that slow, extensive, and re-processing did not result in three factors was somewhat surprising, as similar constructs have been used in various literatures. Slow processing was operationalized as careful and meticulous processing

(e.g., S1 “When faced with a decision, I consider each fact one at a time”). Extensive processing was operationalized as extensive search (e.g., “When I am presented with two good options, I look for a third option”) and consideration (e.g., “I try to consider several factors when making a simple decision”). Janis and Mann’s (1977) vigilance scale includes similar items, including ones that measure slow processing (e.g., “I take a lot of care before choosing”) and extensive processing in both the search (e.g., “When making decisions I like to collect a lot of information”) and consideration (e.g., “I try to find out the disadvantages of all alternatives”) senses. The logic behind the generation of two scales was that slow (i.e., careful) and extensive processing are conceptually distinct. Finally, re-processing was operationalized as checking behavior (e.g., “I triple-check things before deciding”), a construct that is measured by such instruments as the checking subscale of the Maudsley Obsessive Compulsive Inventory (MOCI; Rachman & Hodgson, 1980).

The two-factor solution that did emerge, namely prudent processing and concerned processing, offered more empirical support for the distinction between neurotic and vigilant indecisiveness. It also furthered our understanding of the principles on which these behaviors tend to group factor analytically, which in this case was not an unreasonable proxy for co-occurrence. In Study 1 provided evidence that behaviors related to indecisiveness tended to form factors around the type of behavior, rather than when in the decision episode the behaviors occurred. Study 2 suggested, however, that behaviors were not related simply because of superficial similarity (e.g., all checking behavior), but rather because of shared underlying drivers. Shared underlying drivers help account for why certain qualitatively distinct behaviors loaded together, such as

slowly examining information and planning contingencies both loading on prudent processing. Shared underlying drivers also help explain why quantitatively different behaviors loaded differently, such as triple-checking loading on concerned processing, but double-checking loading on both factors (and consequently being discarded).

Distal Contributors. Although measuring the distal contributors using the Big Five personality structure at the domain level (i.e., openness to experience, conscientiousness, extroversion, agreeableness, and neuroticism) offered an initial sense of the underpinnings of indecisiveness mechanisms, it fell short in two ways.

First, it failed to consider differences in facet-level relations. Each domain is composed of several distinct components called facets, but the exact number and nature of the facets that make up a given personality domain depends on the measure. At a theoretical level, the facets are narrowly defined constructs, whereas domains are clusters of related facets. Conscientiousness in the HEXACO measure of personality (Ashton & Lee, 2007, 2008, 2009) for example, has four facets: diligence, organization, perfectionism, and prudence. Facets within domains may predict dependent variables to different degrees (or not at all) and in different directions. Using the example of the facets of conscientiousness, high perfectionism and low diligence might both be predicted to drive prolonged latency. This means that one consequence of using a domain-level measure is that it can reduce or mask its facet-level relations to the dependent variables.

Second, facet composition of the clusters themselves varies from measure to measure, which, in turn, can make domain-level interpretations harder to translate from measure to measure. Differences in the aggregation of facets in the five factor model and the Big Five are a case in point (John & Srivastava, 1999), as is that between the Big Five

and the six-factor HEXACO model (Ashton & Lee, 2007). In the end, the advantage of using facet-level predictors over domain-level predictors is that facet-level predictors offer conceptually clearer and more meaningful mechanisms to test and compare across measures.

Sample. The undergraduate convenience sample was also a limitation for a number of reasons. First, one cannot assume that undergraduates are representative of the broader population. In addition, the motivation to participate in the study was course credit. Because the study was done online and at home, some participants may have seen this as an opportunity to quickly get course credit without much effort. The lack of experimenter presence may have reduced some participants' sense of accountability (Birnbaum, 2004), which could explain some of the unrealistically fast completion times. Rushing through a study because one lacks the motivation to answer questions carefully creates a form of noise in the data. This noise was corrected for to some extent by excluding from the analysis the roughly 7% of participants who rushed through the study. In contrast, those who took the paper-and-pencil versions were not timed because they filled out the forms in the conventional lab setting in the presence of an experimenter.

Chapter 5: Study 3—Mechanisms of Indecisiveness

Aims

There were four principal aims in Study 3. The first three were to test the multi-dimensionality, multi-determination, and distinct mechanisms hypotheses. The fourth aim was to further validate the CIS. This was done using a status quo task, an optimistic bias task, and a decision change task designed for this study. In addition, self-reported scores on the CIS were compared with peer ratings to address common method variance.

To better achieve these aims, Study 3 also addressed two of the shortcomings of Study 2. First, a larger and demographically more diverse sample was used. Second, more specific distal contributors were used, by measuring personality traits at the facet-level, and by using a measure based on the six-factor HEXACO model of personality rather than on the more established Big-Five model.

The HEXACO is a six-dimensional model of personality that is an alternative to the Big Five model of personality (Ashton & Lee, 2007, 2008, 2009). Unlike the Big Five model, which bases its personality structures on lexical studies in English, the HEXACO is based on the six factors that consistently emerge from lexical studies of personality in various languages (Ashton et al., 2004), including re-analyses of the original lexical studies in English on which the five-factor model was based (Ashton, Lee, & Goldberg, 2004). Consequently, the HEXACO has been shown to have both greater explanatory

power by accounting for a wider range of behaviors (e.g., altruism), and greater cross-cultural validity (Ashford & Lee, 2007; Ashton, Lee, & Goldberg, 2004).

There is considerable overlap between the HEXACO dimensions and those of the NEO-FFI (Costa & McCrae, 1992), a popular Big Five measure. Three of the dimensions are highly correlated—openness to experience, conscientiousness, and extraversion. The HEXACO differs from the NEO-FFI in whether certain facets load on agreeableness or neuroticism/emotionality (e.g., anger, toughness), as well as in its inclusion of a sixth dimension, Humility-Honesty. The correlation between the two agreeableness scales is moderate, as is that between the NEO-FFI's neuroticism and the HEXACO emotionality scales. The Humility-Honesty dimension is moderately related to agreeableness, and has a modest correlation with conscientiousness.

Each of the HEXACO's six dimensions has four facets. Honesty-Humility is composed of items measuring sincerity, fairness, greed-avoidance, and modesty. Emotionality is composed items tapping fearfulness (i.e., fear of physical harm), sentimentality (i.e., strong emotional bonds and empathy), dependence, and anxiety (i.e., worry). Extraversion consists of social boldness, social self-esteem, liveliness (i.e., optimism and energy), and sociability. Agreeableness is made up of gentleness, flexibility, forgiveness, and patience. Conscientiousness includes perfectionism, prudence, organization, and diligence (i.e., work ethic). Openness to experience consists of creativity, unconventionality, aesthetic appreciation, and inquisitiveness.

Predicted Contributors and Mechanisms

A total of 10 mechanisms were hypothesized to contribute to one or more of the core indecisiveness behaviors. The mechanisms were based largely on those implied in

the various literatures, but also included additional plausible mechanisms. Some of these mechanisms were partly alluded to in Study 2 when describing the hypothesized relationships between distal and proximal behavioral contributors (e.g., the reasons why neuroticism was thought to contribute to impasse). The use of facet-level predictors in Study 3 allowed greater precision in specifying the nature of the mechanisms. However, the change from the BFI to the HEXACO allowed only some of the findings from Study 2 to be tied to the present hypotheses. The 10 mechanisms are:

- 1) Worry
- 2) Low self-confidence
- 3) Dependence
- 4) Disengagement
- 5) High standards
- 6) Escapist impulsivity
- 7) Careless impulsivity
- 8) Concern for others
- 9) Low honor
- 10) Active open-mindedness

In the following paragraphs, each core indecisiveness behavior is described in terms of its hypothesized contributing mechanisms. Each mechanism, in turn, is characterized in terms of the facets thought to contribute to it, and the proximal contributing behaviors believed to mediate their effects.

Prolonged latency.

In terms of possible contributing mechanisms, prolonged latency is the most complex of the three core indecisiveness behaviors. At least seven mechanisms were thought to contribute to prolonged latency, several of which were thought to be possibly related. The first four are documented in the literatures: worry, low self-confidence, dependence, and high standards. The second set of three were plausible mechanisms: lack of care, concern for others, and active open-mindedness.

Worry. Worry is perhaps the most common account for prolonged latency (Bacanli, 2005; Chartrand, Robbins, Morrill, & Boggs, 1990; Frost & shows, 1993; Germeijs & De Boeck, 2002). The more one is preoccupied with the possible negative outcomes of one's decisions, including how they might be perceived by others, the more reluctant one is to commit, and consequently the longer one takes to decide.

Worry was thought to lead to prolonged latency through decisional procrastination, buck-passing, impasse, or engaging in concerned processing. The HEXACO facet that was thought to capture worry is anxiety (e.g., "I sometimes can't help worrying about little things"). Consequently, anxiety is predicted to be positively correlated with decision latency. Worry is a key affect contributing to Milgram and Tenne's (2000) "tension," and so would be one of the principal mechanisms driving slow-tense indecisiveness.

Low self-confidence. Low self-confidence has long been thought to be a contributor to indecisiveness (Holland & Holland, 1977), and indecisive individuals have consistently been found to have low self-esteem (Effert & Ferrari, 1989; Ferrari, 1991). The facets of (low) social boldness (e.g., "I can handle embarrassing social situations

better than most people can”) and (low) social self-esteem (e.g., “I sometimes feel that I am a worthless person,” reverse-scored) were believed to be at the core of the low self-confidence mechanism, and both were thought to be mediated by decisional procrastination, buck-passing, and impasse. Low self-confidence would be a second mechanism driving Milgram and Tenne’s (2000) slow-tense indecisiveness.

Dependence. Related to low self-confidence is a dependence on others, which was also believed to contribute to prolonged decision latency. At a clinical level, the first diagnostic criterion of dependent personality disorder in DSM–IV-TR (2000) is “difficulty making everyday decisions without an excessive amount of advice and reassurance from others” (p. 725). However, there is no reason to believe that the same mechanism would not exist at the sub-clinical level. Consistent with the DSM–IV-TR (2000), Salomone (1982) suggested that one contributor of indecisiveness was difficulties with dependence, and Jones (1989) included “reliance on others” as one of the reasons people take unnecessarily longer to decide in his definition of career indecision (p. 479).

Although no study has related the HEXACO facets to dependent personality disorder, the dependence facet of extroversion seemed to capture the idea well for a sub-clinical population (e.g., “When I have a problem, I like to get advice from others”). The effect of dependence on prolonged latency was expected to be mediated by buck-passing and impasse. Dependent deciders were thought to fall under Milgram and Tenne’s (2000) slow-tense indecisiveness, especially as their tension rises if nobody can help them decide.

Disengagement. Disengagement is a somewhat broad mechanism that involves low positive affect and low motivation, and thus a passive form of what Beattie, Baron,

Hershey, and Spranca (1994) call decision avoidance. The mechanism was thought to lead to prolonged latency because the decider who is unmotivated to decide takes longer to finally get around to deciding. Disengagement was captured by (low) liveliness (e.g., “Most people are more upbeat and dynamic than I generally am). The effects of disengagement were hypothesized to be only partly mediated by decisional procrastination, as disengagement was thought to be a more passive form of decision avoidance than was procrastination (e.g., “I waste a lot of time on trivial matters before getting to the final decision”).

Although the disengagement mechanism is one account of why depressed individuals have difficulty making decisions (see DSM IV, p. 380), the very mechanism may well keep these individuals from being (intrinsically) motivated enough to participate in Study 3 given the sampling method. Thus, if such a mechanism did exist, it was not clear that enough of the population whose indecisiveness is driven by disengagement would be captured in the sample of participants who started and completed Study 3.

High standards. Having high standards translates into two distinct, but related, attitudes. On the one hand, it dictates the standard of quality to which one holds oneself when performing a task. In this regard, indecisiveness has reliably been associated with perfectionism (Frost & Shows, 1993; Gayton, Clavin, Clavin, & Broida, 1994; Patalano & Wengrovitz, 2007). On the other hand, having high standards affects how demanding one is of the quality of an option before being willing to commit to it. In this sense, indecisiveness has been associated with maximization, or the belief that “only the best will do” (Spunt, Rassin, & Epstein, 2008). In both senses, then, the higher one’s

standards, the longer one is likely to work or search for the object of one's standard to be of sufficient quality.

The high standards mechanism was captured by the HEXACO conscientiousness facet of perfectionism, though admittedly it better captured the first of the two attitudes. The effect of perfectionism on prolonged latency was hypothesized to be mediated through strategic waiting, concerned processing, and prudent processing. The wording of some facet items (e.g., "I always try to be accurate in my work, even at the expense of time") does not clearly distinguish between the maladaptive, socially proscribed perfectionism that drives concerned processing on the one hand, and the more adaptive, self-oriented perfectionism that drives prudent processing on the other (Hewitt & Flett, 1991). Still, other items (e.g., "I often check my work over repeatedly to find any mistakes") clearly tap the excessive checking (Frost & Shows, 1993; Gayton et al., 1994; Rassin & Muris, 2005b), precision (Rassin & Muris, 2005b), and intolerance of ambiguity (Rassin & Muris, 2005a) characteristics of indecisiveness. For this reason, perfectionism was predicted to be more highly correlated with concerned processing than with prudent processing or strategic waiting.

Having excessively high standards and engaging in concerned processing was thought to be a mechanism underlying Milgram and Tenne's (2000) slow-tense indecisiveness, whereas having moderately high standards and engaging in prudent processing (e.g., "I need to find a good solution, but not necessarily the very best one") was thought to underlie some slow-relaxed indecisiveness.

Concern for others. Individuals with a higher concern for others were thought to take longer to decide insofar as they "try to please everyone" (cf. Yates, 2003, on

acceptability). The more a decider is concerned about a decision's beneficiaries and stakeholders, the more views she will consider, and the more she will try to reconcile conflicting views. All things being equal, more consideration and reconciliation translates into more time taken to decide. The concern for others was conceived as being grounded in genuinely positive sources, such as agreeableness. The mechanism was believed to account for why high agreeableness (e.g., "Is considerate and kind to almost everyone" and "Likes to cooperate with others") was related to prolonged latency in Study 2. In contrast, a more negative take on concern for others (e.g., "what will they think of me if I make this decision?"), driven by such phenomena as socially proscribed perfectionism (Hewitt & Flett, 1991), is ultimately a concern for oneself and associated with low self-confidence and worry.

Again, the meaning of the current mechanism was restricted to the positive concern for others, as is evidenced by the three facets that were thought to contribute to the concern for others mechanism: (high) fairness, (high) sentimentality, and (high) gentleness. Each was expected to be positively related to and have a direct effect on prolonged latency.

Active open-mindedness. This mechanism (hereafter AOM) was named after Baron's concept of "actively open-minded thinking," which he characterized as a disposition to search for and fairly consider evidence contrary to one's current beliefs and goals (Baron, 1985, 1988, 1993). Stanovich and West (1997) expanded and operationalized the concept. Their actively open-minded thinking scale (AOT) is made up of various existing scales that together measure a cluster of dispositions to engage in deliberation, including a willingness to postpone closure (e.g., "There is nothing wrong

with being undecided about many issues”), the consideration of evidence contrary to one’s views (e.g., “People should always take into consideration evidence that goes against their beliefs”), and an openness to alternative opinions and new ideas (e.g., “Beliefs should always be revised in response to new information or evidence”).

An important part of active open-mindedness is the tendency to avoid quick, habitual responses and consider, if not seek, novel alternatives. Doing so takes time, and so active open-mindedness was expected to be mildly correlated with prolonged latency. As the first sample item from the AOT suggests, actively open-minded thinking can also mean a longer suspension of commitment on certain issues, and so the AOM mechanism was also hypothesized to contribute to not-deciding.

The three facets of the HEXACO that approximate actively open-minded thinking were prudence (e.g., “I make a lot of mistakes because I don’t think before I act” reverse scored), flexibility (e.g., “I am usually quite flexible in my opinions when people disagree with me”), and inquisitiveness (e.g., “I’m interested in learning about the history and politics of other countries”). Unconventionality has one item that would be considered characteristic of AOM (e.g., “I like hearing about opinions that are very different from those of most people”), but the other three items do not (See Appendix O), consequently it was not included as part of the mechanism. The effect of all three AOM facets on prolonged latency were expected to be partly mediated through prudent processing, whereas the effects of prudence were also hypothesized to be mediated through strategic waiting.

Not-deciding.

Four mechanisms were thought to contribute to not-deciding: worry, low self-confidence, dependence, and disengagement. The four mechanisms are identical to those described as contributing to prolonged decision latency. Each facet was hypothesized to contribute to not-deciding in the same direction as it was for prolonged latency. Disengagement, however, was believed to be a bigger contributor to not-deciding than it would be to prolonged latency because the low motivation characteristic of disengagement might not lead to a decision at all in the absence of a strong enough exogenous incentive to do so.

Changing decisions.

Three mechanisms were hypothesized to contribute to changing decisions: worry, impulsivity, and low honor.

Worry. Worry was made up of the same facets described earlier, but the mechanism was thought to function slightly differently in changing decisions. Specifically, worry leads one to doubt, regret, and reconsider one's choice after the decision is made. Post-decisional worry, regret, reconsideration, and rumination have all been considered part of or related to indecisiveness. Germeijs and De Boeck (2001), for example, include two items measuring rumination and regret in their indecisiveness scale (i.e., "After making a decision, I can't get it out of my mind" and the reverse-scored "After making a decision, I don't regret the decision"). The mediating variable for the effect of worry on changing decisions was hypothesized to be concerned processing (i.e., excessive information gathering and checking).

Impulsivity. Rassin and Muris (2005a) found that impulsivity was positively associated with indecisiveness. They measured indecisiveness using the IS, and impulsivity using the obsessional impulses to harm self/others subscale (e.g., “I sometimes feel the need to break or damage things for no reason”) of the PADUA Inventory (Burns, Keortge, Formea, & Sternberger, 1996), which measures obsessional behaviors. Unfortunately, the finding shed little light on why impulsivity is related to indecisiveness: Rassin and Muris did not suggest any mechanism, and the IS does not measure changing decisions specifically. What is more, there are several kinds of impulsivity (Whiteside & Lynam, 2001), and it is unclear which is related to that on the PADUA subscale.

The present account of how impulsivity is related to indecisiveness is as follows: Impulsivity leads the decider to make decisions quickly (Whiteside & Lynam, 2001), which leads to poorer decisions. Poor decisions, especially given indecisives’ propensity to worry, increase the likelihood and degree of doubting, regret, and reconsideration. These, in turn, increase the chances of ultimately changing the decisions. Separate mechanisms exist for each of the three parts of this process: deciding quickly, reconsideration, and changing. Forms of doubting, regret, and reconsideration (e.g., rumination) fall under the worry mechanism described earlier. The focus here was on explaining quick deciding and changing.

At least two distinct impulsivity mechanisms explain quickly made decisions—one driven by a desire to escape the decision, and the other by carelessness. The escapist mechanism was thought to be driven by worry, and lead to the same feelings of decision anxiety as those felt by indecisives who avoid the decision process (e.g., procrastinate).

The key difference is that, in this case, the deciders attempt to relieve the pressure to decide by making quick, temporary commitments, thus buying time and postponing their final commitments. Their decision-making process is not unlike the hurried, almost panicked, one that Janis and Mann called (1977) “hypervigilance” (e.g., “Whenever I get upset by having to make decisions I choose on the spur of the moment”), except that with escapist impulsivity the push to make some commitment is endogenous, and not an exogenous deadline.

The escapist impulsivity mechanism involves a type of impulsivity labeled “urgency” by Whiteside and Lynam (2001), who defined it as “engaging the decision problem and committing quickly to alleviate negative emotions, despite the harmful long-term effects of these actions” (p. 685). At least two indecisiveness scales have measured the escapist mechanism. Bacanli’s (2005) impetuous indecisiveness scale measures it (i.e., “I decide quickly for want to get rid of that responsibility and later generally I give it up” [*sic*]), and Haraburda’s (1999) scale measures it, albeit with a conditionally worded item (i.e., “If making a decision is stressful for me, I make quicker decisions than I should just to end the decision-making process”).

Whiteside and Lynam (2001) found that urgency was related to all facets of neuroticism on the NEO-PI-R (Costa & McCrae, 1992). The analogous facets in the HEXACO, where they exist, are anxiety, and (low) social self-esteem. Consequently, anxiety was predicted to be positively related to, and social self-esteem negatively related to, changing decisions.

In contrast, the careless impulsivity mechanism is associated with a different type of impulsivity identified by Whiteside and Lynam (2001): lack of premeditation. Lack of

premeditation is, simply put, not thinking carefully before acting (or deciding). Bacanli's (2005) scale measures the lack of premeditation (i.e., "I decide quickly because of my impatience to search and collect data on it and then I give it up" [*sic*] and "When deciding, instead of thinking in detail, I decide quickly and then I generally give it up" [*sic*]).

Whiteside and Lynam (2001) found that the lack of premeditation was negatively related to all facets of conscientiousness on the NEO-PI-R (Costa & McCrae, 1992). Interestingly, Bacanli's (2005) two aforementioned items correspond closely to two HEXACO conscientiousness facets, (low) prudence and (low) diligence, as well as to the agreeableness facet of (low) patience. A third item in Bacanli's scale combines elements of (low) diligence and (low) prudence: "I choose the most attractive option to me at that time, since I find difficult the search on all options, and later I give it up."

The conscientiousness facets of (low) diligence, (low) prudence, and the agreeableness facet of (low) patience were expected to be negatively related to changing decisions. Although perfectionism is a facet of conscientiousness in the HEXACO, it has no direct counterpart in the NEO-PI_R, and there was no reason to expect it to be related to impulsivity. The effects for both impulsivity mechanisms were predicted to be partly mediated through (low) concerned and (low) prudent processing.

In sum, with both types of impulsivity the decider processes decision-relevant information with little breath, depth, or care. As a result, impulsivity can increase the likelihood of making time-inconsistent choices. Stigler and Becker (1977) define a time inconsistent choice as "one that would not have been made if it had been contemplated from a removed, dispassionate perspective; it represents a transient alteration in tastes,

not a permanent reevaluation of an alternative due to receipt of new information” (p. 493). Making time-inconsistent choices, in turn, helps explain why indecisives tend to have a lingering feeling of uncertainty about the commitment after it has been made (Callanan & Greenhaus, 1990, 1992; Frost & Shows, 1993).

Interestingly, the escapist and carelessness mechanisms might be one difference between how Milgram and Tenne’s (2000) fast-tense and fast-relaxed deciders approach decisions, respectively. Recall that Milgram and Tenne’s definition of indecisiveness was strictly in terms of prolonged decision latency (i.e., slow deciders), and thus fails to include changing decisions.

Low honor. Although “low honor” may appear to be a somewhat anachronistic and dramatic label, it captured the combination of a low concern for both others and social conventions regarding the making and keeping of commitments. In contrast to concern for others, which was hypothesized to drive prolonged latency, the low concern for others was thought to result in less consideration of beneficiaries and stakeholders, and thus would contribute to making decisions quickly. The low honor mechanism was thought to be captured by a combination of (low) fairness, (low) sincerity, and (low) sentimentality. These three facets were predicted to contribute directly to changing decisions insofar changing decisions involves breaking commitments.

More importantly, low honor was believed to lead one to more easily renege on a commitment (i.e., changing decisions). It may lead the indecisive to think of decisions and commitments as less binding, lead to a greater belief in the reversibility of decisions, or lead the decider to an increased sense of her ability to get away with changing commitments. Said differently, at least some changing decisions were thought to be

opportunistic, and driven by a low concern about violating the social conventions associated in making and keeping commitments. Accordingly, the facets predicted to contribute to low honor were (low) fairness (e.g., “I’d be tempted to use counterfeit money, if I were sure I could get away with it,” reverse-scored), (low) sincerity (e.g., “If I want something from someone, I will laugh at that person’s worst jokes,” reverse-scored), and (low) sentimentality (e.g., “I feel like crying when I see other people crying”). This mechanism was believed to have a direct effect on change. Table 10 summarizes the hypothesized relationships between distal contributors, core indecisiveness behaviors, and mediating proximal behavior contributors.

A refined version of the CIS was validated using three behavioral measures expected to have differing relationships to the three core indecisive behaviors: decision change, status quo bias, and optimistic bias. In addition, peer ratings were compared to self-reported scores to address potential method variance in the CIS, and to test the reliability of the self-report scale.

Table 10
Summary of Predicted Relationships Among Distal Contributors, Proximal Behavioral Contributors, and Core Indecisiveness Behaviors

HEXACO Scales	Indecisive Behaviors			Proximal Behavioral Contributors					
	L	ND	Δ	DP	B	I	SW	CP	PP
Honesty-Humility									
Fairness	+ ⁸		- ⁹						
Greed-avoidance									
Modesty									
Sincerity			- ⁹						
Emotionality									
Anxiety	+ ¹		+ ^{1,6}	+ ¹	+ ¹	+ ¹		+ ¹	
Dependence	+ ³	+ ³			+ ³	+ ³			
Fearfulness									
Sentimentality	+ ⁸		- ⁹						
eXtraversion									
Liveliness	- ⁴	- ⁴		- ⁴	- ⁴				
Social boldness	- ²	- ²		- ²	- ²	- ²			
Sociability									
Social self-esteem	- ²	- ²	- ⁶	- ²	- ²	- ²			
Agreeableness									
Flexibility	+ ¹⁰								+ ¹⁰
Forgiveness									
Gentleness	+ ⁸								
Patience			- ⁷						
Conscientiousness									
Diligence			- ⁷						
Organization									
Perfectionism	+ ⁵						+ ⁵	+ ⁵	+ ⁵
Prudence	+ ¹⁰		- ⁷				+ ¹⁰		+ ¹⁰
Openness to experience									
Aesthetic appreciation									
Creativity									
Inquisitiveness	+ ¹⁰								+ ¹⁰
Unconventionality									

Mechanisms: ¹worry, ²low self-confidence, ³dependence, ⁴disengagement, ⁵high standards, ⁶escapist impulsivity, ⁷careless impulsivity, ⁸concern for others, ⁹low honor, and ¹⁰active open-mindedness

Scale validation

Decision change. In principle, if presented with an opportunity to change a decision for a low cost, individuals with high CIS changing decisions scores are more likely to do so than are those with low changing decisions scores. Changing one's decision was here meant in the narrow sense of changing a relatively recent decision

without having received any new information, or there being no other change in conditions aside from the passing of time. In this narrow sense, then, changing one's decision is attributable to the reconsideration of existing information. As such, the number of changes in the decision change task (i.e., sinking ship task) was predicted to be positively related to the CIS changing decisions subscale.

Status quo bias. In contrast to the greater propensity to change one's decision when given the option to do so, status quo bias is a tendency found in the general population to choose the option that reflects the current state of affairs (i.e., the status quo) when presented with similarly attractive options (Samuelson & Zeckhauser, 1988). The underlying driver of the status quo bias is loss aversion (Kahneman, Knetsch, & Thaler, 1991). Individuals who exhibit the status quo bias either do not experience indecisiveness because they choose the status quo quickly and stick with it, or else they do experience indecisiveness and either end up choosing the status quo, or ultimately fail to decide and end up with the status quo. Status quo bias was thus predicted to be positively related to the not-deciding subscale of the CIS, but negatively related to the changing decisions subscale.

Optimistic bias. Optimistic bias is the belief that possible negative future events are less likely and possible positive future events are more likely to happen to oneself than they are to people similar to oneself (Weinstein, 1980). Although optimistic bias has consistently been found in the population at large, depressed individuals appear to be less affected by optimistic bias—a phenomenon called “depressive realism” (Alloy & Abramson, 1988). The leading explanation is that depressed individuals engage in less dissonance reduction of potentially negative outcomes than do less depressed individuals.

Using an earlier version of the indecisiveness scale, Potworowski and Yates (2006) found that indecisives tended to show significantly less optimistic bias for positive and negative future events than did more decisive people. This pattern of depressive realism among indecisives should not come as a complete surprise given that indecisiveness is a diagnostic criterion of depression. The CIS subscales of latency and not-deciding were predicted to correlate with lower optimistic bias.

Peer Rating of CIS. Although the related behavioral tasks in Study 2 provided some criterion validity for the CIS, they were not alternative measures of the CIS itself. As such, it was unclear whether the degree of error variance in the CIS self-reports attributable to method variance was high enough to be of concern. The principal danger of high method variance is that it can increase or decrease the measured relationships between variables, thus leading to erroneous conclusions (see Podsakoff, MacKenzie, Lee, & Podsakoff, 2003 for a recent review of method bias). Using a different source for the criterion variable is the first step recommended by Podsakoff, MacKenzie, Lee, and Podsakoff (2003) to control for method biases. With a peer rating of an individual's indecisiveness, the convergence of the scores from two separate raters (i.e., self- and peer-report) could be tested. A high level of convergence between self- and peer-report scores would offer some evidence of low method variance, and thus help validate the CIS as a self-report scale.

Method

Participants. Participants consisted of a respondent-driven, convenience sample ($N= 573$). Family, friends, and acquaintances were informed of the study by e-mail and posts on the social networking site Facebook, and encouraged to recruit others. The

recruitment message (Appendix I) explained that the study was about differences in decision-making, that participation took about 30 minutes, was voluntary, and completely anonymous. The message also emphasized that the study was the final project of my dissertation and participation would help me graduate. Participants were not remunerated. The recruitment message also indicated that participants had to be at least 18 years old and native speakers of English. The study ran for 12 days. A portion of the subjects did not complete the study.

Missing Data.

Of all participants who began the study ($N = 573$), just over a quarter ($n = 162$, 28.3%) dropped out before completing the study, slightly less than half ($n = 270$, 47.1%) completed the study with no missing data, and just under a quarter ($n = 141$, 24.6%) completed the study with missing data.

Incomplete cases. The consent form in this study explicitly stated that if a participant chose to end the study before it was completed, none of her responses would be submitted (see Appendix L). As such, all participants who failed to complete the study ($n = 162$) were excluded from further analyses. Of those excluded, one third ($n = 54$) dropped out after finishing the sinking ship task (page 1) when faced with the first of seven pages of questions from the core and behaviors questionnaire. This suggests they may have been curious to see the study, but had little motivation to actually participate.

About another third of those who dropped out ($n = 50$, 30.9%) did so by the end of the third page of the core and behaviors questionnaire ($n = 21$ before starting the second page; $n = 13$ before starting the third page; $n = 16$ before starting the fourth page).

Drop off for the rest ($n = 58$, 35.8%) continued in a monotone pattern. In Figure 5, each line indicates the completion rate for each question, and questions are clustered by page.

The overall completion rate of just under 72% is not surprising given that drop out rates tend to be higher for online studies than in lab-based studies (Birnbaum, 2004). In online studies, dropouts typically occur because of technical difficulties (e.g., a bad Internet connection) or because participants intentionally drop-out. Intentional dropping out is often a result of boredom, lack of interest or motivation, or the nature of the questions.

Interviews in pilot testing indicated that the questions were clear and not contentious. There were over 200 questions, however, which may have posed a burden or led to boredom for certain responders. To reduce response burden, the study was designed to have 5–10 questions per page and alternate between self-report questions and (more engaging) decision tasks. In 10 days almost 600 individuals started the study with no remuneration, suggesting that there was sufficient participant interest. Participant interest was highlighted by the fact that several participants sent e-mails expressing interest and asking for information about results. The considerable dropout at the beginning, however, suggests that a portion of participants were only superficially curious.

Complete cases. Almost two thirds of the 411 participants who completed the study, did so with no missing data ($n = 270$, 65.7%), and over a quarter ($n = 120$, 29.2%) completed the study with 2% or less missing data (i.e., 4 or fewer missing responses). Specifically, 61 (14.8%) participants missed one response, 35 (8.5%) were missed two, 20 (4.9%) missed three, and four (1.0%) missed four responses. Just over 5% of

participants ($n = 21$) completed the study, but were missing five or more answers. Only participants with 2% or less missing data ($n = 390$) were retained for further analyses. Figure 6 shows the completion rates of all 573 participants distinguished by whether they completed the study.

Two perspectives were used to understand the nature of the missing data—the first was orthodox, and the second was recent, more comprehensive, and more pragmatic. The more orthodox approach is based on Rubin (1976), who explained that missing data on a given variable can be missing completely at random (MCAR), missing at random (MAR), or missing not at random (MNAR). Missing data that are MCAR are not missing in any systematic way, that is, they do not depend on observed or unobserved variables. Missing data that are MAR are unrelated to unobserved variables, but do depend on one or more observed variables (e.g., gender). MAR data are thus completely random once the observed variables on which they depend have been controlled for. Finally, missing data that are MNAR depend on unobserved variables (Schafer & Graham 2002). The pattern of missing data on a given variable is called its “missingness mechanism.” A missingness mechanism consists of the pattern of binary numbers across a variable representing whether data for each case was observed or not. Each unique missingness pattern can be MCAR, MAR, or MNAR, accordingly, data sets with missing data on more than one variable can have a mix of missingness patterns.

Because MNAR is related to variables that have not been observed, it cannot statistically be distinguished from MAR. To distinguish whether the missing data is MCAR from MAR and MNAR, one tests whether there is a relationship between the missingness mechanism on a given variable and the other variables in the data set.

Figure 5. Response Rate by Variable, Clustered by Page

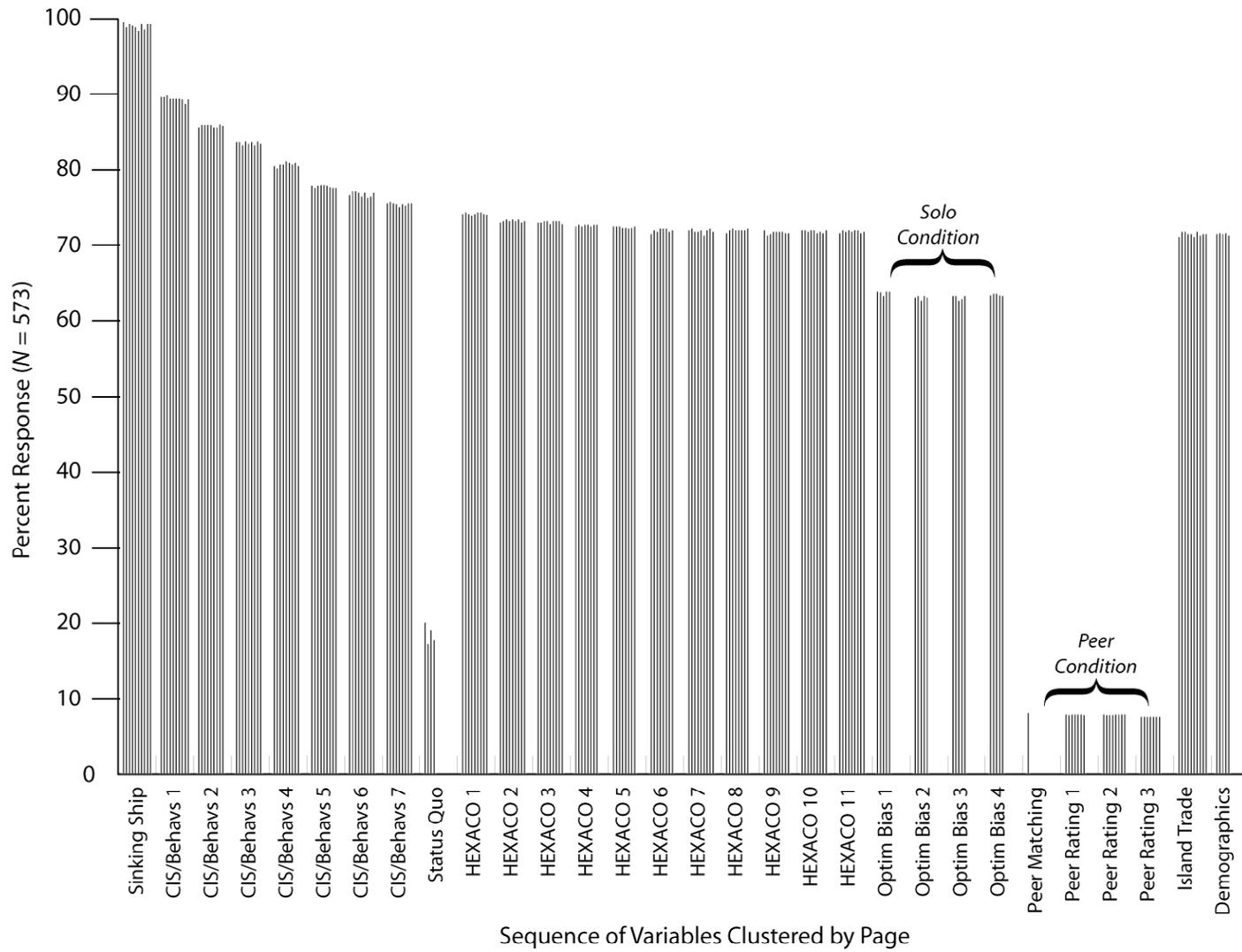
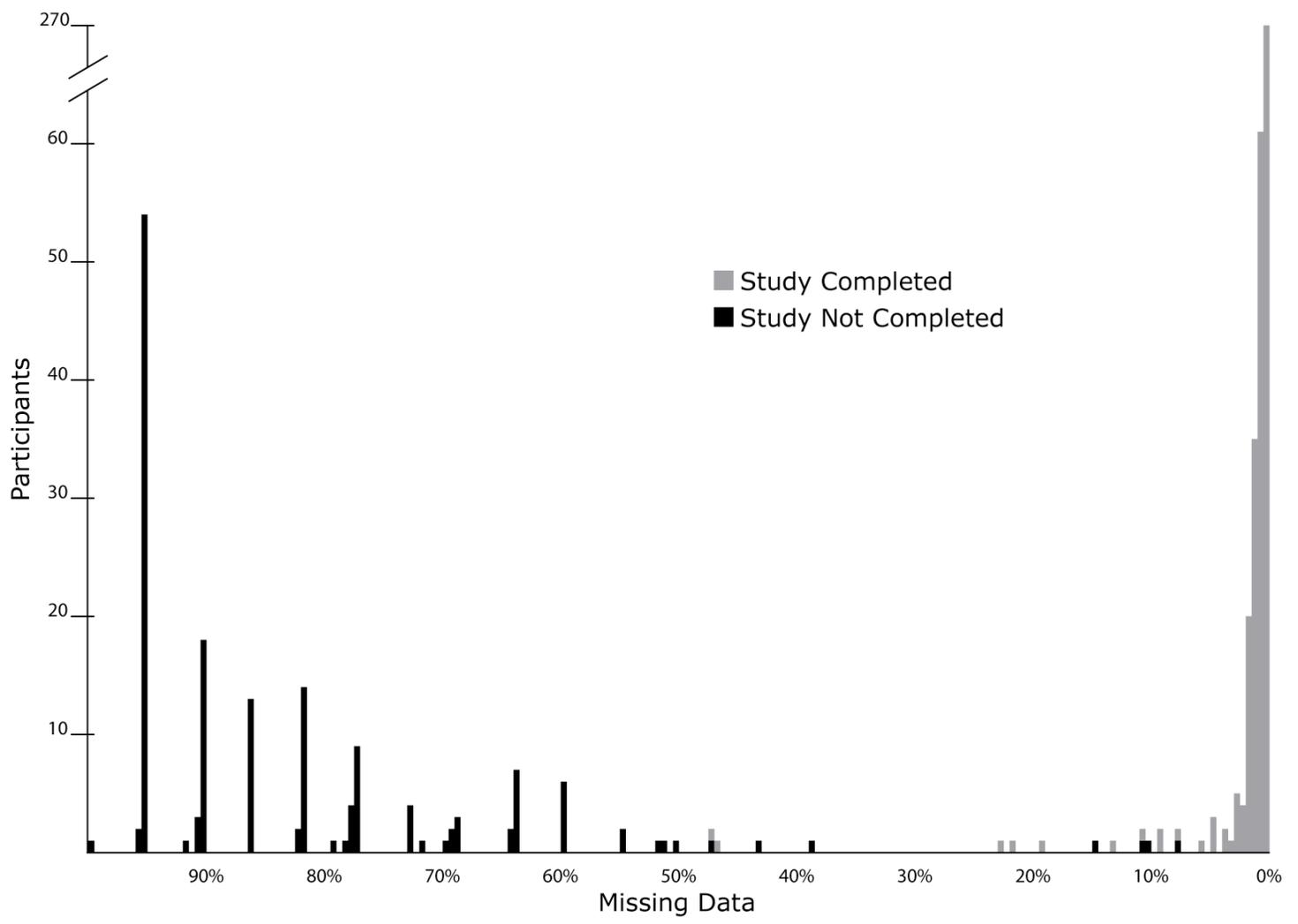


Figure 6. Percent Missing Data by Participant Drop-out Status



When MCAR is tested for, and often it is assumed, the test typically involves comparing responders and non-responders on the other variables using two-sample t tests. Thus, given p variables, each variable can be compared to all other variables, or $p - 1$ times. If every variable has a unique missingness mechanism (i.e., is not missing data from the same combination of participants as any other variable), then the total number of t tests is $p(p - 1)$ (Little, 1988). Little points out that as the number of missingness mechanisms grows, it becomes extremely difficult to meaningfully interpret the large number of t tests.

Of the 231 variables in Study 3, 124 (53.7%) had missing data. There were 114 out of a possible 124 distinct missingness patterns. Only 10 pairs of variables shared a missingness pattern. The mean number of missing data per variable across 390 participants (only 120 of whom were missing data) was $M = 0.91$ ($SD = 1.10$), and the modal number of missing data per variable was 0 (46.3%). No variable had more than 1.3% missing data. Table 11 shows the distribution of missing data by variable.

Table 11
Missing Data by Variable

Number of missing data by variable	Percent missing data by variable	Number of variables missing data	Percentage of total variables
0	0.0	107	46.3
1	0.3	70	30.3
2	0.5	31	13.4
3	0.8	16	6.9
4	1.0	5	2.2
5	1.3	2	0.9

Note: Based on $N = 390$ participants.

In a more recent and comprehensive approach to treating missing data, McKnight, Sidani, McKnight, and Figueredo (2007) also consider the patterns of missing data from the participant perspective. They point out that the fewer (participant) missing data

patterns (i.e., variables on which they are missing data) relative to the number of participants, the more likely that the patterns are systematic and not MCAR. Said differently, the more people who have the same pattern of missing data, the more likely that the pattern is systematic. Conversely, as the number of patterns approaches the number of participants—which they call “messy” missing data—the less likely that data is missing systematically (i.e., the data are more likely to be MCAR). As the messiness increases, the replacement of missing data through more acceptable imputation methods, such as maximum likelihood (see McKnight et al. 2007, for a review), becomes increasingly difficult.

McKnight et al. (2007) proposed using the ratio of missing data patterns to number of participants (n) as an index of messiness, such that the range of the index would be from $1/n$ (i.e., everyone shares the same pattern) to 1 (i.e., everyone has a unique pattern). In Study 3, there were 120 participants with missing data in the final analysis, with 111 unique missing data patterns. Of those patterns, 104 participants had their own patterns, and 16 participants shared patterns. There were five missing data patterns that had two participants each, and two patterns that had three participants each. The messiness index was thus .925, strongly suggesting that the missingness was MCAR, and so the missingness was considered as such.

In subsequent analyses, cases with missing data were deleted either pairwise or listwise (i.e., an entire case is removed from an analysis if one of the case’s relevant values is missing), depending on and reported in the given analysis. Both are appropriate means of dealing with missing data that is MCAR (McKnight et al., 2007). Two sets of

data were analyzed separately and compared for equivalency: 1) completed cases with no missing data ($n = 270$), and 2) completed cases with 2% or less missing data ($n = 390$).

Demographics.

The final sample ($N = 390$) was 34% male ($n = 134$), 65% female ($n = 255$), and one unreported. The sample overwhelmingly self-identified as white non-Hispanic (91%, $n = 354$). Most of the remainder of the sample self-identified as Hispanic or Latino (1%, $n = 4$), African-American, African-Canadian, Afro-Caribbean, or black (3%, $n = 12$), Asian (2%, $n = 6$), or bi-racial or multiracial (3%, $n = 10$). Only two people self-identified as Native American, and one as a Pacific Islander.

One percent of the sample reported having a high school or GED level education ($n = 5$), 12% had some college education ($n = 47$), 7% had a technical or community college degree ($n = 27$), 39% had a bachelor's degree ($n = 154$), 28% had a Master's degree ($n = 109$), 5% had a professional degree (e.g., MD, JD; $n = 18$), and 8% had a doctoral degree ($n = 30$). Most participants were either single and never married (42%, $n = 165$), or else married (48%, $n = 188$). The remainder were either divorced (7%, $n = 28$), separated (2%, $n = 6$), or widowed (1%, $n = 3$).

Procedure. Study 3 was an online study using a respondent-driven convenience sample. Given the objectives of the study, the advantages of an online study, principal among them the ability to gather a large sample quickly, conveniently, and cheaply, outweighed some of its shortcomings, such as higher drop out rates (Birnbaum, 2004). Online studies, which eliminate interviewer bias (Birnbaum, 2004), can also be easily made anonymous, which serves to reduce social desirability bias (Birnbaum, 2004). Although relying on sample that has Internet access may have biased the sample 10 or

even five years ago, this is no longer a serious concern today. At the time of data collection (i.e., March 1, 2009), 72.3 % of Canadians and 74.7% of Americans had Internet access (Miniwatts Marketing Group, 2009).

The respondent-driven convenience sample began with an invitation to participate in the study that were posted on Facebook and e-mailed to friends and family who were unfamiliar with the hypotheses. They were told that this was the final study in my dissertation, and that the study was not remunerated. They were also asked to forward the invitation to anyone they thought might be willing and interested in helping by participating. The combination of participant anonymity and intrinsic motivation to participate were thought to make family, friends, and subsequent participants less likely to feel pressured to participate, and more likely to give candid responses if they did participate.

Two versions of the study were administered, a solo and peer version. Participants chose the version in which to participate. The two versions differed in that only the solo version included the optimistic bias task, and only the peer version included the peer rating on the CIS. The URL that was included in the Facebook posting and e-mail and led to the study's welcome page. The welcome page thanked participants for their interest in the study, briefly outlined the conditions of the study, and included a list of frequently asked questions that addressed most of the issues in a typical psychological consent form (Appendix J). After consenting to participate by clicking on a button, participants were sent to a page explaining the two conditions—solo and peer—and instructed to choose one. Participants then saw the following sequence of pages:

Solo Version (208 Questions)	Peer Version (211 Questions)
1) Sinking Ship Task – Ship Phase (10 questions on 1 page)	
2) CIS and Proximal Indecisive Behaviors scales (64 questions over 7 pages)	
3) Status Quo Task (one question)	
4) HEXACO (95 questions over 11 pages)	
5) Optimistic Bias Task (20 questions over 4 pages)	5) Peer Rating of CIS (23 questions over 3 pages)
6) Sinking Ship Task – Island Phase (10 questions on 1 page)	
7) Demographics (five questions on one page)	

Measures.

CIS. The CIS scale from Study 2 was expanded from 10 to 22 items (Appendix K) with the addition of three latency items, five not-deciding items, and four changing decisions items to flesh out the conceptual space of their respective scales. The most notable additions were the not-deciding items. To rebalance the overrepresentation of items focusing on missing deadlines or opportunities in the scale (e.g. “I miss the deadline for making a relatively straightforward decision”), two of the new not-deciding items emphasize the recognition that a decision ought to (have been) made (i.e., CoreND4, “I fail to make a decision that I had the opportunity to make and feel I should have made,” and CoreND6, “A decision that I am expected to make remains unmade”). Next, in Study 2 Core7 had a higher correlation with the behavioral measure of not deciding (i.e., the Hawaii task) than did the not-deciding subscale of which Core7 was not part. Consequently, a second item similar to Core7 that measured commitment on issues was included (CoreND5; “I do not have an opinion on an important matter that others have opinions on”). CoreND8 echoed the social comparison element of CoreND5, but was not tied to issues specifically (“I ‘sit on the fence’ after those around me have

already committed to something one way or the other”). Finally, CoreND7 introduced a new form of not-deciding (“I abstain from a decision”). All new items were iteratively pilot tested to improve for clarity and consistency of interpretation. The same six-point Likert-type frequency scale was used as in Studies 1 and 2.

Proximal behavioral contributors. The proximal contributing behaviors scales remain largely unchanged from Study 2 (Appendix L). Four items were adjusted so that they referred to a single event in the present tense. For example, impasse item I1 was changed from “I get stuck for a while when making decisions” to “I get stuck for a while when making a decision.” The wording on four items was changed more substantially to simplify, clarify and make them less redundant with other items. Two items were deleted and four new items were added to the scale. One buck-passing item (B6) was added to distinguish buck-passing from legitimate delegation of responsibility: “I ask others to decide for me when I know that I should be deciding.” The three additional items (S6–S8) were slow processing items: “I deliberately take my time when deciding something,” “I slow myself down to consider my options more carefully,” and “I make up my mind about something in an unhurried manner.” The total number of items was 41.

HEXACO. The version of the HEXACO scale used in Study 3 was made up of the 60-item version of the HEXACO (Ashton & Lee, 2009) supplemented by 35 additional items from the full 200-item version of the scale (see Appendix M; HEXACO-200; Lee, Ashton, Pozzebon, Visser, Bourdage, & Ogunfowora, 2009). The additional items were drawn from key facets predicted to be related to the CIS and proximal behavioral contributors, such as prudence (e.g., “I usually stop myself before doing anything that I might later regret”), dependence (e.g., “When I have a problem, I like to get advice from

others”), and social boldness (e.g., “In social situations, I’m usually the one who makes the first move”). The response scale for the HEXACO is a Likert scale (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral (Neither agree nor disagree), 4 = Agree, 5 = Strongly Agree).

Optimistic bias task (solo condition only). Five negative possible future events were selected, some from Weinstein’s (1980) optimistic bias task (e.g., “Being the victim of a mugging”; Appendix N). Events were chosen to vary in how serious they were and to be relevant to the general population. Participants were asked four questions about the events. First, they were asked to estimate the probability that each event would happen to the average person on a seven-point Likert-type scale (1 = No chance, 2 = Very unlikely, 3 = Unlikely, 4 = Moderate chance, 5 = Likely, 6 = Very Likely, 7 = Certain to happen). Second, they were asked to rate the controllability of each outcome on a four-point Likert-type scale (1 = The risk of occurrence cannot be reduced, 2 = The risk of occurrence can be reduced by a little, 3 = The risk of occurrence can be reduced by a lot, and 4 = The event is completely preventable). Third, they were asked to rate the seriousness if it were to occur on a Likert scale (1 = Not at all serious, 2 = Slightly serious, 3 = Serious, 4 = Very serious, 5 = Extremely serious). Finally, participants were asked to estimate the probability that each event would happen to them using the same seven-point Likert-type probability scale as in the first task.

Most studies of optimistic bias ask a single, comparative probability question for the different events (e.g., “Compared to other people like you, what do you think your chances are of experiencing...”). In Study 3, separate probability estimates were

solicited. This permits assessing the effects of two distinct sources of optimistic bias (Helweg-Larsen & Shepperd, 2001).

Peer Rating on CIS (peer condition only). Before the Peer Rating on the CIS was administered, participants in the peer condition were asked to choose and use the same code-word as his or her significant other. They were informed that matching code-words was the only way to pair up their otherwise anonymous responses for later analysis. The peer rating version of the CIS is identical to the 22-item version of the scale used in the present study, except that the wording of each item was modified to refer to the participant's significant other (e.g., "My significant other changes his/her mind after he/she chooses something"). The same six-point Likert type frequency response scale was used as in the CIS.

Sinking ship task. The Sinking Ship task (See Appendix O) is a modification of a task originally measuring the number of binary choices an individual could make in 15 seconds (Potworowski, 2006), which was mildly correlated ($r = .17$) with a very early version of the behavioral indecisiveness scale. The modified version of the task retained the original selection scenario and item pairs, but was not timed. Instead, a second phase was added during which participants could trade the items they had selected. Each item could be traded for the item from the original choice pair that was left behind. For example, if a participant chose bug repellent over sunscreen in the ship phase, she could then trade it for slightly used sunscreen in the second phase. The item traded for was slightly used to reflect the cost of making a trade. Thus, the nature of the new task was changed to measure the number of decisional changes.

The first phase (hereafter “ship phase”) presents a scenario wherein the participant is below deck on a small sinking sailboat and has a limited amount of time to run out to keep from drowning. The participant is told that she realizes she will have to swim for an island to survive. As she runs out, she has the presence of mind to grab a bag in one hand and stuff items into the bag with the other hand. She passes the items two at a time, but can only grab one of the two. Items are presented in pairs (e.g., a metal bowl and a magnifying glass). In the original version, participants were presented one pair of items at a time. Every time they made a choice, the next pair of items was shown. In contrast, all the item pairs were presented on the same page in the modified version.

In the second phase (hereafter “island phase”), the participant met other shipwrecked survivors with whom she had the opportunity to trade. Three parameters of trading were stipulated: 1) all the items that could be traded for were identical to the ones left behind, but in slightly worse condition (i.e., the cost of trading); 2) a given item could only be traded for the item it had been chosen over on the ship; and 3) as few as 0 and as many as 10 trades could be made. The item choices themselves had no bearing on indecisiveness. The number of changes made constituted total task “change” score.

Status quo bias task. The status quo bias task (see Appendix P) was a modified version of Samuelson and Zeckhauser’s (1988) original assistant professor status quo task. In that task, participants are asked to choose between their current job (i.e., the status quo) and three other job opportunities that varied in which attributes were attractive (i.e., location, prestige, salary, or job security).

To make the task more relevant to a non-academic audience, the scenario was changed from being an assistant professor at a university to having a “good job” in a

company. Correspondingly, the original “chance for tenure” attribute was substituted for the more appropriate analog “job security.” All other elements were identical to the original task. Four versions were created, each differing in which of four jobs was the status quo, and varying in answer order. Each participant saw only one version, chosen randomly by the computer.

Results

Multi-dimensionality of the CIS. Using LISREL, two confirmatory factor analyses on the 22 items of the CIS were compared: the uni-dimensional null hypothesis model and the predicted three-factor model (i.e., latency, not-deciding, and changing decisions). The null hypothesis model had poor fit: Chi-square χ^2 (253, $N = 390$) = 4440.01, $p = 0.00$, RMSEA = 0.37, NNFI = 0.68, GFI = 0.25. Although the predicted three-factor model also fell short of acceptable fit, χ^2 (227, $N = 390$) = 690.35, $p < .01$, RMSEA = 0.075, NNFI = 0.96, GFI = 0.86), it clearly had a better fit.

An examination of the correlation matrix revealed that the two not-deciding items (“I do not have an opinion on an important matter that others have opinions on” and “I am undecided about where I stand on a social issue”) were more highly correlated with each other than either was with any other item. In Study 2, the latter item was removed because it did not load highly enough on the not-deciding factor. In the present study, however, the two items were considered to be a fourth factor, named “withholding commitment.” To better reflect the nature of items in the not-deciding factor, it was renamed “failure to decide.” A third confirmatory factor analysis on the four-factor model showed its fit was better than that of the three-factor model, but just short of good fit: χ^2 (253, $N = 390$) = 522.64, $p < .01$, RMSEA = 0.064, NNFI = 0.97, GFI = 0.89).

Again looking at the correlation matrix and fit indices suggested a simpler and better fitting model could be achieved by removing seven items with low factor loadings or high cross-loadings. A simplified version of the four-factor model with 15 of the original 22 CIS items was tested. The chi-square remained significant, but the indices indicated good model fit: $\chi^2(84, N = 390) = 179.13, p < .01$, RMSEA = 0.053, NNFI = 0.98, GFI = 0.94). As was done in Study 2, a confirmatory factor analysis on a uni-dimensional model was conducted on the final 15 items. The model fit was poor: $\chi^2(105, N = 390) = 2468.39, p < .01$, RMSEA = 0.36, NNFI = 0.56, GFI = 0.35). Table 12 shows the final factor structure and factor loadings for the 15-item CIS.

Table 12
Factor Structure and Loadings of the Core Indecisiveness Scale in Study 3

<i>N</i> = 390	<i>Prolonged Latency</i>	<i>Withheld Commitment</i>	<i>Failure to Decide</i>	<i>Changing</i>
Item	Factor Loadings			
When I am in a group that is deciding something, I take longer to make a decision than do other people.	.63			
I need more time than I actually have when I am faced with making a choice.	.67			
It takes me a long time to decide on something trivial.	.73			
I am slow to decide.	.87			
I take longer to settle on an option than do other people faced with the same options.	.85			
I am undecided about where I stand on a social issue.		.71		
I do not have an opinion on an important matter that others have opinions on.		.58		
I miss the deadline for making a relatively straightforward decision.			.70	
I intend to make a decision, but wait so long that the opportunity to decide passes.			.77	
I fail to make a decision that I had the opportunity to make and feel I should have made.			.75	
I change my mind after I choose something.				.80

I have a change of heart about a commitment I made.	.73
I make what I think is a final choice, but then end up switching it later.	.76
I commit to something, but then change my commitment more than once.	.66
Someone points out that I am making a decision that is not consistent with a previous decision that I made.	.44

For all CIS sub-scales in Study 3, scale scores were computed using the average score of items that were not missing. Cases with missing data had fewer items averaged in computing their scale scores. Descriptive statistics for the CIS subscales are presented in Table 13.

Table 13
Descriptive Statistics for the CIS in Study 3

Scales	Items	<i>M</i>	<i>SD</i>	<i>Med</i>	Skew	Kurtosis	Cronbach's α
Prolonged Latency	5	2.58	.76	2.40	.85	1.02	.86
Withholding Commitment	2	2.29	.75	2.00	.90	1.53	.59
Failure to Decide	3	2.01	.67	2.00	1.17	3.11	.78
Changing	5	2.35	.55	2.20	1.18	3.15	.81

Note: Response scale 1 = Never to 6 = Always

Even though the reliability of the two-item withholding commitment scale is low, its pattern of relations to the other CIS subscales suggests that it is distinct from failing to decide. As such, it was included in subsequent analyses with the understanding that any results pertaining to withheld commitment would be interpreted conservatively. Table 14 shows the CIS factor and sub-scale correlations.

Table 14
CIS Factor Correlations, Sub-scale Reliabilities, and Sub-scale Correlations in Study 3

<i>N</i> = 390	Prolonged Latency	Withheld Commitment	Failure to Decide	Changing
Prolonged Latency	.86	.30	.61	.47
Withheld Commitment	.45	.59	.28	.25
Failure to Decide	.77	.49	.78	.56
Changing	.58	.39	.69	.81

Factor correlations on lower diagonal; Cronbach's α s on diagonal; Scale correlations on upper diagonal
All correlations significant, $p < .01$ (two-tailed)

Proximal Behavioral Contributors.

First, the correlations among the strategic waiting items were examined given the difficulties with the factor in Study 2. As in Study 2, only two of the items were related to each other, and so only the two were kept as strategic waiting items. A confirmatory factor analysis was conducted on the 38 items of the six Proximal Behavioral Contributor scales. Chi-square was not significant, and the three fit indices indicated inadequate fit: χ^2 (362, $N=390$) = 1092.82, $p < .01$, RMSEA = 0.074, NNFI = 0.86, GFI = 0.83.

Based on the modification indices, three items were eliminated. Item D1 (“I waste a lot of time on trivial matters before getting to the final decision”) cross-loaded highly on impasse, item B1 (“I leave a decision to someone else”) cross-loaded highly on decisional procrastination and impasse, and item E2 (“When faced with a choice, I make the effort to look for more information than is normally given”) cross-loaded highly across all factors. A second confirmatory factor analysis was conducted on the 35 remaining items. The second model still fell short of good fit: χ^2 (284, $N=390$) = 746.16, $p < .01$, RMSEA = 0.065, NNFI = 0.90, GFI = 0.87. Because the internal reliability (Cronbach's α) of the two strategic waiting items was lower than .60, the items were dropped. To make the remaining scales more parsimonious, 10 additional items with

lower factor loadings, higher cross-loadings, or with some redundancy were dropped, leaving 23 items across five subscales, each with four or five items.

The more parsimonious model was factor analyzed. The chi-square remained significant, and the indices approached good fit: $\chi^2(220, N = 390) = 570.33, p < .01$, RMSEA = 0.063, NNFI = 0.91, GFI = 0.89). The fit of the model of proximal behaviors in Study 3 was similar to that reported in Study 2 (i.e., $\chi^2(367, N = 168) = 612.84, p < .01$, RMSEA = 0.058, NNFI = 0.95, GFI = 0.81). Table 15 shows the final 23 proximal behavioral contributor items and their factor loadings. Table 16 shows scale descriptives for the proximal behavioral contributors, and Table 17 shows factor correlations, scale correlations and scale reliabilities for the proximal behavioral contributors.

Table 15
Factor Structure and Loadings of the Proximal Behavioral Contributors in Study 3

Item	DP	B	I	CP	PP
	Factor Loadings				
When I have to make a decision, I wait a long time before starting to think about it.	.67				
I delay making a decision until it is too late.	.76				
I put off making a decision.	.82				
I avoid thinking about a decision even though I know I will eventually have to make it.	.81				
I avoid taking the responsibility to make a decision.		.79			
If a decision can be made by me or by another person, I let the other person make it.		.75			
I let someone who is better informed decide for me.		.60			
I try to get out of having to make a decision.		.82			
I ask others to decide for me when I know that I should be deciding.		.80			
I get stuck for a while when making a decision.			.73		
When I am thinking about what to choose, there reaches a point where I don't know how to proceed.			.72		
I end up thinking in circles when deciding something.			.77		
When trying to make a decision, I get so overwhelmed that I feel paralyzed.			.77		
Even after I think that I have made up my mind about something, I have trouble getting myself to "bite the bullet" and actually commit to that decision.			.75		

I try to consider several factors when making a simple decision.	.56
When I am presented with two good options, I look for a third option.	.39
I triple-check things before deciding.	.67
I re-examine the benefits of an option until I am convinced it is better than other options.	.65
When faced with a decision, I consider each fact one at a time.	.54
I make up my mind about something in an unhurried manner.	.47
I research my options before deciding.	.80
When I plan something, I make sure I have a backup.	.54
I go over the relevant information as often as necessary for the best option to emerge.	.83

DP = Decisional procrastination, B = Buck-passing, I = Impasse, CP = Concerned processing, PP = Prudent processing.

Table 16
Scale Descriptives for the Proximal Behavioral Contributors in Study 3

Scales	Items	<i>M</i>	<i>SD</i>	<i>Med</i>	Skew	Kurtosis	Cronbach's α
Decisional Procrastination	4	2.17	.71	2.00	.98	1.75	.85
Buck-passing	5	2.33	.76	2.20	.86	1.26	.77
Impasse	5	2.40	.75	2.20	.93	1.09	.85
Concerned Processing	4	3.26	.78	3.25	.34	0.07	.65
Prudent Processing	5	3.64	.74	3.60	.21	0.23	.77

Table 17
Factor Correlations, Scale Correlations and Scale Reliabilities for the Proximal Behavioral Contributors in Study 3

<i>N</i> = 390	Decisional Procrastination	Buck-passing	Impasse	Concerned Processing	Prudent Processing
Decisional Procrastination	.85	.67	.71	.22	-.03
Buck-passing	.81	.77	.73	.17	-.10
Impasse	.87	.87	.85	.34	.04
Concerned Processing	.43	.33	.51	.65	.62
Prudent Processing	.08	-.05	.12	.86	.77

Factor correlations on lower diagonal; Cronbach's α s on diagonal; Scale correlations on upper diagonal
*All correlations > .15 significant, *p* < .01 (two-tailed)*

HEXACO. Although all six HEXACO dimensions had acceptable Cronbach's α s, five subscales had reliabilities lower than .60, and so were not used in subsequent analyses. Table 18 shows scale descriptives for the HEXACO dimensions and facets.

Table 18
Scale Descriptives for the HEXACO Dimensions and Facets.

HEXACO Dimensions and Facets	Items	<i>M</i>	<i>SD</i>	Skew	Kurtosis	Cronbach's α
Honesty-Humility	10	4.23	.59	-.34	.20	.77
Sincerity	3	3.97	.83	-.64	.21	.70
Fairness	3	4.64	.88	-.71	.13	.71
Greed-avoidance	2	3.69	.86	-.21	-.33	.52
Modesty	2	4.63	.83	-.51	.03	.65
Emotionality	20	3.64	.53	-.25	.16	.85
Fearfulness	4	3.31	.76	.20	-.23	.65
Sentimentality	4	4.04	.73	-.47	-.05	.66
Dependence	4	3.63	.73	-.03	-.37	.73
Anxiety	8	3.56	.77	-.13	-.53	.84
eXtraversion	15	3.88	.57	-.32	.38	.86
Social boldness	5	3.71	.76	-.25	-.10	.79
Social self-esteem	3	4.48	.75	-.88	.86	.70
Liveliness	5	3.99	.76	-.58	.26	.83
Sociability	2	3.32	.83	-.18	-.45	.54
Agreeableness	14	3.46	.60	-.26	-.40	.85
Gentleness	3	3.32	.84	-.15	-.77	.72
Flexibility	3	3.68	.75	-.16	-.38	.59
Forgiveness	3	3.01	.75	-.05	-.61	.55
Patience	5	3.82	.79	-.42	-.33	.82
Conscientiousness	20	4.01	.44	-.10	.05	.80
Perfectionism	5	3.86	.60	-.36	.35	.64
Prudence	6	4.14	.58	-.47	.31	.74
Organization	3	3.92	.80	-.35	-.27	.65
Diligence	6	4.26	.61	-.23	-.06	.72
Openness to experience	16	4.10	.44	-.46	.34	.77
Creativity	6	4.19	.67	-.62	.26	.76
Unconventionality	4	4.32	.60	-.40	.07	.69
Aesthetic appreciation	3	4.39	.80	-.54	.12	.59
Inquisitiveness	3	3.49	.49	-.54	.47	.47

Note: Response scale 1 = Strongly Disagree to 5 = Strongly Agree

Mechanisms. Mechanism hypotheses were tested in two ways: 1) zero-order correlations between HEXACO facets, core indecisiveness behaviors, and predicted mediating proximal behaviors (see Table 19), and 2) path modeling to test which mechanisms held when the covariance of all the variables was considered.

Table 19
Correlations Between HEXACO Facets, CIS, and Proximal Behavioral Contributors

HEXACO Scales	CIS				Proximal Behavioral Contributors				
	L	WC	FD	C	DP	B	I	CP	PP
Honesty-Humility	0.02	-0.04	-0.06	-0.12	-0.03	-0.08	-0.06	-0.04	0.04
Fairness	-0.05	-0.05	-0.07	<i>-0.09</i>	<i>-0.09</i>	-0.12	-0.12	-0.04	0.02
Greed-avoidance	0.07	0.03	0.02	-0.06	0.07	0.03	0.05	-0.03	0.01
Modesty	0.03	-0.07	-0.05	-0.08	-0.01	-0.02	-0.04	-0.04	0.04
Sincerity	0.00	-0.03	-0.05	-0.10	-0.04	<i>-0.10</i>	-0.06	-0.01	0.05
Emotionality	0.35	0.17	0.21	0.28	0.22	0.32	0.38	0.04	-0.08
Anxiety	0.32	<i>0.12</i>	0.25	0.28	0.25	0.30	0.41	<i>0.10</i>	<i>-0.09</i>
Dependence	0.24	0.17	<i>0.08</i>	0.20	0.13	0.21	0.25	-0.05	-0.05
Fearfulness	0.29	0.20	0.24	0.22	0.23	0.33	0.32	<i>0.09</i>	-0.05
Sentimentality	0.14	0.01	0.01	0.07	0.01	0.05	<i>0.09</i>	-0.02	-0.02
eXtraversion	-0.33	-0.23	-0.35	-0.29	-0.39	-0.41	-0.39	-0.12	0.06
Liveliness	-0.31	<i>-0.09</i>	-0.35	-0.29	-0.34	-0.28	-0.37	-0.16	0.00
Social boldness	-0.34	-0.33	-0.24	-0.16	-0.31	-0.44	-0.30	-0.02	<i>0.09</i>
Sociability	-0.08	-0.12	-0.10	-0.07	-0.15	-0.17	-0.10	<i>-0.09</i>	-0.01
Social self-esteem	-0.26	-0.15	-0.36	-0.35	-0.36	-0.34	-0.41	<i>-0.09</i>	0.11
Agreeableness	0.07	0.06	-0.07	-0.13	-0.03	0.00	-0.07	-0.03	0.08
Flexibility	0.01	0.08	0.00	-0.07	-0.02	0.01	-0.06	0.01	<i>0.09</i>
Forgiveness	0.05	0.08	-0.08	-0.08	-0.04	-0.02	-0.04	-0.08	-0.03
Gentleness	<i>0.10</i>	0.01	-0.03	-0.08	0.03	0.04	-0.04	-0.01	0.06
Patience	0.04	0.01	-0.08	-0.17	-0.05	-0.03	<i>-0.09</i>	-0.01	0.12
Conscientiousness	-0.21	-0.11	-0.37	-0.31	-0.40	-0.32	-0.29	0.17	0.31
Diligence	-0.36	-0.27	-0.45	-0.35	-0.46	-0.46	-0.41	-0.01	0.19
Organization	-0.23	0.01	-0.36	-0.17	-0.38	-0.22	-0.22	0.07	0.16
Perfectionism	0.13	0.02	0.03	0.02	0.01	0.03	0.11	0.31	0.25
Prudence	-0.07	<i>-0.09</i>	-0.17	-0.37	-0.20	-0.20	-0.26	0.11	0.26
Openness to experience	<i>-0.09</i>	-0.26	-0.06	-0.06	-0.07	-0.20	-0.12	0.07	0.14
Aesthetic appreciation	-0.01	-0.16	-0.02	-0.04	-0.03	-0.12	-0.06	0.05	<i>0.09</i>
Creativity	-0.16	-0.16	-0.11	<i>-0.09</i>	-0.13	-0.24	-0.20	0.01	<i>0.09</i>
Inquisitiveness	-0.01	-0.17	0.01	0.04	0.00	-0.03	0.01	0.03	<i>0.10</i>
Unconventionality	<i>-0.10</i>	-0.22	-0.04	-0.07	-0.03	-0.14	-0.08	0.10	0.12

Bold correlations significant at $p < .01$, **bold italic** correlations significant at $p < .05$, *italic* correlations significant at $p < .10$

Based on the zero-order correlations between the HEXACO facets and the core indecisiveness behaviors and proximal contributors, seven of the 10 mechanisms were well supported, two had moderate support, and one mechanism was unsupported. The facets constituting the worry, low self-confidence, dependence, disengagement, high standards, escapist impulsivity, and careless impulsivity mechanisms were all correlated significantly (albeit some marginally) with both their respective predicted core indecisiveness behaviors and mediating proximal behaviors (where applicable). Note that because the strategic waiting items were not coherent enough to form a scale, predictions about its mediating effect in the high standards and active open-mindedness mechanisms could not be tested.

The concern for others and low honor mechanisms received some support. Of the three facets that made up the concern for others mechanism, only sentimentality and gentleness were related to prolonged latency as hypothesized. Contrary to predictions, fairness was negatively related to prolonged latency, albeit non-significantly. The low honor mechanism also received moderate support. Of the three facets that made up the mechanism, only (low) fairness and (low) sincerity were significantly related to changing decisions as hypothesized. Sentimentality, in contrast, was positively related to changing decisions, but non-significantly.

The active open-mindedness mechanism received very little empirical support. The three facets thought to make up active open-mindedness all significantly predicted prudent processing in the direction hypothesized. None of the facets, however, was significantly related to prolonged latency in the predicted direction, with prudence being negatively related to prolonged latency.

Path Model. In building the initial path model, a HEXACO facet was included if it met two conditions: 1) It had a significant zero-order correlation with at least one core indecisiveness behavior, and 2) it had an internal reliability (i.e., Cronbach's α) of at least .60. As a result, greed avoidance, modesty, flexibility, and forgiveness were excluded because they were not related to any core indecisiveness behavior, whereas sociability, aesthetic appreciation, and inquisitiveness were excluded because of low reliabilities. Of these seven excluded facets, only inquisitiveness and flexibility were hypothesized to be involved in a mechanism of indecisiveness, namely, actively open-minded thinking.

A total of 17 distal contributors, five proximal behavioral contributors, and four core indecisiveness behaviors were included in Model 1, which consisted of the 42 paths (open parameters) between variables that represented the 10 hypothesized mechanisms. As in Study 2, distal predictor variables were allowed to correlate with one another, as were their residuals. Proximal contributing behaviors were also allowed to correlate with one another, as were their residuals.

Although Model 1's fit was inadequate: $\chi^2(131, N = 390) = 438.18, p < .01$, RMSEA = 0.071, NNFI = 0.81, GFI = 0.93, several of the predicted mechanisms had paths with significant loadings. Building on this initial model, four additional paths were freed, one at a time. Each path was added because the beta modification index estimated a weight greater than .10 and the path was theoretically justifiable. Table 20 shows the paths and betas of the initial and final models. It is worth noting that each of the four parameters that were freed exceeded the .10 threshold on the initial model and every subsequent model until freed. In addition, at no point did the modification indices predict any path from fear or creativity that exceeded the .10 criterion.

Table 20
Initial and Final Path Models for Indecisiveness in Study 3

Model 1. Predicted Path Model for Study 3
 $\chi^2(131, N = 390) = 438.18, p < .01, RMSEA = 0.071, NNFI = 0.81, GFI = 0.93$

	Fair	Snc	Anx	Dep	Fr	Snt	Liv	SB	SSe	Gnt	Pat	Dil	Org	Prf	Prd	Crt	Unc	DP	B	I	CP	PP	
DP			.08				-.05	-.19	-.22			<u>-.14</u>	<u>-.19</u>										
B			.11	.09			.08	-.35	-.21														
I			.24	.13				-.14	-.23														
CP			.11											.27	<u>.14</u>								
PP									<u>.11</u>					.21	.15								
L	.01					.07				.09								.21	.14	.47	.12	.06	
WC								<u>-.21</u>									<u>-.18</u>	-.07	.31	.16	.04		
FD																		.61	.03	.12	.05		
Δ	.05	-.01	<i>.09</i>	<u>.16</u>		.06			-.12		.00	-.16			-.30			<u>.30</u>	<u>.34</u>	<u>.45</u>	.23		

Model 5. Predicted Model for Study 3 with Five Additional Parameters Freed
 $\chi^2(127, N = 390) = 283.86, p < .01, RMSEA = 0.053, NNFI = 0.90, GFI = 0.95 (\Delta\chi^2(4, N = 390) = 154.32, p < .01)$

	Fair	Snc	Anx	Dep	Fr	Snt	Liv	SB	SSe	Gnt	Pat	Dil	Org	Prf	Prd	Crt	Unc	DP	B	I	CP	PP	
DP			.10	<u>.11</u>			-.03	-.20	-.18				-.20										
B			.12	.09			.08	-.36	-.20			<u>-.12</u>											
I			.25	.12				-.15	-.21														
CP			.13						<u>-.12</u>					.24	.15								
PP														.19	.24								
L	.01					.07				.09								.20	.13	.48	.12	.06	
WC								<u>.13</u>	-.22								<u>-.13</u>	-.08	.21	.17	.05		
FD																		.60	.02	.20	.02		
Δ	.06	-.03	-.04			.05			-.04		-.06	-.03			-.23			<u>.17</u>	.50	.07			

Bold beta weights significant at $p < .01$, **bold italic** beta weights significant at $p < .05$, *italic* beta weights significant at $p < .10$. Underlined beta weights are noteworthy (i.e., $> .10$) standardized beta modification index estimates. They are for illustrative purposes and are not part of the models.

NOTE: **Fair** = Fairness, **Snc** = Sincerity, **Anx** = Anxiety, **Dep** = Dependence, **Fr** = Fear, **Snt** = Sentimentality, **Liv** = Liveliness, **SB** = Social boldness, **SSe** = Social Self-esteem, **Gnt** = Gentleness, **Pat** = Patience, **Dil** = Diligence, **Org** = Organization, **Prf** = Perfectionism, **Prd** = Prudence, **Crt** = Creativity, **Unc** = Unconventionality, **DP** = Decisional Procrastination, **B** = Buck-passing, **I** = Impasse, **CP** = Concerned Processing, **PP** = Prudent Processing, **L** = (Prolonged) Latency, **WC** = Withholding Commitment, **FD** = Failure to Decide, and Δ = Changing Decisions

Although upward of 10 modifications could have been made to improve model fit, changes were limited to the following four because they had the most compelling rationales to be included. First, social boldness was allowed to have a direct effect on withholding commitment. The path beta in the final model (i.e., -.22) suggests that the more one is outgoing and takes initiative, the less one is likely to withhold commitments. This seems to be an extension of the self-confidence mechanism.

The second path that was freed was between (low) organization and decisional procrastination. Although Lay (1987, 1988) found that disorganization was related to task procrastination, nobody has linked disorganization to decisional procrastination specifically. Nevertheless, one item out of the three that make up the organization scale explicitly taps the temporal dimension of organization (i.e., “I plan ahead and organize things, to avoid scrambling at the last minute”), which explains why it is negatively related to decisional procrastination.

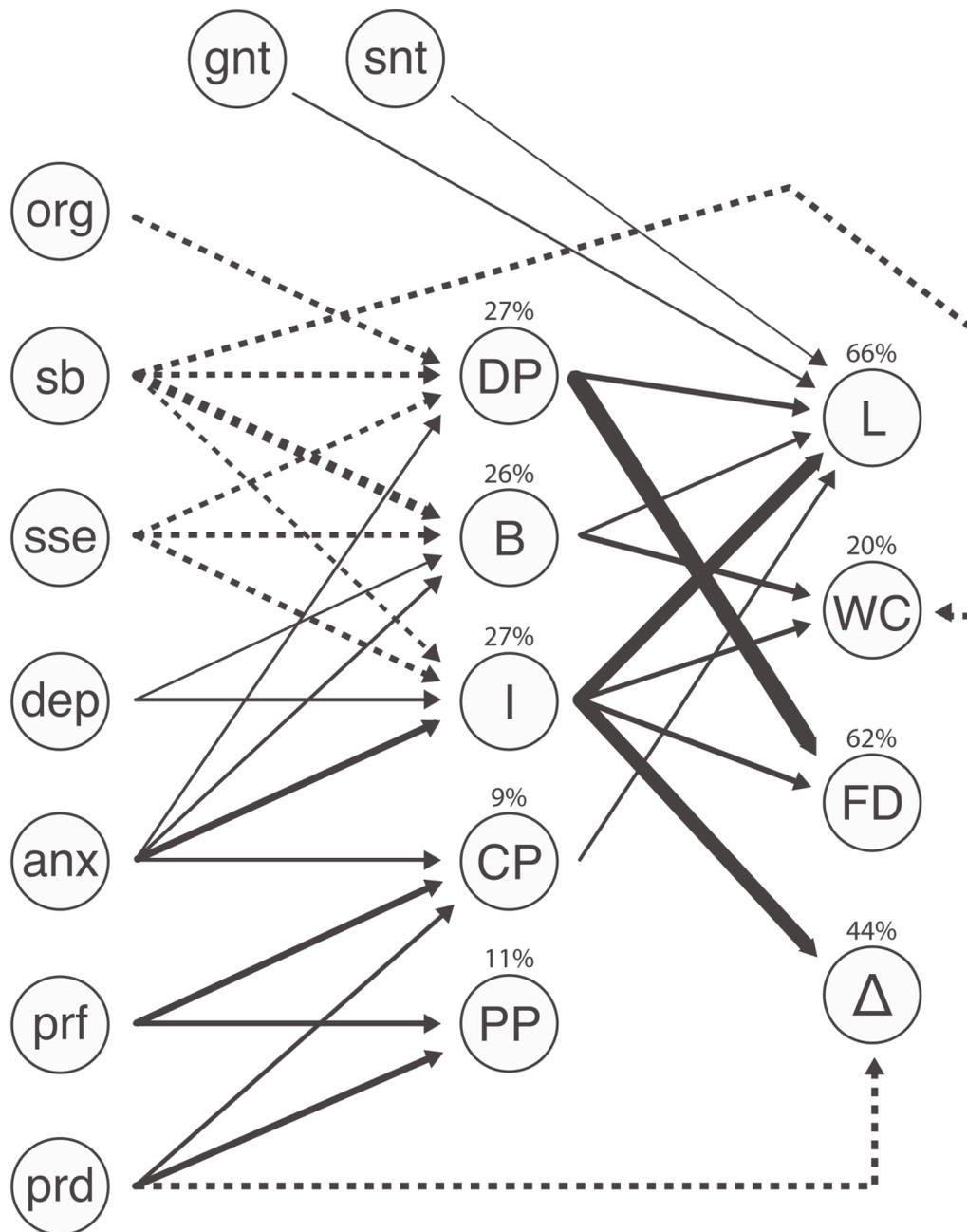
Third, the path from prudence to concerned processing was opened. Prudence is related to concerned processing as they both measure careful thought before action. Prudence more explicitly taps the distinction between impulsivity versus careful thinking (e.g., “I make a lot of mistakes because I don’t think before I act” and “I make decisions based on the feeling of the moment rather than on careful thought,” both reverse scored), whereas concerned processing gauges specific types of excessively cautious thinking (e.g., “I try to consider several factors when making a simple decision” and “I triple-check things before deciding”). Thus, concerned processing describes in greater detail how prudence can manifest itself in decision contexts.

Finally, impasse was allowed to predict changing decisions. The logic underlying the change was that difficulty in coming to a decision (i.e., experiencing impasse) is a very plausible contributor to unstable commitments, but it was unaccounted for in the 10 hypothesized mechanisms. Opening this path affected the direct relationship of five HEXACO facets on changing decisions. Specifically, the effects of anxiety, (low) social self-esteem, and (low) diligence were reduced and became non-significant. The effect of (low) prudence on changing decisions was also reduced, but remained significant, and the effect of (low) patience was increased, but remained non-significant. In addition, it attenuated the estimated effects of dependence, decisional procrastination and buck-passing on changing decisions. Clearly there is considerable covariance among these variables, which merits future attention.

Adding four paths may appear to be an exercise in model-fitting, but the number of changes was kept small and all were justifiable. The modification indices suggested that several additional parameters could have been freed to further improve fit, but in no case was there a sufficiently compelling reason to do so. In addition, predicted paths that were non-significant in the final model were not removed.

The chi-square of the final path model (see Figure 7) was not significant, but two of three fit indices met or exceeded Hu and Bentler's (1999) recommended cutoffs and the third was close to the cutoff, indicating reasonably good fit: $\chi^2 (127, N = 390) = 283.86, p < .01$, RMSEA = 0.053, NNFI = 0.90 GFI = 0.95. The improvement in fit from the initial model was also significant: $\Delta\chi^2 (4, N = 390) = 154.32, p < .01$.

Figure 7
Final Structure of the Indecisiveness Path Model



Line thickness = relative beta weight; Solid lines = negative betas, dotted lines = positive betas
Percentages = R^2

sse = Social self-esteem, *dep* = dependence, *anx* = anxiety, *prf* = perfectionism, *prd* = prudence
DP = Decisional procrastination, *B* = Buck-passing, *I* = Impasse, *CP* = Concerned processing,
PP = Prudent processing
L = Prolonged latency, *WC* = Withholding commitment, *FD* = Failure to decide, Δ = Changing

The path model offered strong support for four of the 10 mechanisms (i.e., worry, low self-confidence, dependence, and high standards), moderate support for three mechanisms (i.e., escapist impulsivity, careless impulsivity, and concern for others), and failed to support three mechanisms (i.e., disengagement, low honor, and active open mindedness). The support for each mechanism is described in more detail below.

Worry. The worry mechanism received considerable support in the final path model (i.e., Model 6). First, anxiety, the sole facet associated with worry, was significantly related to all four of the predicted proximal behavioral contributors: decisional procrastination, buck-passing, impasse and concerned processing. Moreover, all four were significantly related to prolonged latency, suggesting a mediating effect. Although in the final model concerned processing did not have a significant relationship to changing decisions, the relationship was in the predicted direction. As mentioned earlier, the inclusion of the impasse-change path reduced the effect of concerned processing on changing decisions to non-significance. An additional factor may be a dampening effect of the (non-significant) direct effect of anxiety on change.

Low self-confidence. The low self-confidence mechanism was also supported by the final path model. Social boldness and social self-esteem were both significantly related to decisional procrastination, buck-passing, and impasse. As predicted, all three proximal behaviors had statistically significant paths to prolonged latency. Although all three were also predicted to be related to not-deciding, the emergence of two not-deciding factors (i.e., withholding commitment and failure to decide) meant that *a priori* hypotheses across all mechanisms involving not-deciding could not be rigorously tested. Nevertheless, each of the three proximal behavioral predictors in the low self-confidence

mechanism was significantly related to at least one form of not-deciding. Further support for the low self-confidence mechanism is provided by the negative direct effect of social boldness on withholding commitment. Although this direct effect was not predicted, it is consistent with the spirit of the mechanism and as such was considered part of it.

Dependence. The dependence mechanism was supported by the path model. The dependence facet of the HEXACO was significantly related to both buck-passing and impasse, which were both significantly related to at least one facet of not-deciding.

Disengagement. The path model did not support the disengagement model as it was conceived. Although liveliness was negatively related to decisional procrastination as predicted, the beta was not significant. Although liveliness had a significant, negative relationship with buck-passing ($r = -.28$) it had a slight, but significant positive relationship to buck-passing in the path model. The path model suggests that the more energetic and optimistic one is, the more one is likely to try to have others make one's decisions.

High standards. The high standards mechanism was largely supported by the path model. Perfectionism was related to both concerned and prudent processing, though more strongly to the former. Concerned processing was significantly related to prolonged latency, whereas the path between prudent processing and prolonged latency was positive, as predicted, it was not significant. This may be because of the lower expected number of adaptively high standard people (slow relaxed deciders), and because they would not take as long as would more perfectionistic individuals (e.g., who maximize, Schwartz et al., 2002).

Escapist impulsivity. The two facets of escapist impulsivity, anxiety and (low) social self-esteem, had direct effects on change in the first path model. Once the path between impasse and change was opened, both became non-significant and only social remained in the predicted direction.

Careless impulsivity. The three facets of careless impulsivity were predicted to have direct, negative relationships with change. In the initial model, both diligence and prudence had significant paths as predicted, but patience was unrelated to change. When the impasse-change path was unconstrained, it reduced the direct effects of both diligence and prudence on change, with the former becoming non-significant. At the same time, the effect of patience on change approached significance in the predicted direction. It is unclear whether low prudence, especially without low patience, captures the spirit of careless impulsivity, and may constitute a simpler carelessness mechanism.

Concern for others. Two out of three facets that made up the concern for others mechanism, namely sentimentality and gentleness, had significant positive direct effects on prolonged latency, as predicted. Fairness, however, was unrelated to prolonged latency. Recall that contrary to predictions, the correlation between fairness and prolonged latency was negative, though non-significant. One plausible explanation is that individuals who are intentionally trying to be unfair in their decision (e.g., trying to cheat someone) may be more cautious (e.g., preparing a contingency in case they are caught) or just more hesitant (e.g., out of guilt) before committing.

Low honor. The low honor mechanism received no empirical support in the path models. Although sincerity was negatively related to changing decisions, fairness and

sentimentality were positively related to changing decisions, which was contrary to predictions. None of the betas was significant.

Active open-mindedness. With flexibility and inquisitiveness excluded from the analysis on account of low reliabilities, the only remaining facet of the AOM mechanism was prudence. It was significantly related to prudent processing, although as mentioned earlier, prudent processing was not significantly related to prolonged latency.

Distinct Mechanisms. Although correlational data are limited in their ability to test the distinctness mechanisms hypotheses (i.e., that mechanisms do not necessarily co-occur), there is one relatively strong test of the hypothesis: If otherwise unrelated behaviors both predict the same target behavior. This was indeed the case. Gentleness, for example, was unrelated to any of the proximal contributing behaviors, but like decisional procrastination, buck-passing, impasse, and concerned processing, was related to prolonged latency. Sentimentality, which had only a marginally significant zero-order correlation with impasse, was also related to prolonged latency. These suggest that at least some of the mechanisms of indecisiveness do not necessarily co-occur.

Validation Studies.

Sinking Ship Task. A total of 365 participants made choices on all the questions in both phases of the sinking ship task (missing $n = 25$). Change scores were computed by summing the changes participants made from the 10 items in the second phase of the task. Change scores had a reverse-J shaped distribution: 52% of participants ($n = 190$) made no changes, 25% ($n = 92$) made one change, 13% ($n = 49$) made two changes, 6% of participants ($n = 21$) made three changes, 2% of participants ($n = 21$) made four changes, and fewer than 1% of participants made five changes ($n = 1$), six changes ($n =$

2), and seven changes ($n = 2$). For the first nine pairs of items, the mean percentage of participants who made a change in each pair was relatively consistent ($M = 9.7\%$; $SD = 1.5\%$). For the hand mirror and toothbrush pair, however, 58% of respondents changed their choice.

Because the number of changes had a J-shaped distribution, the number of changes by respondents was dummy coded into four change groups: missing data ($n = 25$), no change ($n = 190$), one change ($n = 92$), and many changes ($n = 108$). A one-way one (changing decisions) by four (change group) ANOVA was conducted to test differences in scores on changing decisions across the four change groups. The ANOVA contrasted the no change with the many changes groups. Contrary to predictions, the mean changing decisions score for the no change group ($M = 2.35$, $SD = 0.57$) was not lower than that for the many changes group ($M = 2.36$, $SD = 0.54$). Levene's statistic was not significant $F(3,386) 1.38$, $p = .25$, so equality of variance could be assumed. The ANOVA was marginally significant, $F(3,386) = 2.20$, $p = .09$, but the contrast between the no change and many change groups was not, $t(386) = 0.08$, $p = .93$.

Status Quo Task. In all four conditions the status quo option received the most responses. The proportion of status quo responses across conditions, however, varied. Responses were compiled across conditions into a binary dummy variable indicating whether the participant's response was the status quo or not. Table 21 indicates the number and percentage of status quo and non-status quo responses for each job.

Because the split between participants who chose the status quo option (46%) and those who chose one of the three non-status quo options (54%) was not exactly even, it was more appropriate to use biserial correlation rather than the point biserial correlation

(i.e., Pearson product moment coefficient) to measure the relation between the dichotomous choice response (i.e., status quo or not) and the CIS sub-scale scores.

Table 21
Number and Percentage of Status Quo Responses and Non-status Quo Responses Overall and Across Conditions

<i>N</i> = 383		Chosen When SQ Option		Chosen When Not SQ Option	
Job	<i>n</i>	% within condition response	<i>n</i>	% of all not SQ options	
East Coast	53	50.0%	62	30.2%	
West Coast 1	61	62.2%	67	32.7%	
West Coast 2	35	39.3%	39	19.0%	
Midwest:	29	32.2%	37	18.0%	
Total	178	46.5%	205	53.5%	

NOTE: "Chosen When not SQ Option" refers to the three conditions under which the option was not SQ

Point biserial correlations (r_{pbis}) were converted to biserial correlations (r_{bis}) using Ferguson's (1976) formula, where p and q are the proportions of the largest and smallest groups, respectively, and y is the height of the ordinate at p on the normal curve:

$$r_{bis} = r_{pbis} \frac{\sqrt{pq}}{y}$$

As predicted, status quo bias was positively related to withholding commitment ($r_{bis} = .13, p = .01$), and negatively correlated to changing decisions ($r_{bis} = -.10, p = .05$). In contrast, status quo bias was not related to either prolonged latency ($r_{bis} = .03, p = .56$) or failure to decide ($r_{bis} = -.01, p = .82$).

Optimistic Bias Task (solo version only)

For each participant, an optimistic bias score was calculated for every one of the five negative possible future events. Each score was calculated by subtracting the probability estimate made for the average person from that made for one's self. A positive score indicated optimistic bias, and a negative score indicated a pessimistic bias.

All five bias scores were significantly and positively correlated with each other at the .01 level ($r = .28$ to $r = .44$), so an average bias score was calculated. Inter-correlations among all five seriousness ratings were also positive and significant at the .05 level or better ($r = .11$ to $r = .34$), and inter-correlations among the preventability ratings were positive and significant at the .01 level ($r = .16$ to $r = .28$). Consequently, average seriousness and preventability scores were computed. Means and standard deviations for optimistic bias, seriousness ratings, and preventability ratings for each of the five negative possible future events and average scores are displayed in Table 22.

Table 22
Means and Standard Deviations for Optimistic Bias, Seriousness, and Controllability of Negative Possible Future Events

<i>N</i> = 347	Optimistic bias		Seriousness		Preventability	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Car accident	0.52	0.99	4.01	0.92	2.47	0.66
Food poisoning	0.46	1.11	2.09	0.88	2.39	0.66
Job loss	1.44	1.36	3.62	1.05	2.03	0.75
Mugging	0.35	1.00	3.27	0.96	2.47	0.66
Disastrous trip	0.60	1.03	1.84	0.87	2.53	0.77
Average Score	0.67	0.75	2.96	0.59	2.38	0.42

Note: Possible range for optimistic bias is -6 to 6, with 0 indicating no bias.

Seriousness scale: 1 = Not at all serious to 5 = Extremely serious.

Preventability scale: 1 = The risk of occurrence cannot be reduced, to 4 = The event is completely preventable

As predicted, optimistic bias was negatively correlated with the CIS subscales of prolonged latency ($r = -.09$, $p = .08$) and failure to decide ($r = -.08$, $p = .15$), although only the former reached marginal significance. In contrast, optimistic bias was unrelated to withholding commitment ($r = .03$, $p = .63$) or changing decisions ($r = -.04$, $p = .45$). Seriousness was not significantly related to prolonged latency ($r = .07$, $p = .20$), withholding commitment ($r = .07$, $p = .20$), failure to decide ($r = .06$, $p = .24$), or changing decisions ($r = -.02$, $p = .77$), but was in the predicted directions. Preventability

was negatively related to prolonged latency ($r = -.09, p = .09$) and withholding commitment ($r = -.13, p = .02$), although the former was marginally significant.

Peer Rating on CIS. A total of 11 pairs of raters had matching code words, which resulted in 22 sets of matched data to compare. (Each pair of raters yielded two sets: one's own and that of one's peer.) To describe the discrepancies between self-report and peer ratings, difference scores were calculated by subtracting the self-reported score from the corresponding peer reported score. Thus negative difference scores indicated higher self-reported indecisiveness, and difference scores could range from -5 to 5.

The degree of inter rater agreement was assessed using Brown and Hauenstein's (2005) a_{wg} (or a_{wg}) index. The a_{wg} index is based on the proportion of observed agreement to the maximum possible disagreement. Maximum possible disagreement in the a_{wg} index is based not only on the observed mean, but also where on the scale that mean occurs (i.e., close to the middle or close to the ends of the rating scale) by including the minimum and maximum possible scores in the formula (Brown & Hauenstein, 2005).

The Brown and Hauenstein's (2005) a_{wg} index incorporates five values: The mean M of the two scores (i.e., those of the participant and peer rater); the variance, s_x^2 , of the two scores; the highest possible scale value, H ; the lowest possible scale value, L ; and the number of raters, k (i.e., 2). The a_{wg} index formula is:

$$a_{wg} = 1 - \frac{2 \cdot s_x^2}{[(H + L)M - (M^2) - (H \cdot L)] \cdot [k / (k - 1)]}$$

As in other inter rater agreement statistics (e.g., r_{wg} , see LeBreton & Senter, 2008 for a review) the maximum score is 1, which indicates perfect agreement. Based on the standard cutoff of .70 recommended in the literature, Brown and Hauenstein (2005)

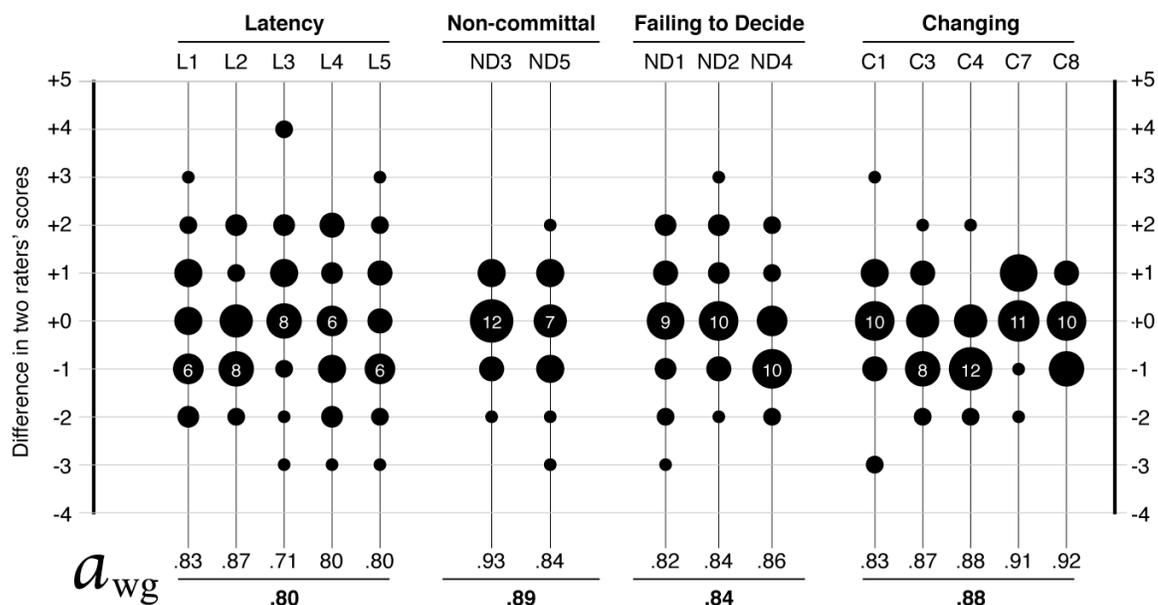
suggested that .80 and above indicated strong agreement, .60 to .69 indicated weak agreement, and that 0 to .59 should “probably” be considered unacceptable. More recently, LeBreton and Senter proposed five levels of agreement, with scores from 0 to .30 indicating a lack of agreement, .31 to .50 weak agreement, .51 to .70 moderate agreement, .71 to .90 strong agreement, and .91 to 1.00 indicating very strong agreement.

A total of 503 a_{wg} indices were generated, one for each matched CIS items score, less three missing scores that were deleted pairwise. Each CIS item had 22 a_{wg} indices, with the exception of the three variables that had 21 indices each because of the aforementioned missing scores. Agreement was measured at the item and sub-scale levels. Following Brown and Hauenstein’s (2005) recommendation, the mean of a_{wg} indices across respondents and scale items were used as the measures for item-level agreement and sub-scale-level agreement, respectively. All items showed moderate to very strong inter rater agreement.

Figure 8 shows the distribution of the differences of agreement by item, as well as the modal difference of agreement by item. Figure 8 also indicates the a_{wg} indices for each of the final 15 CIS items and for the four CIS subscales.

Fourteen of fifteen items showed strong agreement by both Brown and Hauenstein’s (2005) and LeBreton and Senter’s (2008) standards. The weakest item (i.e., L3) showed at least moderate inter rater agreement using Brown and Hauenstein’s more conservative agreement cutoffs. All four scales showed strong inter rater agreement by both standards.

Figure 8. Item-level and Scale-level Inter Rater Agreement on the CIS Sub-scales



The high level of convergence between self- and peer report scores—two different methods of measuring indecisiveness—suggested that the amount of method variance in the CIS was not high. That is, the amount of systematic variance on the CIS attributable to the method of measurement (e.g., because of social desirability) was not great enough to confound the meaning of its relationships with other constructs. Although the peer rating was only a limited test of method variance, it nevertheless further supports the validity of the CIS as a self-report scale, which in turn affords greater confidence in validity of the other results in Studies 2 and 3.

Discussion

The first two aims of Study 3 were to replicate the findings in Studies 1 and 2, namely, to test the multi-dimensionality and multi-determination hypotheses. The third aim was to test the distinct mechanisms hypothesis and test specific mechanisms using

facet level distal predictors. The fourth aim was to further validate the CIS using a status quo task, an optimistic bias task, and a decision change task. Scale validity was further tested by comparing self-report and peer ratings of the CIS to address common method variance.

Multidimensionality. As in Study 2, confirmatory factor analysis showed that the CIS fits significantly better as a multi-dimensional model than it did as a unidimensional model. Although almost all of the CIS items loaded onto the predicted factors, the not-deciding items formed two distinct factors—failing to decide and withholding commitment. This did not come entirely as a surprise, as one of the two withholding commitment items (i.e., “I am undecided about where I stand on a social issue”) was first seen in Study 2, where it loaded onto its own factor. The withholding commitment factor, however, is narrower than its name implies. Specifically, it encompasses not taking a position on (social) issues, as opposed to withholding commitment more generally. Tellingly, item ND7 (“I abstain from a decision”) did not end up loading highly enough on the withholding commitment factor to remain part of it. This suggests that there may be other conceptually and empirically distinct forms of not-deciding besides failing to decide and withholding commitment.

As expected, the four CIS factors were all moderately inter-correlated. This distinct, but related, pattern is the same found for the indecisive behaviors in Studies 1 and 2, and empirically supports the hypothesis that indecisiveness is multi-dimensional. Additional support for the multi-dimensionality hypothesis comes from both the evidence for multi-determinism, and from the distinct relational patterns between the validation tasks and the core indecisiveness behaviors. Both are described below.

Multi-determination. Multi-determination can be thought of in two senses—between forms of indecisiveness, and within forms of indecisiveness. In the first sense, the multi-determination hypothesis would hold that different forms of indecisiveness have distinct contributors from each other. In the second sense, the hypothesis would hold that a given form of indecisiveness has more than one contributing mechanism. The two are not mutually exclusive.

Mirroring the results in Study 2, each core indecisiveness behavior had a distinct pattern of both zero-order correlations with and paths from contributors. For example, in the final path model, prolonged latency had direct effects from sentimentality and gentleness and was related to four of the five proximal behaviors. In contrast, changing decisions was related to only impasse and directly to (low) prudence. This supports the multi-determination hypothesis between forms of indecisiveness.

There is also evidence that at least some of the core indecisiveness behaviors are multi-determined. With the greatest range of contributors, prolonged latency is the prime example. First, the concern for others mechanism has gentleness and sentimentality directly related to prolonged latency. Second, a lack of organization is related to decisional procrastination, which, in turn, is related to prolonged latency. Third, the low self-confidence mechanism affects prolonged latency through decisional procrastination, buck-passing, and impasse. Then there is the worry mechanism, which in addition to decisional procrastination, buck-passing, and impasse, is also mediated by concerned processing. Finally, in the high standards mechanism, perfectionism and prudence also contribute to prolonged latency through concerned processing.

Distinct Mechanisms. Of the 10 hypothesized mechanisms contributing to the different forms of indecisiveness, seven received moderate or better support from both the zero-order correlations and the path model: worry, low self-confidence, dependence, high standards, escapist impulsivity, careless impulsivity, and concern for others. In addition, there was some evidence for at least one new mechanism—lack of organization. Some of the hypothesized mechanisms are, of course, documented in the literature (i.e., worry, low self-confidence, and high standards), and even incorporated into some definitions of indecisiveness (see Table 1). In contrast, dependence, escapist impulsivity, careless impulsivity, and concern for others had not been previously shown to be associated with indecisiveness. Moreover, this is the first time that these mechanisms have been tested a) using the facets of an established measure of personality, b) mediated by proximal behavioral contributors, and c) on an a priori multi-dimensional model of indecisiveness. The result is that each form of indecisiveness is related to a distinct pattern of contributing mechanisms.

A total of six mechanisms contributed to prolonged latency: worry, low self-confidence, dependence, high standards, concern for others, and lack of organization. These were made up of no fewer than eight HEXACO facets, two of which had direct effects on prolonged latency, and six of which were mediated by some combination of decisional procrastination, buck-passing, impasse, and concerned processing. Impasse was the greatest singular contributor to prolonged latency, which may well explain why the two are often confounded (see Table 1). The range and number of contributors to prolonged latency strongly suggests that, even if defined this narrowly, indecisiveness is a more complex phenomenon than researchers had previously thought.

Three mechanisms contributed to withholding commitment: worry, dependence, and low self-confidence. The effects of the four HEXACO facets that make up these mechanisms were mediated by two proximal behaviors, buck-passing and impasse. Despite the mediation, social boldness still had a sizeable direct effect, having a roughly equal contribution to withholding commitment as did boldness and buck-passing.

The same three mechanisms that predicted withholding commitment also predicted failure to decide. This was because the hypotheses were made for not-deciding, which was only revealed to be two constructs—withholding commitment and failure to decide—during data analysis. Nevertheless, there were meaningful differences in how the mechanisms contributed to each form of indecisiveness—chief among them was that decisional procrastination was the greatest singular contributor to failing to decide, but was unrelated to withholding commitment. Thus, the path model suggests that individuals who miss opportunities and deadlines to decide, do so most often because they put off those decisions, either because they have low confidence, they worry, or they are disorganized. In contrast, buck-passing was unrelated to failure to decide, nor was there a direct effect of social boldness.

Contributing mechanisms for the fourth type of indecisiveness, changing decisions, were more problematic. The initial model supported three mechanisms contributing to changing decisions: worry, escapist impulsivity, and careless impulsivity. Worry consisted of anxiety mediated through concerned processing and, it was argued, was what drove reconsideration of decisions (e.g., via post-decisional regret). Escapist impulsivity consisted of the direct effects of anxiety and (low) social-self esteem, whereas careless impulsivity consisted of the direct effects of (low) patience, (low)

diligence, and (low) prudence, though only the latter two paths were in the expected direction and significant. In contrast to worry, the two forms of impulsivity were thought to contribute to making rash decisions, which were more prone to being later reconsidered. Furthermore, impulsivity was thought to contribute to the actual changing of decisions (i.e., breaking commitments) in that it contributes to less consideration of the consequences of changing. Finally, low honor was also thought to contribute to breaking commitments, though there was no empirical support for the mechanism as it was conceived.

Once the path between impasse and changing decisions was freed, only impasse and (low) prudence were significantly related to changing decisions. A possible account for how impasse contributes to changing decisions is that it too can lead to unstable commitments. To wit, the more serious the conflict and difficulty during the decision process (i.e., impasse), the less likely that it will be fully resolved at the time of commitment. This results in an unstable commitment, and one could expect the instability to be even more tenuous if the decision were arrived at by endogenously or exogenously induced hypervigilance (e.g., “After a decision is made I spend a lot of time convincing myself it was correct,” Janis & Mann, 1977).

A lack of prudence, on the other hand, is central to the careless impulsivity mechanism. In both cases, the resulting decisions would be ripe for reconsideration, which, in turn, increases the likelihood of decision change. This means that the path model accounts for two of the three parts of the changing decision process: making unstable decisions, and, to some extent, changing them. It does not account for the intermediate step of post-decisional regret and reconsideration.

Although most of the hypothesized mechanisms received some support, three of mechanisms received little or no empirical support: disengagement, low honor, and AOT. Liveliness, the sole facet making up the disengagement mechanism, had significant, negative correlations with prolonged latency and failure to decide, as well as with the predicted mediating variables of decisional procrastination and buck-passing. However, the path loading on decisional procrastination was non-significant, and that on buck-passing was significant, but positive. The change in relationship from the zero-order correlations to the path loadings may well be due to co-variance with social self-esteem and social boldness, both of which had significant, negative loadings on decisional procrastination and buck-passing.

The low honor mechanism received very little empirical support as only fairness and sincerity had significant negative zero-order correlations with changing decisions as expected. Contrary to predictions, sentimentality had a non-significant, positive zero correlation with changing decisions. Moreover, all three path loadings in the path model were non-significant, and only that of sincerity was in the predicted direction. One account of why the low honor mechanism failed to predict changing decisions is that it is a fundamentally social mechanism, and of the five changing decisions items only two could be read as implying a social dimension to the changed decision by using the word “commitment” (e.g., “I commit to something, but then change my commitment more than once”). This does highlight, however, the importance of a distinction made in the analysis following Study 2 between decisions that substantially involve others (e.g., a commitment is made to someone), and more private decisions (e.g., what to eat for dinner).

Finally, the AOM mechanism received partial support. Unfortunately, because two of its three facets (i.e., flexibility and inquisitiveness) had low reliabilities, they were excluded from the analysis. Although both were uncorrelated with prolonged latency, they each had marginally significant correlations with the AOM's only predicted mediating variable, prudent processing. The one AOM facet that was included in analyses, prudence, was significantly related to prudent processing. (Recall that despite the nominal similarity, their items are noticeably distinct.) On the other hand, prudence had a negative, but non-significant zero-order correlation with prolonged latency, suggesting the more prudent one is, the less time it takes to make a decision. In the path model, prudence continued to be positively related prudent processing, but prudent processing fell short of a significant, positive correlation with prolonged latency.

It may be that the active open-mindedness facets did not have significant, negative zero-order correlations with prolonged latency because the majority of slow deciders have low flexibility and inquisitiveness scores. Neuroticism and openness to experience tend to be negatively correlated (Costa & McCrae, 1992). AOM is associated with Milgram and Tenne's (2000) slow-relaxed deciders, who were outnumbered 3:1 by slow-tense deciders.

Scale Validation. In Study 3, the validity of the expanded CIS was supported by three of the four tasks: Status quo, optimistic bias, and peer rating. These three also offered additional support for the multidimensionality hypothesis, and served to flesh out our understanding of the different forms of indecisiveness.

Status quo task. The status quo task was positively related to withholding commitment, suggesting that individuals who tend not to take positions on issues also

tend to choose the status quo options when available. Although choosing the status quo in the task necessarily meant participants actively made a choice, the possibility remains that withholding commitment may also be related to status quo bias through inaction. That is, individuals who score high on withholding commitment may also tend to not decide and thereby end up with the status quo.

Status quo bias was also negatively related to changing decisions, suggesting, not surprisingly, that if one tends to choose the option that reflects the current state of affairs, one is less likely to change one's decisions.

Optimistic bias task. Optimistic bias was negatively correlated with prolonged latency and failure to decide, but unrelated to withholding commitment or changing decisions. The logic was that the more optimistic and positive one is, the less likely one will be concerned about making a commitment. The same logic accounts for why liveliness, which taps energy and optimism, was related to shorter latencies.

Thus, the status quo and optimistic bias results not only serve as criterion validity for the CIS, but also lend further support to the discriminant validity of the four CIS subscales, and as such support the multi-dimensionality hypothesis.

Sinking ship task. Contrary to predictions, the sinking ship decision change task was unrelated changing decision scores. Despite a range in the number of changes participants made, those who made two or more changes had essentially the same scores as those who made no changes. There are a few plausible accounts for why this might be.

One simple explanation is that because the opportunity to change (i.e., the second phase of the task) came near the end of the study, respondent fatigue, boredom, or low patience may have led a disproportionate amount of participants to not (re-)engage in the

decision task. Although no study to date has looked at the effects of fatigue, boredom, or impatience on status quo bias, Webster, Richter, and Kruglanski (1996) did find that fatigue was related to lower information search and greater primacy effects in impression formation. They interpreted these findings to mean that fatigue increases the need for closure. Once a decision had been made (i.e., the ship choices), the fatigue-induced need for closure could be thought of as a reason for preferring the status quo (i.e., not making changes).

A second interpretation of why the decision task failed to predict changing decision scores hinges on the unexpected effect of task transparency on participant participation. Of the three decision-related tasks in Study 3, the second part of the sinking ship task was the most obviously related to indecision and indecisiveness because it came after the CIS items explicitly addressed decision change. Although several people did make changes, it is unclear what systematic effect on participant task engagement and response, if any, may have resulted from knowing that one's decision changing behavior was being measured.

Peer rating scores. The high convergence between the peer rating scores and self-report scores supports the validity of the CIS as a self-report scale. The level of convergence between the two measurement methods suggests that individuals are able to accurately self-report the degree to which they exhibit the four core indecisiveness behaviors. In all likelihood, the anonymity of Study 3 contributed to the high inter-rater agreement scores by helping reduce social desirable responding in self-reports. Nevertheless, indecisiveness appears to be a phenomenon that may be less susceptible to social desirability when measured than are other constructs. For one, in my own casual

conversations about indecision and indecisiveness, many people are not only interested in the topic, but a surprising number enthusiastically volunteer that they are indecisive and offer themselves as case studies.

Beyond this anecdotal evidence, Frost and Shows (1993) found that indecisives reported being bothered by their indecisiveness and claimed that it interfered with the quality of everyday functioning, implying that they recognized and admitted that they were indecisive. Finally, in Study 3 there was a slight negative trend in difference scores between peer and self reports, with a negative modal difference score for 40% of the items. This means that individuals self-reported higher indecisiveness scores than their respective peers did for them. If there had been a strong social desirability effect, the trend would have been in the opposite direction.

Limitations. There are important conceptual, operational, and methodological limitations in Study 3. First, at least three conceptual issues were identified.

Strategic waiting. As in Study 2, some of the strategic waiting items were moderately correlated, but again failed to form a coherent factor. Many were closely related to decisional procrastination, which points to the need to better distinguish items measuring the two constructs. Unfortunately, little research appears to exist about the disposition to strategically wait, so it would require considerable legwork to conceptually develop and improve the scale in an informed manner.

Concerned and prudent processing. The items that ended up in the concerned processing and prudent processing items were mostly, but not exactly, the same ones as in Study 2, suggesting that the scale items need to better distinguish between the two constructs. It also raises the question about whether the two are quantitatively or

qualitatively different from each other, even though the conceptual distinction was born out empirically in Studies 2 and 3.

HEXACO. Of the 24 facet scales of the HEXACO, over a quarter had low reliabilities. This was partly due to the low number of items for certain facets. Because facets with reliabilities $< .60$ were excluded from the path model, the AOM mechanism could not be fully tested and the possibility of serendipitous findings was reduced.

A second limitation of the HEXACO is that, despite its advantages, it is less well established than Big Five measures of personality. Although there is considerable overlap between the two in the case of the NEO, one does not map easily onto the other. The result is that the range of research using Big Five measure of personality are sometimes difficult to translate into hypotheses using the HEXACO, and the HEXACO findings can be difficult to tie back into the relevant literatures.

Sample. The sample in Study 3 was biased in a number of ways. First, because it was a convenience sample, it was not a random. Second, the participant drop-out rate was close to 30%. Third, the consent limited the use of data to participants who completed the study. Nevertheless, the missing data analysis suggested that the missingness of the data that was retained was MCAR. Furthermore, the sample was considerably larger and more diverse than that in Study 2, and participation was intrinsically motivated.

Chapter 6: General Discussion

Summary

The principal aim of this dissertation was to better explain indecisiveness. Recall the story of Maya, who, received a variety of commitments (and non-commitments) from family members about attending the family reunion: Sam waited until the RSVP deadline, Pat missed the deadline, and Mark kept changing his mind. The three main hypotheses were that indecisiveness is multi-dimensional, its dimensions are multi-determined, and by extension, there are distinct contributing mechanisms to indecisiveness.

To test these hypotheses and understand the range of indecisive behaviors required a clear, behavioral definition and measure of indecisiveness. After searching the relevant literatures, none were found. Consequently, the following behavioral definition of indecisiveness was synthesized from the various conceptions compiled from across those literatures: *The tendency to not make a timely and stable commitment to a course of action when the need for such a commitment is acknowledged.* This definition was found to be consistent with the common usage of the term “indecisiveness,” as represented by entries in eight dictionaries.

Armed with this definition, indecisiveness was initially conceived of as occurring at any of the four phases in a decision episode: 1) before making a commitment to a course of action, 2) before enacting the commitment, 3) while enacting the commitment,

and 4) once the commitment had been fulfilled. A scale was developed with items measuring various behaviors that tapped not committing or not remaining committed at each of these four phases.

Results from Study 1 supported the multi-dimensionality hypothesis, but also revealed that the distinction between the behaviors themselves was as important as when they occurred in the decision process. This led to further conceptual refinement, which resulted in the view that indecisiveness consisted of three core indecisive behaviors—behaviors that were indisputable manifestations of the tendency to not make a timely and stable commitment to a course of action when the need for such a commitment is acknowledged. These were: 1) prolonged latency, 2) not-deciding, and 3) changing decisions. By asking what might immediately lead to each of these three core behaviors, a taxonomy of proximal contributing behaviors was developed. The original indecisiveness scale was distilled and parsed into core indecisiveness and proximal contributing behaviors, and additional scales and items were used to complete the proximal contributing behaviors scales.

Study 2 tested the multi-dimensionality of the new core indecisiveness scale (CIS), and tested the multi-determination hypothesis. Factor analysis confirmed the multi-dimensionality of indecisiveness. Using the CIS, the BFI as a distal predictor, and the proximal contributing behaviors scales as mediating contributors, a three-level path model of indecisiveness was tested. As predicted, indecisiveness was not just attributable to trait anxiety or high neuroticism (e.g., Goodstein, 1972; Meyer & Winer, 1993). Moreover, each of the core indecisiveness behaviors had different patterns of contributors. Thus, the path model supported the multi-determination hypotheses.

The CIS was validated using measures of information processing style, a concurrent measure of decision latency, and a disjunctive reasoning task. First, individuals with strong analytic information processing tendencies were more likely to not decide and change their decisions than were more intuitive deciders. Second, when decision tension was controlled for, Milgram and Tenne's (2000) decision speed predicted only prolonged latency, providing both convergent and discriminant validity for the CIS. Third, reason-based decisions on the Hawaii task were only related to not-deciding, again providing both convergent and discriminant validity for the CIS.

Finally, Study 3 aimed to replicate and extend the findings of Study 2, replacing dimension-level with more specific, facet-level personality scales as distal predictors. Study 3 also used a larger and more demographically diverse sample. Factor analyses again supported a multi-dimensional model of indecisiveness, although two types of not-deciding emerged: withholding commitment and failing to decide. Principal components analyses (PCAs) of the 62-item BIS, the 10-item CIS and the 22-item CIS (Appendix S) showed progressively more convergence with their corresponding confirmatory factor analyses (CFAs). The factor structure of the PCA and CFA of the 22-item CIS in Study 3 were identical, lending further support to the dimensionality of indecisiveness.

Study 3 also found evidence supporting several of the hypothesized contributing mechanisms, and, as in Study 2, each of the core indecisiveness behaviors had different patterns of contributors. Each type of indecisiveness also had at least two contributing mechanisms, thus the multi-determination hypothesis was again confirmed.

Comparison of results across Studies 2 and 3 needs to be done with some caution. Not only were the personality measures different and not directly translatable, but the

facet level HEXACO scales revealed distinctions that were masked by the BFI, especially the effects of conscientiousness. Nevertheless, most of the relationships between variables in Study 2 are consistent with the mechanisms confirmed in Study 3 and are explained in the summary of findings below.

Contributions: Explaining Indecisiveness

Their keystone contribution to our understanding of indecisiveness from this dissertation is that the phenomenon is not unidimensional. Consequently, it may be more appropriate to frame the following findings in terms of our understanding of the various types of indecisive behaviors.

Prolonged Latency. Studies 2 and 3 confirmed and built on Milgram and Tenne's (2000) finding that prolonged decision latency was related to high neuroticism. Study 2 found that although neuroticism had a direct effect on latency, its effects were also mediated by decisional procrastination, buck-passing, and impasse. The mediated effects were confirmed in Study 3: The worry mechanism, made up of the anxiety facet, predicted latency through the same three proximal behavioral contributors as well as through concerned processing. The worry mechanism was given further credibility by the fact that in Study 3 prolonged latency was found to be related to low optimistic bias.

Study 3 also replicated Milgram and Tenne's (2000) finding that prolonged decision latency was related to low extroversion, but was more specific about the mechanisms: low self-confidence, made up of low social boldness and low social self-esteem, and dependence. Milgram and Tenne found that low conscientiousness was also related to prolonged latency, but that the effect was not significant once neuroticism and low openness were controlled for. In contrast, Study 3 found that both high and low

conscientiousness predicted prolonged latency. On the one hand, low organization was related to prolonged latency, with its effect mediated by decisional procrastination. On the other hand, the high standards mechanism—prudence and perfectionism mediated by concerned processing—was positively related to prolonged latency.

Finally, Study 2 also found that agreeableness had a direct, positive effect on prolonged latency. This was replicated in Study 3 as the concern for others mechanism, which consists of gentleness and sentimentality.

Why, then, did Sam wait until the RSVP deadline before answering? The evidence suggests that Sam is either concerned about others (e.g., wanted to check with Wendy, who had other plans), is dependent (e.g., wanted to check with Wendy because he makes no decisions of consequence without her advice), has low self-confidence, is disorganized, or has high standards (e.g., wanted to check to see if Wendy's plans were a the more interesting way to spend his weekend).

Withholding commitment. Withholding commitment emerged as a factor in Study 3, so there were no specific hypotheses for it. It was treated as a form of not-deciding, and the three hypothesized mechanisms for not-deciding predicted withholding commitment: worry, dependence, and low self-confidence, these three mechanisms were mediated only through buck-passing and impasse. This suggests that people who withhold commitments on social issues may be doing so because they are concerned about the consequences, especially social consequences, of taking one position over another. This interpretation is further supported by the direct effect of low social boldness (e.g., “In a large group discussion, I would only make comments if someone asked me directly”) on withholding commitment.

Withholding commitment was also related to high status quo bias. The more obvious account for this finding is that by withholding commitment on certain issues, one can end up endorsing the status quo. Given the pattern of related mechanisms, this seems more plausible than a more proactive, “conservative” support for keeping things the way they are.

Failure to decide. In Study 2, low conscientiousness and high neuroticism were related to the failure to decide. Both were mediated through decisional procrastination and impasse, though low conscientiousness also had a direct effect. Study 2 also found that a tendency to think analytically rather than intuitively was related to a failure to decide. A second finding sheds some light on the nature of that analytic thinking. Namely, individuals who fail to decide tend to rely on reason-based, as opposed to consequentialist, decision making. The upshot is that these individuals may be focusing their thinking on trying to reduce the uncertainty of their decisions by generating reasons for them, rather than on counterfactually considering their possible outcomes (see Yates, 2003, on possibilities). This may be one reason why they reach impasse. It is also consistent with the three mechanisms found in Study 3 to be associated with failure to decide: worry, dependence, and low self-confidence.

It is important to note, however, that decisional procrastination was by far the more prominent proximal contributor to the failure to decide. Thus it is likely that the bigger reason people tend to fail to decide is that they put off decisions, either because they worry, they have low self-confidence, or they are disorganized.

Taken together, these studies suggest that Pat missed the RSVP deadline for at least one of four reasons. Pat may be a worry wart (e.g., what if Sam makes a scene when

he finds out about Mark and Wendy?). She may have low self-confidence (e.g., what will my relatives think of the way I look?). She may be dependent on someone to (help her) make decisions (e.g., accept the RSVP!), or else Pat may be so disorganized that she lost the invitation altogether.

Changing Decisions. Study 2 found that high neuroticism and low conscientiousness were related to changing decisions, and that their effects were mediated through decisional procrastination and impasse. There was also a direct effect of neuroticism. These results were somewhat consistent with findings in Study 3. First, the careless impulsivity mechanism as represented by the conscientiousness facet of (low) prudence, had a direct effect on changing decisions. Buck-passing and impasse were also related to changing decisions, with the latter being the largest, single contributor.

The interpretation of the effect of impasse on changing decisions is that it raises the possibility that commitments are made despite a lack of final resolution, and such commitments would be especially vulnerable to reconsideration and change. Although worry mediated through concerned processing was the predicted mechanism to account for this reconsideration, worry was not, ultimately, part of the path model in Study 3. There is some evidence, however, from Study 2 that reconsideration is involved in changing decisions: Analytic thinkers who tend not to trust their intuitions changed their decisions more than did intuitive thinkers with low analytic thinking tendencies. Not surprisingly, Study 3 found that changing decisions was associated with low status quo bias, which suggests a greater-than-average propensity to change.

Returning to our opening vignette one final time, these studies offer two possible accounts of why Mark kept changing his mind. First, Mark could have been torn between attending the family reunion and or spending the weekend with Wendy. As the RSVP deadline approached, he was forced to decide quickly (i.e., exogenously induced hypervigilance), but his decision was very tenuous. He thought it over and changed his mind, more than once. The second account is that Mark is impulsive and accepted immediately. He then realized he had forgotten to check with Wendy, so he impulsively recanted his acceptance. Soon after, it dawned on him that he could bring Wendy along, and so accepted again.

Contributions: Theoretical and Methodological

In addition to extending our understanding of indecisiveness, this dissertation makes contributions to its theory and operationalization. At the theoretical level, this work represents the first attempt to explicitly take stock of the range of conceptions of indecision and indecisiveness, and identify the different phenomena in those conceptions. It also provides the first strictly behavioral definition of indecisiveness derived from the conceptions in the relevant literatures, and validated against the common usage of the term “indecisiveness.”

In terms of operationalizing indecisiveness, the CIS is the only *a priori* multi-dimensional self-report measure of indecisiveness that has been validated by factor analysis, several different behavioral tasks, and peer report. Three of the four core indecisiveness scales have acceptable reliabilities, and the fourth (i.e., withholding commitment) shows promise. Because it emerged in the last of the three studies, it has not yet benefited from conceptual and operational refinement (e.g., the generation of

items that specifically measure different ways of withholding commitment).

The three studies also deepened our understanding of indecisiveness in a number of ways. First, the multi-dimensional measure of indecisiveness allowed hypotheses to distinguish which mechanisms contributed to what type of indecisive behaviors, rather than to indecisiveness generally. The contributing mechanisms themselves were also more specific than in previous studies tying personality variables to indecisiveness because, for the first time, facet-level scales and mediating proximal behaviors were used.

Limitations

The development of any new concept and scale takes many iterations, and must begin somewhere. There were several shortcomings in these three studies that limit the generalizability of the findings, and more work needs to be done to develop and refine the CIS and proximal behavioral contributors.

One persistent limitation was the failure of the strategic waiting items to converge in Studies 2 and 3. Their high correlation with some of the decisional procrastination items also highlights the need to develop items that better discriminate between purposefully suspending further deliberation and deferring commitment on the one hand, and avoiding engagement in the decision process altogether on the other.

A second limitation is that few proximal contributing behaviors were included in the studies. Some of the proximal contributing behaviors that were specified in the taxonomy were not included in the studies, such as slow deciding caused by lower cognitive ability or distractedness. Future effort needs to be devoted to identifying and testing additional proximal contributing behaviors to indecisiveness, and research that

addresses decision difficulty might prove to be a fruitful starting point (e.g., Yates, Veinott, & Patalano, 2003; see also Yates, 2003).

Another limitation of the three studies is that they took a variable-centered approach to understanding indecisiveness. A variable-centered approach focuses on understanding and modeling how different variables are related to each other. Such an approach is the dominant one in psychological research and has its advantages. However, it also has drawbacks—principal among them is that it focuses on mean values, which can mask more subtle and complex relationships between variables, such as crossover effects. A variable-centered approach can indicate the absence of certain contributing mechanisms when they are simply less prominent. This may have been the case with the actively open-mindedness mechanisms, as was discussed earlier.

To address the limitation of a variable-centered approach, and to better test the extent to which the contributing mechanisms operate independently of one another (i.e., the distinct mechanisms hypothesis), one could supplement variable-centered analysis with some person-centered analysis. Person-centered analysis focuses on identifying groups of individuals who display similar patterns (i.e., scores) across a set of variables. Thus, its main aim is to identify and distinguish, or cluster, different homogenous groups.

A promising person-centered technique given the present goal of understanding indecisiveness is latent profile analysis, which would identify the more prominent patterns of scores among the distal contributors, proximal contributors, and core indecisive behaviors. Each latent profile would consist of a type of indecisiveness from mechanism to core behavior. Such profiles have two advantages over the analogous complex interactions of variables in variable-centered approaches. First, the profiles are

more easily interpretable, and second, they avoid the problem of insufficient power as the number of variables and interactions increase (Bauer & Shanahan, 2007). Note that the aim of a person-centered approach would not be to identify types of indecisive individuals per se, as one cannot reliably infer the existence of such types from behavioral patterns (Bauer & Shanahan, 2007). Rather, it would help confirm or disconfirm the distinctness of the mechanisms that contribute to indecisiveness.

A final major limitation of the three studies is that the samples were all convenience samples, and were not representative of the broader population. Even though Study 3 was the largest and by far the most demographically diverse of the three studies, it also had a dropout rate over 27%. The biased sample problem is mitigated to some extent by the fact that the results of Study 2 were largely consistent with those in Study 3, and that both sets of results, in turn, were consistent with findings in the literature. Nevertheless, testing the mechanisms on a random sample should be a priority in future studies.

Future Directions

There are several avenues of future research that have the potential to make important contributions to the theory, measurement, and understanding of indecisiveness in addition to those already mentioned.

With the emergence of withholding commitment as a type of indecisiveness in Study 3, and the failure of the decision abstention item to load onto either not-deciding factor, a more thorough investigation of different possible types of not-deciding is warranted. This investigation could be part of a broader search for other mediating behaviors and mechanisms, such as low cognitive ability and distractibility.

There is also room for further theoretical development by considering indecisiveness in terms of having two dimensions. The focus in this work has been on the first of the two, its frequency, but the degree of indecisiveness should also be looked at. There are a number of ways one could conceive and measure the degree of indecisiveness, ranging from the relative duration of decision latency, to *how* superior one option needs to be to another for someone to commit, to how many times one switches a given commitment.

A promising methodological advance would involve focusing on observing and measuring more naturalistic indecisive behavior. This has been done with limited success by looking at how long it took to declare a college major (Gayton et al., 1994), although it would be more appropriate to study decisions that are more frequent and less significant. Ideally, the decisions would be such that they could realistically lead to prolonged latency, failure to decide, and changing decisions. Retail decisions are one established context where decisions have been studied for some time, though many of the studies of consumer choice tend to focus on larger purchases.

Although one could study the purchase of products that commonly result in indecision, such as wine, ice cream, or movie rentals, it might be difficult to track many decisions made by the same individuals, and it is unclear whether these naturally admit the range of possible indecisive behaviors. How often, for example, does one leave a movie rental store empty-handed because no film looked good enough? Studying online shopping, however, may be one solution. Some of the more sophisticated commercial websites not only track customers' orders and returns history, but also their browsing (i.e., information search) behavior.

Next, the role of contextual effects in the expression of individual differences in indecisiveness would move our understanding of the phenomenon forward in an important way. Given the role of negative affect in several of the definitions of indecision and indecisiveness, it would be informative to investigate the effects of emotion and mood. Milgram and Tenne (2000) started the ball rolling by distinguishing prolonged latency from decision tension, but they did not explore their interaction. Mixed emotions and dispositional ambivalence (see van Harreveld, van der Pligt, & de Liver, 2009, for a recent review) are closely related to decisional conflict and impasse, and so understanding how they might affect the different types of indecisiveness would be invaluable.

Finally, decisions are not always made by individuals, and so indecisiveness can also be construed at the group and organizational levels. Although indecision has been considered (e.g., Charan, 2001) and studied in the organizational context (e.g., Denis, Dompierre, Langley, & Rouleau, 2006), published research is almost non-existent. Multi-level research nesting individual indecisiveness in more social forms of indecisiveness would advance organizational decision-making theory, as well as open a new family of contributing mechanisms to explore.

Appendix A

Scholarly Definitions of Indecision and Indecisiveness

Source and Conceptual definition	Operational definition or why inferred
Bacanli (2000, 2005, 2006)	
<p>Although two types of indecisiveness are defined, there is no account of why these are types of the same phenomenon— indecisiveness:</p> <p>1) Exploratory indecisiveness, which consists of “a long decision-making process even though all options have been explored thoroughly, as well as having difficulties in making decisions” (2006, pp. 321–322).</p> <p>Ten items characterized by: Difficulty under time pressure (1) Prolonged consideration (2, 9) Fear of mistakes (3) Unstable decisions (3) Information search (4) Inability (4, 6) Panic under time pressure (5) Prioritizing (6, 7) Instability under time pressure (8) Self-categorization (10)</p> <p>2) Impetuous indecisiveness, which consists of quick decision making and giving up such decisions easily” (2006, p. 322).</p> <p>Eight items characterized by: Impatience (11) Changing (11, 13, 14, 15, 16, 17) Self-categorization (12) Fear of missing opportunities (13) Careless consideration (14) Divestment of responsibility (15) Short latency (11, 13, 14, 15, 16) Inability (4, 6) Difficulty searching for information (17) Change because cannot meet obligation (18)</p>	<p>Personal Indecisiveness Scale (PIS) revised from 29 items (2000) to 18 items (2005).</p> <p>Exploratory Indecisiveness subscale (EIS: 10 items):</p> <ol style="list-style-type: none"> 1. I have trouble when I have to decide quickly. 2. I think for hours even when I make simple decisions. 3. I can not [sic] generally make my decisions definitely for fear that I make mistakes. 4. When deciding, I collect data on all options and search them. Nevertheless, I can not [sic] decide which is the best option. 5. I am always in panic when I have to decide quickly. 6. When deciding, I can not [sic] decide which is the best option for me. 7. I have trouble to decide which I will do the first among the works I have to do. 8. I can not [sic] make my decisions definite when I have to decide in a limited period of time. 9. I think for hours even when I make decision similar to the ones that I have made before. 10. I see myself as an indecisive person. <p>Impetuous Indecisiveness Scale (IIS: 8 items)</p> <ol style="list-style-type: none"> 11. I decide quickly because of my impatience to search and collect data on it and then I give it up. 12. I see myself as an impetuous person. 13. I decide quickly for fear that I might miss the opportunities, and then I give my decision up. 14. When deciding, instead of thinking in detail, I decide quickly and then I generally give it up. 15. I decide quickly for want to get rid of that responsibility and later generally I give it up. 16. I decide quickly and give it up quickly 17. I choose the most attractive option to me at that time, since I find difficult the search on all options, and later I give it up. 18. When deciding, I choose the option which gives me the best solution, and if I can not fulfill my expectations, I give my decision up.

	Note, original scale is in Turkish, and English translation does not appear to have been back-translated.
Callanan & Greenhaus (1990, 1992)	
Indecision: "Inability to select a goal or, having selected a goal, to experience significant feelings of uncertainty about the goal"	Derived from career indecision status definition (1990, p. 80)
Chartrand, Robbins, Morrill, & Boggs (1990)	
Indecisiveness (explicit): "Inability to make decisions even when the necessary conditions to do so are present. High indecisiveness represents a lack of competence in formulating decisions" (1990, p. 493) (Implicit from scale): experience of difficulty, haziness, or frustration when deciding, characterized by slowness, worry, and uncertainty. NOTE: Criticized by Lewis & Savickas (1995) in their factor analysis of the CFI given Chartrand et al.'s definition: "GI items lack face validity as indicators of indecisiveness" (p. 54). They point out that decisions that are "hard," "hazy," "frustrating," and decision processes that are "slow" and "uncertain" "do not denote an inability to make decisions. Instead, they denote a difficulty in making decisions" (p. 55).	Generalized Indecisiveness (GI) subscale (5 items) from the Career Factors Inventory (CFI): For me, decision making seems: Hard/easy (item 4) Clear/hazy (item 5) Frustrating/fulfilling (item 6) While making most decisions I am: Persistent/easy to give up Quick/slow (item 18) Worried/calm Certain/uncertain (item 19)
Cooper, Fuqua, & Hartman (1984), Fuqua & Hartman (1983)	
Indecisiveness: "Difficulty making personal decisions" (1984, p. 354)	Trait Indecisiveness Scale (TIS)
Crites (1969)	
Indecisiveness: "Difficulty in making all sorts of life decisions, whether they are of great or little significance...even after all the conditions for doing so, such as choice supply, incentive to make a choice, and the freedom to choose are provided" (p. 114, 306)	
Danan & Zieglmeyer (2006)	
"An individual's inability to determine which of two alternatives would leave her better off" (p.3)	Notation for when an individual is indecisive between a and b : $a \bowtie b$ indifference and indecisiveness are behaviorally indistinguishable "the lack of a behavioral characteristic of indecisiveness precludes observed choice behavior from fully revealing preference." "indecisiveness can be revealed by preference for flexibility."

Denis, Dompierre, Langley, & Rouleau (2006)	
<p>“Escalating indecision” occurs when “people and organizations continually make, unmake and remake strategic decisions, resulting over the long term in a large expenditure of energy with little concrete strategic action and the constant possibility of reversal” (p. 2).</p>	<p>These definitions fall under “chronic difficulty in reaching decisions” (p. 2) Definition of decision is a “commitment to action” (from Langley et al., 1995)</p>
Elyadi (2006)	
<p>Indecisiveness: “Becoming stuck in the decision-making process while experiencing negative concurrent emotions” (p. 1368)</p> <p>Specific examples of negative affect include: Feeling of negative affect when committing Decision stress Feeling paralyzed/stuck/trapped Sick when thinking about having to decide Frustrated and overwhelmed Numb, confused</p>	<p>Please answer the following questions based on the biggest decision you are currently facing in your life. Indicate how much you agree or disagree using the following six-point scale:</p> <ol style="list-style-type: none"> 1. Because of this decision, I feel incapable of enthusiasm, commitment, or excitement 2. I get a lot of negative feelings when I try to commit to one of my choices 3. Though this is a big decision, I feel in control mentally and emotionally (reverse scored) 4. I am feeling frustrated, numb, and confused because of this decision 5. Thinking about committing to a choice is one of the most stressful parts of my day 6. At this point, I am undecided but do NOT feel uncomfortable or stressed out (reverse scored) 7. I feel paralyzed or stuck and cannot move or act 8. I cannot think straight in trying to make this decision 9. I am having an emotionally difficult time with making a decision and feel trapped in the decision-making process 10. I feel sick when I think about making a decision 11. I feel emotionally frustrated and overwhelmed when attempting to make a final decision 12. I feel comfortable with the choices and decisions I will have to make (reverse scored) 13. I feel I cannot decide, and this is causing me so much stress and frustration
Ferrari & Dovidio (2001)	
<p>Indecisiveness: Chronic “postponing [of] a decision when faced with conflicts and choices...Indecision is more than not making timely decisions” (p. 1113). “Decisional procrastination is a maladaptive pattern of postponing a decision when faced with conflicts and choices” (p. 127).</p>	<p>Procrastination subscale of the Melbourne Decision Making Scale (Mann, Burnett, Radford, & Ford, 1997).</p> <ol style="list-style-type: none"> 1. I waste a lot of time on trivial matters before getting to the final decision. 2. Even after I have made a decision I delay acting upon it. 3. When I have to make a decision I wait a long time before starting to think about it. 4. I delay making decisions until it is too late. 5. I put off making decisions.
Frost & Shows (1993)	

<p>Indecisiveness (implicit definitions)</p> <p>Chronically prolonged decision latency (inferred from behavioral measure, and item 8)</p> <p>Procrastination or strategic waiting (Item 1)</p> <p>Not knowing what one wants (Items 2, 15)</p> <p>Experienced decision making difficulty (Items 3, 7)</p> <p>Experienced planning difficulty (Items 4, 13, 14)</p> <p>No desire for decision authority (Item 5)</p> <p>Post-decisional doubt/worry (Items 6, 9, 12)</p> <p>Decision making worry/anxiety (Items 10, 11)</p>	<p>1) Behavioral measure: Time to choice on binary laboratory decision tasks in a variety of domains</p> <p>2) Indecisiveness Scale (IS):</p> <ol style="list-style-type: none"> 1. I try to put off making decisions. 2. I always know exactly what I want. 3. I find it easy to make decisions. 4. I have a hard time planning my free time. 5. I like to be in a position to make decisions. 6. Once I make a decision, I feel fairly confident that it is a good one. 7. When ordering from a menu, I usually find it difficult to decide what to get. 8. I usually make decisions quickly. 9. Once I make a decision, I stop worrying about it. 10. I become anxious when making a decision. 11. I often worry about making the wrong decision. 12. After I have chosen or decided something, I often believe I have made the wrong choice or decision. 13. I do not get assignments done one time because I cannot decide what to do first. 14. I have trouble completing assignments because I can't prioritize what is most important. 15. It seems that deciding on the most trivial things takes me a long time.
Gati, Krausz, & Osipow (1996)	
<p>Chronic problems individuals may have in making decisions</p>	<p>Inferred from the alleged consensus on the use "career indecision" to mean "the problems individuals may have in making their career decision" (p. 510)</p>
Germeijs & De Boeck (2002)	
<p>Indecisiveness: Domain-general difficulty in making decisions, which includes seven categories: 1) latency, 2) delay, 3) avoidance, 4) buck-passing, 5) instability, 6) worry, and 7) decision regret.</p> <p>Eleven features have been discerned:</p> <ol style="list-style-type: none"> 1. difficulty 2. don't know how 3. feeling uncertain 4. takes a long time 5. delaying 6. avoidance 7. leaving to others 8. reconsideration 9. worrying 10. regretting 	<p>Taking a long time (e.g., "I make decisions quickly")</p> <p>Delaying decisions (e.g., "I delay deciding")</p> <p>Avoiding decisions (e.g., "I try to avoid making decisions")</p> <p>Leaving decisions to someone else (e.g., "I tend to leave decisions to someone else")</p> <p>Instability of decision (e.g., "I often reconsider my decision.")</p> <p>Worrying about decisions after they're made (e.g., "After making a decision, I can't get it out of my mind.")</p> <p>Regretting decisions after they're made (e.g., "After making a decision, I don't regret the decision")</p>

<p>11. calling oneself indecisive</p> <p>NOTES: 1) Attributes indecisive behaviors to difficulty; 2) Unclear whether delay is evasive or engaged; 3) Behaviors 1–5 each seem to be face valid indecisive behaviors, whereas behaviors 6 and 7 appear to be epiphenomenal. That is, it seems odd to characterize someone as indecisive (i.e., having difficulty deciding) if they exhibited none of the first five behaviors, but chronically worry about or regret their decisions; 4) Unclear what the worry is about.</p>	
Goodstein (1972)	
Indecisiveness: Inability to make decisions.	
Haraburda (1999)	
<p>Explicitly adopts Van Matre & Cooper's (1984) definition of indecisiveness. Items in Haraburda's scale suggest a range of meanings of indecisiveness, including 1) perceptions by others of not being decisive (item 2); 2) low decision process or outcome quality (item 1 reversed); 3) experience of stress when deciding (item 3); 4) hypervigilant decision-making (item 4); 5) failure to follow-through (item 5 reversed)</p>	<p>Domain general scale:</p> <ol style="list-style-type: none"> 1. I am good at making decisions. 2. People who really know me (e.g., friends, family) describe me as a decisive person. 3. Making decisions is stressful for me. 4. If making a decision is stressful for me, I make quicker decisions than I should just to end the decision-making process. 5. Once I make a decision, I follow through on it.
Holland & Holland (1977)	
<p>No explicit definition, yet identify three types of indecisives: 1) doesn't have to decide yet, so stays undecided, 2) mildly anxious, immature, or incompetent, 3) indecisive</p> <p>NOTE: The three types of indecisives do not have the same logical status. The first describes both a cause and a behavior, the second a cause and no behavior, and the third is tautological.</p>	<p>The authors speculate on the causes of indecisiveness:</p> <ul style="list-style-type: none"> Failure to acquire necessary cultural involvement Low self-confidence Low tolerance for ambiguity Undeveloped sense of identity
Jones (1989)	
<p>Indecisiveness: "Inability to make decisions without unnecessary delay, difficulty, or reliance on others" (p. 479).</p>	<ol style="list-style-type: none"> 1. I feel relieved if someone else makes a decision for me. 2. I am an indecisive person; I delay deciding and have difficulty making up my mind. 3. I frequently have difficulty making decisions.
Mann, Burnett, Radford, & Ford (1997)	
<p>Indecision (inferred from items in the procrastination subscale of the decisional conflict scale): "Delay in deciding or acting on a decision."</p>	<p>Procrastination subscale of the Melbourne Decision Making Questionnaire:</p> <ol style="list-style-type: none"> 1. I waste a lot of time on trivial matters before getting to the final decision. 2. Even after I have made a decision I delay acting upon it. 3. When I have to make a decision I wait a long

	<p>time before starting to think about it.</p> <p>4. I delay making decisions until it is too late.</p> <p>5. I put off making decisions.</p>
Milgram & Tenne (2000)	
<p>Indecisiveness: Inability to make timely decisions in minor matters.</p> <p>NOTE: The authors considered defining “indecisiveness” as decision (cognitive) difficulty, but chose decision latency instead because the latter was less strongly correlated with decision tension. Decision tension itself consists of two parameters: i) the tension or discomfort experienced during the decision making process and (ii) the tension or discomfort experienced after making the decision when having second thoughts. By defining indecisiveness as latency, they were able to construct a 2 x 2 (indecisiveness x tension) typology, yielding tense and relaxed indecisives.</p> <p>NOTE: Response to scale items are on a 4-point Likert scale measuring decision latency: 1) “Immediately or Very Quickly,” 2) “Less Quickly,” 3) “Much Less Quickly,” and 4) “After Considerable Delay.”</p>	<p>Questions that are of minor importance in life</p> <ol style="list-style-type: none"> 1. Whether to go out to have a good time or not? 2. Which garment/pair of shoes to buy? 3. Which restaurant to go to? 4. Where to spend a vacation? 5. What to wear in the morning? 6. Which movie to see? 7. Whether to go to the beach? 8. Whether to leave a tip for the waiter when the service was poor? 9. Whether to celebrate a happy occasion in an expensive restaurant? 10. What to choose from the menu in the restaurant? 11. Whether to buy a new appliance (e.g., TV, video)? 12. Whether to work overtime nights, holidays, or weekends? 13. Which road to take to reach a new destination? 14. What birthday present to buy for a friend? 15. Whether to buy an expensive book that everyone is talking about? <p>Questions that are of major importance in life</p> <ol style="list-style-type: none"> 1. Which course of studies to choose? 2. Whether to continue to study for a higher degree (M.A. or Ph.D.)? 3. Which career to choose? 4. Where (in what setting, company) to work? 5. Whether to remain in one’s current place of 6. employment or to look for a better job? 7. Whether to change one’s current occupation (field, profession) or to make no change? 8. In what direction to make a change in occupation? 9. To choose a lifetime companion? 10. To marry? 11. Whom to invite to the wedding when the number of places is limited? 12. To separate from/divorce one’s spouse (long-term companion)? 13. Where to buy a new home/apartment? 14. To leave the parents’ home in which one grew up? 15. To live overseas for an extended period?
Rassin & Muris (2005a, 2005b) and Rassin, Muris, Franken, Smit, & Wong (2007)	
Indecisiveness (implied): Domain-general	Indecisiveness Scale (Frost & Shows) 15- and 11-item

<p>difficulty with decisions (but see Frost & Shows entry above for specific breakdown).</p>	<p>versions. Note that the 11-item version dropped the following domain-specific items:</p> <p>4) I have a hard time planning my free time.</p> <p>7) When ordering from a menu, I usually find it difficult to decide what to get.</p> <p>13) I do not get assignments done on time because I cannot decide what to do first.</p> <p>14) I have trouble completing assignments because I can't prioritize what is most important.</p>
<p>Reed (1985)</p>	
<p>Indecision: "Failure or hesitation in deciding, an inability to make up one's mind or come to a conclusion. Basically, it refers to <i>difficulty</i> in choosing between alternatives" (p. 171).</p> <p>NOTE: It is unclear how asking for more information is a <i>direct</i> measure of indecision. Rather, it would lead to increased decision latency both in acquiring the information and in processing it, presumably.</p>	<p>Suggests two ways to quantify (i.e., operationalize) indecision are by a) the time taken to make a choice or decision, or b) the number of requests made for further information.</p>
<p>Salomone (1982)</p>	
<p>Indecisiveness: "Fail[ure] to make important decisions not because of a lack sufficient information, but because of personal qualities that will not allow one to reach a decisional state of mind and take a course of action" (p. 496).</p>	
<p>Van Matre & Cooper (1984)</p>	
<p>Indecision is herein defined as the <i>state</i> of being undecided. On the other hand, indecisiveness is herein defined as the <i>trait</i> of having difficulty making decisions</p> <p>Indecisiveness: "Trait of having difficulty making decisions" (p. 16).</p>	<p>Personal Decisiveness Scale (Van Matre & Cooper, 1984), an eight item measure using a 5-point Likert scale</p>
<p>von Neumann & Morgenstern (1944)</p>	
<p>Indecisiveness: inability to state which alternative one prefers, while not admitting that the alternatives are equally desirable</p>	
<p>Wanberg & Muchinsky (1992)</p>	
<p>Indecisiveness: The inability to make decisions readily.</p>	<p>Inferred from their agreement with what they state is the consensus definition</p>

Appendix B

Definitions of “Indecision,” “Indecisive,” and “Indecisiveness” from Eight Dictionaries

Dictionary	Definition
The American Heritage Dictionary of the English Language, (2009). Fourth Edition. Houghton Mifflin Company.	<p>Indecision: Reluctance or an inability to make up one's mind; irresolution</p> <p>Indecisive:</p> <ol style="list-style-type: none"> 1. Prone to or characterized by indecision; irresolute: <i>an indecisive manager.</i> 2. Inconclusive: <i>an indecisive contest; an indecisive battle.</i> 3. Not clearly defined; indefinite: <i>indecisive boundaries running through mountainous terrain.</i>
Random House Dictionary (2009)	<p>Indecision: Inability to decide</p> <p>Indecisive:</p> <ol style="list-style-type: none"> 1. Characterized by indecision, as persons; irresolute; undecided. 2. Not decisive or conclusive: a severe but indecisive battle. 3. Lacking definition; vague or indistinct: the indecisive outline of the distant hills.
The Merriam Webster's Collegiate Dictionary, 10 th Edition 1994 Merriam-Webster Springfield, MA	<p>Indecision: A wavering between two or more possible courses of action: IRRESOLUTION (uncertain how to act or proceed.)</p> <p>Indecisive: Marked or prone to indecision: IRRESOLUTE</p>
<i>Webster's New World College Dictionary</i> (2005). Wiley Publishing: Cleveland, OH	<p>Indecision: Lack of decision; inability to decide or tendency to change the mind frequently; hesitation or vacillation</p> <p>Indecisive:</p> <ol style="list-style-type: none"> 1. Not decisive; not conclusive or final 2. characterized by indecision; hesitating or vacillating
Oxford 2 nd Edition 1989	<p>Indecision: Want of decision; inability to decide or to make up one's mind; a wavering between possible courses of action; hesitation.</p> <p>Indecisive:</p> <ol style="list-style-type: none"> 1. Not decisive; not such as to decide or settle (a question, contest, etc.); inconclusive. 2. Characterized by indecision; undecided; hesitating; irresolute. 3. Uncertain, doubtful; not definite, indistinct. <p>Indecisiveness: The quality of being indecisive.</p>
Kernerman English Learner's Dictionary. 1986-2008 K Dictionaries Ltd and partners. All rights reserved.	<p>Indecision: The state of not being able to decide; hesitation.</p> <p>Indecisive:</p> <ol style="list-style-type: none"> 1 not producing a clear decision or a definite result; an indecisive battle. 2 unable to make firm decisions indecisive person.
Webster's Revised Unabridged Dictionary.	<p>Indecision: Want of decision; want of settled purpose, or of firmness; indetermination;</p>

<p>Copyright 1996, 1998 MICRA Inc.</p>	<p>wavering of mind; irresolution; vacillation; hesitation.</p> <p>Indecisive:</p> <ol style="list-style-type: none"> 1. Not decisive; not bringing to a final or ultimate issue; as, an indecisive battle, argument, answer. 2. Undetermined; prone to indecision; irresolute; unsettled; wavering; vacillating; hesitating; as, an indecisive state of mind; an indecisive character. <p>Indecisiveness:</p> <p>The state of being indecisive; unsettled state.</p>
<p>WordNet 3.0</p>	<p>Indecision:</p> <ol style="list-style-type: none"> 1. Doubt concerning two or more possible alternatives or courses of action; <i>"his indecision was only momentary but the opportunity was lost"</i> [syn: irresolution, indecisiveness] 2. The trait of irresolution; a lack of firmness of character or purpose; <i>"the king's incurable indecisiveness caused turmoil in his court"</i> [syn: indecisiveness] <p>Indecisive:</p> <ol style="list-style-type: none"> 1. Characterized by lack of decision and firmness; <i>"an indecisive manager brought the enterprise to a standstill"</i> 2. Not definitely settling something; <i>"a long and indecisive war"</i> 3. Not clearly defined; <i>"indecisive boundaries running through mountains"</i>

Appendix C

Behavioral Indecisiveness Scale

Commitment Indecisiveness

- comm1 I take a long time to think before I settle on one of the options I am faced with.
- comm2R I come to a decision quickly.
- comm3 I take “forever” to make up my mind.
- comm4 I wait until the last minute before deciding on something.
- comm5 I avoid making definite plans until I have to.
- comm6R When I have to take a position on some matter, I do.
- comm7 I refuse to take a stand on an issue, even though I feel that I should decide.
- comm8R When faced with a choice, I make it with certainty.
- comm9 When asked to commit to something, I answer something non-committal, like “Maybe,” “I’ll see,” or “I’ll think about it.”
- comm10 When I have to decide, I find myself unwilling to commit to a specific course of action.
- comm11R I take less time to commit to a choice than do other people.
- comm12 It seems that deciding on the most trivial thing takes me a long time.
- comm13R When ordering from an unfamiliar menu, I’m the first in my party to select a meal.
- comm14R I do not spend a lot of time thinking about decisions before making them.
- comm15R I commit to a course of action well before the deadline.
- comm16 I don’t come to a decision until I am reminded of the consequences of not deciding.
- comm17 I intend to make a decision, but the opportunity passes because I wait too long.
- comm18 I feel forced to make a choice when I would rather not choose at all.
- comm19R When I shop, I don’t need to spend too much time thinking about what to buy.
- comm20R I do not need to be pressured in order to make a difficult commitment.

Initiation indecisiveness

- init1 When I can, I take a long time to think before acting on a decision I have made.
- init2R I implement my plan at the first opportunity.
- init3 I wait until the last minute before proceeding with a path I’ve chosen.
- init4 When it comes time to implement a plan, I drag my feet.

init5R	Once I make a decision, I do not go back over it when it comes time to act.
init6	I deliberately pass up an opportunity to start fulfilling an obligation I have made.
init7	When asked when I will do what I said I would do, I answer something non-committal, like "I'll see," "Soon," or "I'm not sure."
init9	I hesitate before actually going through with a commitment.
init10	I back out of a decision I have made.
init11R	I follow through on my promise.
init19	When I actually have to proceed with a choice I've made, I reconsider my options.
init8R	I waste no time starting on something I said I would do.
init12	When it comes time to act on a choice, I change my mind and choose a different option.
init13	Before I start a course of action I intended to carry out, I change my mind and take the opposite course of action.
init14R	I do not waver when I have to actually fulfill a pledge I have made.
init15R	I do not hesitate when it comes time to honor a commitment.
init16	I make commitments knowing I will probably not follow up on them.
init17	I say I will do something, I intend to do it, but ultimately I don't.
init18R	When it comes time to act on a decision I've made, I do not change my mind.
init20R	I put my money where my mouth is.

Completion Indecisiveness

comp1	I take longer than I should to complete a commitment.
comp2R	I complete a task I have agreed to do without delay.
comp3	I wait until the deadline before bringing a project to a close.
comp4R	I finish something ahead of schedule.
comp5	I abandon a plan before I have seen it through to the end.
comp6	After I have started to carry out my decision, I start questioning it.
comp7R	I steadfastly work to finish something even when I am not 100% confident about it.
comp8	I hesitate about whether to complete an obligation.
comp9R	I see a commitment through to the finish.
comp10	Before I finish acting on my decision, I abruptly stop and reverse that decision.
comp12R	I follow through on a decision I make.

Post-completion Indecisiveness

- post1 After I do something, I promptly change my mind and undo it.
- post2 I try to reverse the effects of a recent decision I made.
- post3 I make a decision that is inconsistent with something I decided a short time before.
- post4 I make a choice that is the opposite of a previous choice.
- post5 I take a position that is different from a position I took recently.
- post6 I have a sudden change of heart, and switch my stand on an issue.
- post7 Soon after deciding, I find myself making a second decision that reverses the effects of the first.
- post8 People find it surprising how I change my mind about a decision soon after I make it.
- post9R Once I make a commitment to something, I do not change my mind.
- post10R When I take a position on something, I do not reconsider.

Appendix D

Core Indecisiveness Scale

Latency

1. When I am in a group that is deciding something, I take longer to make a decision than do other people.
2. I need more time than I actually have when I am faced with making a choice.
3. It seems that deciding on the most trivial things takes me a long time.
4. I am slow to decide.

Not-deciding

5. I miss the deadline for making a relatively straightforward decision.
6. I intend to make a decision, but wait so long that the opportunity to decide passes.
7. I am undecided about where I stand on a social issue.

Changing

8. I change my mind after I choose something.
9. I try to undo the effects of a previous decision I made.
10. I have a change of heart about a commitment I made.

Appendix E

Proximal Behavioral Contributors – Study 2

Decisional Procrastination

1. I waste a lot of time on trivial matters before getting to the final decision.
2. When I have to make a decision, I wait a long time before starting to think about it.
3. I delay making a decision until it is too late.
4. I put off making a decision.
5. I avoid thinking about a decision even though I know I will eventually have to make it.
6. Once I know I have a choice to make, I do not put off thinking about it. (R)

Buck-passing

1. I leave a decision to someone else.
2. I avoid taking the responsibility to make a decision.
3. If a decision can be made by me or by another person, I let the other person make it.
4. I let someone who is better informed decide for me.
5. I try to get out of having to make a decision.
6. I ask others to decide for me when I know that I should be deciding.

Impasse

1. I get stuck for a while when making a decision.
2. When I am thinking about what to choose, there reaches a point where I don't know how to proceed.

3. I end up thinking in circles when deciding something.
4. When trying to make a decision, I get so overwhelmed that I feel paralyzed.
5. Even after I think that I have made up my mind about something, I have trouble getting myself to “bite the bullet” and actually commit to that decision.

Strategic Waiting

1. After making a tentative selection, I wait for a while before committing to it in case I discover something that might change my mind.
2. As soon I decide something, I immediately go with that decision. (R)
3. Once I make a choice, I sleep on it before actually going through with it.
4. When I know exactly what I want and there is pressure to decide, I still do not make my decision final until I have to.
5. I make a decision without much delay, but then wait for the right moment before actually committing to that decision.

Slow Processing

1. When faced with a decision, I consider each fact one at a time.
2. I slowly examine the relevant information in a decision.
3. I take my time thinking about my choices before going ahead with one of them.
4. I am not fast at comparing my alternatives.
5. I do not decide in a rush.

Extensive Processing

1. When making a decision, I collect lots of facts.
2. When faced with a choice, I make the effort to look for more information than is normally given.

3. I research my options before deciding.
4. When I am buying something, I compare the details on the labels.
5. I try to consider several factors when making a simple decision.
6. When I plan something, I make sure I have a backup.
7. When I am presented with two good options, I look for a third option.

Re-processing

1. I double-check everything before making my final commitment.
2. I triple-check things before deciding.
3. I go over the relevant information as often as necessary for the best option to emerge.
4. I re-examine the benefits of an option until I am convinced it is better than other options.

(R) denotes reverse-scored items

Appendix F

Milgram and Tenne's Minor Decision Scales

Minor Decision Speed Scale

Routine Decisions of Daily Life

There are people who reach decisions on routine matters very quickly, and others who reach decisions on the same matters only after a considerable lapse of time. By the same token, there are issues that one decides immediately and other issues that the same person hesitates for some time before reaching a decision. How do you reach these kinds of decisions on routine matters?

The following is a list of things of no great importance in and of themselves. How much time do you need to make up your mind about them? If a given question is not relevant for you, please try to answer it as if it were. Please, do not skip any of the items. For each question there are four choices. Circle the answer that is most correct for you and try to be as forthcoming as possible.

If you decide about a given question immediately or very quickly, circle the number 1.

If you decide about a given question less quickly, circle the number 2.

If you decide about a given question much less quickly, circle the number 3.

If you decide about a given question after considerable delay, circle the number 4.

1	2	3	4
Immediately or Very Quickly	Less Quickly	Much Less Quickly	After Considerable Delay

How quickly do you decide

1. Whether to go out to have a good time or not?	1	2	3	4
2. Which garment/pair of shoes to buy?	1	2	3	4
3. Which restaurant to go to?	1	2	3	4
4. Where to spend a vacation?	1	2	3	4
5. What to wear in the morning?	1	2	3	4
6. Which movie to see?	1	2	3	4
7. Whether to go to the beach?	1	2	3	4
8. Whether to leave a tip for the waiter when the service was poor?	1	2	3	4
9. Whether to celebrate a happy occasion in an expensive restaurant?	1	2	3	4
10. What to choose from the menu in the restaurant?	1	2	3	4
11. Whether to buy a new appliance (e.g., TV, video)?	1	2	3	4
12. Whether to work overtime nights, holidays, or weekends?	1	2	3	4
13. Which road to take to reach a new destination?	1	2	3	4
14. What birthday present to buy for a friend?	1	2	3	4
15. Whether to buy an expensive book that everyone is talking about?	1	2	3	4

Minor Decision Tension Scale

Routine Decisions of Daily Life

We would like to know how you feel when you are making a decision. There are people that feel comfortable and are completely relaxed when they are making a decision. There are others who feel tense and troubled when they are making a decision. They hesitate, shift back and forth, and fear they will make a mistake, etc. How is it with you?

The following is a list of routine matters that appeared on the previous page. Answer each question according to the following scale:

If you feel comfortable and relaxed while making the decision, circle the number 1.

If you feel a little tense, but not really troubled while making the decision, circle the number 2.

If you feel tense and uncomfortable while making the decision, circle the number 3.

If you feel very tense and uncomfortable while making the decision, circle the number 4.

1	2	3	4
Comfortable and Completely Relaxed	A Little Tense, but not Troubled	Tense and Uncomfortable	Very Tense and Uncomfortable

How comfortable are you when you decide

1. Whether to go out to have a good time or not?	1	2	3	4
2. Which garment/pair of shoes to buy?	1	2	3	4
3. Which restaurant to go to?	1	2	3	4
4. Where to spend a vacation?	1	2	3	4
5. What to wear in the morning?	1	2	3	4
6. Which movie to see?	1	2	3	4
7. Whether to go to the beach?	1	2	3	4
8. Whether to leave a tip for the waiter when the service was poor?	1	2	3	4
9. Whether to celebrate a happy occasion in an expensive restaurant?	1	2	3	4
10. What to choose from the menu in the restaurant?	1	2	3	4
11. Whether to buy a new appliance (e.g., TV, video)?	1	2	3	4
12. Whether to work overtime nights, holidays, or weekends?	1	2	3	4
13. Which road to take to reach a new destination?	1	2	3	4
14. What birthday present to buy for a friend?	1	2	3	4
15. Whether to buy an expensive book that everyone is talking about?	1	2	3	4

Appendix G

Big Five Inventory

Here are a number of characteristics that may or may not apply to you. For example, do you agree that you are someone who likes to spend time with others? Please write a number next to each statement to indicate the extent to which you agree or disagree with that statement.

1	2	3	4	5
Disagree strongly	Disagree moderately	Neither agree nor disagree	Agree a little	Agree strongly

I see myself as someone who...

<input type="text"/>	1. Is talkative	<input type="text"/>	23. Tends to be lazy
<input type="text"/>	2. Tends to find fault with others	<input type="text"/>	24. Is emotionally stable, not easily upset
<input type="text"/>	3. Does a thorough job	<input type="text"/>	25. Is inventive
<input type="text"/>	4. Is depressed, blue	<input type="text"/>	26. Has an assertive personality
<input type="text"/>	5. Is original, comes up with new ideas	<input type="text"/>	27. Can be cold and aloof
<input type="text"/>	6. Is reserved	<input type="text"/>	28. Perseveres until the task is finished
<input type="text"/>	7. Is helpful and unselfish with others	<input type="text"/>	29. Can be moody
<input type="text"/>	8. Can be somewhat careless	<input type="text"/>	30. Values artistic, aesthetic experiences
<input type="text"/>	9. Is relaxed, handles stress well	<input type="text"/>	31. Is sometimes shy, inhibited
<input type="text"/>	10. Is curious about many different things	<input type="text"/>	32. Is considerate and kind to almost everyone
<input type="text"/>	11. Is full of energy	<input type="text"/>	33. Does things efficiently
<input type="text"/>	12. Starts quarrels with others	<input type="text"/>	34. Remains calm in tense situations
<input type="text"/>	13. Is a reliable worker	<input type="text"/>	35. Prefers work that is routine
<input type="text"/>	14. Can be tense	<input type="text"/>	36. Is outgoing, sociable
<input type="text"/>	15. Is ingenious, a deep thinker	<input type="text"/>	37. Is sometimes rude to others
<input type="text"/>	16. Generates a lot of enthusiasm	<input type="text"/>	38. Makes plans and follows through with them
<input type="text"/>	17. Has a forgiving nature	<input type="text"/>	39. Gets nervous easily
<input type="text"/>	18. Tends to be disorganized	<input type="text"/>	40. Likes to reflect, play with ideas
<input type="text"/>	19. Worries a lot	<input type="text"/>	41. Has few artistic interests
<input type="text"/>	20. Has an active imagination	<input type="text"/>	42. Likes to cooperate with others
<input type="text"/>	21. Tends to be quiet	<input type="text"/>	43. Is easily distracted
<input type="text"/>	22. Is generally trusting	<input type="text"/>	44. Is sophisticated in art, music, or literature

Please check: Did you write a number in front of each statement?

BFI scale scoring (“R” denotes reverse-scored items):

Extraversion: 1, 6R, 11, 16, 21R, 26, 31R, 36

Agreeableness: 2R, 7, 12R, 17, 22, 27R, 32, 37R, 42

Conscientiousness: 3, 8R, 13, 18R, 23R, 28, 33, 38, 43R

Neuroticism: 4, 9R, 14, 19, 24R, 29, 34R, 39

Openness: 5, 10, 15, 20, 25, 30, 35R, 40, 41R, 44

Appendix H

Rational-Experiential Inventory (REI)

1. I don't like to have to do a lot of thinking. (R)
2. I try to avoid situations that require thinking in depth about something. (R)
3. I prefer to do something that challenges my thinking abilities rather than something that requires little thought.
4. I prefer complex to simple problems.
5. Thinking hard and for a long time about something gives me little satisfaction. (R)
6. I trust my initial feelings about people.
7. I believe in trusting my hunches.
8. My initial impressions of people are almost always right.
9. When it comes to trusting people, I can usually rely on my "gut feelings."
10. I can usually feel when a person is right or wrong even if I can't explain how I know.

(R) denotes reverse-scored items

REI scale scoring:

Rational (Analytic): 1, 2, 3, 4, 5

Experiential (Intuitive): 6, 7, 8, 9, 10

Appendix I

Fundamental Attitudes Scale (FAS)

The statements below address difficult societal topics. For each one indicate whether you agree, disagree, or do not know.

1. It is fundamentally wrong for politicians to act based on a religious viewpoint.
2. The death penalty is sometimes justified.
3. Marriage should exclusively take place between a man and a woman.
4. Euthanasia is a fundamental human right.
5. Couples that are unable to procreate should adopt children instead of turning to in vitro fertilization.
6. Governmental intervention should be kept at the minimum.
7. Suicide is never a rational option.
8. Western society is obliged to interfere in third world countries.
9. Humans are meant to have only one sexual partner.
10. Crime can best be tackled by more investigations and more severe penalties.
11. There is life on other planets.
12. Traffic jams can best be tackled by making car driving more expensive.
13. Official writings that contain spelling and grammar flaws should be disregarded.
14. Ethnical integration is the best way to prevent cultural conflicts.
15. Environmental interests should by definition be given priority over economic interests.

Appendix J

Modified Hawaii Task

Hawaii

Imagine that you have just taken a tough qualifying examination. It is the end of the semester, you feel tired and run-down, and you are not sure that you passed the exam. In case you failed you would have to take the exam again in a couple of months—after the holiday break. You now have an opportunity to buy a very attractive five-day vacation package to Hawaii at an exceptionally low price. The special offer expires *today*. Would you (circle one)

1. Not buy the vacation package
2. Buy the *non-refundable* vacation package
3. Buy the *refundable* vacation package for an additional \$10 fee (Note: the fee is non-refundable)
4. Pay a \$10 non-refundable fee to retain the rights to buy the vacation package at the same exceptional price the day after tomorrow—after you find out whether or not you passed the exam

Hawaii Alternative Endings...

Imagine that you have just taken a tough qualifying examination. It is the end of the semester, you feel tired and run-down, and **you know you failed the exam**. You will have to take the exam again in a couple of months—after the holiday break. You now have an opportunity to buy a very attractive five-day vacation package to Hawaii at an exceptionally low price. The special offer expires *today*.

(Circle one)		
Would you buy the vacation package?	Yes	No

(Counterbalancing version below)

Imagine that you have just taken a tough qualifying examination. It is the end of the semester, you feel tired and run-down, and **you know you passed the exam**. You now have an opportunity to buy a very attractive five-day vacation package to Hawaii at an exceptionally low price. The special offer expires *today*.

(Circle one)		
Would you buy the vacation package?	Yes	No

Appendix K

Recruitment Message for Study 3

Dear ...,

As you know, I am in the final stages of my graduate work at the University of Michigan studying how people decide. One of the reasons I'm writing is that for my last study, I am turning to friends and family and asking them to participate in my online study, and to spread the word to others they think would be willing and able to help. The more participants I have, the more reliable my results will be.

To participate, just click the link below. I would also be very grateful if you could forward this e-mail to friends who you think would be willing to take about 30 minutes of their time to help out. They just have to be native speakers of English and 18 years or older.

http://lessons.umm.umich.edu/2k/how_you_decide/assignment

Thanks so much, and let me know how you are doing!

Georges

Appendix L

Online Consent for Study 3

Welcome to the differences in decision making study!

Before you begin, please read the four points below describing participation in the study, and then decide whether you want to continue.

1. I understand that participation in this study is open to adults only, and attest that I am at least 18 years old.
2. I understand that my participation is anonymous. Although I will be asked to provide a few pieces of basic demographic information for statistical reasons, I will not be asked to provide any personally identifying information.
3. I understand that participation in this study is voluntary: I can skip or refuse to answer any survey question that makes me feel uncomfortable, and can leave the study at any time.
4. I understand that my responses will only be submitted at the end of the study. If I choose to end the study before the end, none of my responses will be submitted.

If you have questions, read the Frequently Asked Questions below. If you do not want to participate, simply close the browser. Otherwise scroll down and click "continue" to consent to participate.

Frequently Asked Questions

Q: Why do you need my help?

A: I study decision making. In my research so far, all my participants have been 18 to 20 year-old college students who participated for course credit. For my results to be more generally valid, I need to draw on a broader sample of participants—ideally ones who might be more intrinsically motivated to answer questions.

Q: Who can participate?

A: Simple: I am looking for the widest variety of people possible, but they must be fluent in English, and be at least 18 years old. Because the study is online, participants must also have internet access.

Q: What is the study about?

A: The study looks for differences in how people make decisions. It consists of responding to questions and performing a few decision-related tasks online. The study poses no risk and no discomfort to participants.

Q: Why should I do the study?

A: There is no direct and immediate benefit to you for participating in this study. However, your participation would really help Georges with his dissertation research, which aims to eventually inform methods to improve people's decision-making.

Q: What do I need to do?

A: Simply click on "continue" below and you will be asked to answer some questions, perform some decision tasks, and provide basic demographic information. Note that your participation in this project is voluntary. You can skip or refuse to answer any survey question that makes you feel uncomfortable. You can decide to leave the study at any

time.

Q: How long does it take?

A: The study itself usually takes about 30 minutes, and has to be done in one sitting.

Q: What will you do with my responses?

A: The study is anonymous. You are not asked to provide any personally identifying information. There is no way for me or anyone else to connect responses with specific individuals. There is also no way for me or anyone else to know whether or not you chose to participate. The study data will be analyzed and, hopefully, published. It is kept confidential to the extent provided by federal, state, and local law. However, the Institutional Review Board or university and government officials responsible for monitoring this study may inspect these records. Again, the study is anonymous.

Q: What would I be agreeing to by participating in the study?

A: First, you are authorizing the University of Michigan to use the information from your participation in this experiment for research and teaching purposes. Second you agree not to divulge the nature of the tasks and questions in the study to other potential participants until the study is completed in July 2009. I encourage you to send this e-mail invitation to whomever you think might want to participate, but *please do not comment about the study in any way—positive or negative—as that may influence how that person responds.*

Q: Where can I see the results of the study?

A: The responses will be compiled and analyzed in May and June and a summary of the results will be published on <http://sitemaker.umich.edu/decisionlab/home>. Note that because the study is anonymous, individual results are non-identifiable.

Appendix M

Core Indecisiveness Scale (CIS-22)

Latency

1. When I am in a group that is deciding something, I take longer to make a decision than do other people.
2. I need more time than I actually have when I am faced with making a choice.
3. It takes me a long time to decide on something trivial.
4. I am slow to decide.
5. I take longer to settle on an option than do other people faced with the same options.
6. I make my choice as quickly as possible.
7. Someone tells me that I am taking a long time to choose something.

Not-Deciding

1. I miss the deadline for making a relatively straightforward decision.
2. I intend to make a decision, but wait so long that the opportunity to decide passes.
3. I am undecided about where I stand on a social issue.
4. I fail to make a decision that I had the opportunity to make and feel I should have made.
5. I do not have an opinion on an important matter that others have opinions on.
6. A decision that I am expected to make remains unmade.
7. I abstain from a decision.
8. I “sit on the fence” after those around me have already committed to something one way or the other.

Changing

1. I change my mind after I choose something.
2. I try to undo the effects of a previous decision I made.
3. I have a change of heart about a commitment I made.

4. I make what I think is a final choice, but then end up switching it later.
5. I commit to something, but then change my mind and break the commitment.
6. Someone tells me that I am flip-flopping on a choice that I have already made.
7. I commit to something, but then change my commitment more than once.
8. Someone points out that I am making a decision that is not consistent with a previous decision that I made.

Appendix N

Proximal Behavioral Contributors – Study 3

Decisional Procrastination

1. I waste a lot of time on trivial matters before getting to the final decision.
2. When I have to make a decision, I wait a long time before starting to think about it.
3. I delay making a decision until it is too late.
4. I put off making a decision.
5. I avoid thinking about a decision even though I know I will eventually have to make it.
6. Once I know I have a choice to make, I do not put off thinking about it.

Buck-passing

1. I leave a decision to someone else.
2. I avoid taking the responsibility to make a decision.
3. If a decision can be made by me or by another person, I let the other person make it.
4. I let someone who is better informed decide for me.
5. I try to get out of having to make a decision.
6. I ask others to decide for me when I know that I should be deciding.

Impasse

1. I get stuck for a while when making a decision.
2. When I am thinking about what to choose, there reaches a point where I don't know how to proceed.

3. I end up thinking in circles when deciding something.
4. When trying to make a decision, I get so overwhelmed that I feel paralyzed.
5. Even after I think that I have made up my mind about something, I have trouble getting myself to “bite the bullet” and actually commit to that decision.

Strategic waiting

1. After making a tentative selection, I wait for a while before committing to it in case I discover something that might change my mind.
2. As soon I decide something, I immediately go with that decision.
3. Once I make a choice, I sleep on it before actually going through with it.
4. When I know exactly what I want and there is pressure to decide, I still do not make my decision final until I have to.
5. I make a decision without much delay, but then wait for the right moment before actually committing to that decision.

Slow processing

1. When faced with a decision, I consider each fact one at a time.
2. I slowly examine the relevant information in a decision.
3. I take my time thinking about my choices before going ahead with one of them.
4. I am not fast at comparing my alternatives.
5. I do not decide in a rush.
6. I deliberately take my time when deciding something.
7. I slow myself down to consider my options more carefully.
8. I make up my mind about something in an unhurried manner.

Extensive processing

1. When making a decision, I collect lots of facts.
2. When faced with a choice, I make the effort to look for more information than is normally given.
3. I research my options before deciding.
4. When I am buying something, I compare the details on the labels.
5. I try to consider several factors when making a simple decision.
6. When I plan something, I make sure I have a backup.
7. When I am presented with two good options, I look for a third option.

Re-processing

1. I double-check everything before making my final commitment.
2. I triple-check things before deciding.
3. I go over the relevant information as often as necessary for the best option to emerge.
4. I re-examine the benefits of an option until I am convinced it is better than other options.
5. I reconsider my alternatives one last time just before I go through with a decision.

Appendix O

HEXACO

Honesty/Humility

Fairness

1. If I knew that I could never get caught, I would be willing to steal a million dollars
2. I would never accept a bribe, even if it were very large
3. I'd be tempted to use counterfeit money, if I were sure I could get away with it

Greed

1. Having a lot of money is not especially important to me
2. I would get a lot of pleasure from owning expensive luxury goods

Modesty

1. I think that I am entitled to more respect than the average person is
2. I want people to know that I am an important person of high status

Sincerity

1. I wouldn't use flattery to get a raise or promotion at work, even if I thought it would succeed
2. If I want something from someone, I will laugh at that person's worst jokes
3. I wouldn't pretend to like someone just to get that person to do favors for me

Emotionality

Anxiety

1. I sometimes can't help worrying about little things
2. I often find myself lying awake in bed and worrying about something

3. If I were a parent, I would probably tend to worry a lot about my children
4. I worry a lot less than most people do
5. Sometimes I feel nervous without really knowing why
6. I rarely, if ever, have trouble sleeping due to stress or anxiety
7. I tend to remain calm even when other people get stressed out
8. I get very anxious when waiting to hear about an important decision

Dependence

1. When I suffer from a painful experience, I need someone to make me feel comfortable
2. I can "tough it out" on my own through any kind of personal hardship
3. When I have a problem, I like to get advice from others
4. I can handle difficult situations without needing emotional support from anyone else

Fearfulness

1. I would feel afraid if I had to travel in bad weather conditions
2. People say that I am a fearless person
3. When it comes to physical danger, I am very fearful
4. Even in an emergency I wouldn't feel like panicking

Sentimentality

1. I feel like crying when I see other people crying
2. I feel strong emotions when someone close to me is going away for a long time
3. People sometimes say that I am not sensitive to others' feelings
4. I remain unemotional even in situations where most people get very sentimental

eXtraversion

Liveliness

1. I am energetic nearly all the time
2. On most days, I feel cheerful and optimistic
3. People often tell me that I should try to cheer up
4. I tend to look on the bright side of a situation more than other people do
5. Most people are more upbeat and dynamic than I generally am

Social boldness

1. I rarely express my opinions in group meetings
2. In social situations, I'm usually the one who makes the first move
3. When I'm in a group of people, I'm often the one who speaks on behalf of the group
4. In a large group discussion, I would only make comments if someone asked me directly
5. I can handle embarrassing social situations better than most people can

Sociability

1. I prefer jobs that involve active social interaction to those that involve working alone
2. The first thing that I always do in a new place is to make friends

Social self-esteem

1. I feel reasonably satisfied with myself overall
2. I feel that I am an unpopular person
3. I sometimes feel that I am a worthless person

Agreeableness

Flexibility

1. People sometimes tell me that I'm too stubborn
2. I am usually quite flexible in my opinions when people disagree with me
3. When people tell me that I'm wrong, my first reaction is to argue with them

Forgiveness

1. I rarely hold a grudge, even against people who have badly wronged me
2. My attitude toward people who have treated me badly is "forgive and forget"
3. I find it hard to fully forgive someone who has done something mean to me

Gentleness

1. People sometimes tell me that I am too critical of others
2. I tend to be lenient in judging other people
3. Even when people make a lot of mistakes, I rarely say anything negative

Patience

1. It doesn't take much to make me angry
2. People think of me as someone who has a quick temper
3. I rarely feel anger, even when people treat me quite badly
4. Most people tend to get angry more quickly than I do
5. People can approach me without having to worry about the mood I'm in

Conscientiousness

Diligence

1. I often push myself very hard when trying to achieve a goal
2. People sometimes call me a "workaholic"

3. Often when I set a goal, I end up quitting without having reached it
4. I do only the minimum amount of work needed to get by
5. I tend to give up on a task if it seems very difficult
6. I tend to procrastinate a lot before really getting to work on a project

Organization

1. I like to keep all my belongings stored in their proper place
2. I plan ahead and organize things, to avoid scrambling at the last minute
3. When working, I sometimes have difficulties due to being disorganized

Perfectionism

1. I often check my work over repeatedly to find any mistakes
2. When working on something, I don't pay much attention to small details
3. I always try to be accurate in my work, even at the expense of time
4. People often call me a perfectionist
5. Even when writing a personal letter, I read it over to make sure there are no errors

Prudence

1. I make decisions based on the feeling of the moment rather than on careful thought
2. I make a lot of mistakes because I don't think before I act
3. I don't allow my impulses to govern my behavior
4. I usually stop myself before doing anything that I might later regret
5. Sometimes I do things on impulse that turn out later to be unwise
6. I prefer to do whatever comes to mind, rather than stick to a plan

Openness

Aesthetic appreciation

1. I would be quite bored by a visit to an art gallery
2. I wouldn't spend my time reading a book of poetry
3. If I had the opportunity, I would like to attend a classical music concert

Creativity

1. I prefer doing things the way I've always done them, rather than waste time looking for a new way
2. I would like a job that requires following a routine rather than being creative
3. I have often solved problems by using new ideas that other people had not imagined
4. I would enjoy creating a work of art, such as a novel, a song, or a painting
5. People have often told me that I have a good imagination
6. I don't think of myself as the artistic or creative type

Inquisitiveness

1. I'm interested in learning about the history and politics of other countries
2. I find TV nature programs to be very boring
3. I've never really enjoyed looking through an encyclopedia

Unconventionality

1. I like hearing about opinions that are very different from those of most people
2. I think that paying attention to radical ideas is a waste of time
3. I like people who have unconventional views
4. I find it boring to discuss philosophy

Appendix P

Optimistic Bias Task

In the next few pages, you will be asked some questions about five events that could occur in the future.

(Page 1)

Using the scale below, rate how likely you think it is for the following events to occur to the average North American of your age and gender in the next 5 years.

1	2	3	4	5	6	7
No chance	Very unlikely	Unlikely	Moderate chance	Likely	Very likely	Certain to happen

- Being involved in a serious car accident
- Food poisoning
- Losing a job
- Going on a vacation that ends up being a disaster
- Being the victim of a mugging

(Page 2)

Using the scale below, rate the extent to which one could prevent the following events from occurring in the next 5 years.

The risk of occurrence cannot be reduced	The risk of occurrence can be reduced by a little.	The risk of occurrence can be reduced by a lot.	The event is completely preventable.
--	--	---	--------------------------------------

Note: The same five events are used and order is randomized on each page by computer

(Page 3)

Using the scale below, rate how serious each of the following events would be if they occurred in the next 5 years.

Not at all serious Slightly serious Serious Very serious Extremely serious

(Page 4)

Using the scale below, rate how likely you think it is for the following events to occur to you in the next 5 years.

1	2	3	4	5	6	7
No chance	Very unlikely	Unlikely	Moderate chance	Likely	Very likely	Certain to happen

Appendix Q

Sinking Ship Task

Part 1

Imagine you are on sailboat cruise on the South Pacific Ocean. You are below deck when the captain shouts down that the ship is sinking. You look out the window and see a desert island not far in the distance. You think you can swim to it.

As you run to get out and off of the ship, you spot several objects on the way that might be useful on the desert island. With a bag in one hand, you use the other hand to grab one thing from each pair of items that you run past.

Don't take too much time, or the ship will sink with you on it!

Which do you grab?

- | | |
|------------------------|---------------------------------|
| 1. A) a metal bowl | B) magnifying glass |
| 2. A) a popular novel | B) an almost fully charged iPod |
| 3. A) rain poncho | B) fleece blanket |
| 4. A) cooking pot | B) water purification tablets |
| 5. A) bug repellent | B) sunscreen |
| 6. A) an axe | B) first aid kit |
| 7. A) a compass | B) diving mask and snorkel |
| 8. A) 10 feet of rope | B) a hunting knife |
| 9. A) a box of matches | B) flare gun with 1 flare |
| 10. A) hand mirror | B) a toothbrush |

(Part 2)

Meanwhile, back on the desert island...

After getting to shore safely and exploring around the island for a few days, you suddenly come across a couple at their makeshift camp. They are also apparently shipwrecked.

They greet you and start up a friendly conversation. When you suggest sticking together, however, they insist on going their own way. You decide to respect their wishes.

You then notice that they have managed to salvage quite a few things from their ship, including the same kinds of items you left behind on your ship. *Their items are all in working condition, but your items are clearly in better condition.* They too realize this, and propose 10 trades. For each trade, choose which item you want in the end. It can be the item you grabbed from the sinking ship and already have, or the item they are offering in trade.

Trade #1: A metal bowl for a magnifying glass. Which do you want?

Trade #2: A popular novel you haven't yet read for a fully charged iPod with headphones. Which do you want?

Trade #3: A rain poncho for a fleece blanket. Which do you want?

Trade #4: A cooking pot for water purification tablets. Which do you want?

Trade #5: Insect repellent for sunscreen. Which do you want?

Trade #6: A small hatchet for a first aid kit. Which do you want?

Trade #7: A compass for a diving mask with snorkel. Which do you want?

Trade #8: 10 feet of rope for a hunting knife. Which do you want?

Trade #9: A box of matches for a flare gun with 1 flare. Which do you want?

Trade #10: A hand mirror for a toothbrush. Which do you want?

Appendix R

Status Quo Bias Task

Next, imagine you currently have a good job at Company A on the East Coast. Recently you have been approached by colleagues at other companies with job offers. Your choices are:

- 1) Remain at Company A: very prestigious company, high salary, fair job security.
- 2) Company B: West Coast, low prestige company, high salary, good job security.
- 3) Company C: Midwest, low prestige company, moderate salary, very good job security.
- 4) Company D: West Coast, prestigious company, moderate salary, good job security.

NOTE: There are a total of four versions of this task, one with each company in the status quo position. The order of the remaining companies is rotated in each version.

Appendix S

Principal Component Analyses for the BIS and CIS in Studies 1, 2, and 3

Study 1

A principal components analysis was conducted on the 62 BIS items using oblique rotation because the factors were believed to be correlated. A total of 13 factors with Eigenvalues greater than 1 were extracted that together explained 57.80% of the variance. Although the scree plot suggested four factors, the rotation failed to converge in 25 iterations.

Study 2

A principal components analysis was conducted on the 10 CIS items using oblique rotation because the factors were believed to be correlated. Two factors with Eigenvalues greater than 1 were extracted that together explained 56.25% of the variance (see table below). Factor 1 is a combination of not-deciding and changing decisions items, whereas factor 2 consists of prolonged latency items. CORE7 failed to load on either factor.

Principal Components Analysis of the 10-Item CIS in Study 2

Factor	1	2
Eigenvalue	4.83	1.10
% variance explained	45.81	10.45
When I am in a group that is deciding something, I take longer to make decision than do other people.		-.596
I need more time than I actually have when I am faced with making a choice.	.362	-.441
It seems that deciding on the most trivial things takes me a long time.		-.929
I am slow to decide.		-.819
I miss the deadline for making a relatively straightforward decision.	.594	
I intend to make a decision, but wait so long that the opportunity to decide passes.	.814	
I am undecided about where I stand on a social issue.		
I change my mind after I choose something.	.606	
I try to undo the effects of a previous decision I made.	.864	
I have a change of heart about a commitment I made.	.728	

Study 3

A principal components analysis was conducted on the 22 revised CIS items using oblique rotation because the factors were believed to be correlated. Four factors with Eigenvalues greater than 1 were extracted that together explained 60.15% of the variance. Factor 1 consists chiefly of prolonged latency items. Factor 2 consists changing decisions

items. Factor 3 consists of withholding commitment items, and factor 4 consists of failure to decide items.

Principal Components Analysis of the 22-Item CIS in Study 3

Factor	1	2	3	4
Eigenvalue	8.63	2.06	1.36	1.19
% variance explained	39.22	9.36	6.19	5.39
When I am in a group that is deciding something, I take longer to make a decision than do other people.	.718			
I need more time than I actually have when I am faced with making a choice.	.574			
It takes me a long time to decide on something trivial.	.662			
I am slow to decide.	.793			
I take longer to settle on an option than do other people faced with the same options.	.745			
I make my choice as quickly as possible. (Reversed)	.648			
Someone tells me that I am taking a long time to choose something.	.704			
I miss the deadline for making a relatively straightforward decision.				-.766
I intend to make a decision, but wait so long that the opportunity to decide passes.				-.766
I am undecided about where I stand on a social issue.			.794	
I fail to make a decision that I had the opportunity to make and feel I should have made.				-.599
I do not have an opinion on an important matter that others have opinions on.			.819	
A decision that I am expected to make remains unmade.				-.886
I abstain from a decision.	.320			
I "sit on the fence" after those around me have already committed to something one way or the other.	.602			
I change my mind after I choose something.		.743		
I try to undo the effects of a previous decision I made.		.574	.310	
I have a change of heart about a commitment I made.		.838		
I make what I think is a final choice, but then end up switching it later.		.785		
I commit to something, but then change my mind and break the commitment.		.724		
Someone tells me that I am flip-flopping on a choice that I have already made.		.601		
Someone points out that I am making a decision that is not consistent with a previous decision that I made.		.426		

The PCA of the BIS yielded 13 factors with Eigenvalues greater than one, but the rotation failed to converge making it difficult to compare with the final confirmatory factor analysis (CFA) in Study 1. The fact that the former was conducted on 62 items and the latter on only 18 items suggests that many of the items themselves were ill-conceived.

Nevertheless, in Study 2 the PCA of the CIS had two factors whereas the corresponding CFA had three factors. Moreover, one of the PCA factors was clearly a fusion of two of the factors from the CFA. This suggests that in Study 2, the factor structure of the CFA had some validity.

Finally, in Study 3 the four factors in the PCA were identical to those in the CFA. Furthermore, most items loaded onto the same factors in both analyses. This increased degree of convergence lends further support to the four indecisiveness dimensions found in Study 3.

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