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Thinking Can Be Dangerous: How Increased Cognitive Deliberation about Political  
Candidates Impedes Political Decision Making

A Dissertation Presented

By

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Abstract of the Dissertation

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Recent empirical evidence suggests that unconscious thinking, or the problem-solving that occurs when a person's conscious attention is directed at some other task, improves the quality of decisions that people make. This finding has very exciting implications of political decision making, as most people are generally uninterested in politics. As such, by learning to harness the power of unconscious thought processes, people may be able to increase the accuracy of their political decisions without necessarily increasing the effort that they consciously expend during the decision making process.

To examine the effectiveness of unconscious thinking for political decision making, an experimental paradigm was adapted from the decision making process examined in the existing literature to ensure that the two processes were theoretically equivalent. More specifically, across five experiments, participants first learned the political preferences of several candidates vying for office, and then were randomly assigned to think about the information they learned consciously, unconsciously or not at all. After thinking, participants decided which candidate they would vote for. Participants voted for the correct candidate if they chose the most ideologically proximate candidate.

The effectiveness of these differential styles of thinking was highly inconsistent across the five studies. In the first study, strong support was found for the beneficial effect of unconscious thinking on correct voting. This effect, however did not replicate in the subsequent studies. More specifically, in some studies, unconscious thinking seemed to be weakly preferable to conscious thinking while in others conscious thinking was more effective. Thus, it is not possible to conclude that the either conscious or unconscious thinking was a more effective style of thinking. The implications of the results and possible reasons for the null effects are discussed.

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## Chapter 1 – Introduction

When a random person meets a political scientist, most of the time they immediately confess that they do not care about politics. This observation corresponds with research demonstrating that people have very little knowledge about political groups, events and individuals. Furthermore, most people are not adequately interested in politics to spend their time searching for information that could increase their level of political sophistication (Delli Carpini and Keeter, 1996). The depressingly small amount of knowledge and interest the average person has about political affairs poses an obvious barrier to the effective functioning of a democratic society: if people do not care about politics how can they be good citizens?

The traditional solution to this problem is to attempt to externally stimulate interest in politics. Consequently, normative political scientists advocate the use of educational tools aimed at increasing interest in political events in the hopes that citizens will eventually internalize the importance of politics in their lives. This is not the approach that I take in this project. Rather, I accept that people truly do not care about politics. Instead of artificially inducing idealistic political behavior, I focus on how the central political outcomes, specifically the choices that citizens make in the voting booth, can be effectively achieved without fundamentally altering the intrinsic lack of political interest. My goal is to demonstrate that a citizen does not need to have high levels of political knowledge in order to function effectively as a political decision maker.

When talking about decision making, regardless of whether the decision is who to vote for, whom to marry, or even what car to buy, it is necessary to assume that the decision maker wants to make the “correct” choice. This does not insinuate that people always make the correct choices but rather that the mistakes that they make are unintentional, and hence stochastic. Without assuming that people inherently want to make the best decisions possible, the whole idea of studying decision making becomes absurd. Moreover, just because people may not be particularly interested in the content of their decisions does not mean that they want to make the incorrect choice. As such, so long as people are making the political decisions that are correct for them, they are not required to have encyclopedic levels of political knowledge.

But how do people make accurate decisions, or at least decisions that accurately reflect their preferences? It is often assumed that people should think carefully about important decisions, meaning they should engage in effortful conscious decision making. Specifically, one should derive a complete set of implications and outcomes that could result from each course of action, weigh each possibility by its importance to the ultimate decision, and act on the basis of these calculations. The intuitiveness of this style of careful conscious decision making underscores the apparent lunacy of the opposite style of decision making. Surely, deciding willy-nilly is not an effective strategy for making correct decisions. Most people, most of the time, however, fall dramatically short of intense, reasoned, conscious decision making.

Recent empirical evidence, however, has begun to challenge the benefits of conscious thinking on a person’s ability to make choices that accurately reflect his or her

preferences. Dijksterhuis (2004) has demonstrated that a phenomenon dubbed *unconscious thinking* actually leads people to decisions that more accurately reflect their internal preferences than the more common-sense based method of thinking carefully. Before delving into a discussion of the costs and benefits of thinking consciously versus unconsciously, a quick definition of unconscious thinking must be offered, as the first several times one hears the term it sounds utterly ridiculous. For the purpose of this project, I borrow the definition of unconscious thinking used by Dijksterhuis and Nordgren (2006: 96) “Unconscious thought refers to object-relevant or task-relevant cognitive or affective thought processes that occur while conscious attention is directed elsewhere ... Conscious thought is thought with attention; unconscious thought is thought without attention.”

Dijksterhuis and his collaborators find that unconscious thinking is advantageous when making complicated decisions (Dijksterhuis, 2004, Dijksterhuis et al 2004, Dijksterhuis and Nordgren 2006). Thus paradoxically, unconscious thinking is most effective in the precise situations where common sense suggests that thinking carefully is necessary. Given the fact that most political decisions are relatively complex, these findings provide an exciting opportunity to test whether this low effort thinking strategy can actually increase the accuracy of an individual’s political decisions without changing his basic interest in the subject.

In the pages that follow, I examine the different methods of thinking that lead to accurate political decision making strategies. To do this, I examine the impact that various styles of thinking have on people’s abilities to make accurate decisions, or decisions that accurately reflect their preferences.

### *Making Political Decisions*

The majority of the decisions that people make in their daily lives are apolitical and it is precisely these apolitical decisions that have dominated the empirical investigations of decision making in psychology. While at a general level, various decision making techniques are interchangeable. Political decisions, however, differ from apolitical decisions in important ways that caution the automatic extension of the existing decision making findings to the political domain. As suggested above, although political decisions have enormous implications on our everyday lives, most people simply do not care about politics (Delli-Carpini and Keeter, 1996). Thus, by the standards outlined by political theorists, most citizens are woefully unqualified to make political decisions in the first place. Further, when voting for political candidates, the prototypical political choice, the candidate’s preferences, as well as the mass public’s, vary on a number of relevant dimensions. This is further complicated by the fact that candidates intentionally obfuscate their true attitudes in order to appeal to a wider constituency (Franklin, 1991). Moreover, political decisions are highly abstract, making it difficult to see the direct outcomes of our choices: simply voting for a candidate that supports your side of an issue does not guarantee that you will be happy with the final outcome of the political process. In short, political decisions are distinct from apolitical decisions in that they are more complicated and people are generally less invested in the decisions.

So, how do people go about making political judgments? What process do they follow? According to Zaller (1992), people follow four stages.<sup>1</sup> First, in the reception stage people must be exposed to information. Logically, if people are not exposed to new information, their attitudes will not change, or at least there is no mechanism for informational influence to occur. Second, during the acceptance stage, people evaluate the information, deciding whether this information should influence their attitudes or preferences. People can filter out potentially irrelevant or invalid messages. In addition, people can counter argue attitudinally incongruent information preventing it from influencing their preferences and judgments. The first two stages of Zaller's model are less integral to my project, and therefore I will not spend further time discussing them.

During the third stage of political information processing, people must integrate the information that they accept into their memory structures. In other words, this is the stage where people consciously thinking about the political decisions that they are going to make. This is the untested portion of Zaller's model and is the focus of this dissertation. Zaller argues that with the current methods of inquiry – surveys – it would not be possible to directly examine the manner in which people integrate information into their long term memory. I will focus on this stage of the information processing stream throughout this dissertation.

The final stage of Zaller's model is the sample or retrieval stage, where people attempt to access the available considerations that go into their attitudes or preferences. It is this sample of available considerations that survey respondents report when they answer survey questions. Essentially, it is in this final stage where people actually state their attitude or make their decision, and therefore, the stage where the measurement of the quality of an individual's decision can be assessed. A visual depiction of Zaller's model can be seen in Figure 1.

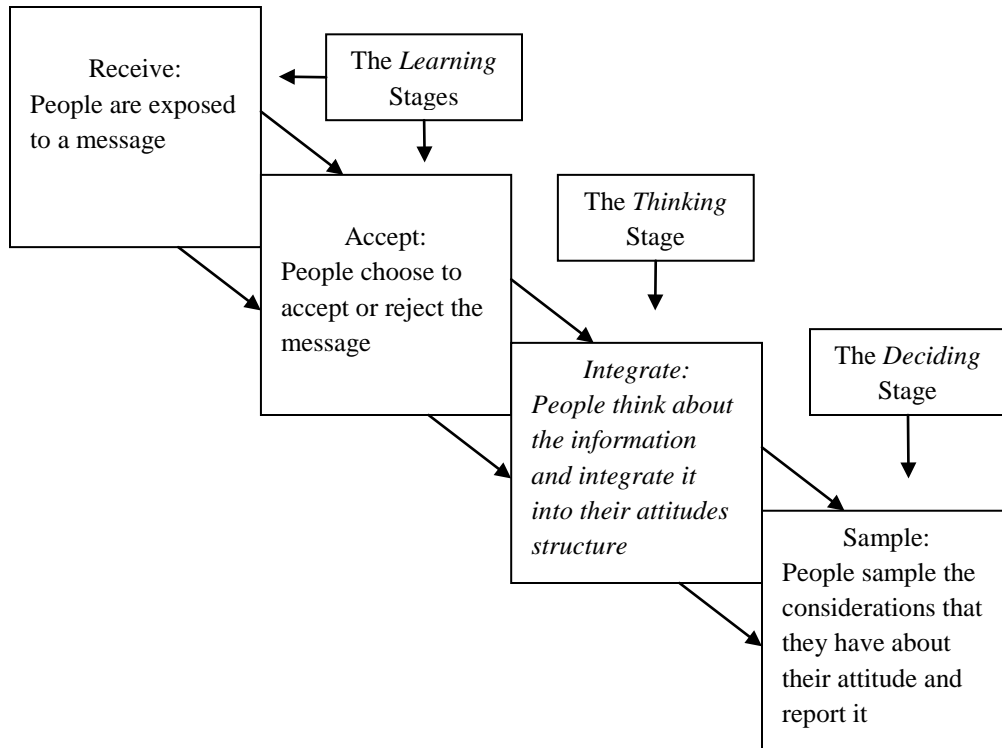
The problem with Zaller's model is that its theoretical expectations derive from assumptions that are empirically testable. This is especially true of the integration portion of his model. Zaller is right that the assumptions of his model are not directly testable, but only in the restricted world of survey methodology. If one moves away from surveys toward more controlled experimental procedures, then the integration mechanisms that Zaller dismisses as "untestable" can be empirically analyzed. In fact, it is precisely this integration mechanism that I focus on in this dissertation.

How do diverse ways of thinking about an issue lead people to integrate specific information into long term memory? How do differences in information integration affect the decisions people make? I examine whether in-depth consciously thinking about a problem and integrating information into long term memory leads to better or worse decisions than unconscious thinking? Under what conditions each style of thinking results in superior decisions? My goal throughout this dissertation is to explore the ways that conscious and unconscious thinking improve or impair the accuracy of decision making. Specifically, when people engage in unconscious thinking, is there an increase in the accuracy of the political decisions they make?

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<sup>1</sup> His original model is the Receive-Accept-Sample model, but he admits that there is likely a more accurate Receive-Accept-Integrate-Sample model. I will focus on the latter, as the project will examine the way that people think about information and integrate it into their existing memory.

**Figure 1-1: The Response – Accept – Integrate – Sample Model Proposed by Zaller (1992)**



### **Thinking Consciously: Franklin’s Rule**

First, let us examine the most widely accepted method of thinking and reasoning that exists: effortful conscious thinking typified by rational decision makers making well reasoned choices. The intuitive explication of this style of thinking is best captured by Benjamin Franklin who asserts:

Follow your own judgment. If you doubt, set down all the reasons, pro and con, in opposite columns on a sheet of paper, and when you have considered them two or three days, perform an operation similar to that in some questions of algebra; observe what reasons or motives in each column are equal in weight, one to one, one to two, two to three, or the like, and when you have struck out from both sides all the equalities, you will see in which column remains the balance. It is for want of having all of the motives for and against an important action present in or before the mind at the same time, that people hesitate and change their determinations backwards and forwards day after day, as different sets of reasons are recollected or forgot, and if they conclude and act upon the last set, it is perhaps not because those were the best, but because they happen

to be present in the mind, and the better absent. This kind of Moral Algebra I have often practiced in important and dubious concerns, and tho' it cannot be mathematically exact, I have found it to be extremely useful.

I refer to this style of thinking as Franklin's Rule. According to Franklin's advice, the first thing a person should do when attempting to solve a problem of any sort is to write down all the relevant considerations they can think of over an extended period of time. Although, Franklin suggests this should take a number of days, the key is not so much the time as the enumeration of an exhaustive set of consequences that may result from either choice. Once all of the possible considerations have been enumerated, the list of considerations should be separated into positive and negative attributes, each assigned a separate importance rating or decision weight. Finally, the decision maker should cancel out the positives and the negatives until there are only positive considerations left in one of the two columns. Then the decision maker should decide in favor of the option that has the most positives or least negatives remaining.

It is possible that the threshold that Franklin sets for consciously thinking about choices is less stringent than the ideal level that most rational choice theories imply. Franklin's style of decision making still requires more effort than most people are willing to expend on any decision they make, and it almost certainly exceeds what we would expect of average citizens making political decisions they don't care about (Delli-Carpini and Keeter, 1996; Converse, 1964). Rather than focusing on this unattainable level of political interest, I focus on a more attainable level of involvement. Still in the spirit of Franklin's Rule, it stipulates that the more carefully a person thinks about politics the more likely that they are going to make a good political decision. Essentially, Franklin would agree that cognitive effort is good, and more is better.

The essence of this belief can be seen in the development of several dual-process models of attitudes such as the Elaboration Likelihood Model (ELM: Petty and Cacioppo, 1986) or the Heuristic-Systematic Model (HSM: Eagly and Chaiken, 1993). According to these dual-process models, effortful cognitive information processing should reduce the potential for irrelevant information to affect judgments in many situations. By examining the differential impact of strong or weak arguments, researchers have demonstrated that strong arguments led to more attitude change compared to weak arguments when people have the ability and motivation to process the information carefully (Petty, Cacioppo and Goldman, 1981; Petty and Cacioppo, 1986; Petty and Wegener, 1998). People who are neither willing nor able to process the information carefully are not differentially influenced by the strong arguments which require effortful processing. In other words, according to the ELM and HSM, people who think carefully about an issue should be in the best position to reason their way to accurate judgments, and therefore make the best possible decisions.

From Franklin's Rule I derive my first hypothesis. Accordingly, the *Conscious Thinking Hypothesis* posits that conscious thinking should be preferable to all other styles of thinking in all situations. This hypothesis is the primary foil for the other hypotheses presented in this paper, but it plays a central role in the development of the argument. After all, conscious thinking is the keystone of lay theories of decision-making and as

such is the minimum threshold by which other styles of decision making must exceed to be seriously considered.

### *Problems with Franklin's Rule*

The problem with Franklin's Rule is that people are terrible at thinking this way (Simon, 1955; Kahneman and Tversky, 1974): the requisite computational capacity is too immense (Miller, 1956); people are unable to accurately weigh information (Dawes, 1979); people are highly susceptible to bias even when they intentionally attempt to be unbiased (Taber and Lodge, 2006) and unduly influenced by the order in which information is presented (Miller and Campbell, 1959; Luchins, 1957; Krosnick and Alwin, 1987). Basically, people do not think this way. Franklin set the bar way too high for anyone to actually make decisions in this manner.

One of the reasons that people are subject to cognitive pitfalls and biases in their decision making is that they quickly forget information. According to research on memory, the ability to recall information declines rapidly at first, and then stabilizes at a surprisingly low level (Watts and McGuire, 1964; Hastie and Park, 1986). The evidence guiding one's decisions cannot be based on the specific information that led to the initial attitude because one inevitably forgets these specific facts. Instead, people base their judgments on the general emotional theme or affective gist of the information that they have encountered.

The online model suggests this gist takes the form of an online evaluative tally for attitude objects (Hastie and Park, 1986; Lodge, McGraw and Stroh, 1989). When information is encountered, it is effortlessly incorporated into one's online tally using the information's evaluative gist: the details are forgotten and only the evaluative tally remains. When asked why they like or dislike the object, people provide justifications which are consistent with the attitudes they hold, but are not necessarily the actual reasons that led to the formation of the attitude (Betsch et al, 2001). Importantly, the presence of the attitude object is sufficient to bring this evaluative tally back into working memory (Lodge and Taber, 2005). If the object is a politician, each bit of information a person is exposed to influences the person's evaluation of the politician, while the specific information is forgotten. As such, when it comes time to decide, all an individual needs is his online evaluation, and not a laundry list of considerations.

In addition, human beings are subject to severe cognitive limitations. It is only possible for the average person to hold roughly seven, plus or minus two, pieces of information in working memory at any given point in time (Miller, 1956). Consequently, the limitations on conscious information processing require that people ignore most of the available information, relying on a selection of information that happens to be salient or available at the time of the decision (Simon, 1955). Accessible information dominates the decision making process even if it is not the most important or relevant information to the decision at hand (Tversky and Kahneman, 1973, 1974). Therefore, when people actively think about information they pull as much information as they can into conscious working memory, including irrelevant information that should not be incorporated into their decision calculus.

Another possibility for why relying on Franklin's Rule impedes accurate decision making is that each consideration that is brought into working memory is not necessarily independent. Thinking one thought activates a network of related thoughts which are



then brought into working memory (Anderson, 1983; Read and Miller, 1998). This is likely to lead to biased memory searches, where it is easier to access considerations that are affectively or semantically consistent with the concepts currently in working memory (Kunda, 1990). Therefore, the reported decision or attitude statement is a function of the initial consideration that was brought into working memory when the question is asked (Zaller and Feldman, 1992). The more a person thinks about the question, the more information is activated, and the greater the probability that some of the information is irrelevant to the specific decision at hand. If a person engages in effortful conscious thinking, the initial considerations he accesses are the last statements that he heard (which may or may not be representative of his broad attitude). The more he thinks about an issue, the more likely he will be led astray by the thoughts that happen to be accessible (Cassino and Lodge, 2008). In other words, recency effects likely bias effortful conscious thinking.

The study of unconscious thinking is a new and rapidly expanding line of research in psychology, but there is very little work that has examined this research question in political science. The closest that political science has come to examining the effect of in-depth conscious thinking on political decision making is Zaller and Feldman's (1992) survey response paper. Zaller and Feldman argue that an individual's survey responses are a snap-shot of the accessible considerations available when a question is asked. Therefore, survey responses are not necessarily respondent's true attitudes, but a sample of their attitude relevant considerations that was temporarily accessible at the time when they are asked to make a decision and state their attitude. When people were asked to stop and think about the factors they believe should influence their attitudes, response stability decreased. Essentially, the considerations that people enumerated were not entirely representative of their true attitudes. Instead, when asked to consciously think about the reasons for their attitudes, respondents tried to conjure up as much relevant information as possible, including information that was not central to their beliefs. When they integrated all of this information into a summary evaluation, the attitudes they professed were not necessarily indicative of their true attitudes, as indicated by higher levels of response instability.

These problems highlight the importance of searching out alternative styles of thinking that outperform careful conscious thinking. Two prominent alternatives exist. The first is making gut-level snap judgments through reliance on cognitive shortcuts. Second is a more active style of thinking that happens without conscious control: unconscious thinking. Each will be discussed in turn.

### **Unconscious Thinking**

The preceding discussion suggests that consciously thinking about a problem, at least in some circumstances, leads to suboptimal decisions. The primary alternative to in-depth conscious thinking that I present throughout this project is unconscious thinking. On its face, unconscious thinking sounds like an oxymoron. How can someone think unconsciously? Thinking is an active, effortful process. It is difficult to imagine how unconscious processes can take such an active role in decision making. Moreover, unconscious thinking is perhaps the quintessential unobservable cognitive process. There is no way to directly observe unconscious thinking as it happens and the existing methods

to assess conscious thinking are antithetical to unconscious thinking. For example, research examining how people solve problems and make decisions asks participants to verbalize the steps that they take and the accessible thoughts that guide this process (Newell and Simon, 1972). The process of measuring thinking in these studies is antithetical to unconscious thinking. By asking participants about their thoughts, the thoughts become conscious and explicit, effectively excluding the possibility that people think unconsciously.

### *Effects of Unconscious Processes*

Prior research has demonstrated that unconscious processes play an active role in cognition. In this section I demonstrate that the unconscious has a clear impact on thoughts and behaviors to the point that unconscious processes can be invaluable in the decision making process.

One way prior research has demonstrated the effectiveness of unconscious thinking processes is by presenting information to people in such a manner that there is no plausible way that the information can be processed consciously. According to Bargh (1994), automatic processes are immediate, uncontrollable, efficient and unintentional. Although automaticity is only one type of unconscious process, for the most part, Bargh's insights into automatic, or non-conscious, information processing are exactly the characteristics of unconscious thinking. If a behavior is unconsciously motivated, as is true of automatic behaviors, it is not consciously intended or controlled. Some evidence suggests that these unconsciously motivated thoughts and behaviors may be consciously moderated after the fact, but this can only happen if the person is extremely determined to alter his behavior (Moscowitz et al , 1999; Devine, 1989; Wilson, Lindsay and Schooler, 2001).

Based the serious limitations of conscious information processing, people are routinely exposed to much more information than they are aware of consciously. Even though this information is not technically subliminal, the limitations on conscious processing make it impossible to intentionally process all of the information in our environment, leaving most of the information we encounter in a type of limbo at the edges of our awareness. This information presented at the edges of our awareness, however, has a measurable impact on the way that people think, behave and evaluate their environment and the people around them. For example, Bargh, Chen and Burrows (1996) demonstrate that participants, who are subliminally primed with rude-related words, are more likely than individuals subliminally primed with polite-related words to later interrupt the researcher who was engaged in a conversation. When individuals are subliminally primed with elderly-related or African-American-related words they behave in stereotype consistent ways, by walking slower or behaving aggressively, respectively. In sum, people engaged in behaviors while being completely unaware of the reasons for their actions.

Another example of an active unconscious can be seen in the *cocktail party effect* (Moray, 1959). For example, imagine that you are having a conversation in a social setting and you hear someone in another part of the room speak your name. All of the sudden you tune into that distant conversation to find out what that person is saying about you. Importantly, you were not consciously listening to that conversation prior to hearing your name, but you heard your name just the same. For the cocktail party effect to occur,

some unconscious process must monitor every other conversation in ear shot, even if you consciously do not process any of the other information besides the conversation at hand. Thus, when a highly personally relevant cue is presented, like your name, your unconscious immediately directs your attention to that conversation and away from the conversation that you were previously attending to. Therefore, even though you may not be consciously monitoring the environment all of the time, due to limitations on human conscious processing, your unconscious is, because it is not subject to the same limitations as consciousness.

Unconscious information processing also influences people's evaluations of political candidates. Specifically, rather than attenuating the potential bias induced by subliminal information, careful, conscious thinking actually accentuates bias imposed by unconsciously presented stimuli. When people effortfully deliberate about their likes and dislikes of a political candidate, information presented outside of their conscious awareness strongly influences their candidate evaluations (Verhulst, Lodge and Taber, 2008). In this set of studies, participants read information about the beliefs of hypothetical political candidates, which were manipulated to be either similar to or dissimilar from those that the participant expressed in a pretest. While the participants read these statements, they were subliminally primed with either positive or negative words. The participants then immediately evaluated the candidates or evaluated them after writing several statements about what they liked and disliked about the beliefs held by the candidate. We found that subliminal primes had a greater influence on participants that thought carefully than those making immediate judgments. Specifically, positive primes lead to more positive evaluations and negative primes resulted in more negative evaluations for participants who deliberated. Therefore, conscious cognitive deliberation actually exacerbated the effect of the subliminal primes on the evaluations of the candidates. Essentially, additional cognitive effort led participants to incorporate the information that was presented outside of their awareness into their evaluations of the candidates. Effortful processing resulted in greater bias.

Another particularly relevant demonstration of the unconscious taking an active role in information integration is Betsch et al (2001). They asked participants to memorize the content of television advertisements while stock information scrolled across the bottom of the screen (similar to what people would see on various television channels).<sup>2</sup> The stock information suggested that an individual stock went up or down a specific amount. Participants saw a total of 75 pieces of stock information about 15 different stocks (five pieces of information about each stock) over the course of 10 minutes, which is too much for anyone to keep track of while explicitly paying attention to something else. Betsch et al (2001) demonstrated that even though participants were instructed to pay attention to the content of the advertisements, something in their unconscious kept a tally of the stocks' value: the participants were able to accurately order the value of the different stocks. Therefore, subjects must have been keeping some sort of unconscious, on-line tally of the stock information, even though they were not consciously paying attention to it (in fact they were explicitly paying attention to something else).

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<sup>2</sup> News channels typically have other stories scrolling across the bottom of the screen. Sports channels have the earlier scores scrolling across the bottom of the screen.

Another examination of unconscious behaviors is in split-brain patients.<sup>3</sup> When stimuli or instructions are presented only to the right hemisphere of the brains of split-brain patients (the left visual field), patients are unable to verbalize what they are seeing, although comprehension and behavior remains unaffected. For example, Gazzaniga (1998) presented the instructions “take a walk” to the right side of split-brain patients’ brains and the patients began walking around. When these patients were asked what they were doing, they would come up with some sort of rationalization: “I was thirsty and I wanted a drink.” In essence, the split-brain patients did not know why they stood up and began to go for a walk; they just did it without “conscious” control. When asked to explain their behavior, the patients were able to quickly come up with a rationalization. The rationalization, however, was entirely unrelated to the real reason why they engaged in the behavior in the first place (because they were instructed to).

These rationalizations happen all the time in politics. For example, a consistent finding in the projection literature demonstrates that to hold consistent attitudes, voters rationalize their evaluations of political candidates and project their preferences onto them (Martinez 1988). In line with the on-line model of candidate evaluation, Lodge, Steenbergen and Brau (1995) demonstrate that the specific information that led to their initial attitude is forgotten very quickly. This means, as Rahn, Krosnick and Breuning (1994) argue, that the real reason that an individual supports a particular candidate is due more to the rationalization of current feelings towards the political candidate than to the actual evidence that lead the person to form his initial attitude. Thus, voters are effectively engaging in the same processes as Gazzaniga’s split-brain patients.

As can be seen, the unconscious is clearly an active part of our everyday experience: it can lead us to appraise situations automatically, it can influence our behavior, and it can fill in the blanks allowing us to rationalize our behaviors and attitudes. At this point it should be clear that unconscious processes exert a powerful influence over the ways that people think and behave.

The focus of the next section will be on the way that unconscious processes actively process information. Unconscious thinking, as is described in this dissertation, has its basis in some culturally accepted folk wisdom: “Before making an important decision, sleep on it.” Even though this sentiment is not formally accepted by the scientific community, many scientists have suggested that their best ideas simply come to them, or “pop into their heads,” rather than being the product of conscious and effortful deliberation (Koestler, 1989; quoted in Wegner, 2005). Therefore, even though people formally endorse Franklin’s Rule, there is still an informal acceptance of a more

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<sup>3</sup> The split-brain procedure is typically a last resort treatment for severe epilepsy. It entails severing the corpus callosum, which is the central link between the left and the right hemispheres of the brain. This medical procedure creates a unique quasi-experimental situation. Essentially, once the Corpus Callosum is severed, the two sides of the brain act autonomously. Because the visual system is perfectly crossed (the right side of the visual field is presented to the left side of the brain and vice versa), neural hemispheric autonomy allows researchers to present different visual stimuli to each side of the brain. This is important because the right and the left side of the brain engage in different specialized functions. More specifically, the left side of the brain is more central in verbal skills and problem solving.

intangible, unconscious method of decision making. The next question is can the unconscious actively process information in a similar, or even superior, manner to conscious processing strategies.

### *Unconscious Thinking*

The goal of unconscious thinking is to recreate moments often experienced by people who have abandoned a difficult task only to find the perfect solution pop into their head while they are doing something completely different. In such cases, the unconscious continued to think about solutions to the problem, even after conscious attention was directed elsewhere. Take the account of Poincaré, the famous French Mathematician:

I left Caen, where I was then living, to go on a geologic excursion under the auspices of the school of mines. The changes of travel made me forget my mathematical work. Having reached Coutances, we entered an omnibus to go some place or other. At the moment when I put my foot on the step the idea came to me without anything in my former thoughts seeming to have paved the way for it ... [Later, the same thing happened again.] Then I turned my attention to the study of some arithmetical questions apparently without much success and without a suspicion of any connection with my preceding searches. Disgusted with my failure, I went to spend a few days at the seaside, and thought of something else. One morning, walking on the bluff, the idea came to me, with just the same characteristics of brevity, suddenness and immediate certainty (quoted in Wegner, 2002: 82)

Other famous instances of this phenomenon include Archimedes 'discovery' of mass while purportedly taking a bath, or even Newton's 'discovery' of gravity while sitting under an apple tree. Although these examples are likely exaggerated, they align well with the accounts of other scientific discoveries. For example, Albert Einstein attributed his initial insight for his theory of relativity to some unknown unconscious process. He noted: "I was sitting in a chair in the Patent Office at Berne when all of the sudden a thought occurred to me: 'If a person falls freely he will not feel his own weight.' I was startled. This simple thought made a deep impression on me. It impelled me toward a theory of gravitation" (Quoted in Highfield and Carter 1993).

In such cases, it is impossible to directly trace the solution to effortful, careful, deliberate, conscious thinking. Instead, in all of these cases, something else is happening that propelled the solution into the thinker's conscious awareness. Whether these "breakthroughs" could have happened in the course of careful thinking remains unknown. At minimum, these autobiographical reports demonstrate that conscious thinking is not a necessary component of problem solving.

Of course, true eureka moments are exceedingly rare, but more mundane events with the same basic characteristics happen to people all of the time. The tip-of-the-tongue phenomenon is an excellent example, where people have an exceedingly strong feeling that they know something, like a colleague's name or the perfect word to describe something, but they cannot verbalize it. Then while engaged in an unrelated task (like

sleeping), the name of the colleague or perfect word pops into their head. Although this effect is much more mundane than true eureka moments, the psychological mechanism seems similar.

Dijksterhuis and his colleagues have conducted several studies on active unconscious thinking (Dijksterhuis, 2004; Dijksterhuis et al., 2004; Dijksterhuis and Nordgren, 2007). Building on the work of Wilson and Schooler (1991), Dijksterhuis demonstrates that effortful conscious thinking impedes accurate decision making while unconscious thinking improves decision accuracy. In this research project, participants who are distracted from consciously thinking about a problem – forcing them to unconsciously think – made better judgments than individuals who consciously thought about the problem.

The question then becomes, why should unconscious thinking be more effective than conscious thinking? First, because unconscious processes are not subject to the same severe informational limitations as conscious thinking, unconscious thinking should not be as sensitive to informational complexity as conscious thinking. Thus, although conscious processes can handle approximately 7 pieces of information at any given point in time, unconscious processes can handle an enormous amount of information (Norranders, 1998). Looking at visual information processing alone, unconscious processes can integrate over 10,000,000 bits of information per second, nearly all of which is processed unconsciously. As is clear, most of the information that we perceive is not processed consciously.

Second, one of the primary goals of thinking consciously is to bring as much information into working memory as possible. Accordingly, when people search their memories for reasons to support or oppose a choice, they focus on factors that are plausible and easy to verbalize (Wilson and Schooler, 1991). There is no reason to assume, however, that these factors are the actual reasons that led them to form their attitudes in for first place or that the central reasons that lead them to form the attitude are effectively brought into working memory (Wilson and Schooler, 1991; Dijksterhuis 2004; Dijksterhuis et al 2004). Thus, when people think consciously, they will bring some irrelevant considerations into working memory, and these irrelevant considerations may lead them away from making decisions that reflect their preferences.

### *Exploring the Empirical Evidence for Unconscious Thinking*

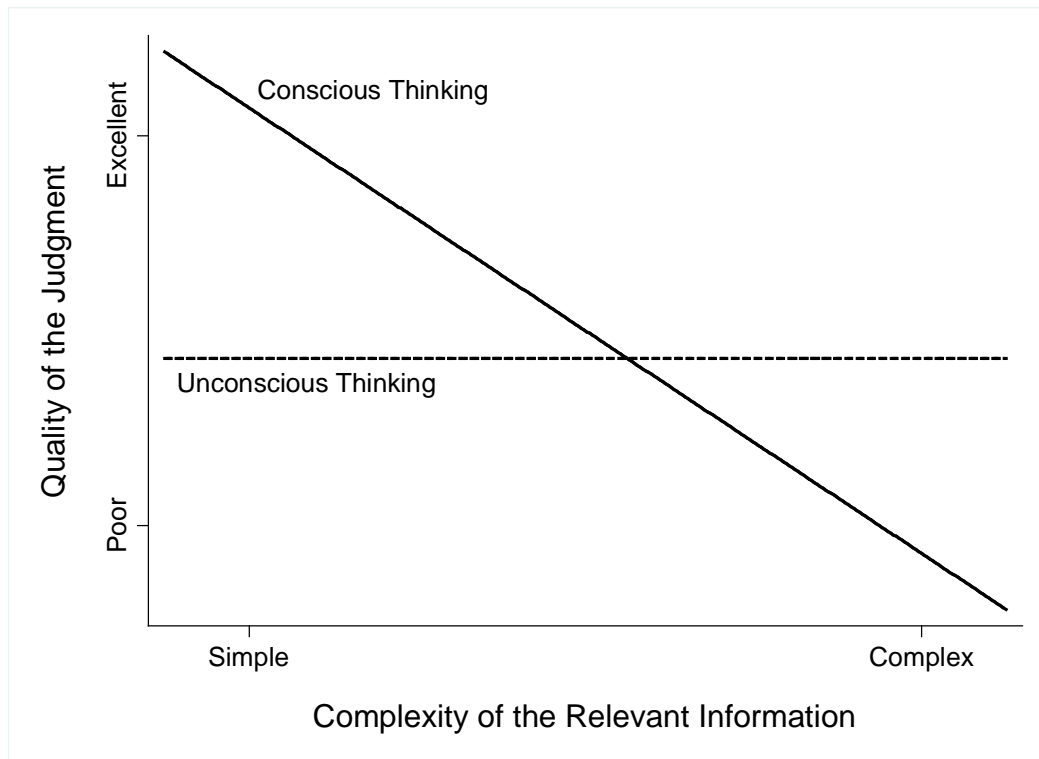
The extant empirical findings pertaining to unconscious thinking offer an important caveat for the effectiveness of unconscious thinking in various settings. Most notably, if a decision is ‘easy’, meaning that the available choices are highly distinct, thinking consciously produces the best results. Essentially, when decisions are very easy, conscious processes are not overwhelmed, and effortful reasoning is an effective way of making accurate decisions. Importantly, this does not mean that unconscious thinking will be highly detrimental to the quality of the decision. In fact, in most cases, when the decision is relatively simple, unconscious thinkers will do fairly well at making the correct decision. The reason conscious thinking is effective in these situations is that conscious thinking can potentially catch the preventable errors that lead unconscious thinkers to make sub-optimal choices.

When the decision is ‘difficult’ however, effortful conscious thinking decreases the quality of the decisions people make (Dijksterhuis and Nordgren, 2006; Wilson and

Schooler, 1991). The existing research suggests that when the information environment is difficult, as people engage in effortful deliberation, the quality of the decision goes down in both objective terms (people make the wrong choice) and in subjective terms (higher levels of post-decision regret; Dijksterhuis and Nordgren, 2006; Dijksterhuis, 2004; Dijksterhuis et al 2004). In stark contrast to Franklin’s Rule, evidence suggests that people are the most satisfied with their decisions when they do not attempt to systematically evaluate every possible piece of information (Wilson and Schooler, 1991).

Many political decisions are difficult, suggesting that in-depth conscious thinking will result in worse decisions. Existing research on unconscious thinking, however, focuses on issues like which jam tastes the best or which apartment is the most appealing, and not more socially relevant issues like which political candidate a person should support in the upcoming election. It is this category of decisions that we are most interested in as political scientists.

**Figure 1-2: Theoretical Expectations for the quality of judgments people make based on their mode of thinking (Adapted from Dijksterhuis and Nordgren 2006)**



The expected effects of conscious and unconscious thinking on the quality of an individual’s decision based on the complexity of the information are presented in Figure 1-2. Two interdependent hypotheses can be derived from the empirical expectations outlined in Figure 1-2 that constitute the unconscious thinking hypothesis. For simple decisions, one would hypothesize that conscious thinking should produce higher quality decisions than unconscious thinking. Importantly, this hypothesis does not differentiate between the expected results for the conscious and unconscious thinking hypotheses. For complex decisions, however, the unconscious thinking hypothesis suggests that

unconscious thinking should result in better decisions or higher levels of correct voting. This prediction clearly contradicts the conscious thinking hypothesis.

### **Snap Judgments**

Another alternative to conscious thinking, that is also distinct from unconscious thinking, is to simply not think about decisions. If the problem is just with thinking, not thinking is a viable alternative. Deciding without thinking suggests that the person relies more on preformed decision rules or heuristics. For example, the most prominent heuristic in politics is the party identification heuristic. In contrast with the effortful process of actually learning what each candidate stands for (Downs, 1957; Fiorina, 1981), the party identification heuristic allows voters to support the candidate of their preferred party and avoid any candidate-specific learning (Campbell et al, 1960; Lau and Redlawsk, 2001).

Narrow-mindedly focusing on a candidate's party affiliation and voting on that basis ignores a great deal of the information that people are exposed to that could potentially lead a person to vote for the opposing political party. More problematic, there is a high level of heterogeneity in the political attitudes of politicians within a single party. Because of the vast number of political issues, it stands to reason that most people will disagree with their party on at least one issue. Accordingly, it is also likely that candidate's will disagree with their party on at least one issue. In fact, bucking the party line is an effective strategic decision for candidates seeking re-election in fragmented electoral districts. As such, simply voting for the candidate of one's favored political party risks supporting a candidate that is actually less ideologically proximate and therefore potentially the wrong choice, at least from a representation perspective.

Lau and Redlawsk (2001) note four other heuristics that are highly prevalent in determining vote preferences. The ideology heuristic suggests people rely on perceptions of an ideological match for their vote choice. The endorsement heuristic is where people rely on their stored evaluation of the endorsing party or individual as the basis for their vote choice. Voters who used the viability heuristic rely on public opinion polls and change their vote preferences on the basis of which candidate can feasibly win the election. Finally, the appearance heuristic occurs when voters prefer the most attractive candidate. Building on the appearance heuristic, Todorov et al (2005) demonstrate that respondents can extract a sense of competence from photographs of political candidates after seeing the photos for only one second. More importantly, this sense of competence predicts the vote differential in real elections.<sup>4</sup>

The heuristics enumerated above, however, are not exhaustive and almost any piece of information that people have available to them can be used as a cognitive shortcut. Sniderman, Brody and Tetlock (1991) also demonstrated that liking a candidate can propel a voter's support in the absence of actual issue information. Lupia (1994) demonstrated another prominent example of successful heuristic use: if people with a low

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<sup>4</sup> Verhulst Lodge and Lavine (2010) demonstrated with this data that competence judgments were a function of even earlier heuristic assessment of age and attractiveness. Furthermore, competence judgments mediated the effects of age and attractiveness on the same vote differentials.



level of political sophistication have one important piece of information (which reference which groups support which policy) they are able to behave as well as people with higher levels of political sophistication. Specifically, using exit poll data from the 1988 California state election where voters were confronted with a complex set of ballot propositions that sought to deal with skyrocketing insurance premiums Lupia demonstrated that politically unsophisticated voters who knew the insurance companies' preferred outcome were more likely to vote like sophisticated citizens. In other words, one specific piece of information allowed voters to act in a highly sophisticated manner.

These heuristic styles of information processing and decision making are highly prevalent in political decision making (Lau and Redlawsk, 2001) as well as in more general situations (Gigerenzer and Goldstein, 1996). Although in some cases it is possible to identify which heuristic people employ, for the current project it is not necessary to identify which specific piece of information people are using as a heuristic. In essence, different people may use idiosyncratic heuristics: some may focus on attractiveness, others on ideology, and still others on likeability. So long as people are using a cognitive shortcut to reduce the cognitive demands on information processing, I can remain agnostic as to which specific piece of information they are using.

Across a wide range of situations, using a wide range of low effort informational cues, people make enough "correct" decisions to ensure the maintenance of the effective short cuts and the extinction of the ineffective heuristics (Gigerenzer and Goldstein, 1996). Heuristics, however, do not offer a panacea for the issue of an uninterested electorate. The problem with this style of heuristic decision making is that although these simple, low-effort mechanisms are able to vastly increase the information processing capacities of individuals, their use is prone to predictable errors. Although heuristics may work quite well in many instances, they lead the decision maker astray a non-trivial amount of the time. For example, Cohen (2003) demonstrated that people would readily support policies that were contradictory to their personal policy preferences so long as the proposal was made by a fellow partisan. Furthermore, this simple informational cue was not overridden when people engaged in effortful, systematic thinking.<sup>5</sup> Therefore, even though heuristics vastly simplify decisions, if we believe that accuracy should be an important criterion in decision making techniques, heuristics still leave much to be desired.

### **Distinguishing Unconscious Thinking from Heuristic Processing**

Although in some ways unconscious thinking may be similar to other styles of low effort information processing, like heuristic processing, the differences in the expectations derived from these various forms of thinking diverge dramatically. In heuristic processing, the judgments and behaviors that people make are a function of some sort of cognitive process that does not require consciously mediated attention.

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<sup>5</sup> According to Petty & Cacioppo (1986) argument quality varies on a continuum. In the case of partisanship, the party identification of the speaker could be a sufficiently strong cue that would allow individuals to process the cue centrally as a strong argument in a political situation. The cue however, would be equally effective if processed heuristically.

Heuristic information processing allows people to simplify their decision making process by relying on cognitive shortcuts while unconscious thinking allows people to integrate a wide range of information, more information than can be consciously culled into working memory at one time, into their judgments. Thus, while heuristics simplify the information people use when making decisions, unconscious thinking results in a global integration of information that is brought to bear on the decision.

Take the results of Lupia (1994), described above, as an example: when unsophisticated citizens had one specific piece of information, their choices mirrored people with much higher levels of political sophistication. Thus, it is not that these people were politically sophisticated, clearly they had low levels of political knowledge, but rather they had an information shortcut that allowed them to circumvent the need for higher levels of political knowledge. This example typifies the difference between heuristic processing and unconscious thinking. Essentially, heuristics allow people to ignore information while unconscious thinking attempts to expand the amount of information that people use in their decisions.

Thus the true distinction between heuristic information processing and unconscious thinking rests on the active nature of unconscious thinking. With heuristic processing, individuals base their decisions on truncated sets of information while for unconscious thinking a wide array of information is incorporated into an individual's preferences. Because unconscious thinkers actively integrate all of the available information into a person's choice, unconscious thinking is more related to active conscious thinking than to low effort heuristic processing. Therefore, when people make decisions between candidates that differ in multidimensional ideological space, thinking unconsciously allows people to integrate information from every dimension into their candidate evaluations. Heuristic processing focuses on a single piece of information. As such, people who think unconsciously should be more likely than heuristic processors to vote for the candidate who most closely approximates their ideological ideal. As with the unconscious thinking hypothesis, this effect should be exaggerated when the decisions are complex, as these decisions are more likely to require multidimensional considerations when choosing between the political candidates.

### **The Complexity of the Decision**

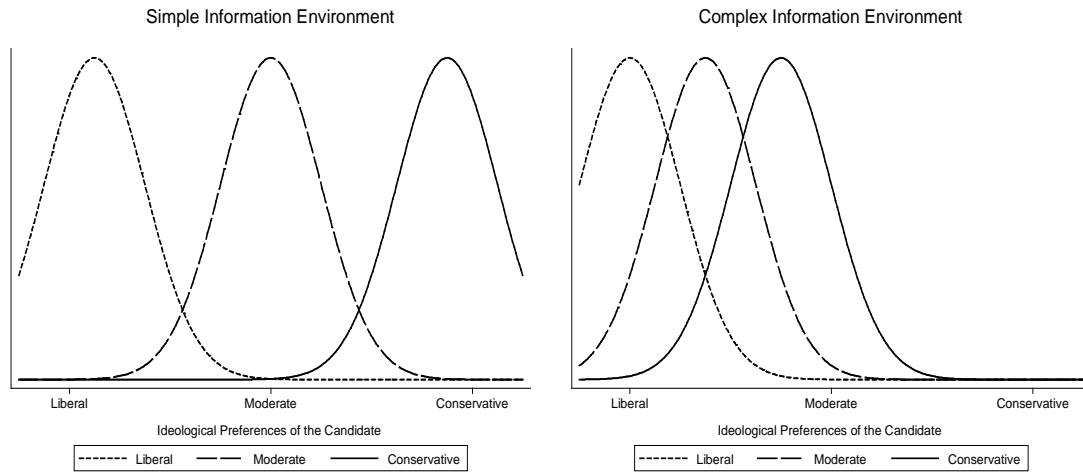
#### *External Information Complexity*

Much of the discussion about the effectiveness of one type of information processing strategy relative to another is related to the complexity of the information that participants integrate into their decisions. There are myriad ways to manipulate informational complexity within the political realm. The simplest way is to manipulate the distinctiveness of the candidates that people will vote for. Highly distinct alternatives make the decision relatively simple while indistinct options are complex. Specifically, if people read about 3 apartments with similarly attractive attributes (all about the same size, price and location), it is fairly difficult to decide between the alternatives. Reciprocally, if people read about 3 apartments that are all very different, with one clearly superior apartment, then the information is fairly easy.

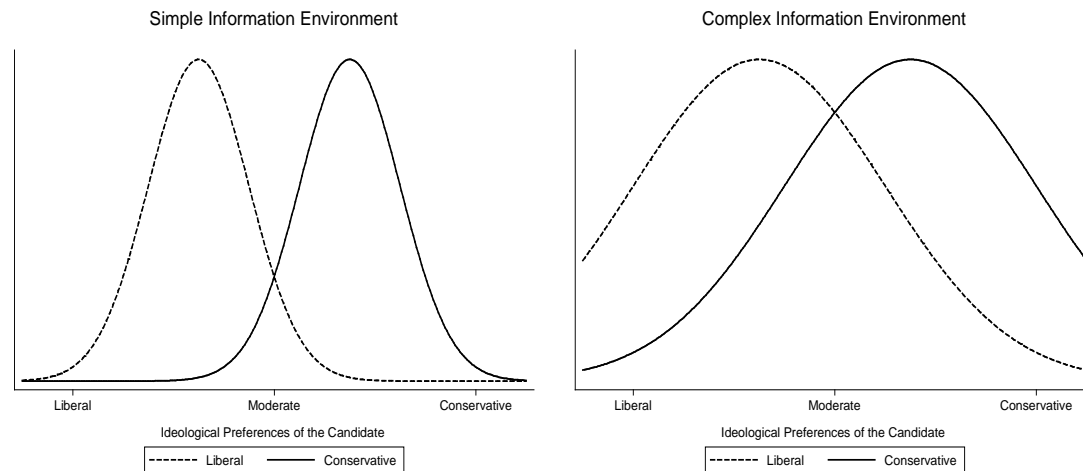
This same logic can be applied to the evaluation of political candidates. In a simple information environment, deciding between several ideologically distinct

candidates would be much simpler than deciding between candidates who are clustered around one ideological pole. This situation is presented in Figure 1-3.

**Figure 1-3: Manipulating the complexity of the information by varying the mean ideological tendencies of the candidates**



**Figure 1-4: Manipulating the complexity of the information by varying the variance of the ideological tendencies of the candidates**



Alternatively, one could also manipulate the ideological variability of the candidate's statements. If the candidates obfuscate their ideal preferences in order to appeal to the widest possible audience, the informational context is much more complicated than when candidates express more ideologically consistent preferences. This scenario is presented in Figure 1-4. I rely on these two methods of manipulating information complexity in the studies that I present herein.

Importantly, ideological consistency is not the only way of manipulating informational complexity. For instance, external complexity can also be manipulated by varying the sheer amount of information people learn about the candidates (Casey, 1980;

O'Reilly, 1980), the number of relevant attributes and dimensions that may influence the decision (Payne, 1976; Payne, Bettman and Johnson, 1988), or even the complexity of the syntax of the arguments that people read.

At base, the more information that people are required to integrate into a decision, the more complex the decision (Casey, 1980; O'Reilly, 1980). It is possible to manipulate the complexity of a decision by simply increasing the amount of information that people learn. For example, if people learn 10 pieces of information in one condition and 100 pieces of information in another condition, the first condition will be simpler than the second because people simply have less information. In other words, if information exceeds a minimum threshold people experience information overload and cannot effectively process the information. This threshold is not very high (Simon, 1956; Miller, 1957). Similarly, increasing the attribute and dimensions of the decision also increases the complexity of the external information (Payne, 1976; Payne, Bettman and Johnson, 1988). Other things being equal, the more dimensions that people must evaluate a set of options along, the more complex the decision.

Finally, it is possible to manipulate the complexity of the information by manipulating the syntax or the difficulty of the information. Take the following statement used by Sweller (1993) as an example of a complex statement: "Suppose five days after the day before yesterday is Friday. What day of the week is tomorrow?" As is clear the statement is made increasingly complex by the convoluted nature of the sentence structure.

The reason I chose ideological distinctiveness as the method of varying informational complexity is that ideological distinctiveness is inherently political, whereas information overload, the number of attributes and dimensions, or the syntactic complexity the information is almost inherently apolitical.

### *Internal Information Complexity*

A different type of complexity, the complexity of an individual's memory, is also integral to the assessment of decisional complexity. The amount of information people have stored in long term memory, which is accessible when making decisions, is theoretically related to the complexity of their judgments. The more people remember about the candidates, the more information it is possible for them to integrate into their decisions. The more people remember, the more complicated the decision. Importantly, the impact of memory or internal informational complexity on the likelihood of making correct choices has been ignored in the current literature on unconscious thinking. I derive several expectations based on research that has dealt with memory, cognitive activation of thoughts, and accessibility.

Research on attitude accessibility has demonstrated that more accessible considerations are retrieved faster (Neely, 1977; Anderson, 1983; Huckfeldt, Levine, Morgan, and Sprague. 1999). From one perspective this suggests that people may use accessible considerations that are stored in long term memory to construct attitudes 'on the doorstep' or at the moment they are called upon to make a decision (Zaller and Feldman, 1992). It is completely possible that people form opinions about candidates only after they are asked to provide a statement regarding their preference (Zaller and Feldman, 1992). As such, they search their long term memories for information relevant to their decision. Every time that they are asked to report their preference, different

considerations are accessed, thus decreasing the likelihood of consistently voting correctly.

Three seemingly unrelated processes influence the relationship between memory and correct voting. First, people who hold strong attitudes about an issue or a political candidate are likely to have consistent preference structures. These consistent preference structures are highly accessible upon activation of any individual node of the attitudes' associative network and will culminate in correct voting (Petty and Krosnik, 1995). Moreover, consistent with Zaller and Feldman (1992), when the same considerations are retrieved, due to their high levels of accessibility, the responses that individuals give will be more consistent. Because this project deals with hypothetical political candidates, however, the likelihood that people have exceptionally strong attitudes is negligible, and thus the probability of a participant making errors in this situation is increased.

The second possible way internal information complexity influences correct voting is through the variance in the number of considerations people have available in memory. One might be tempted to assume that the more considerations a person has stored in long term memory, the more stable their attitudes will be over time, increasing the likelihood that they will vote correctly. Evidence on this point, however, suggests that when people are asked to conjure up relevant information about choices they are about to make, the more information that they sample, the less stable their attitudes are across time (Zaller and Feldman, 1992). The number of considerations people have in long term memory can be measured with a simple recall or recognition task. If people simply have bad memories, their ability to effectively conjure up multiple conflicting considerations about a candidate is diminished.

The third factor is the distribution of evaluations of the candidate's statements stored in long term memory. Because nearly all political information has some affective or evaluative component, makes any politically relevant consideration that a voter has stored in long term memory about a candidate meaningful for their personal evaluation of the candidate (Taber and Lodge 2005). Assuming that the affective component of these considerations is distributed around a central tendency, it follows that the lower the variance of this distribution of considerations, the more stable the attitudes would be over time.

As the distribution of considerations overlap, the sample of evaluative considerations people can conjure into working memory about any individual candidate become less distinguishable from the considerations they can conjure about the other candidates. In this situation, the more considerations that people have stored in long term memory, the more difficult it should be to effectively disentangle their evaluations of the candidates in order to vote for one of them.

When the relevant distribution of stored considerations does not overlap, the difference between the distributions will be sufficiently large to ensure that any single consideration is highly diagnostic in distinguishing between the candidates. As such, when multiple considerations are conjured into working memory, people will still be able to consciously think their way to the optimal solution.

When people remember more information about political candidates whose preferences overlap, unconscious processes should improve the quality of their decisions. Specifically, unconscious processing should be more effective as the number of considerations stored in long term memory increase. Accordingly, consciously thinking

should reduce the quality of political decisions for people who have stored more information in long term memory. In essence, the number of considerations that people will attempt to sort through when making their choices will quickly overwhelm the ability to consciously disentangle their evaluations of the candidates.

Importantly, the effect of the internal information stored in long term memory should be conditional on the available information in the external political environment. The distribution of considerations is contingent on the information available in a voter's political environment: people can only "learn" information that they encounter in the first place. When the external information environment is relatively simple, people do not need an exceptionally accurate memory. One or two pieces of information about each candidate are enough to construct accurate preferences. In this case, good memories are superfluous. Alternatively, when the information about the candidates is complex and nuanced, accurate memories can have an incredibly large impact on the perceived complexity of the information. For people with poor memories, even a very complex information environment is relatively simple, as the only information they can base their attitudes on is a limited set of considerations. For people with increasingly accurate memories, the better their memories, the greater the potential impact of the complex informational setting. Thus, in the complex information environment, one would expect a cumulative level of complexity for people with increasingly accurate memories.

In sum, both internal (recognition-based) and external (environment-based) types of complexity should exert an independent and interactive effect on the probability that people vote for the correct candidate.

### **Correct Choices**

How can one measure the quality of a political judgment in order to determine whether the choice is correct or incorrect? Traditional psychological research has solved this predicament by focusing on problems with objective solutions, allowing researchers to measure the quality of the decision in black or white terms. For example, if one solution is clearly correct, as in a logic or math problem, or if one solution is consensually preferable to the others, determining the correct choice is relatively simple (Dijksterhuis, 2004). For example, an apartment that is cheaper, larger, and in a good neighborhood is generally preferable to the opposite, other things being equal. Similarly, polite, considerate and quiet people are generally seen as better roommates.

In politics, however, these objective indicators are highly elusive: for most issues there is no objective right answer, although everyone believes that their preferred stance is correct. In fact, if two people with vastly different ideological preferences voted for the same candidate, one of them probably made a mistake. Therefore, political judgments necessitate a different method of judging the quality of decisions. The most justifiable metric would be to weigh the agreement between the participants and the candidate on a variety of issues by the importance of the issue to the participant.

Therefore, assessments of correct decision making in the political context make it necessary to incorporate the preferences of the individual voter. To this end, I am in complete agreement with Lau and Redlawsk (1997: 586) who argue that correctness must be "*based on the values and beliefs of the individual voter*, not on any particular ideology that presumes the values and preferences which ought to be held by members of different

social classes, for instance, and not on any larger social goods or universal values (emphasis in original).” Therefore, as Dahl suggests, “correctness” should reflect the preferences an individual would have, given that the person was completely informed or had “the fullest attainable understanding of the experiences resulting from that choice and its most relevant alternatives (quoted in Lau and Redlawsk, 1997).” For the purposes of this dissertation, I rely on two decision rules to determine whether the participants vote for the correct candidate. The first decision rule is a relatively simple rule while the second rule is a more complicated, weighted additive rule.

### *Decision Rules*

The potential decision rules that could be used to determine correct voting are vast. Within this project I focus on two. The first is one that is relatively simple and captures the affective evaluation of the candidates while the second is more complex and weights the voter’s evaluation of the candidate’s preferences by the importance of each issue. Thus the complex rule is akin to a weighted additive decision rule while the simple rule is analogous to an affective tally. In this section I justify the choice of decision rules on theoretical grounds and leave the details of the coding until the next chapter.

The complex weighted additive decision rule, is perhaps the ideal decision rule for calculating the ideal candidate for each participant. Not only does it take into consideration the agreement between the voter and the candidate but it also weights this agreement by the importance of each issue. Moreover, this style of decision rule is held up as the ideal procedure for making accurate decisions (Payne, 1976; Payne, Bettman and Johnson 1988). It is possible, however, that such a complicated decision rule does not approximate the way that people actually make political decisions. In many situations, the computational demands necessary to utilize weighted additive decision rules overwhelms the cognitive capacities of information processors (Gigerenzer, 2007). As such, a simple decision rule constructed with the same information may better capture the process by which people are actually thinking. One possibility is to simply assume that the candidate that the participant agreed with more often, disregarding the strength of that agreement, would be the candidate that the participant should support. This type of decision rule is much simpler than the weighted additive rule and therefore can be seen as a lower bound on the quality of a participants’ decision.

Of course there are a plethora of decision rules that could be used to calculate correct voting within this context. For example, satisficing (Simon 1955) the lexicographic, and the elimination by aspects decision rules have received a great deal of attention within the judgment and decision making literature.

Satisficing is simply choosing the first option where the choice exceeds some minimum threshold for acceptance. Thus, voters would vote for the first person who was reasonably similar to their ideal preferences, but not necessarily the most proximate candidate. Clearly, using this rule, many people would vote incorrectly.

For the lexicographic rule, decision makers establish the most important dimension upon which to base their decision and choose the option that is most preferable on that dimension. For example, within politics, single issue voters would be lexicographic decision makers. These people have a clear view of which issue is the most central to their vote choice and vote for the candidate who is the most ideologically proximate on that issue. With this rule, voters may prefer one candidate on the most

important issue and disagree with them on the rest. In some instances the correct candidate would be the same as the weighted additive rule would suggest, however in many cases this decision making procedure would lead voters astray.

The elimination by aspect decision rule suggests that voters rank the various decision dimensions. Then, starting with the most important issue, systematically begin to eliminate the options that do not exceed the satisfactory level on each successive dimension. In the end, these decision makers choose the alternative that is satisfactory on the greatest number of important decision dimensions. Elimination by aspects appears to be the most effective with sequential choices where choice A is compared to choice B, and then the more preferable is compared to choice C and so forth (Tversky 1972). With the elimination by aspects decision rule, determining the correct candidate for each citizen is quite complex, which would lead to high levels of measurement error in the dependent variable.

These decision rules, do not rely on the full set of information that voters may have at their disposal, and by using these rules, I may be unfairly privileging one form of thinking over another. By definition, each of these rules ignores at least some of the available information. As the benefit of both conscious and unconscious thinking is assumed to be the ability to incorporate all of the available information into the citizen's preferences, by relying on only a subset of the information, the decision is simplified, and thus, the central component of the hypotheses cannot be tested.

Because the weighted additive rule is often viewed as overly complex, the theoretical differences between the two decision rules offer a possibility to examine one of the theoretical implications of unconscious thinking. Because unconscious thinking is not bound by the same limitations as conscious thinking, unconscious thinkers should be much more accurate decision makers when the decision quality is based on decision rules that require intense computational demands. Thus, although it is expected that unconscious thinkers should make better choices than conscious thinkers in complex decision environments, this effect should be exaggerated when the decision rule used to calculate the correct choice is more complicated.

### **Hypotheses**

I summarize the central hypotheses here.

*The Conscious Thinking Hypothesis:* When people think consciously about their decisions, they will make superior judgments.

This hypothesis is a statement of the general wisdom. The conscious thinking hypothesis suggests that there is a strong benefit to carefully and consciously thinking about one's choices and effortfully attempting to wade through the various options. Given the intuitiveness of this hypothesis, not finding a statistically significant benefit of conscious thinking would be highly surprising and therefore this may be seen as the true null hypothesis.

*The Null Hypothesis:* Thinking does not matter.

If the manner in which people integrate information into their existing attitude is unaffected by the specific way that they think about the information, whether



consciously, unconsciously or not at all, then it can be concluded that thinking does not matter. Although most researchers do not explicitly state the null hypothesis, in this case the null hypothesis can be seen as an interesting state of the world. Rather than being taken as a baseline hypothesis, the null hypothesis can be seen as the opposite of the conscious thinking hypothesis, where the mode of thinking has a relatively small impact on the observed outcomes.

*The Heuristics Hypothesis:* When people are given information, they seek to simplify it with heuristic devices that make the decision easier.

The heuristics hypothesis attempts to account for findings in the judgment and decision making literature on the benefits of informational cues that people use when making decisions. This hypothesis acknowledges that in many situations people do not think consciously or unconsciously about their choices. Instead they base their judgments on the particularly relevant bits of information they can extract from the situation.

*The Unconscious Thinking Hypothesis:* When people think unconsciously about their decisions, they will make superior judgments.

This hypothesis must be separated into two discrete components that are moderated by the informational constraints implied by the situation.

*The Simple Information Environment:* When the political information is simple, people who think unconsciously will make less accurate judgments.

*The Complex Information Environment:* When the political information is complex, people who think unconsciously will make more accurate decisions.

When people are asked to make decisions based on relatively simple information, conscious thinking should enable people to base their decisions on the most relevant information. Essentially, when the information is simple, there is no relative benefit to unconscious thinking. People can simultaneously hold all decision relevant information in working memory, and therefore unconscious processing does not improve the quality of decisions. Alternatively, when the information is complex, effortful cognitive deliberation will interfere with the information integration process because the conscious thinking simply cannot process all of the relevant factors at the same time. Because the unconscious is not hindered by the cognitive limitations of consciousness, unconscious thinking should not be expected to impede the quality of the decision when the decision is relatively difficult.

*Information Complexity:* People are more likely to vote correctly when the decision is simple than when it is complex.

Although this hypothesis is relatively intuitive, this is a clear hypothesis that supports the conventional wisdom.

*Decision Rules:* Unconscious thinking should be relatively advantaged with the more complicated weighted additive decision rule than the simple affective tally decision rule.

Because of cognitive limitations conscious thinking is highly restricted relative to unconscious thinking, unconscious thinking should be more capable of utilizing the more computationally intense decision rules. Therefore, unconscious thinking should be especially advantaged relative to conscious thinking when the decision rule used to calculate correct voting is the weighted additive rule rather than the affective tally rule.

### **Plan for Rest of the Dissertation**

In this chapter I have attempted to justify several expectations regarding the effectiveness of different styles of thinking and the conditions that each style of thinking would be particularly advantageous or detrimental to the quality of the final decision. In the next chapter I will discuss the operationalization of various factors that go into the decisions I ask participants to make as well as the central components of the experiments that I present throughout my dissertation. Because the experiments can be seen as variations on a general theme, a single experimental methods chapter is more efficient than reiterating the general procedure for each experiment. Further, this allows me to go into more detail about the construction and measurement of the central variables.

In the third, fourth and fifth chapters I present the experimental results that test the hypotheses that I have outlined. In the third chapter I present an initial study aimed at examining the basic effects of conscious and unconscious thinking. The fourth chapter provides three separate conceptual replications, while the fifth chapter seeks to explore alternative mechanisms that can account for the unconscious thinking results. In short, the initial study finds very strong support for the unconscious thinking hypothesis, though the replications fail to confirm these findings. Moreover, the alternative mechanism presented in chapter five suggests that the beneficial effects of unconscious thinking are simply effective heuristic use.

The implications of these findings for the theory of unconscious thinking as well as potential shortcomings and directions for future research are provided in the concluding chapter.

## Chapter 2 – General Experimental Procedure

In this chapter I discuss the operationalization of the independent and dependent variables, as well as the analytical techniques used throughout this dissertation. Because there is a high degree of similarity between the experimental procedures across all of the studies, an overarching procedure section is appropriate. To remain consistent across studies and make the results more directly comparable, the statistical models are specified in the same way across the various studies. Any deviations from this procedure or study specific clarifications are presented in the study specific methods section.

### General Procedure

All of the studies were conducted on PC computers using the MediaLab® 2.0 experimental software package. After obtaining consent, participants were taken to a room where they completed the experimental procedure. Figure 2-1 depicts the general procedure used in all the studies.

#### *Issue Importance Questionnaire*

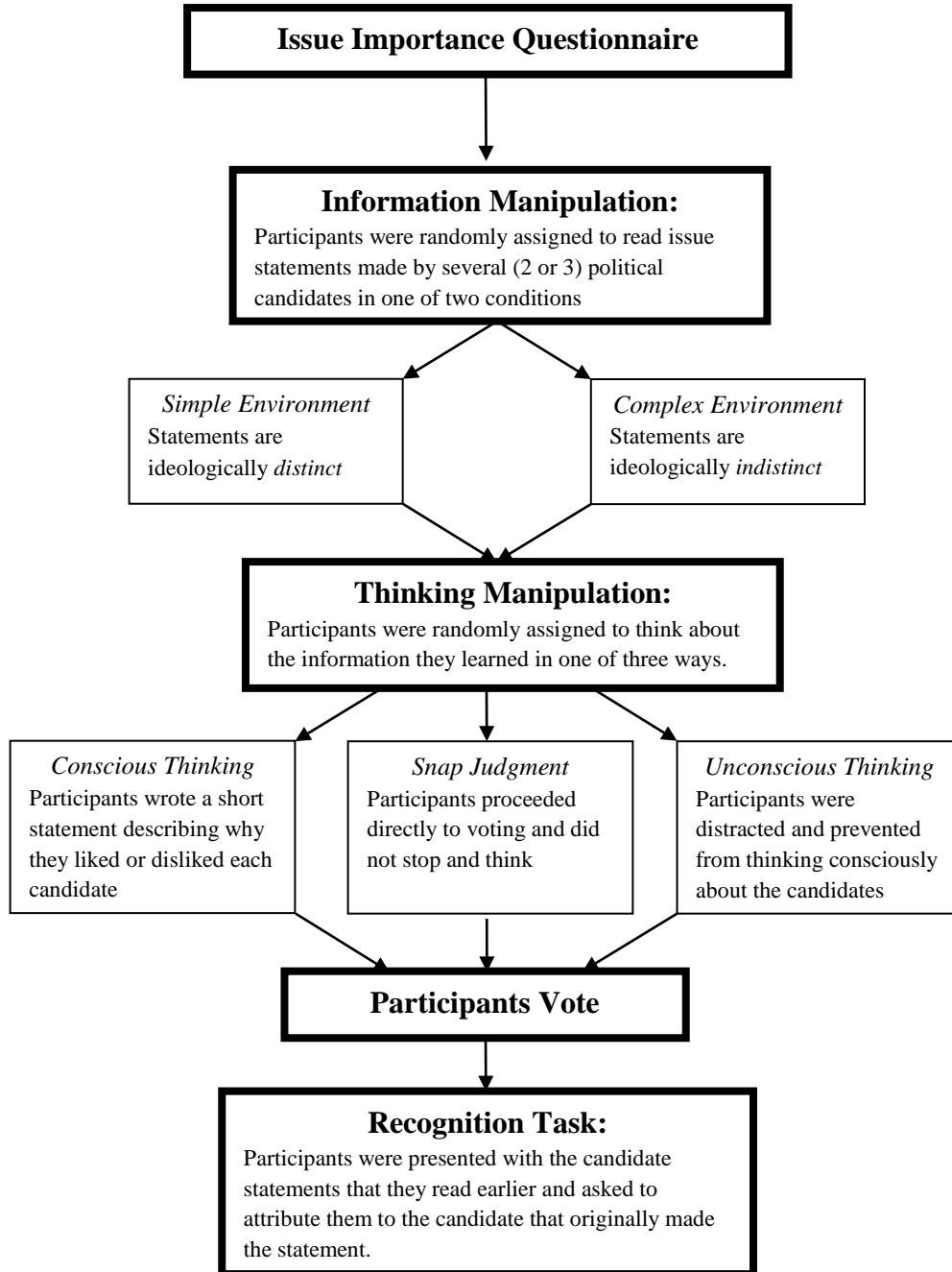
The first questionnaire assessed the importance of a variety of common political issues. Ideological statements based on a selection of these issues were later presented to the participants as statements made by the fictional political candidates. Participants were asked: “Thinking about how you evaluate political candidates, how important are the candidates’ views about ...” and responded on an interval scale ranging from 0 to 10.

The responses to this questionnaire allow me to weight the agreement between the candidate and each participant across a wide range of issues by the importance participants placed on each specific issue. This weighting procedure is particularly important for the construction of the weighted additive decision rule, which I will discuss in more detail in the correct voting section below.

#### *Information Environment Manipulation*

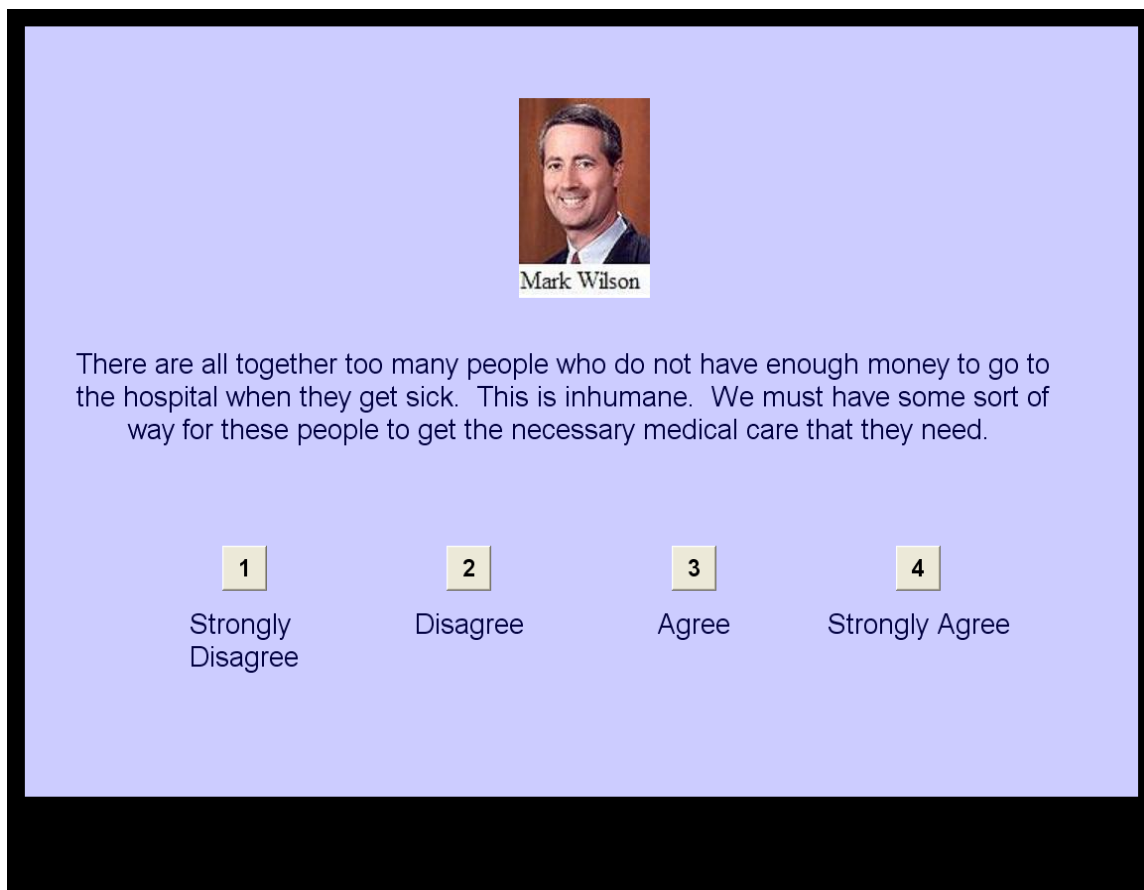
After the issue importance questionnaire, participants read a series of statements made by the hypothetical candidates presented in a manner analogous to a candidate debate. This was the only point in the study where participants were presented with information about the candidates. Although the specific issue statements, the number of statements that the candidates made, as well as the number of candidates varied from study to study, the underlying procedure was very similar across the various studies.

**Figure 2-1: The general experimental procedure**



During this portion of the experiment, participants were randomly assigned to one of two different debate scripts: in one condition the candidates were ideologically distinct while in the other the candidates were ideologically indistinct. The variation in ideological distinctiveness creates either a simple or a complex information environment based on the assumption that it is easier to evaluate candidates when the candidate's stated preferences are highly distinct rather than indistinct. For example, in an electoral race with two candidates, it is easier to evaluate two candidates when one candidate is consistently liberal and the other is consistently conservative relative to an electoral race where both candidates are ideologically inconsistent or indistinct.

**Figure 2-2: Example of what participants saw while reading the candidate statements.**



The statements used in the various studies were taken from the 2008 Presidential debates, speeches made by real political candidates to the press, and issue statements posted on the websites of political action groups or politicians. All of the statements were derived from the contemporary political environment. Each statement appeared as a sound bite rather than as part of a larger narrative, which circumvented the need to create a coherent story linking the statements together. While the participants read each statement, a picture of the candidate who was purported to have made the statement was

posted above the text along with his name. Below each statement, participants were asked to rate the extent to which they agreed or disagreed with the statement on a 4 point scale. An example of one of the statements that the participants read is presented in Figure 2-2.

To ensure the results are not a function of specific issues, the information participants learned was slightly different in each study. As such, the details of the information environment manipulations are discussed in the study specific methods section.

### *Mode of Thinking Manipulation*

After the information phase of the experiment, participants were randomly assigned to a thinking condition. Specifically, participants were either prompted to think carefully about the candidates (the conscious thinking condition), were distracted and therefore prevented from thinking consciously about the candidates (the unconscious thinking condition), or they skipped the thinking condition, proceeding directly to the voting section (the snap judgment condition). The specific manner of inducing conscious or unconscious thinking is presented below. Across all of the experiments, the thinking manipulation remained constant. This manipulation contained three separate levels: in-depth conscious thinking, snap judgment, and unconscious thinking.

In the conscious thinking condition, participants were asked to write a few sentences describing what they liked and disliked about each of the candidates. Writing their reasons for liking or disliking the candidates forced the participants to consciously and effortfully think about the candidates' beliefs. Specifically, participants were instructed to describe what they liked and disliked about each candidate and were given 90 seconds to type their responses. While they typed their responses, a picture of the candidate, along with his name, appeared on the screen.

In the snap judgment condition, as soon as the participants finished reading the debate statements, they proceeded to the next section of the experiment and immediately made their vote choice. In this condition, participants were not given any time to carefully and consciously think about the candidates. Instead, they were forced to make a snap judgment.

In the unconscious thinking condition the procedure for inducing unconscious thinking builds directly off of the Dijksterhuis (2004) model. In this condition, participants were asked to complete a substantively unrelated number task called the two-back task. The goal of the task is to direct the participants' attention away from consciously thinking about the candidates, but still give their unconscious processes a chance to work out the details of their preferences and guide their subsequent judgments.

In the two back task, participants saw a string of single digit numbers and their job was to identify whether the number on the screen was the same as the number presented two numbers prior (Dijksterhuis, 2004). For example, if the string of numbers happened to be:

2 – 5 – 7 – 4 – 7 – 3 – 2 – 3 – 2 – 4

Participants were asked to press the Z button on the keyboard when the number that they saw on the screen matches the number that they were presented with two numbers prior, and a the / button when the non-underlined numbers were presented. The buttons were counterbalanced across participants in order to minimize the impact of handedness on

memory. In the example above the underlined numbers are the numbers that fit the two-back rule. In the experiment each digit was presented separately, making the task more difficult. This task is not impossible, but it is surprisingly difficult and undoubtedly distracting enough to prevent participants from thinking consciously about the candidates.

### *Voting*

Directly following the thinking manipulation, participants were asked to vote for one of the candidates, with the picture and name of each candidate appearing on the screen. Because a picture of the candidates appeared on the screen each time a statement was attributed to them, having the picture on the screen when the participants made their vote choice minimized the potential impact of participants forgetting the name of the candidate they preferred and voting at random.

### *Recognition*

After participants voted for one of the candidates, they were asked to complete a surprise recognition task aimed at gauging the accuracy of their memories. Participants were presented with a selection of the statements that the candidates made during the debate and asked to attribute the statement to the candidate who made it. To aid their memory, pictures of every candidate remained on the screen while the participants saw the statements. Each participant's recognition score is the number of times they accurately attributed the statement to the correct candidate.

There are different ways to assess recognition memory. I used each of the following three ways of assessing memory in at least one of the studies. The most straight forward way is to simply present all of the statements that each candidate made and ask participants to attribute the statements to the correct candidate. An alternative is to present statements the candidates made along with several statements that the candidates did not make. This method would tap into false alarms or projected attitudes. A third possibility would be to present the participants with a subset of the actual statements, making the recognition score a probabilistic assessment of the participants' memory.

In every study the recognition task followed the vote choice question. It is possible that the accuracy of each participant's recognition was a rationalization of their stated vote choice and motivated by their desire to remain cognitively consistent. In the current situation the impact of voting for one candidate relative to another may have carry-over effects leading participants to selectively remember more information (and potentially more biased information) about the candidate they prefer. But, the reverse order would have been much more likely to bias the results. If the recognition task preceded the vote choice, it is very likely that anomalies in participants' memories would lead them to project their preferences onto their preferred candidate leading to a biased vote choice. Moreover, engaging in the recognition task before the vote choice would have negated the thinking manipulation as every participant would be forced to carefully reflect on each statement that the candidates made. Therefore, every participant would be in the conscious thinking condition. Although there may be some problems with the placement of the recognition task, the ordering was the best solution available.

### **The Dependent Variable: Correct Voting**

Now I turn to the assessment of correct voting. In politics, there is rarely an objectively correct decision: whether in a primary election, a general election, or a referendum all of the choices are valid for all individuals.

Within the confines of a real campaign, it would be impossible for any individual to have encyclopedic knowledge of all the relevant campaign information. In the laboratory, however, we can mimic the learning process that happens during a political campaign while carefully controlling the information the participants have at their disposal. Rather than attempting to impute the participants' preferences, I can construct decision rules that approximate ideal information integration processes using the importance participants place on each issue and their agreement with the candidates on a range of issues. We can then compare the participant's actual vote choice with the ideal vote choice for each participant. Accordingly, a correct vote is a vote for the candidate that a participant agrees with most.

There are a great number of decision rules that could be utilized to determine which candidate the participant should prefer. In this dissertation two rules are used that vary the demands placed on the subject: one is very stringent while the other is quite simple.

The simple decision rule is a tally of the number of times that a participant agrees with the candidate's statements. Every time that participant agrees with one of the candidates, be it strongly or weakly, that candidate is scored 1 for the statement. If the participant disagrees with the candidate, either strongly or weakly, the candidate is scored 0 for that statement. The scores for each candidate are then summed. For this *affective tally* rule, I assume that the participant should prefer the candidate that they agreed with most. In other words, if for participant X candidate A scores 7, candidate B scores 9, and candidate C scores 2, the participant X should choose to vote for candidate B because he agreed with candidate B more than the other candidates.

The complex decision rule weights the agreement items by the importance of the issue. Remember that issue importance was assessed in the first stage of the experiment. This weighting procedure creates a *weighted additive* decision rule. Each participant rated each statement made by each candidate on a 4 point agreement scale. Then that was weighted by the importance that each participant put on each issue, rated on an 11 point issue importance scale. Participants are assumed to support the political candidate that they agree with most, after taking into consideration the importance of each individual issue.

### **The Analytical Technique**

Because the primary dependent variable, correct voting, is a binomial variable, traditional Analysis of Variance estimators are inappropriate as they would calculate biased standard errors of the parameter estimates. The more appropriate analytical technique is logistic regression.

There are three key problems with using the typical logistic regression estimator in the current project. First, because experimental techniques typically rely on smaller sample sizes, a maximum likelihood estimator such as logistic regression is not the ideal estimator. Specifically, logistic regression relies on asymptotic assumptions to identify



the model parameter, the properties of which are not well understood in smaller samples (Long, 1997).

Second, the problem of perfect separation, which is reasonably common in large samples, is very probable in smaller samples (Zorn, 2005; Gelman et al 2008). Perfect separation occurs when a linear combination of the independent variables is perfectly predictive of the dependent variable. If separation occurs, the model is unidentified and cannot be estimated (Albert and Anderson, 1984; Gelman et al 2008). To deal with this, the standard procedure is to drop predictors so that a linear combination of the independent variables no longer perfectly predicts any observation, or alternatively to drop the observations that are perfectly predicted. As is obvious, these solutions will either remove the most potent predictors or the most ideal responses, unfairly favoring the null hypothesis over the alternative hypothesis, and increasing the probability of a Type II error.

Furthermore, in the current data, there is also the problem of invariance. Specifically, in some conditions all of the participants voted for the correct candidate, which results in the condition having zero variance. Thus, with traditional frequentist statistics, hypothesis tests cannot be conducted. One solution to this problem may be to simply collect more data until at least one participant in each condition votes correctly or incorrectly. This solution, however, is unsatisfying as no condition or participant should be penalized for accurately completing the task. Furthermore, this solution would increase the likelihood of perfect separation.

All three of these statistical problems boil down to a lack of information available in the data (Gelman et al, 2008). Therefore, information must be added to obtain reasonable estimates of the parameters. In other words, to account for these information problems, I will incorporate Bayesian priors into the estimation technique. Importantly, the priors are constructed exogenously from the model, meaning that the Bayesian priors on parameters in the model are constructed based on statistical expectations surrounding the likelihood of observing unrealistically large effects. Basically, the priors make it difficult (but not impossible) for the logistic regression estimator to return beta estimates greater than 5. A coefficient this large would imply that a one standard deviation increase in the independent variable will not produce more than a 5 standard deviation increase in the latent dependent variable, or more than a 50 percent increase in the predicted probability of observing the outcome of interest (Gelman et al 2008). As such, the priors seem fairly reasonable and minimal. More importantly, the priors do not make it easier to reject the null hypothesis. Instead, these weakly informative priors allow me to estimate the model without the biases induced by traditional ML approaches.

## Chapter 3 – The Initial Study

To examine the hypotheses proposed in Chapter 1, I conducted an experimental study to explore the impact of different styles of thinking and the complexity of the information people have at their disposal on the probability that they will vote for the candidate who most closely aligns with their preferences.

According to the conscious thinking hypothesis, when people consciously think about political candidates, they come to a superior decision relative to relying on gut preferences or unconscious thinking. Alternatively, it is possible that the unconscious actively processes information outside conscious awareness, and propels unconscious thinkers to prefer the candidate who is the most ideologically proximate. I hypothesize that this process of unconscious thinking is especially effective when the available candidate information is complex, meaning that participants would not be able to simultaneously hold all of the information necessary to make an accurate decision in working memory at the same time.

### Method

*Participants.* 140 undergraduates participated in the study in exchange for class credit. Among the participants recruited, there is a liberal and democratic skew (57 liberal, 51 moderate, 24 conservative and 6 other; 70 Democrats, 35 Independents, and 27 Republicans). There is also an overrepresentation of males (77 men, 63 women). As for the academic breakdown, the sample is comprised of 66 seniors, 45 juniors, 17 sophomores, and 12 freshmen.

*Procedure.* The basic structure of the experiment follows what was presented in the methodological chapter. Specifically, participants were presented with 30 randomized statements attributed to three different candidates (10 statements from each candidate). After reading each statement, participants rated whether they agreed with the statement on a 4 point scale

*Information Environment.* In the ideologically distinct condition, the liberal candidate made 10 statements that were rated as very liberal in a pretest, the conservative candidate made the 10 statements rated as very conservative in a pretest, and the moderate candidate made 10 statements which were comfortably between the liberal or conservative extremes. In the indistinct condition, one candidate made 10 very liberal statements, the second candidate made 10 liberal statements and the third candidate made 10 moderately liberal statements. Therefore, all the candidates were considered liberal, but one was very liberal, one was liberal and the third was moderately liberal.

*Mode of Thinking.* After reading the candidate statements, participants were then randomly assigned to think consciously, unconsciously, or make a snap judgment. For the conscious thought condition, participants were given 90 seconds to type what they liked and disliked about each of the three candidates (a total of 4 minutes and thirty seconds). In the unconscious thought condition, participants completed the two-back task described above which took approximately the same amount of time. In the snap judgment condition, participants proceeded to the next section of the experiment.

## Results

### *The Basic Analysis*

The experimental design reduces to a 2 (candidate distinctiveness: distinct versus indistinct) X 3 (style of thinking: conscious, unconscious, or snap judgment) between subjects factorial design. Because vote choice is a dichotomous variable, the data was analyzed using a logistic regression model using weakly informative priors with the categorical factor variables dummied out (Gelman et al 2008).<sup>6</sup> All of the independent variables were mean centered prior to estimation. The data analysis procedure can be seen as a simple extension of moderated regression (West, Aiken, and Krull, 1996). Table 3-1 provides the logistic regression coefficients. Because logistic regression coefficients are not directly interpretable do to the inherent non-linearity of the models, mean centering, and interactions making all of the lower order coefficients and their probability values conditional on the other variables in the model, I present the predicted probabilities for each model in Figures 3-1 and 3-2.

As can be seen in Figure 3-1, when the affective tally rule is used to determine the correct candidate for each participant, in general the more ideologically distinct the candidates are, the more likely participants voted for the correct candidate. In particular, participants in the snap judgment condition were marginally more likely to vote for the correct candidate if the candidates were highly distinct, while in the conscious thinking condition this relationship falls just shy of marginal significance and in the unconscious thinking condition, the difference is not even close to statistically significant. Because all of the slopes are in the same direction, it is not possible to conclude that the mode of thinking altered the participants' decisions.

**Table 3-1: The Effect of the Mode of Thinking and the Information Environment on the Probability of Voting for the Correct Candidate using various decision rules**

	Affective Tally (se)	Weighted Additive (se)
Unconscious	-0.22 (0.46)	-0.66 (0.44)
Snap Judgment	0.01 (0.48)	0.01 (0.44)
Indistinct Candidates	-1.15 (0.39)	-1.27 (0.37)
Unconscious * Indistinct Candidates	0.84 (0.93)	0.24 (0.88)
Snap Judgment * Indistinct Candidates	-0.36 (0.96)	-0.83 (0.89)
(Intercept)	0.12 (0.20)	-0.14 (0.18)

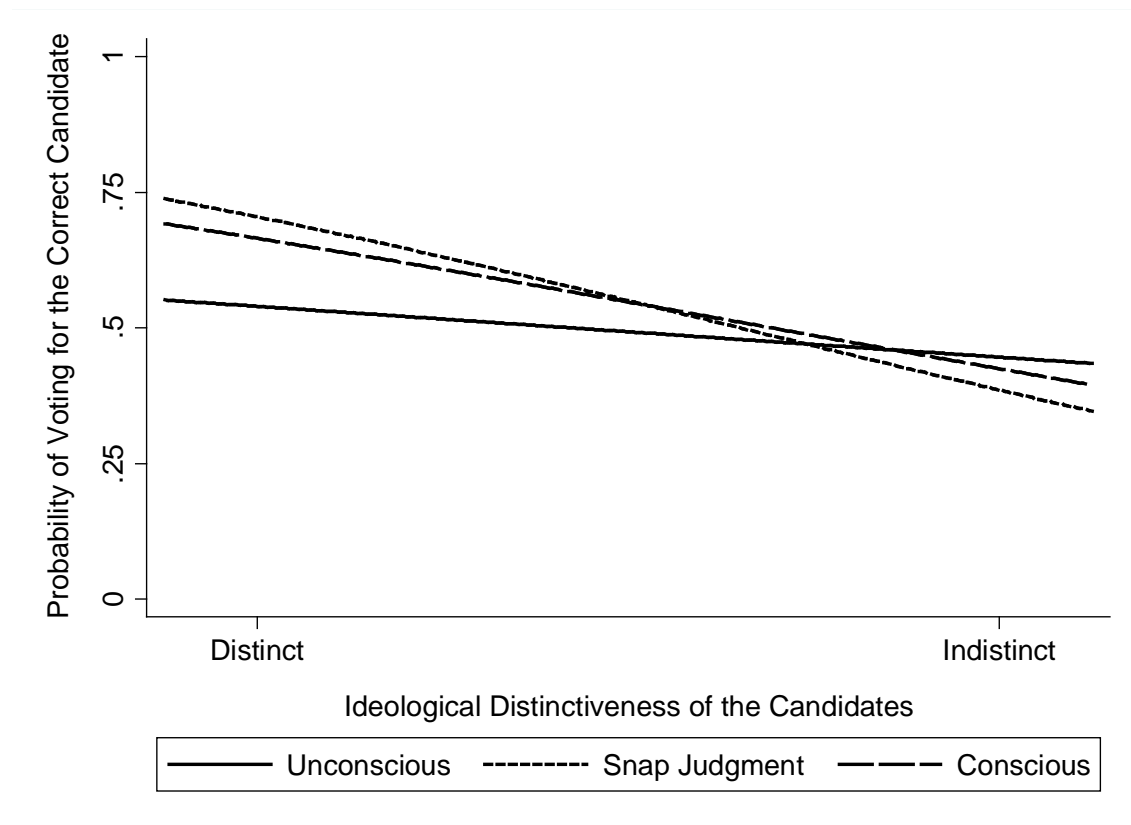
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<sup>6</sup> The substantive interpretation of the model does not change if the data are analyzed using a traditional logistic regression maximum likelihood estimator.

Furthermore, in neither the ideologically distinct nor the ideologically indistinct conditions were the probabilities of voting for the correct candidate significantly different depending on how the participants thought about their choices. Thus, the probability of voting correctly is unaffected by the way that participants thought about the information.

The only statistically significant result that emerges is the effect of the difficulty of the information environment, which is consistent with the complexity hypothesis. Essentially, participants voted correctly when their decision was easy.

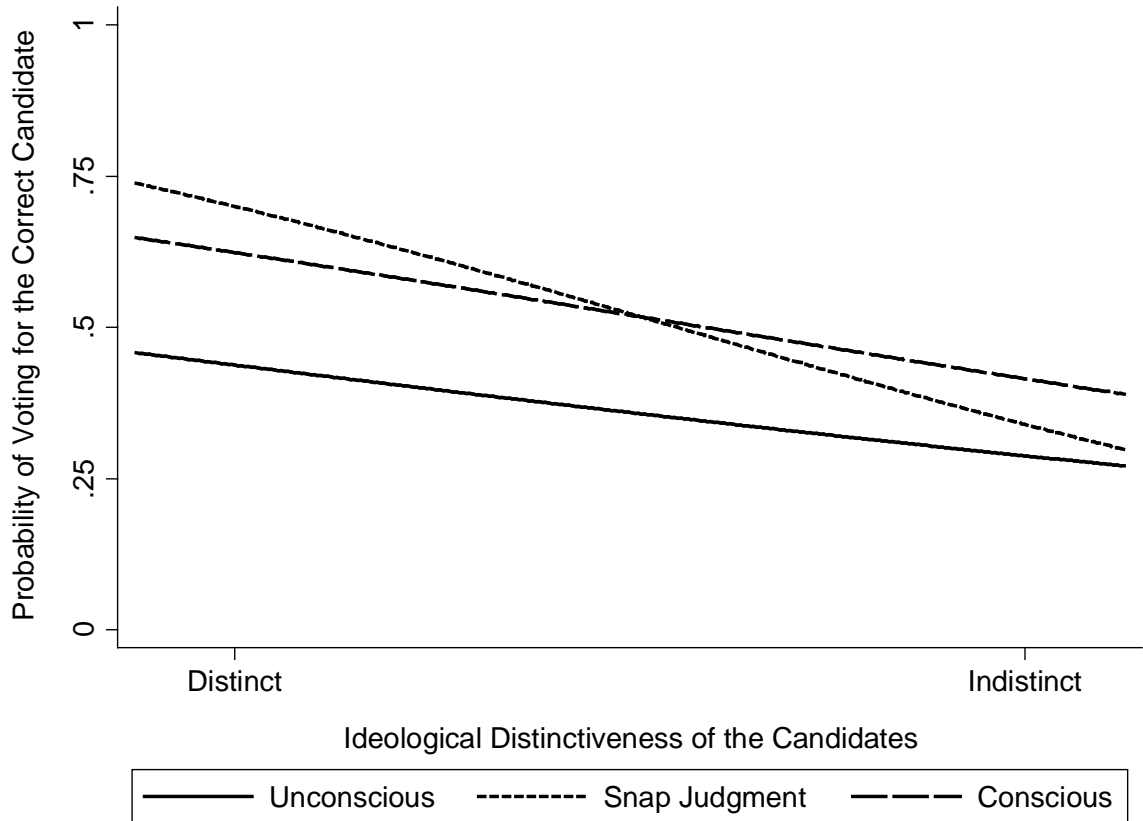
**Figure 3-1: The Effect of the Mode of Thinking and the Information Environment on the Probability of Voting for the Correct Candidate (Affective Tally)**



A similar story emerges when the weighted tally rule is used to determine the correct candidate. The dominant trend in Figure 3-2, that in every thinking condition the more difficult the information environment, the more likely participants vote for the incorrect candidate. Furthermore, the style of thinking does not significantly moderate the probability of voting for the correct candidate. Specifically, using the Weighted Additive rule to determine correct voting, participants in the snap judgment condition were significantly more likely to vote for the correct candidate if the candidates were ideologically distinct, a trend that is marginally significant in the conscious thinking condition, though insignificant in the unconscious thinking condition. The prevailing result for both decision rules is that participants in the simple information environment are more likely to vote for the correct candidate.

There are very few discrepancies between the decision rules. Although there are slight differences in the probability of voting for the correct candidate across the two models, the pattern of results is consistent as well as the interpretation. The two models are substantively equivalent.

**Figure 3-2: The Effect of the Mode of Thinking and the Information Environment on the Probability of Voting for the Correct Candidate (Weighted Additive)**



*Basic Analysis Discussion*

The results are consistent across the decision rules used to calculate the correct candidate for each participant. In general, the more complicated the decision, based on the ideological distinctiveness of the candidates they must choose between, the less likely that participants will choose to vote for the correct candidate. These results are also relatively intuitive. Consistent with the information complexity hypothesis, people made more mistakes when the decisions were more difficult, however this finding is a little obvious.

Based on these initial results, the mode of thinking does not alter the probability of voting for the correct candidate. The fact that the style of thinking did not significantly alter the probability that participants would make the correct choice is surprising on two accounts. Importantly, these results are clearly inconsistent with the conscious thinking hypothesis that suggests thinking carefully should increase the likelihood of voting for the correct candidate. Thinking carefully did not significantly

increase the likelihood of voting for the correct candidate relative to either the snap judgment condition or the unconscious thinking condition.

These results are also inconsistent with the unconscious thinking hypothesis which suggests that distraction will improve the probability that participants will make the correct choice when the available information is more complex making the decision more complicated.

**Table 3-2: The Effect of the Mode of Thinking and the Information Environment on the Probability of Voting for the Correct Candidate using various decision rules**

	Affective Tally (se)	Weighted Additive (se)
Unconscious	-0.61 (0.54)	-1.08 (0.52)
Snap Judgment	-0.57 (0.56)	-0.51 (0.52)
Indistinct Candidates	-0.77 (0.45)	-1.01 (0.43)
Unconscious * Indistinct Candidates	0.08 (1.07)	-0.08 (1.03)
Snap Judgment * Indistinct Candidates	-0.54 (1.13)	-0.71 (1.04)
Memory	-0.83 (0.53)	-0.49 (0.49)
Difficult * Memory	0.86 (1.08)	0.61 (0.99)
Unconscious * Memory	1.34 (1.24)	0.09 (1.12)
Unconscious * Indistinct * Memory	5.13 (2.52)	3.92 (2.26)
Snap Judgment * Memory	0.67 (1.38)	-0.48 (1.22)
Snap Judgment* Indistinct * Memory	5.06 (2.81)	3.95 (2.46)
(Intercept)	0.06 (0.23)	-0.17 (0.22)

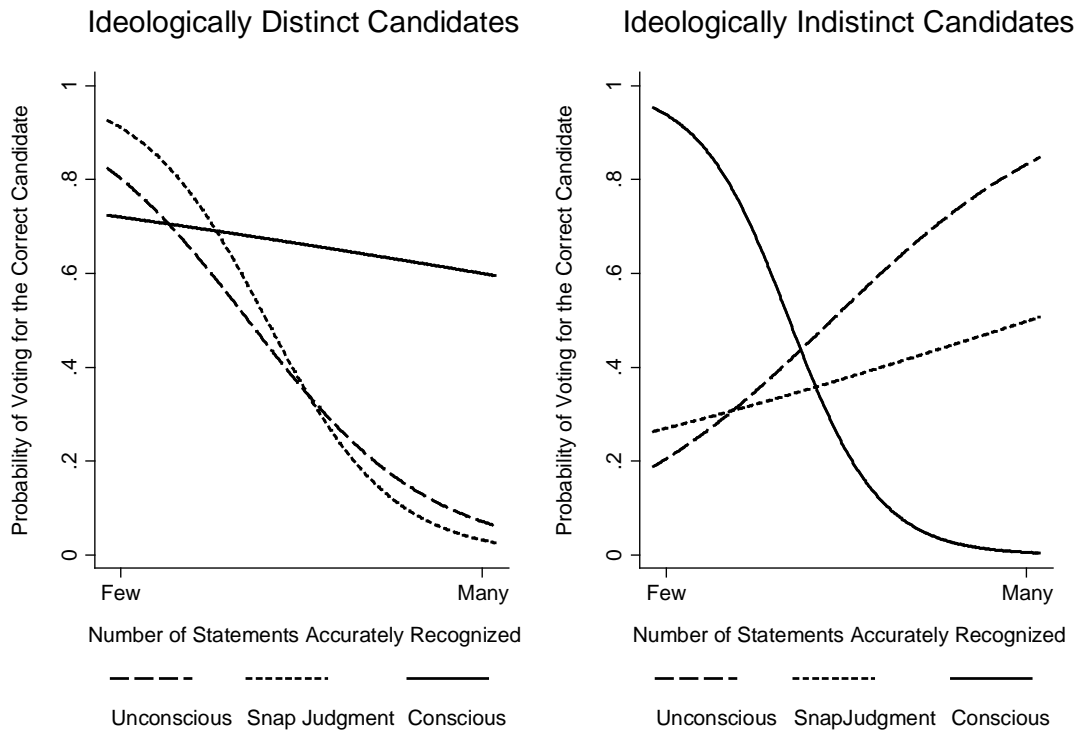
The preceding analysis ignores the possibility that the information people encode into long term memory also affects the complexity of the information. Essentially, the model above assumes that every piece of information that people encounter influences their vote choice. It is possible that people form opinions about candidates only after they are asked to provide a statement regarding their preference (Zaller and Feldman, 1992). At this time they search their long term memories for information relevant to their decision. In the next section, I test the impact of the different styles of thinking on the

probability of voting for the correct candidate, after accounting for the effects of recognition memory.

*The Memory Model*

The same 2 (information environment: easy versus difficult) X 3 (style of thinking: unconscious, deliberate or snap judgment) between subjects factorial design was estimated, with the additional inclusion of the number of statements the participants accurately recognized in the memory task included as a continuous factor. The parameter estimates for the various decision rules are presented in Table 3-2.

**Figure 3-3: The Effect of the Mode of Thinking, Recognition Memory and the Information Environment on the Probability of Voting for the Correct Candidate (Affective Tally)**



Beginning with the simple affective tally, as can be seen in Figure 3-3, the accuracy of the participants’ memory clearly moderates the effect of thinking on the ability of making correct vote choices. As the left panel of Figure 3-3 demonstrates, when the candidates were ideologically distinct, participants in the snap judgment and unconscious thinking conditions made significantly worse decisions as they accurately recognized more of the statements that the candidates made. This deterioration was not characteristic of the participants who were induced to think carefully about the candidates. Importantly, there are no differences between the various styles of thinking for the participants with relatively poor memories. For every style of thinking, participants with relatively poor memories were very likely to vote for the correct

candidate if the candidates were highly distinct. For the participants who accurately recognized more of the candidates' statements, however, the group who thought consciously about the candidates made better decisions than either unconscious thinking condition or snap judgment condition.

This finding is consistent with both the conscious and unconscious thinking hypotheses. When the candidates are ideologically distinct, making the decision relatively simple, consciously thinking about the decision lead to better decisions than snap judgments or unconsciously thinking for the participant's who had a good memory. Importantly, these hypotheses does not account for the fact that there were no differences in the probability that participants with poor memories would vote for the correct candidate.

When the candidates are ideologically indistinct, depicted in the right panel of Figure 3-3, the pattern of effects are much different. In this situation, if the participant consciously thought about the candidates, the more of the candidate's statements they accurately recognized, the less likely they were to vote for the correct candidate. Thus accurate memories appear to interfere with the ability of the participants to make the correct decision if they were in the conscious thinking condition. If participants made snap judgments or engaged in unconscious thinking, the more information available in memory, the more likely the participant would vote correctly. In other words, as participant's memories were increasingly accurate, careful thinking decreased the likelihood of voting for the correct candidate while unconscious thinking and snap judgments increased the likelihood of correct voting.

A consistent story begins to emerge when looking at the weighted additive decision rule. As depicted in the left-hand panel of Figures 3-4, when the candidates are ideologically distinct, participants are more likely to vote for the correct candidate regardless of how they think if they have poor memories. For participants with better memories, participants who thought consciously were significantly more likely to vote for the correct candidate than in the snap judgment or unconscious thinking condition.

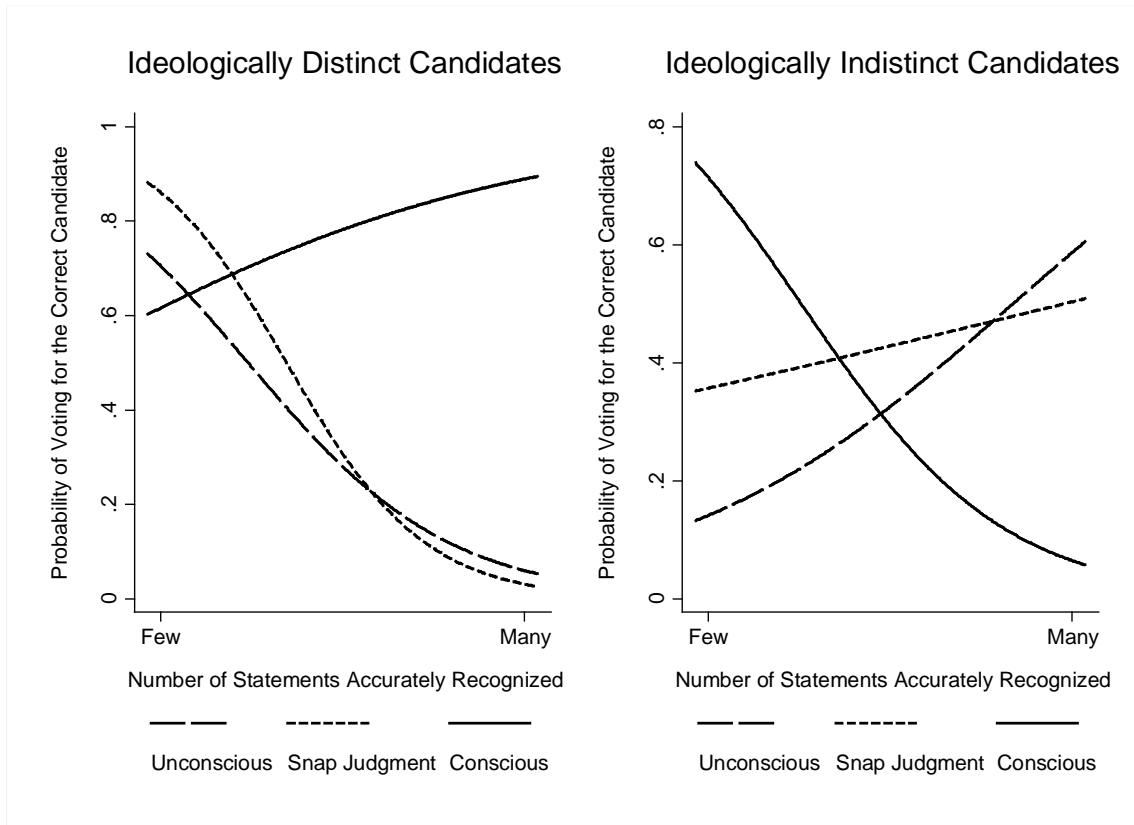
In the complex information environment, when people thought consciously about their choices, the more statements they recognize, the less likely they would vote for the correct candidate. By contrast, for the participants who thought unconsciously, those with better memories were marginally more likely to vote correctly relative to those with worse memories in the same thinking condition. As for the snap judgment condition, better memories generally tended to induce a nonsignificant increase in the probability that participants would vote for the correct candidate. In sum, for participants in the complex information environment, those with poor memories were best served by thinking consciously while those with better memories were better suited to think consciously.

Importantly, and in contradiction to the decision rules hypothesis, the effects are very consistent across the decision rules. Specifically, the decision rules hypothesis suggests that unconscious thinkers should be advantaged with the more complicated weighted additive decision rule. However, when looking at the models presented in Table 3-2, the three-way interaction between unconscious thinking, complexity, and memory is only marginally significant for the weighted additive rule, while statistically significant for the affective tally rule. As such, unconscious thinking appears to be



slightly more effective for the affective tally rule than the weighted additive rule. That said, the results from both models are supportive of the unconscious thinking hypothesis.

**Figure 3-4: The Effect of the Mode of Thinking, Recognition Memory and the Information Environment on the Probability of Voting for the Correct Candidate (Weighted Additive)**



### General Discussion

A summary of the support for the primary hypotheses tested in the initial study are outlined in Table 3-3. As can be clearly seen, there is no support for the conscious thinking hypothesis, strong support for the unconscious thinking hypothesis when the participants memory is included as a moderator of information complexity, and strong support for the information complexity hypothesis across all of the model specifications. As such, it appears that unconscious thinking improves the quality of the decisions that people make when the decisions are complex and the citizen has a decent memory.

The results from the memory models are highly supportive of the unconscious thinking hypothesis and they emphasize the importance of incorporating the amount of information that people are able to remember about the candidates as an integral factor in the decision making process. In accordance with the unconscious thinking hypothesis, when people based their political decisions on complex information, those who thought consciously about their decisions were less likely to make correct judgments as they

remembered more information. Reciprocally, those who thought unconsciously were more likely to vote correctly as they accurately remembered the information.

**Table 3-3 : Support for the Primary Hypotheses in the Initial Study**

	Support for the Hypothesis					
	Conscious Thinking		Unconscious Thinking		Information Complexity	
	AT	WA	AT	WA	AT	WA
Without Memory	X	X	X	X	√	√
With Memory	X	X	√	√	√	√

Note: X denotes the failure to support the hypothesis, √ denotes the support of the hypothesis. Highlighted boxes denote marginal support for the hypothesis.

Also consistent with the unconscious thinking hypothesis, when the candidates are ideologically distinct, thinking consciously is weakly preferable to thinking unconsciously or relying on snap judgments. Specifically, when people can remember relatively little information about the candidates in the simple information condition, most of them make the right choice. As their memories improve, however, those who think consciously were able to consciously correct potential judgmental mistakes and vote for the correct candidate.

These results point to the centrality of the participant’s memory as a moderating factor in the decision making process. Although most would expect that better memories would simply improve the quality of judgments that people make, the current results suggest a more nuanced view. Specifically, having a good memory is not automatically an asset. When the information is complicated, remembering more information may simply confuse the decision maker if they attempt to consciously weigh their options. Specifically, because people can hold only a limited number of considerations in working memory at any given point in time, those with better memories cannot hold all of the relevant information they have stored in their long term memory in working memory at one point in time leading them to come to the conclusion that they prefer an ideologically less proximate candidate. By contrast, people with relatively poor memories can hold all of the considerations they have stored in long term memory in working memory at the same time, making it possible to base their judgments on all of the relevant considerations at their disposal.

When the information is easy, accurate memories are also not beneficial for decision makers: people with poor memories make fairly accurate judgments. As the participants’ memories improved, however, their probability of voting for the correct candidate declined unless they thought consciously. The results clearly suggest that there is a different decision making process that occurs for unconscious thinking and conscious thinking.

These results, however, also imply a different cognitive process is occurring for unconscious thinking and snap judgments as demonstrated by the significant, predicted increase in the decision quality for the unconscious thinkers. Rather than simply delaying the judgment with the distraction task, the distraction allowed the participants’ unconscious to sort through the information they learned, leading to superior judgments.

Furthermore, when the people think in a conscious, in-depth manner, the more considerations they are able to bring to the decision making environment, the worse their decision making gets, if they use a complicated rule.

These results do not bode well for the conscious thinking hypothesis that suggests that conscious thinking should always be superior to snap judgments and unconscious thinking. Contrary to this hypothesis, conscious thinking was only superior when the decision was relatively simple and the participants remember a lot of information about the candidates, or when the information was complex and participants remembered relatively little information. In the former scenario, conscious thinking decreased the probability of voting for the correct candidate as people remembered more, suggesting that conscious thinking prevented people from basing their judgments on less important information or from relying on a poor heuristic.

In the latter scenario, conscious thinking seems to work best when people could not remember very much information about the candidates. Thus, when people who think consciously can only remember a limited amount of the information that they were presented, they are essentially forced to rely on heuristic processing, and can derive the informational shortcuts from the information they have at their disposal.

## Chapter 4 – The Issue Trespassing Studies

The effects of conscious and unconscious thinking, up to this point, suggest that the optimal style of thinking about politics may be much different than what is typically assumed to be the best way to think about politics. Specifically, expending a great deal of conscious effort weighing the pros and cons of various political options do not invariably lead to better decisions. In fact, as the analysis from the previous chapter suggests, conscious thinking may actually impede one's ability to make optimal decisions when the information is complex and for people with better than average memories. The studies presented in this chapter are intended to conceptually replicate and extend the findings from the initial study.

In the previous chapter, the complexity of the information was manipulated by varying the ideological similarity of the candidates. In the complex information condition all three candidates were liberal, in the simple condition the three candidates were spread across the ideological spectrum. As predicted by the unconscious thinking hypothesis, the beneficial effect of unconscious thinking was limited to the complex information environment. In typical American elections, however, there are only two candidates vying for the office. As such, although the informational complexity manipulation makes sense theoretically, generalization is admittedly limited.

In this study, rather than manipulating the complexity of the information by making all of the candidates liberal or conservative, the candidates trespass on the issue positions from their opponent's side of the ideological spectrum. In the simple choice condition, the "stolen" political issues are relatively unimportant while the difficult choice scenario will be relatively important. Thus, the unimportant issues should be ignored and lead participants to perceive the candidates as relatively ideologically distinct while when candidates steal important issues, participants will perceive more relevant information that must be integrated into their decisions. From a theoretical perspective, manipulating complexity in this manner should be equally effective at complicating the information environment, with the added benefit of increased experimental realism.

The importance of the issues that violate a voter's expectations should play a key role in their political decisions. Specifically, when political candidates steal issue positions on tangential or unimportant issues, this should not have a strong impact on participants' voting behavior. Alternatively, when candidates steal important issue preferences from their opponents, these issue preferences should influence the voters' perceptions of the candidates. Varying the importance of stolen issues approximates the information complexity manipulation from the previous study, with the unimportant issue trespassing condition corresponding with the simple information environment and the important issue trespassing condition with the hard information environment. This is analogous to the ideological orientations of groups like "Log-Cabin" Republicans or pro-life Democrats.

Importantly, some issues are generally considered more important than others. For example, most people consider issues like the war in Iraq, illegal immigration, and the economy to be much more important than charter schools or congressional term limits. Capitalizing on the differential importance of these issues, issue importance will

be manipulated by varying issue that are generally important, though issue importance will still be assessed on a participant by participant basis to allow for individual differences in perceptions of issue importance.

Theoretically, when participants in the important issue trespassing condition think consciously, they attempt to weigh all the information they learned and incorporate this information into their decision. Because of limitations on conscious information processing, however, the attempt to consciously weigh the information will lead them to make inferior political decisions. Alternatively, when participants are distracted and therefore forced to think unconsciously, the problems associated with conscious thinking are ameliorated.

The studies presented in this chapter focus on the conscious and unconscious thinking hypotheses and are intended to replicate and extend the findings presented in the initial study. Importantly, because both the unconscious and conscious thinking hypotheses posit that conscious thinking will be more effective in the simple information environment, the increased likelihood that conscious thinking would vote correctly in the simple information environment is non-diagnostic for disentangling the effects of conscious and unconscious thinking.

There are three primary effects that would distinguish between the conscious and unconscious thinking hypothesis. First, if conscious thinking increases the probability that participants will vote for the correct candidate in the complex information environment, this evidence supports the conscious thinking hypothesis. Second, if unconscious thinking increases the probability of correct voting in the more complex decision environment, this result supports the unconscious thinking hypothesis. The third effect that would distinguish between the conscious and unconscious thinking hypotheses is if the patterns demonstrated in complex information condition the initial study were replicated in these studies. As people remember more information about the candidates, if unconscious thinkers are more likely to vote for the correct candidate while conscious thinkers are less likely to vote correctly, this would support the unconscious thinking hypothesis. It would also confirm the importance of explicitly modeling the impact of memory as a moderating factor on probability of voting for the correct candidate.

The analysis for the three studies presented in the current chapter follows the format that I used when analyzing the initial study. Specifically, the analytical procedure is broken down into two stages. In the first stage, I examine effects of different styles of thinking and the external information environment on the probability of voting for the candidate whose preferences most closely match the participants' private preferences. In the second stage, I re-estimate the models incorporating memory into the analysis.

## **Methods**

*Participants.* 127 undergraduates participated in the study in exchange for extra credit in one of their political science classes. 49 participants identified as liberal, 55 as moderate, 13 as conservative and 10 other. In terms of party affiliations, there were 68 Democrats, 26 Independents, and 19 Republicans. In this study, there are 58 men and 69 women). As for the academic breakdown, the sample is comprised of 51 seniors, 38 juniors, 20 sophomores, and 16 freshmen.

*Issue Importance.* As in the first study, participants first rated the importance of all of the issues that would be discussed in the study on a 0-10 scale.

*Trespassing Manipulation.* Participants were then presented with the 30 randomized statements attributed to two different candidates (15 statements from each candidate). In each condition, the candidates steal issue positions from their opponent, essentially creating overlapping ideological distributions: one candidate will be liberal two-thirds of the time, and conservative one-third of the time and the other second candidate will be conservative two-thirds of the time and liberal one-third of the time. Each candidate espoused 10 issue positions from their side of the ideological spectrum and 5 issue positions traditionally associated with the other side of the political spectrum. In the important condition, the issues that the candidates professed from the opposing side of the ideological spectrum were rated as more important by prior participants, while in the unimportant condition, the stolen issues were rated as less important. After reading each statement, participants rated whether they agreed with the statement on a four point scale, regardless of which candidate made the statement.

*Thinking Manipulation.* After participants finished reading the candidate statements, they were then randomly assigned to the second manipulation: conscious thinking, snap judgments, or unconscious thinking. For the conscious thinking condition, participants were given 2 minutes to type what they liked or disliked about each of candidates (a total of 4 minutes of conscious thinking). In the unconscious thinking condition, participants completed the two-back task described earlier. In the snap judgment condition, participants proceeded to the next section of the experiment.

*Voting.* Following the thinking manipulation, participants were asked which candidate they would vote for. When making their vote choice, participants saw both the name and the picture of the candidates for whom they were voting.

*Recognition.* Following the voting question, participants were given a surprise quiz asking them to identify which candidate made each of the 30 statements.

## Results

### *The Basic Model*

I estimate a logistic regression function with weakly informative priors, analogous to a 2(importance of stolen issues: important versus unimportant issues) X 3(Mode of Thinking: unconscious thinking, snap judgment and conscious thinking) ANOVA. All of the independent variables were mean centered prior to estimation. I present the parameter estimates for the basic model using each decision rule in Table 4-1 and a graphical depiction of the probability of voting for the correct candidate conditional on their experimental treatments in Figures 4-1 and 4-2.

A brief glance at Figure 4-1 shows initial, though tentative, support for the hypothesis that unconscious thinking is the preferable mode of thinking if the information environment was complex, or the ideologically inconsistent statements made by the candidates were important. The mode of thinking was completely irrelevant if the information was unimportant. Using the affective tally rule to determine who the participants should prefer, there are no statistically significant differences between the thinking conditions if the candidates stole unimportant issue positions. When these stolen issues were important, however, unconscious thinking was marginally more likely to lead to a correct vote relative to conscious thinking. The differences between the probabilities of voting for the correct candidate in the snap judgment condition did not

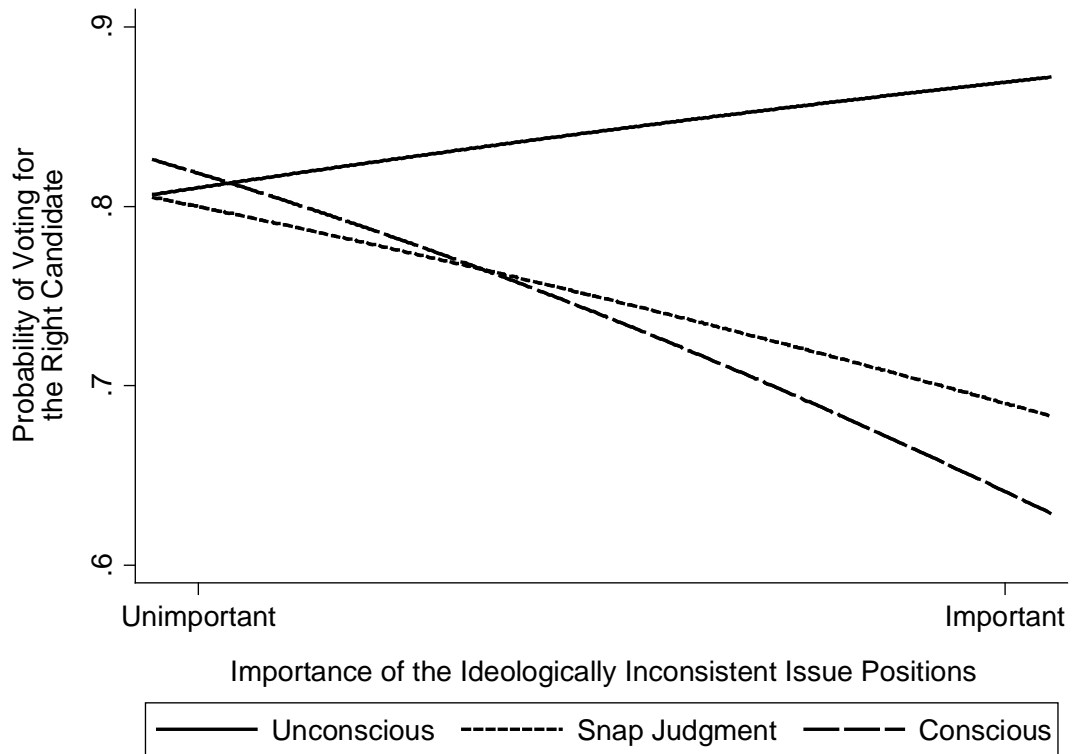
differ from either the conscious or unconscious thinking condition. It is important not to overemphasize these effects, as technically the interaction between unconscious thinking and importance presented in Table 4-1 does not reach conventional levels of significance, nor are any of the slopes reliably different from zero.

**Table 4-1: The Effect of the Mode of Thinking and the Importance of Ideologically Inconsistent Statements on the Probability of Voting for the Correct Candidate using Various Decision Rules**

	Affective Tally (se)	Weighted Additive (se)
Importance	-0.44 (0.46)	-0.53 (0.41)
Unconscious	0.63 (0.58)	0.56 (0.51)
Importance * Unconscious	1.52 (1.17)	0.43 (1.03)
Snap Judgment	0.05 (0.51)	-0.05 (0.46)
Importance * Snap Judgment	0.38 (1.02)	-0.08 (0.92)
Intercept	1.25 (0.23)	1.05 (0.21)

These caveats notwithstanding, however, the pattern of results is consistent with the unconscious thinking hypothesis. Relative to conscious thinking, unconscious thinking improves the quality of judgments people make when the judgment task is complex. However, unconscious thinking is indistinguishable from conscious thinking when the task is simple.

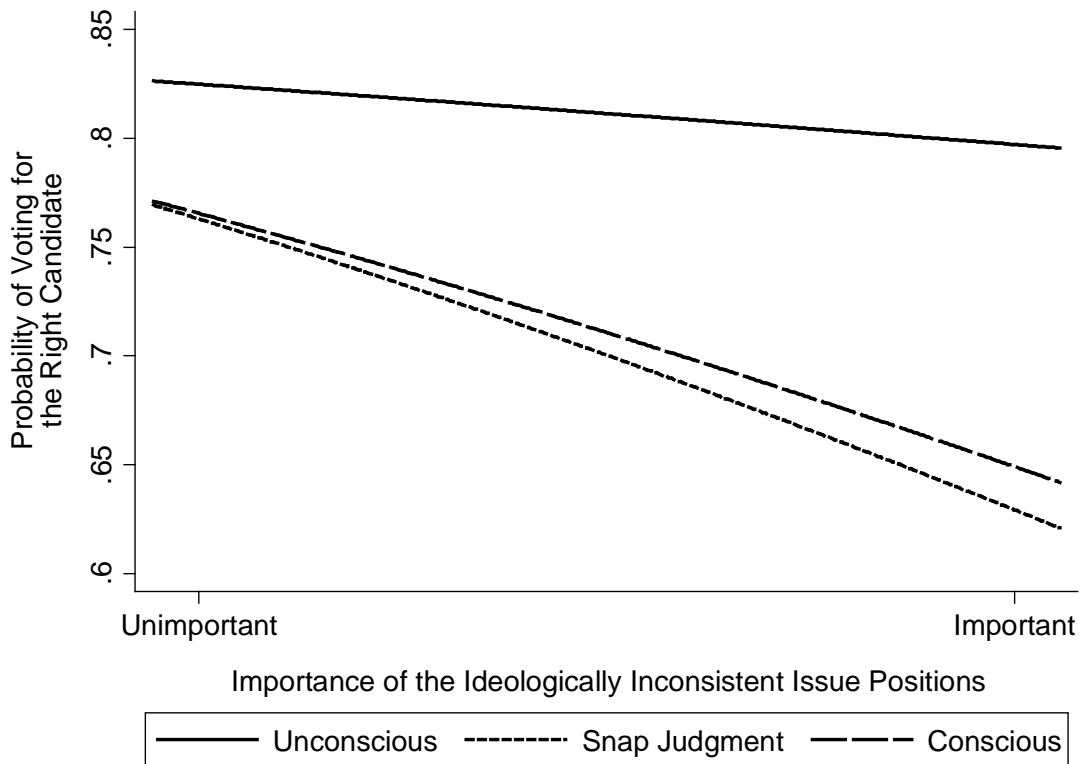
**Figure 4-1: The Effect of the Mode of Thinking and the Importance of Ideologically Inconsistent Statements on the Probability of Voting for the Correct Candidate (Affective Tally)**



The general pattern of results from the simple affective tally rule replicate when the weighted additive rule is used to determine correct voting. The results for the weighted additive decision rule, are less supportive of a beneficial role for unconscious thinking. Specifically, none of the slopes or means are significantly different from each other in or Figure 4-2 for the weighted additive rule.



**Figure 4-2: The Effect of the Mode of Thinking and the Importance of Ideologically Inconsistent Statements on the Probability of Voting for the Correct Candidate (Weighted Additive)**



In sum, when the ideological encroachment involved unimportant issues there were no differences in correct voting. When the information was important, however, participants who thought unconsciously about the information were more likely to vote for the correct candidate. Importantly, these effects are marginally significant.

These results have two primary implications. First, these results are relatively weak compared with the existing research on unconscious thinking. Specifically, with the same approximate sample size, Dijksterhuis (2004) was able to find a statistically significant benefit of unconscious thinking over both snap judgments and conscious thinking. The results in this situation, though consistent with the pattern described by Dijksterhuis, are notably weaker. Importantly, these effects are much stronger than those for the comparable model presented in the initial study. In the initial study, differential styles of thinking did not alter the likelihood of voting for the correct candidate until memory was incorporated into the model. In the present study, memory does not seem to be a necessary component for observing the impact of the style of thinking on the probability of voting for the correct candidate. This gives rise to the possibility that the inclusion of one’s memories about the candidates will magnify the differences observed in the initial analysis.

Second, these results again suggest that unconscious thinking is more beneficial when the decision rule used to determine the correct candidate is simple. Essentially, when the correct candidate was calculated using the affective tally decision rule, the

difference between conscious and unconscious was more statistically significant in the complicated information environment. This seems to suggest that unconscious thinking is not a function of the unconscious more effectively weighting the available information in memory, although the differences between these models are not overwhelming. More specifically, the differences between conscious and unconscious thinking in the complex information condition are still marginally significant with the weighted additive rule.

In the next section, I will incorporate the impact of memory on the probability that people will vote for the correct candidate. In the first study, significant results did not emerge until the memory variable was taken into consideration. As in the current study, marginally significant differences in the probability of voting for the correct candidate in the complex external information condition are present before memory is incorporated into the model. This suggests that these differences should be exaggerated when people's memories are taken into account.

**Table 4-2: The Effect of the Mode of Thinking, the Importance of Ideologically Inconsistent Statements and Recall on the Probability of Voting for the Correct Candidate using Various Decision Rules**

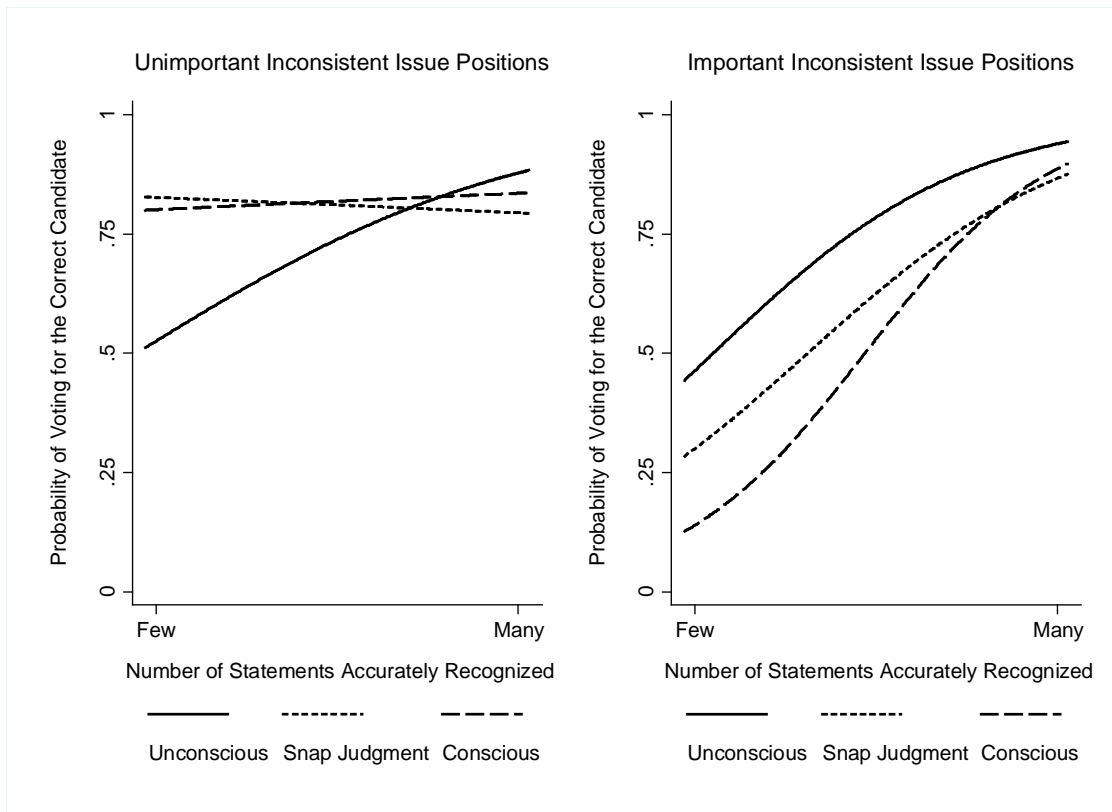
	Affective Tally (se)	Weighted Additive (se)
Intercept	1.31 (0.25)	1.11 (0.22)
Unconscious	0.41 (0.61)	0.48 (0.52)
Snap Judgment	0.03 (0.54)	0.09 (0.49)
Importance	-0.28 (0.48)	-0.50 (0.43)
Unconscious * Importance	1.18 (1.23)	0.40 (1.05)
Snap Judgment * Importance	0.32 (1.09)	0.02 (0.98)
Memory	1.10 (0.52)	0.93 (0.42)
Importance * Memory	1.53 (1.04)	0.07 (0.83)
Unconscious * Memory	0.19 (1.35)	0.15 (1.06)
Snap Judgment * Memory	-0.47 (1.18)	0.74 (0.96)
Unconscious * Importance * Memory	-1.55 (2.69)	-0.13 (2.11)
Snap Judgment * Importance * Memory	-0.42 (2.36)	0.99 (1.93)

*The Memory Model*

To explore the impact of memory on the probability of voting for the correct candidate the analogous 2 (issue importance: important versus unimportant) X 3 (style of thinking: unconscious, deliberate or snap judgment) between subjects ANCOVA estimated, with inclusion of the number of statements the participants accurately recognized in the memory task included as a continuous factor. The parameter estimates for each decision rule are presented in Table 4-2.

As Table 4-2 suggests, the only coefficient that consistently predicts the probability of voting for the correct candidate is the first order coefficient of recognition memory.<sup>7</sup> In short, the more participants accurately remembered about the candidates, the more likely they were to vote for the correct candidate. Because lower order coefficients are conditional on the higher order coefficients, in order to better understand the effects Figures 4-3 and 4-4 present the predicted probabilities of voting for the correct candidate.

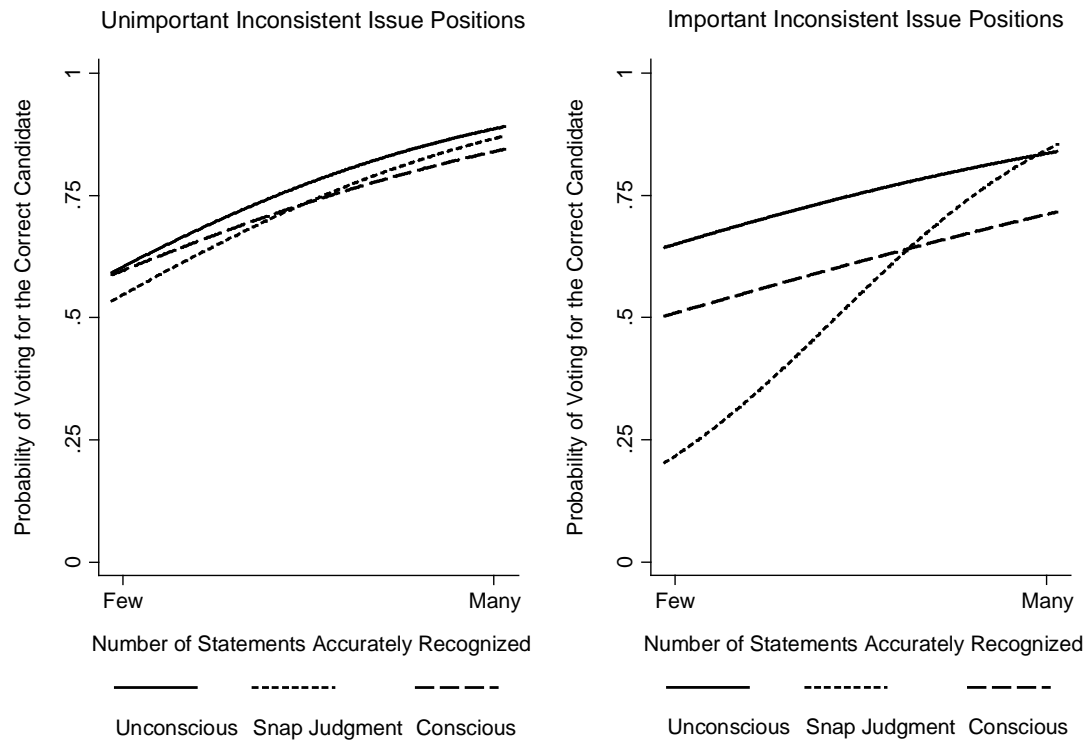
**Figure 4-3: The Effect of the Mode of Thinking, the Importance of Ideologically Inconsistent Statements and Recognition Memory on the Probability of Voting for the Correct Candidate (Affective Tally)**



<sup>7</sup> Technically the first order coefficient is conditional on the level of the other variables in the model. However, the fact that the higher order interactions between memory and the other variables fail to reach statistical significance suggests that this significant first-order effect is not moderated by any of the other variables in the model, and thus can be interpreted as a general main effect.

When examining the condition where the candidates trespassed on unimportant issues, there were no statistically significant differences between the probability of voting for the correct candidate regardless of the participant's memory, the mode of thinking or the decision rule.

**Figure 4-4: The Effect of the Mode of Thinking, the Importance of Ideologically Inconsistent Statements and Recognition Memory on the Probability of Voting for the Correct Candidate (Weighted Additive)**



When the candidates trespassed on important issues the effect of memory is much stronger. When the candidate information was complex, the better participants' memories, the more likely participants vote for the correct candidate. Thus, for conscious thinkers in this study, accurate memories seem to have the opposite effect on the probability of voting for the correct candidate than was observed in the initial study. Specifically, in the initial study, more accurate memories led conscious thinkers to sub-optimal choices. In the current study, more accurate memories led conscious thinkers to better choices

### Study 1 Discussion

In the first trespassing study, the best predictor of correct voting was the ability to accurately remember more candidate information. This effect was strongest when the candidates trespassed on important issues, making the participants' decision is more

complex, although there is a slight trend in this direction when the external information is simple. Furthermore, the mode of thinking did not reliably influence the probability that participants would vote for the correct candidate after controlling for the participants' memories.

Alone, study one is weakly supportive of the unconscious thinking hypothesis. Without accounting for the accuracy of the participants' memory, in general participants who thought unconsciously were marginally more likely than those who thought consciously to vote for the correct candidate when the external information was complex. After accounting for the accuracy of each participant's recollections, however, this effect dissolves.

This finding is not automatically damning for the unconscious thinking hypothesis. In fact, the original research on unconscious thinking makes no mention of the possibility that participant's memories would moderate the impact of thinking and external information on the probability of making the right choice (Dijksterhuis, 2004, Dijksterhuis and Nordgren, 2006).

The current results and the results from the initial study, however, are contradictory. Each study taken on its own supports the unconscious thinking hypothesis. Unfortunately, this support is provided by a different pattern of results in each study. In the initial study, the differential effects of thinking did not emerge until after incorporating the participant's memories in correct voting model. In the current study, controlling for accurate memories removes the impact of the differential styles of thinking on the probability of voting for the correct candidate. Thus, a second related study was needed to probe these inconsistencies.

## **Trespassing Study 2**

The first trespassing study weakly supported the unconscious thinking hypothesis. The style of thinking did not matter in the unimportant trespassing or simple information condition, while in the more difficult important information condition there was some evidence suggesting that unconscious thinking was, in fact, increasing the probability that participants would vote correctly. This evidence, however, was only marginally significant and therefore a second trespassing study was intended to further examine the impact of unconscious thinking on political decision making.

The procedure for the second trespassing study was quite similar to the procedure for the first trespassing study with a few minor changes that may increase the likelihood of detecting the impact of unconscious thinking.

The first change was an increase in the number of statements that each candidate made. In the initial study, participants evaluated three candidates, each of whom made ten issue statements. In the first trespassing study, participants evaluated two candidates who made fifteen statements each. As such, participants in the initial study and the first trespassing study read the same number of issue statements. As it is more difficult to simultaneously form an attitude towards three candidates than two, it is possible that the important trespassing condition, where unconscious thinking was particularly likely to be effective, was not complex enough. If the information was made more complex, the effects that had been marginally significant in the first trespassing study might be much more significant. If the deleterious impact of conscious thinking was a function of

participants attempting to incorporate more information into their evaluation than conscious processing can cope with, then a few more pieces of information about each candidate should exacerbate this effect.

The second change in the second trespassing study was to drop the snap judgment condition. In both the initial study and the first trespassing study, the effect of the snap judgment condition was a middle ground between the unconscious and the conscious thinking conditions. As the central hypotheses in this project focus on the difference between unconscious thinking relative to conscious thinking, in the current study we directly focus on these two conditions.

### Methods

*Participants.* 94 undergraduates participated in the study in exchange for class credit. 32 of the participants identified as liberal, 30 as moderate, 14 as conservative and 18 participants stated they hadn't thought about it much. In terms of party affiliations, there were 49 Democrats, 18 Independents, and 20 Republicans. There were 42 males. As for the academic breakdown, the sample is comprised of 19 seniors, 36 juniors, 19 sophomores, and 18 freshmen.

### Results

#### *The Basic Model*

Again, the analysis for the current study follows the general format that I used when analyzing the first trespassing study. I estimate a 2(Importance: important versus unimportant) X 2(Mode of Thinking: unconscious or conscious thinking) using a logistic regression function with weakly informative priors. All of the independent variables were mean centered prior to estimation. I present the parameter estimates for the basic model using each decision rule in Table 4-3.

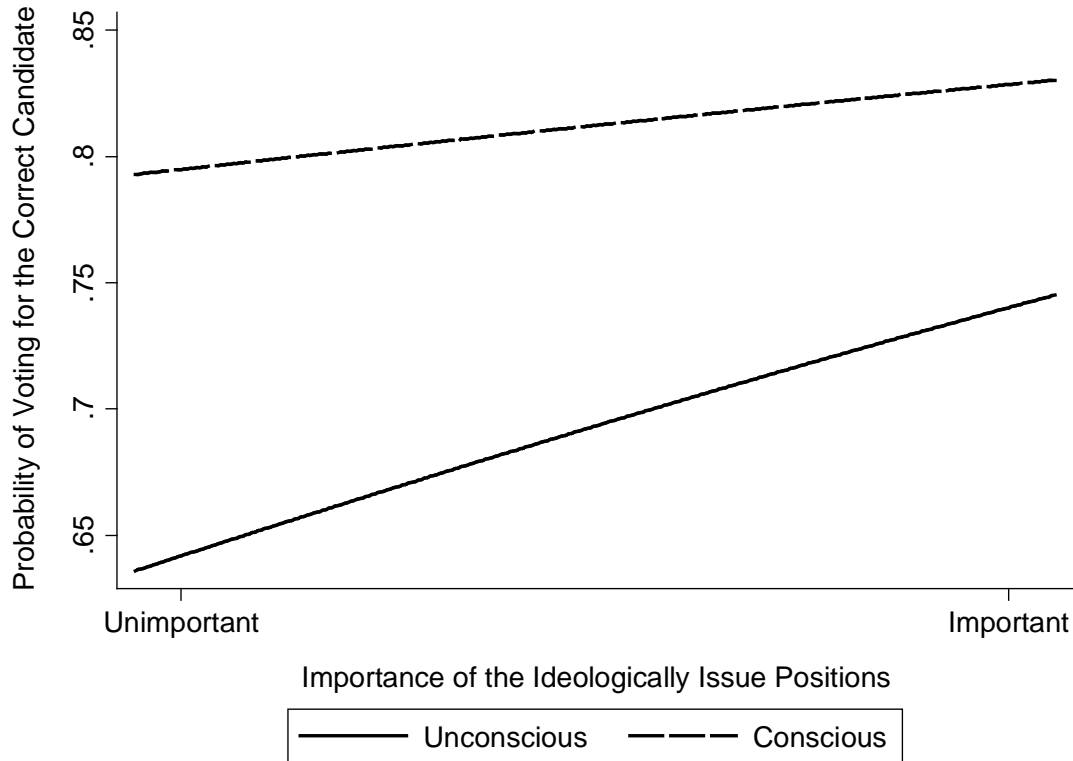
**Table 4-3: The Effect of the Mode of Thinking and the Importance of Ideologically Inconsistent Statements on the Probability of Voting for the Correct Candidate using Various Decision Rules**

	Affective Tally (se)	Weighted Additive (se)
Importance	0.38 (0.52)	-0.39 (0.41)
Unconscious	-0.65 (0.52)	-0.15 (0.41)
Importance * Unconscious	0.27 (1.04)	0.44 (0.82)
Intercept	1.14 (0.27)	0.25 (0.21)

A brief glance at Figures 4-5 and 4-6 shows that the support for the unconscious thinking hypothesis in the previous study may have been optimistic. In the current study,

unconscious thinking does not increase the probability that participants will vote for the correct candidate. Instead, across both decision rules, conscious thinking is more likely to enable the participants to vote for the correct candidate, however in no case was this increase statistically significant.

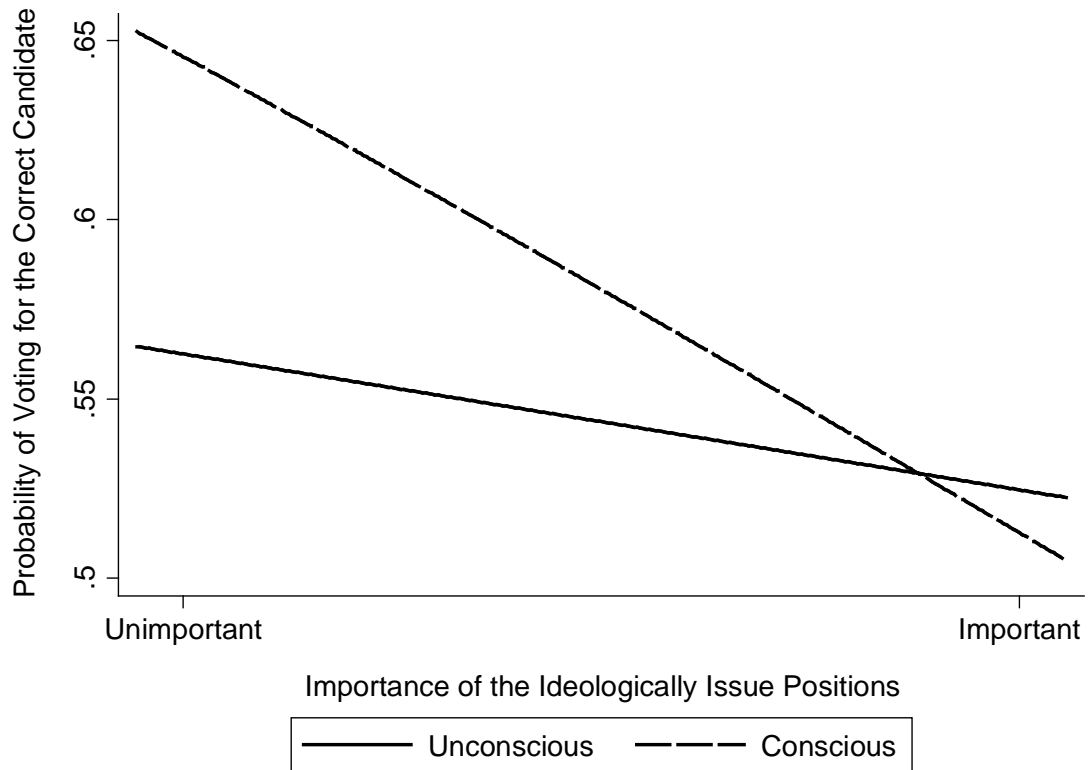
**Figure 4-5: The Effect of the Mode of Thinking and the Importance of Ideologically Inconsistent Statements on the Probability of Voting for the Correct Candidate (Affective Tally)**



In sum, trespassing study 2 fails to replicate the findings that we observed in the previous trespassing study and in the initial study. Not only are the probabilities of voting for the correct candidates insignificantly different from each other in any of the conditions, these probabilities are not even in the same direction as they were in the first study. Thus, this study strongly cautions the conclusions that should be drawn about the importance of conscious thinking for decision making.

It is possible, as was demonstrated in the initial study, that the effects of unconscious and conscious thinking are conditional on the participants' memory. Accordingly, this would suggest that unconscious thinking will increase the probability of voting for the correct candidate as the participants' memories improve and the reverse for conscious thinking.

**Figure 4-6: The Effect of the Mode of Thinking and the Importance of Ideologically Inconsistent Statements on the Probability of Voting for the Correct Candidate (Weighted Additive)**



*The Memory Model*

As in the first trespassing study, to explore the impact of memory on the probability of voting for the correct candidate the analogous 2 (issue importance: important versus unimportant) X 2 (style of thinking: unconscious versus conscious) between subjects factorial design was estimated, with inclusion of the number of statements the participants accurately recognized in the memory task included as a continuous factor. The parameter estimates for each decision rule are presented in Table 4-4.

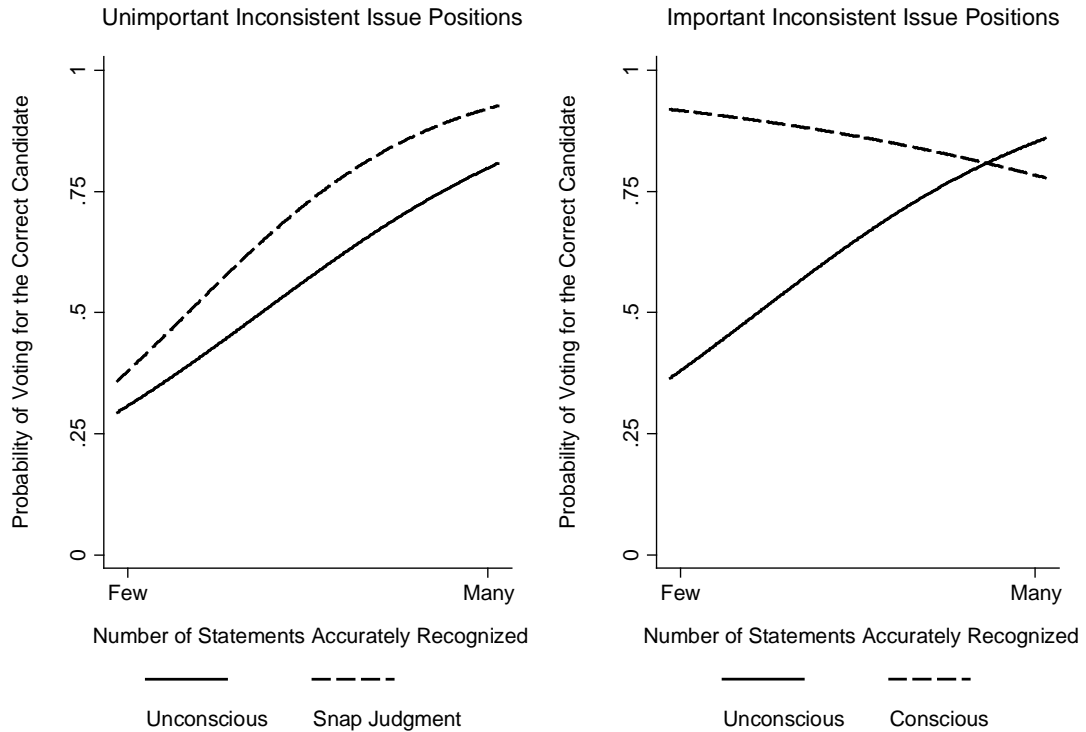


**Table 4-4 : The Effect of the Mode of Thinking and the Importance of Ideologically Inconsistent Statements and Recall on the Probability of Voting for the Correct Candidate using Various Decision Rules**

	Affective Tally (se)	Weighted Additive (se)
(Intercept)	1.21 (0.29)	0.30 (0.22)
Unconscious	-0.73 (0.56)	-0.21 (0.42)
Importance	0.25 (0.56)	-0.40 (0.42)
Unconscious * Importance	0.21 (1.11)	0.61 (0.85)
Memory	0.92 (0.56)	-0.23 (0.45)
Importance * Memory	-1.18 (1.11)	-0.98 (0.90)
Unconscious * Memory	0.76 (1.11)	-1.02 (0.90)
Unconscious * Importance * Memory	2.42 (2.21)	2.24 (1.79)

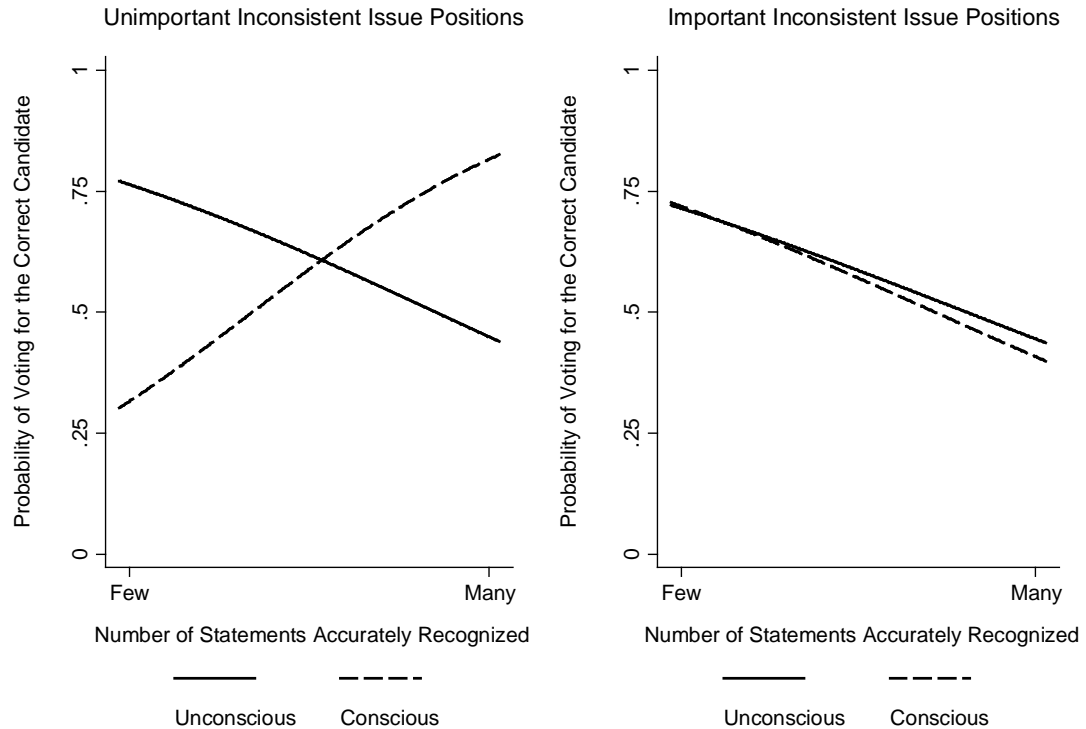
As was true for the first trespassing study, the primary predictor of voting for the correct candidate is accurately recognizing the statements that the candidates made. The more accurately participants remembered information about the candidates the more likely they were to vote for the correct candidate. In the second study, the impact of accurately recognizing the candidate information is less consistent. In the weighted additive decision rule, accurate memories are not related to the probability of voting for the correct candidate.

**Figure 4-7: The Effect of the Mode of Thinking and the Importance of Ideologically Inconsistent and Recognition Memory on the Probability of Voting for the Correct Candidate (Affective Tally)**



Figures 4-7 and 4-8 present the predicted probabilities of voting for the correct candidate based on the participant's mode of thinking, the importance of the issues that were trespassed and the accuracy of the participants' memories. In the current study, the effects are much less consistent across the various decision rules.

**Figure 4-8: The Effect of the Mode of Thinking and the Importance of Ideologically Inconsistent and Recognition Memory on the Probability of Voting for the Correct Candidate (Weighted Additive)**



When correct voting is calculated by the affective tally an interesting pattern of relationships emerges. When a candidate trespasses on unimportant issues, the more the participants remember about the candidates, the more likely they will vote for the correct candidate. Alternatively, when the candidates trespass on important issues, the situation is quite different. If the participants thought unconsciously, the more they remembered the more likely they would vote for the correct candidate. When the participants thought consciously about the candidate, there is a marginally significant decline in the probability that they would vote for the correct candidate as they remembered more information about the candidates.

The weighted additive rule shows a different pattern of effects. In the unimportant information condition, unconscious thinking led to a significantly higher probability of voting for the correct candidate than the conscious thinking condition if the participants had poor memories. For participants with good memories, the conscious thinking condition led to a higher probability of voting for the correct candidate.

In the important condition, the modes of thinking did not alter the probability of voting for the correct candidate whatsoever. In this situation, as memories improved, the probability of voting for the correct candidate decreased.

In sum, the results from the second trespassing study are highly inconsistent both with the previous studies and between the decision rules. Specifically, the results from

the current study are categorically different from the initial study in chapter 3 and the first trespassing study discussed above. Moreover, the subtle changes in the calculation of the dependent variable had dramatic effects on the results. As such, none of the hypotheses are supported with the results from this study.

### **Trespassing Study 2 Discussion**

The results from the second trespassing study are much less supportive of the unconscious thinking hypothesis than in the previous studies. In no condition did unconscious thinking increase the probability that participants would make the correct decision. In the relatively simple information condition, where candidates stole unimportant issues from their rival, participants who thought consciously were more likely to vote for the correct candidate than those who thought unconsciously. This result is consistent with both the conscious and unconscious thinking hypotheses.

It is possible that this study is simply an anomaly. At this point, the balance of the evidence is somewhat supportive of the unconscious thinking hypothesis in two studies, albeit in different and possibly contradictory ways, and unsupportive in one study. Thus, another study in the same direction is needed to disentangle the reliable effects of conscious and unconscious thinking.

### **Trespassing Study 3**

One potential limitation of the previous studies is that in the process of forcing participants to agree or disagree with the issue statements when they were presented by the candidates, participants may be induced to think carefully about the issues while they are learning about the candidates, and therefore, thwarting the possible effect of the thinking manipulation. Accordingly, it is possible that even participants in the unconscious thinking condition were thinking consciously about the candidates.

To account for these possibilities, the design of the experiment had to be modified. The major change in this study was the inclusion of a set of political arguments the participants rated immediately after the issue importance questionnaire and prior to the statements being attributed to the candidates. Specifically, participants stated their agreement with each statement the candidates would later make as well as their preferences on other unrelated issues that were included in the candidate statements. By altering the design in this way, participants are not forced to over think their evaluations while they were learning about the candidates.

### **Method**

*Participants.* 121 undergraduates participated in the study in exchange for class credit. 52 of the participants identified as liberal, 50 as moderate, 14 as conservative and 5 stated that they “hadn’t thought about it too much.” In terms of party affiliations, there were 62 Democrats, 29 Independents, and 19 Republicans. In this study, there are 65 males. As for the academic breakdown, the sample is comprised of 57 seniors, 43 juniors, 18 sophomores, and 3 freshmen.

### Study 3 Results and Discussion

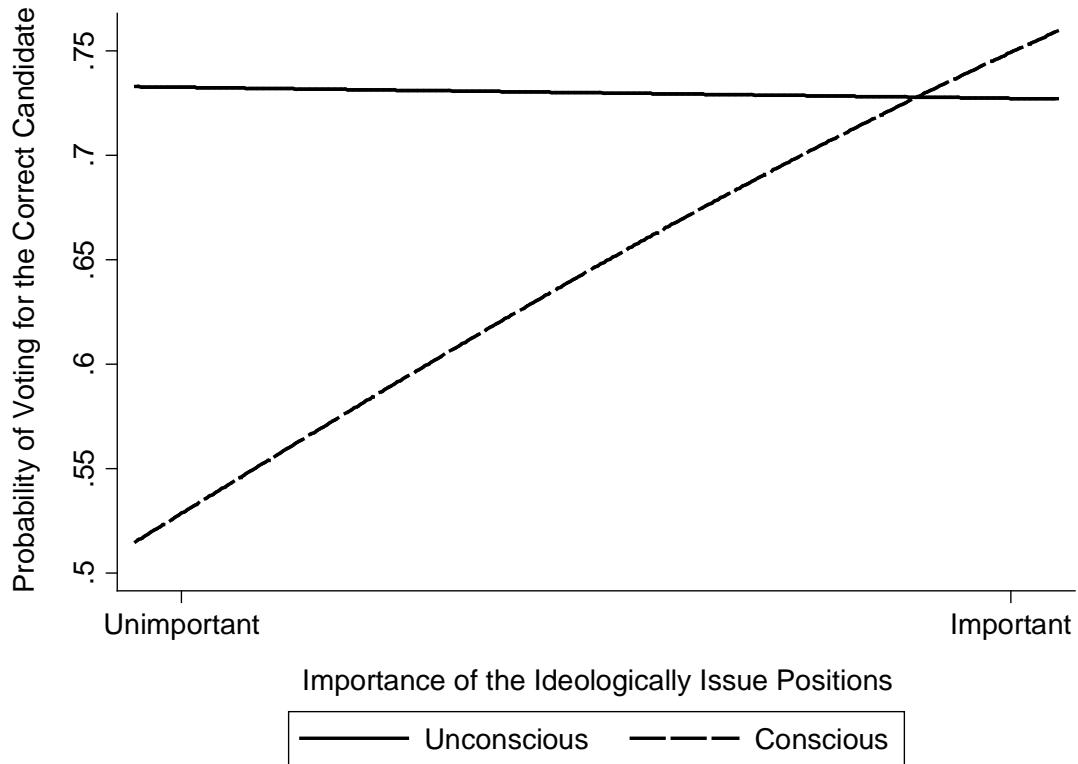
#### *The Basic Model*

The analysis for the third trespassing study follows the format used when analyzing the prior studies. I estimate a 2(Importance: important versus unimportant) X 2(Mode of Thinking: unconscious versus conscious thinking) using a logistic regression function with weakly informative priors. All of the independent variables were mean centered prior to estimation. I present the parameter estimates for the basic model using each decision rule in Table 4-5.

**Table 4-5: The Effect of the Mode of Thinking and the Importance of Ideologically Inconsistent Statements on the Probability of Voting for the Correct Candidate using Various Decision Rules**

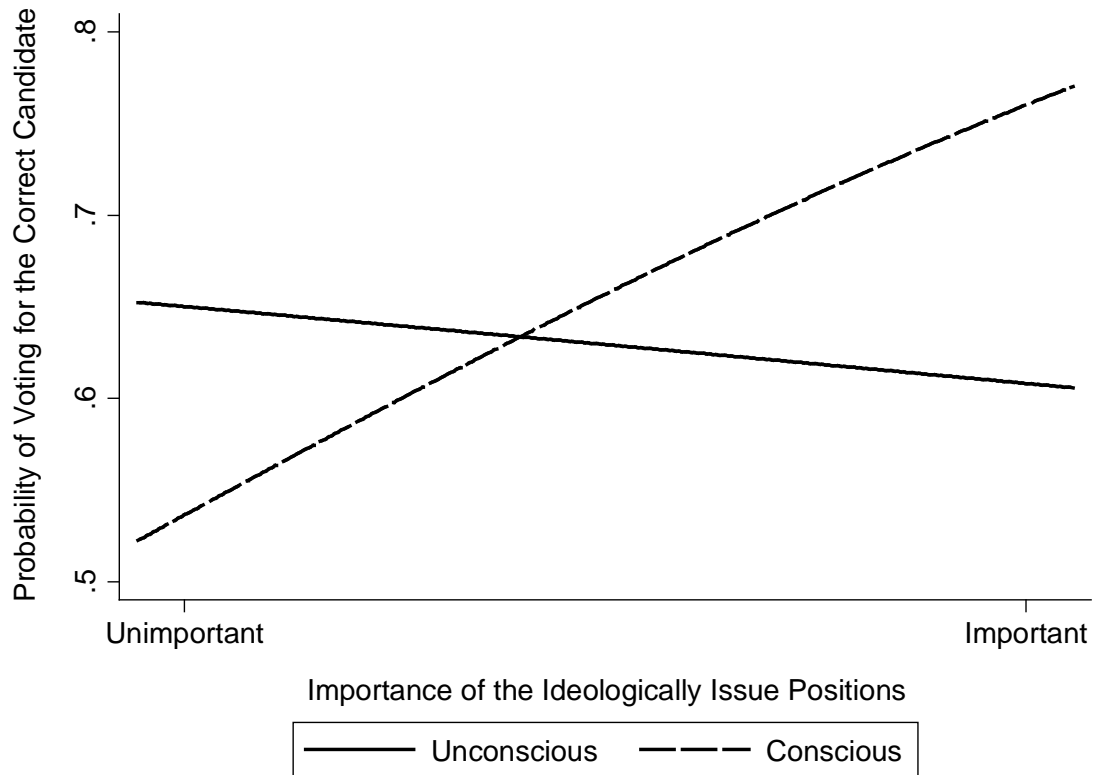
	Affective Tally (se)	Weighted Additive (se)
Unconscious	0.39 (0.42)	-0.12 (0.39)
Importance	0.53 (0.42)	0.46 (0.38)
Unconscious * Importance	-1.12 (0.84)	-1.32 (0.780)
(Intercept)	0.80 (0.21)	0.59 (0.19)

**Figure 4-9: The Effect of the Mode of Thinking and the Importance of Ideologically Inconsistent Statements on the Probability of Voting for the Correct Candidate (Affective Tally)**



A brief glance at Figures 4-9 and 4-10 show paradoxical support for the process of thinking unconsciously. When using both the affective tally and the weighted tally rules, thinking unconsciously increases the probability that participants will vote for the correct candidate in the unimportant information condition, however this effect is only marginally significant. Importantly, this is the exact situation where both the conscious and unconscious thinking hypotheses predict that conscious thinking would lead to more optimal decisions than unconscious thinking. Thus, even though unconscious thinking was more effective in this scenario, this evidence does not support the hypothesis of unconscious thinking.

**Figure 4-10: The Effect of the Mode of Thinking and the Importance of Ideologically Inconsistent Statements on the Probability of Voting for the Correct Candidate (Weighted Additive)**



As for weighted additive decision rule, neither the mode of thinking nor the importance of the trespassed information significantly alters the probability that the participants will vote for the correct candidate.

*The Memory Model*

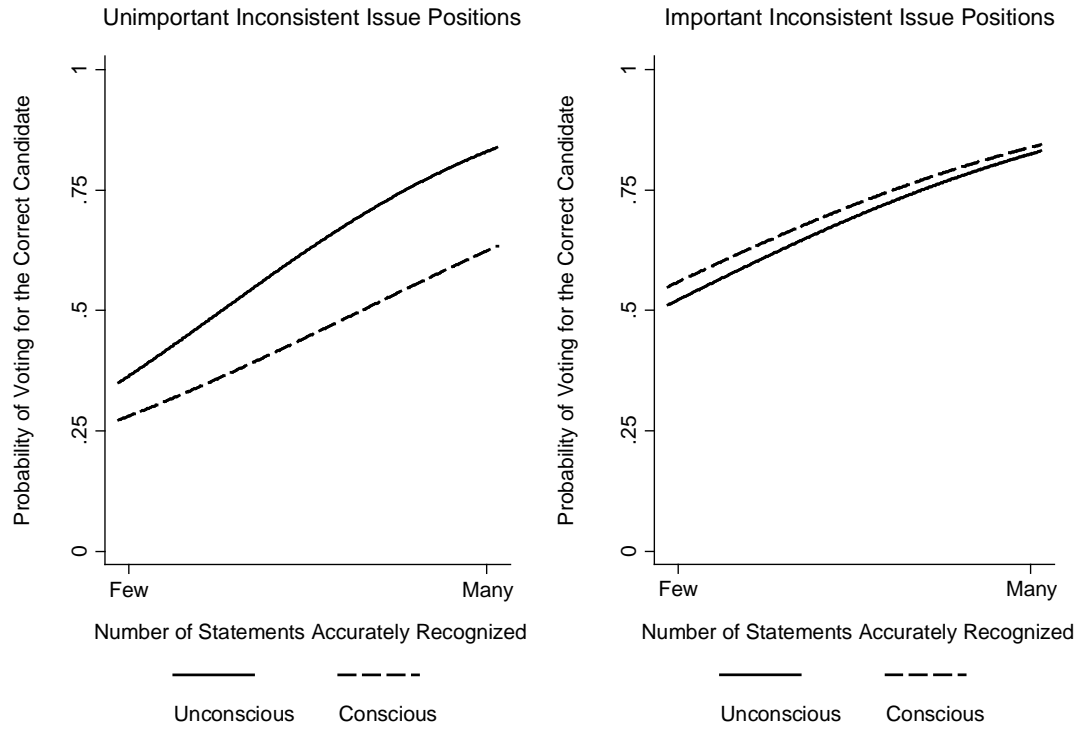
As with the recall models presented in study 2, the recall models in the current study are inconsistent with the unconscious thinking hypothesis. In the affective tally model, the primary predictor of correct voting is the quality of the participant’s memory. Specifically, in both thinking conditions and both importance conditions the more participants were able to remember about the candidates, the more likely they were to vote for the correct candidate.

**Table 4-6: The Effect of the Mode of Thinking, the Importance of Ideologically Inconsistent Statements and Recall on the Probability of Voting for the Correct Candidate using Various Decision Rules**

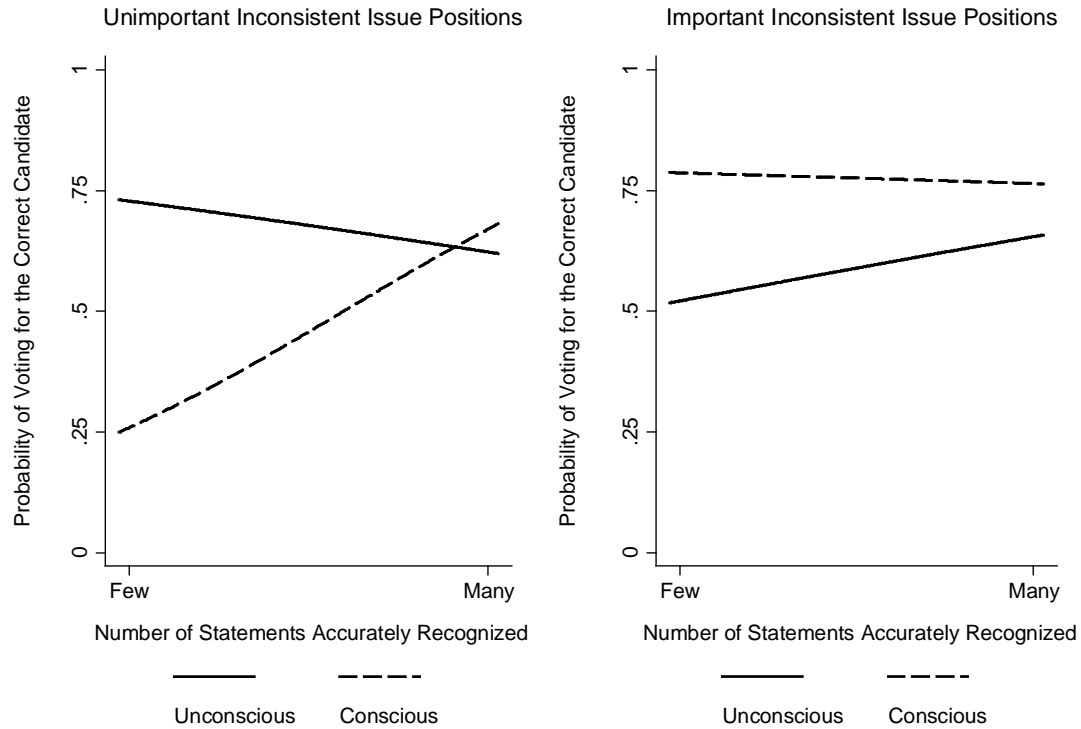
	Affective Tally (se)	Weighted Additive (se)
(Intercept)	0.80 (0.22)	0.62 (0.20)
Unconscious	0.37 (0.44)	-0.12 (0.39)
Importance	0.67 (0.44)	0.44 (0.39)
Unconscious * Importance	-0.97 (0.88)	-1.28 (0.79)
Memory	0.95 (0.47)	0.25 (0.40)
Importance * Memory	-0.21 (0.94)	-0.25 (0.81)
Unconscious * Memory	0.22 (0.93)	-0.46 (0.82)
Unconscious * Importance * Memory	-0.38 (1.88)	1.72 (1.66)



**Figure 4-11: The Effect of the Mode of Thinking, the Importance of Ideologically Inconsistent Statements and Recognition Memory on the Probability of Voting for the Correct Candidate (Affective Tally)**



**Figure 4-12: The Effect of the Mode of Thinking, the Importance of Ideologically Inconsistent Statements and Recognition Memory on the Probability of Voting for the Correct Candidate (Weighted Additive)**



Using the weighted additive rule to determine correct voting, a different pattern of effects emerges: the differences between conscious and unconscious thinking emerge in the unimportant trespassing condition. Specifically, unconscious thinking is significantly more likely to lead participants with poor memories to vote for the correct candidate relative to conscious thinking if the information that the candidates trespassed was unimportant. When the trespasses information was important, there are no statistically significant differences between the modes of thinking regardless of the participants' memories.

### General Discussion

Across the three importance studies, very few consistent results emerge. A summary of the support for the primary hypotheses tested in the studies are outlined in Table 4-3. Across the three trespassing studies, there is no support for the conscious thinking hypothesis. Furthermore, there is inconsistent support for the unconscious thinking hypothesis. Specifically, the unconscious thinking hypothesis is only marginally supported in the first trespassing study when memory is not included in the model.

Interestingly, the information complexity hypothesis is not supported in any of the trespassing studies. As such, across the three trespassing studies, there is very little support for any of the primary hypotheses.

One consistent effect that did emerge was the main effect of memory on correct voting. Essentially, the more people remembered about the candidates, the more likely they would vote correctly. Although this was not a primary hypothesis, this effect does seem relatively intuitive.

**Table 4-7 – Support for the Primary Hypotheses in the Trespassing Studies**

		Support for the Hypothesis					
		Conscious Thinking		Unconscious Thinking		Information Complexity	
		AT	WA	AT	WA	AT	WA
Trespassing 1	Without Memory	X	X	√	√	X	X
	With Memory	X	X	X	X	X	X
Trespassing 2	Without Memory	X	X	X	X	X	X
	With Memory	X	X	X	X	X	X
Trespassing 3	Without Memory	X	X	X	X	X	X
	With Memory	X	X	X	X	X	X

Note: X denotes the failure to support the hypothesis, √ denotes the support of the hypothesis. Highlighted boxes denote marginal support for the hypothesis.

In the first trespassing study, the results seem to weakly support the unconscious thinking hypothesis. When the information is complex, participants who thought unconsciously about the information were more likely to vote for the correct candidate than those who thought consciously. This effect, however, evaporated after controlling for the participant’s memory.

In the second trespassing study, no support was found for the unconscious thinking hypothesis. Specifically, significant differences between the likelihood of voting for the correct candidate favored those who thought consciously about the information. This effect was the strongest when the information was easy. As such, the condition where conscious thinking was most effective equally satisfies both the expectations outlined by the conscious and unconscious thinking hypotheses.

In the third trespassing study, again, no support was found for the unconscious thinking hypothesis. Interestingly, no support is found for the conscious thinking hypothesis either. In fact, the only marginally significant results that were found in the third trespassing study were, paradoxically, completely opposite of those found in the second trespassing study.

The second and third trespassing studies suggest that the tentatively positive results in the first trespassing study were not simply thwarted by underpowered statistical tests. Rather, when more data was gathered to explicate the results, the effects proved remarkably unstable, and were quite contradictory to the expectations outlined by the unconscious thinking hypothesis.

In sum, the studies presented in this chapter are unsupportive of the unconscious thinking hypothesis. Interestingly, the results are also unsupportive of the conscious

thinking hypothesis. Specifically, neither conscious nor unconscious thinking was more effective in guiding participants to vote for the correct candidate.

The fact that the complexity hypothesis was not supported in any of the studies, however, is rather concerning. This hypothesis is highly intuitive and the lack of support for this hypothesis may suggest that the information provided was not as complex in the complex information condition as was necessary for unconscious thinking to be effective. As such, conscious thinking was able to sort through the information and come to an optimal decision. Importantly, conscious thinking was not preferable to unconscious thinking in any of the complex information conditions. Because there are no significant differences between conscious and unconscious thinking, it is impossible to reliably determine whether the information was complex enough.

Intriguingly, across all of the trespassing studies, the most consistent predictor of correct voting is the participant's ability to accurately remember more candidate information. Furthermore, the mode of thinking did not reliably influence the probability that participants would vote for the correct candidate.

As such, it appears that thinking, at least as it is operationalized in the current studies, is unrelated to the probability that people will vote for the correct candidate. Specifically, neither conscious thinking nor unconscious thinking hypotheses were consistently found to be preferable. In fact the utter lack of consistent findings within the studies presented in this chapter point in the direction of the following conclusion: thinking does not matter.

## Chapter 5 – Disentangling Heuristic Processing from Unconscious Thinking

This chapter explores the occasional support for the unconscious thinking hypothesis and attempts to disentangle the influence of unconscious thinking from the more established heuristic information processing (Petty and Cacioppo, 1986; Eagly and Chaiken, 1993). In light of the fragile empirical support for the unconscious thinking hypothesis, it is necessary to explore alternative explanations for the effects of unconscious thinking. One interpretation of the empirical difference between unconscious thinking and heuristic information processing is that the difference between the conditions is more reasonably a difference in the degree participants were relying on heuristics.

It is possible that unconscious thinking improves the quality of decisions that people make because unconscious thinking allows people to latch onto available heuristic cues, like the source of the information or their on-line tally of the candidate, and base their political decisions on these cognitive shortcuts. Accordingly, this suggests that rather than being an active process analogous to systematic processing, unconscious thinking may simply be a type of heuristic processing.

As the political heuristics literature has demonstrated, heuristics simplify the information people have at their disposal when making political decisions. Essentially, if people extract a heuristic cue from the information, they can discard the actual content of the information or political arguments. The use of heuristics in political decision making is wide spread. In fact, most political decisions people make are, in some way, affected by heuristic processing (Lau and Redlawsk, 2001), a trend that is more extensive for people who are politically sophisticated. Within the information processing literature in social psychology, heuristic processing is generally construed as an inferior style of processing leading to myriad preventable errors when compared with systematic or central route processing (Petty and Cacioppo, 1986; Eagly and Chaiken, 1993). Furthermore, people who rely on heuristic devices typically neglect large portions of the available information that is potentially informative for the judgment that they are going to make (Tversky and Kahneman 1974), and they may over estimate the likelihood of a rare, yet vivid, event (Reyes et al 1980) or anchor on a piece of information failing to adequately update their beliefs and allow subsequent information to sufficiently adjust their preferences (Tversky and Kahneman 1974).

Heuristics, however, do not automatically lead to errors and biases. More often than not heuristics lead to reasonable outcomes (Gigerenzer, 2007). After all, if the heuristic did not work fairly well most of the time, the cognitive shortcut would not develop in the first place and would rapidly be extinguished after it failed to be effective. In most cases these simple psychological mechanisms yield more correct inferences than stochastic decisions. Moreover, some research suggests that heuristics are approximately as accurate as the more effortful processing strategies traditionally equated with rational inferences and expend significantly less cognitive effort in the process (Gigerenzer and Goldstein 1996).

Effectively employing heuristic cues can dramatically improve an individual's political judgments. People with low levels of general political knowledge that are able

to latch onto one heuristic behave like politically sophisticated decision makers (Lupia 1994). Importantly, well informed citizens have been demonstrated to rely on heuristics more than their less informed counterparts, making it nearly impossible to find a group of sophisticates who do not use heuristics and instead systematically process all the information they learn (Kuklinski and Quirk 2000; Lau & Redlawsk, 2001).

Moreover, heuristic use depends on several well identified factors. People are less likely to rely on heuristics if the judgment is highly self-relevant (Petty and Cacioppo, 1986), if they are ambivalent (Basinger and Lavine, 2005), or if they are anxious (Marcus and Neuman, 1993; Marcus, Neuman and MacKuen, 2000). In these situations, an individual's personal circumstances motivate them to pay more attention to the content of the information, spend more time and energy searching for information, learning, and processing the information they encounter more carefully. In other words, people rely on heuristics if they lack the internal motivation to think carefully.

Accordingly, it is possible that unconscious thinking is an extreme form of heuristic processing. Instead of the distraction causing people to allow their unconscious processes to filter through the information, carefully weigh the relevant considerations, and arrive at an optimal solution, it is possible that unconscious thinking simply enhances heuristic processing. As such, the snap judgment condition used in the current research paradigm can be seen as a weak form of heuristic use, where the impact of careful cognitive thinking during the learning phase has not yet receded making conscious processing accessible. Accordingly, the unconscious thinking condition is a relatively pure form of heuristic processing, as by the end of the distraction task, the residual motivation to process information consciously has dissolved.

If this is true, it has enormous implications for unconscious thinking. If unconscious thinking is an extreme form of heuristic processing, then unconscious thinking reduces to a basic dual process theory of attitudes, analogous to the Elaboration Likelihood Model (Petty and Cacioppo, 1986) or the Heuristic-Systematic Model (Eagly and Chaiken, 1993).

## Methods

*Participants.* 234 undergraduates participated in the study in exchange for class credit. The sample consisted of 128 Democrats, 55 Independents, and 36 Republicans. In this study, there are 91 males. As for the academic breakdown, the sample is comprised of 63 seniors, 88 juniors, 27 sophomores, and 52 freshmen.

*Information environment.* The difficulty of the information environment was manipulated in a similar manner as in the trespassing studies: by varying the extent of ideological overlap between the two political candidates. Specifically, in the simple information condition, the candidates remained ideologically pure while in the complex information environment, both candidates borrowed issue positions from the other side of the political spectrum.

*Mode of Thinking.* The thinking conditions were manipulated in the same way as in the previous studies.

*Informational Cues.* The novel manipulation in this study was the inclusion of ideological cues that either corresponded or did not correspond with the actual ideological slant of the candidate. Specifically, while participants read the statements the

candidates made, the word liberal or conservative appeared under the candidate's name. Thus, in the "good" cue condition, the candidate that made liberal (conservative) statements was actually labeled liberal (conservative), while in the "bad" cue condition, the liberal (conservative) candidate was labeled conservative (liberal).

## Results

The analysis for the study presented in this chapter departs slightly from the format that I used when analyzing the previous studies. Because memory did not moderate the likelihood of voting for the correct candidate in the last chapter, the memory model is not presented in this chapter.<sup>8</sup> To analyze the impact of heuristic cues on the probability of voting for the correct candidate, I estimate a logistic regression function with weakly informative priors that is analogous to a 2(Cue: accurate vs inaccurate) X 2(Ideological distinctiveness: distinct vs indistinct) X 3(Mode of Thinking: unconscious thinking, snap judgment and conscious thinking) ANOVA. All of the independent variables were mean centered prior to estimation. I present the parameter estimates for the basic model using each decision rule in Table 5-1.

Two effects are evident from a quick glance at Table 5-1. First, there is a consistent and strong main effect of the ideological distinctiveness of the candidates. As predicted by the complexity hypothesis, when the candidates are less ideologically distinct, voting for the correct candidate is more difficult. Second, participants in the snap judgment condition made significantly better choices when they were exposed to an accurate ideological cue using the affective tally rule. The fact that this effect does not reach traditional levels of statistical significance in the weighted additive rule is more a reflection of all conditions using the ideological heuristic when the correct candidate was determined by the weighted additive rule.

Interestingly, the interaction between the ideological cue and the unconscious thinking condition consistently falls just shy of traditional levels of marginal significance. Thus, it seems that while similar processes are occurring for both unconscious and snap judgments, the additional distraction in the unconscious thinking condition reduces the reliability of the relationship between the cue and the probability of voting for the correct candidate below traditional levels of statistical significance.

The predicted probabilities of voting for the correct candidate are presented in Figures 5-1 and 5-2. When looking at the figure depicting the results for the affective tally rule, Figure 5-1, a nuanced story begins to emerge that is partially obscured when looking at the coefficients.

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<sup>8</sup> When the models that include memory are estimated, the effect of memory does not reliably alter the probabilities of voting for the correct candidate.

**Table 5-1: The Effect of the Mode of Thinking, Heuristic Cues and the Ideological Distinctiveness of the Candidates on the Probability of Voting for the Correct Candidate using various decision rules**

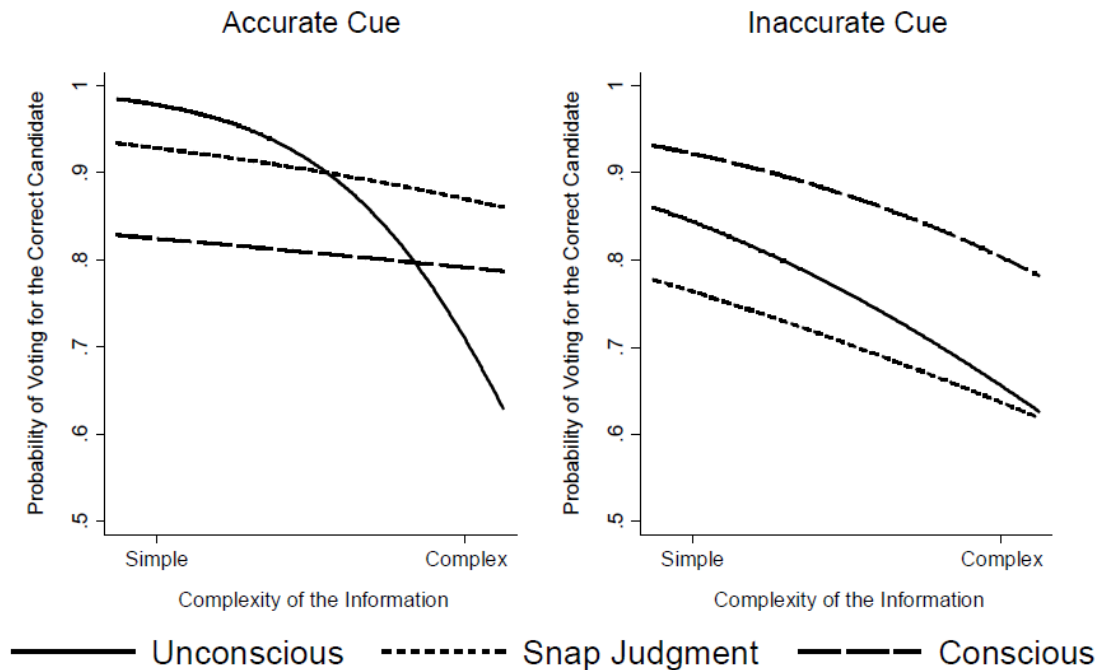
	Affective Tally (se)	Weighted Additive (se)
Good Cue	0.69 (0.44)	0.71 (0.44)
Complexity of Information	-1.37 (0.45)	-1.60 (0.45)
Cue * Complexity	-0.50 (0.88)	0.05 (0.89)
Unconscious	0.07 (0.56)	0.14 (0.57)
Unconscious * Complexity	-1.68 (1.13)	-1.83 (1.15)
Unconscious * Cue	1.69 (1.13)	1.44 (1.15)
Unconscious * Cue * Complexity	-3.41 (2.27)	-3.30 (2.31)
Snap Judgment	-0.14 (0.46)	-0.14 (0.46)
Snap Judgment * Complexity	-0.07 (0.93)	-0.22 (0.93)
Snap Judgment * Cue	1.87 (0.93)	1.18 (0.93)
Snap Judgment * Cue * Complexity	-1.15 (1.86)	-1.95 (1.86)
(Intercept)	1.67 (0.23)	1.74 (0.23)

When the ideological cue is accurate, if the candidates are ideologically distinct, participants are much more likely to vote for the correct candidate. Importantly, the probability of voting for the correct candidate declines precipitously for unconscious thinkers when the ideological cue is accurate. When participants made snap judgments or thought carefully it still decreased, but the decrease was not statistically significant.

When the ideological cue is inaccurate this decline is essentially parallel for every thinking condition, however the decline is only statistically significant for the conscious thinking condition. Because there is no interaction between any of the thinking conditions and the complexity of the information, it is reasonable to conclude that the decline in the probability of voting for the correct candidate when the information is complex is a reliable effect.



**Figure 5-1: The Effect of the Mode of Thinking, Heuristic Cues and the Ideological Distinctiveness of the Candidates on the Probability of Voting for the Correct Candidate (Affective Tally)**

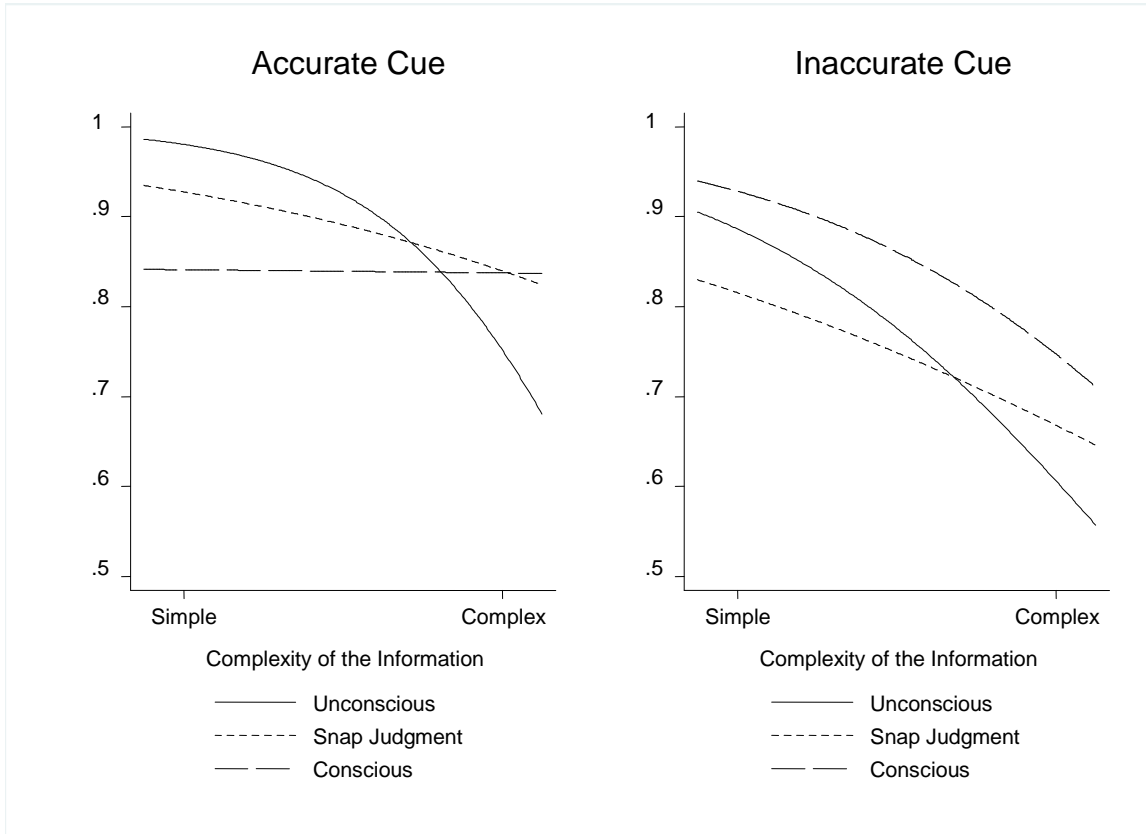


The other effect highlighted by Table 5-1 was the interaction between the accuracy of the ideological cue and the snap judgment condition. It is important to keep in mind that the coefficient tests the specific interaction between the conscious thinking condition and the snap judgment condition. Accordingly, when participants were given an accurate ideological cue, participants in the snap judgment condition used the ideological cue more effectively than participants in the conscious thinking condition, although this effect falls just shy of statistical significance. Alternatively, when participants are given an inaccurate cue, participants in the conscious thinking condition are significantly more likely to vote for the correct candidate than participants in the snap judgment condition. As such, the reversal of the observed effects in the snap judgment and conscious thinking conditions depending on the accuracy of the ideological cue explain the significant interaction presented in Table 5-1. This effect is entirely consistent with the heuristics hypothesis that suggests that heuristic processors would rely on informational shortcuts when making their decisions.

The effects are less consistent with the unconscious thinking condition, though the general pattern of results in the unconscious thinking condition is similar to the pattern observed in the snap judgment condition. Specifically, when the information was simple and the unconscious thinkers were presented with accurate ideological cues every participant voted correctly. However, when the candidate information was more complex, unconscious thinkers were the least likely participants to vote for the correct candidate even though they were provided with an accurate ideological cue. This suggests that when simple decisions are made even easier, distraction allows people to

effectively use cognitive shortcuts. When the information is more complex, distraction leads people to forget these shortcuts that would simplify their decision.

**Figure 5-2: The Effect of the Mode of Thinking, Heuristic Cues and the Ideological Distinctiveness of the Candidates on the Probability of Voting for the Correct Candidate (Weighted Additive)**



When examining the predicted probabilities of the weighted additive decision rule, presented in Figures 5-2, a similar pattern of results emerges. As with the affective tally rule, when the weighted additive rule is used to calculate correct voting, increasing the complexity of the information decreases the probability that a person will vote for the correct candidate has a slightly stronger effect except in the conscious thinking condition with the accurate cue.

In contrast with the significant interaction between the snap judgment condition and the accuracy of the ideological cue is no longer statistically significant, although the pattern of results is still in the same direction. Thus, the additional information that is incorporated into the correct vote calculations using the weighted additive decision rule obscures the effect of the ideological cue on the decisions.

Notably, unconscious thinking is significantly more effective than conscious thinking when the candidates are ideologically distinct and when they have an accurate ideological cue. But, unconscious thinking is consistently the least effect way of thinking when the candidate information is complex.

Importantly, the pattern of effects in the unconscious thinking and snap judgments condition are highly similar. As such, it is impossible to conclude that the decision

making process is any different in the unconscious thinking condition versus the snap judgment condition

### Discussion

A summary of the results from the heuristics study are presented in Table 5-2. Again, as with the previous studies, no support is found for the conscious thinking hypothesis. Furthermore, there is no support for the unconscious thinking hypothesis. Strong support for the heuristics hypothesis and the information complexity hypothesis are found.

**Table 5-2 – Support for the Primary Hypotheses in the Heuristics Study**

Support for the Hypothesis							
Conscious Thinking		Heuristics		Unconscious Thinking		Information Complexity	
AT	WA	AT	WA	AT	WA	AT	WA
X	X	√	√	X	X	√	√

Note: X denotes the failure to support the hypothesis, √ denotes the support of the hypothesis. Shaded boxes denote marginal significance.

The results presented in this chapter do not support the unconscious thinking hypothesis. Specifically, the pattern of results for the unconscious thinkers closely approximates the pattern of results in the snap judgment condition. Participants who made snap judgments consistently made significantly better decisions when they had an accurate ideological cue at their disposal. While this effect was weaker and less consistent for participants who thought unconsciously, it was in the same direction. Furthermore, unconscious thinking was most successful relative to conscious thinking when participants had an accurate ideological cue and when the decision was relatively simple.

Importantly, this result directly contradicts the expectation suggested by the conscious and unconscious thinking hypotheses that conscious thinking would outperform unconscious thinking when the information context was simple. This result is consistent with the expectations of the heuristics hypothesis. Specifically, these results seem to support the more traditional dual process framework of attitudes. When participants thought carefully about the candidate information, they relied less on the ideological cues relative to the other thinking conditions where the cues tended to improve decision quality. Thus, the conclusion that can be drawn from this study is that the cognitive process that leads people to make better decisions when they think unconsciously is very similar to those that lead people to make correct judgments when they rely on heuristics.

## Chapter 6 – Conclusion

The results from the studies presented in the previous chapters are inconsistent. In some studies, unconscious thinking appears to be preferable while in others, conscious thinking results in the highest probability of voting for the correct candidate. Consequently, it is difficult to draw strong conclusions from such an inconsistent set of empirical findings.

### Summary of the Results

The primary support for the unconscious thinking hypothesis was found in the initial study when recognition memory was included in the analysis. With this model specification, when the external information was complex, participants who engaged in unconscious thinking were more likely to vote correctly than participants who thought consciously if they had good memories. Specifically, when participants learned about ideologically similar candidates, participants who thought consciously about the candidates were more likely to vote for the correct candidate than those who thought unconsciously if they remembered only one or two ideological statements to the correct candidate. Essentially, because these participants could not remember very much information about the candidates, they were forced to rely on whatever information they could remember and consciously use this information as a cognitive short cut. Alternatively, the participants who thought unconsciously were unable to use the limited amount of information they could remember as a shortcut, because they were distracted before making their judgments, and ended up voting for the wrong candidate.

When the candidates were ideologically distinct, making the political decision relatively easy, most people were able to vote for the correct candidate. The participants with better memories were more likely to vote for the correct candidate if they thought consciously about the information. This decline occurs because those who thought unconsciously were less likely to vote correctly if they had better memories. For participants who thought consciously, the quality of their memory was unrelated to the probability that they would vote correctly if the candidates were ideologically distinct. Therefore, in the more simplistic information environment participants who thought consciously were slightly more likely to vote correctly than unconscious thinking.

This specific pattern of results is extremely supportive of the unconscious thinking hypothesis. The unconscious thinking hypothesis predicts that for simple decisions, conscious thinking will be more effective while for complex decisions unconscious thinking will be more effective. The initial study demonstrates just that. When the candidates were ideologically distinct, the participants who thought consciously were more likely to vote correctly. When the candidates were ideological indistinct, participants were more likely to vote correctly if they thought unconsciously and had very good memories.

These effects have very interesting implications for the way that people should make political decisions. If the alternatives are distinct and the choice is easy, knowing the painstaking details about the different political options does not lead to better choices.

In this situation, thinking consciously about the options prevents people with fairly decent memories from making careless errors which are typical of low effort information processing strategies. Consistent with the political heuristics literature, if a choice is easy, people should rely on their immediate gut-level preferences, which will lead to fairly accurate decisions. Although the heuristics hypothesis was not formally tested in the initial study, these results are consistent with what would be expected.

In order to have confidence in these conclusions, however, it is essential to replicate the findings using a slightly different, though conceptually equivalent, task. Unfortunately, none of the results that supported the unconscious thinking hypothesis were replicated in the subsequent studies. In the issue trespassing studies presented in Chapter 4, virtually no results emerged that supported any of the primary hypotheses.

The initial study shows that unconscious thinking works better for people with good memories, while the first trespassing study shows that it works better for all people regardless of memory, a result that is also supportive of the unconscious thinking hypothesis. In essence, unconscious thinkers were marginally more likely to vote for the correct candidate relative to conscious thinkers if the information was complex. Importantly, these results were only marginally significant, and evaporated after controlling for the accuracy of each participant's memory. Therefore, in contrast with the initial study, including memory as a moderator of the information complexity eliminated the difference in effectiveness between the two styles of thinking. As such, these weakly supportive results contradict the supportive results from the initial study.

Neither the second nor the third trespassing study provides any support for the unconscious thinking hypothesis. In the second study, unconscious thinking did not increase the probability that participants would make the correct decision, in any condition for either decision rule. In the third trespassing study, unconscious thinking was more effective than conscious thinking when the information was simple; however this finding is not expected on the basis of the unconscious thinking hypothesis. In fact, both the conscious and unconscious thinking hypotheses predict that conscious thinking would do better than unconscious thinking when the information is simple.

Looking across these three studies, one consistent effect emerges that was *not* predicted by the primary hypothesis. The more information that people accurately remember about the candidates, the more likely they will vote correctly. The fact that as people remembered more information they were more likely to vote correctly in all of the condition is evidence against the argument that unconscious thinking is more effective for complex decisions. As people remember more information, the additional information stored in long term memory allows them to incorporate more information into their decisions. Because people base their decision on more information, the situation is more complex. The unconscious thinking hypothesis argues that people who think consciously will weigh the information in a suboptimal way that emphasizes unimportant information (Dijksterhuis and Nordgren, 2006). If this were true, we should have consistently observed the pattern of effects shown in the initial study. In that first study I found that better memories only helped the unconscious thinking group make better choices. In these later studies I find that better recognition memory help everyone make better choices, suggesting that thinking carefully about the relevant information led to better decisions. In other words, people thinking carefully in these later studies were able to

accurately and effectively wade through whatever information they were presented with and come to an optimal choice.

Taken together, the three issue trespassing studies find virtually no support for the unconscious thinking hypothesis. This lack of support undermines the reliability of the initial study. It is possible that the evidence that supported the unconscious thinking hypothesis in the first study was actually a Type I error. In other words, the beneficial effect of unconscious thinking was simple luck. In the trespassing studies, the slope of the participants' recollection in the complex information condition was consistently positive and significant, regardless of how the participants thought about the candidates.

The heuristics study presented in Chapter 5 takes a very different approach in evaluating the unconscious thinking hypothesis. While the initial study and the trespassing studies focused on comparing the conscious and unconscious thinking conditions, those studies do very little to disentangle the unconscious thinking hypothesis from the more general heuristics hypothesis. The heuristics study focuses specifically on this issue. The results from the heuristics study, again are unsupportive of the unconscious thinking hypothesis, and instead support the predictions of the classic dual process theories (Eagly and Chaiken, 1993; Petty and Cacioppo, 1986). In this study, in both the snap judgment and unconscious thinking conditions, when participants were given an accurate cue, they were more likely to vote correctly than participants who thought consciously about the candidates.

In the inaccurate cue condition, the reverse effects emerge. The participants who were given an inaccurate cue and thought consciously about the information were more likely to vote correctly than the other two thinking conditions. Essentially, these participants were able to intentionally disregard the cue and vote for the correct candidate anyway.

### *Support for the Main Hypotheses*

As can be seen in Table 6-1, the results are highly inconsistent and not overly supportive of the main hypotheses. The conscious thinking hypothesis is not supported in a single study. This is a very intriguing finding, as this is truly the baseline for making decisions. As Franklin suggests, people should think very carefully and that will help them come to the best decisions. In the current data, however, thinking carefully was not beneficial. People were able to vote correctly even if they did not think about the decision after they had learned all of the information. This could occur if people had already made their judgments prior to the thinking manipulation. Consistent with the online processing model (Lodge, Steenbergen and Brau, 1995), the additional thinking was unnecessary for the evaluations: people immediately made their evaluations and the additional thinking neither aided nor impeded their ability to rely on their pre-formed evaluations.

The heuristics hypothesis is directly supported in the heuristics study, which is really the only study that fairly tests this hypothesis. In this study people were given either an accurate or inaccurate ideological cue that they could use to simplify their decisions. Consistent with expectations derived from the judgment and decision making literature (Gigerenzer, 2007; Gigerenzer and Goldstein, 1996), and the dual process literature (Petty and Cacioppo, 1986; Eagly and Chaiken, 1993), when people thought carefully about the information they were less likely to rely on either the accurate or the

inaccurate ideological cues. This lower level of reliance on the cue in the conscious thinking condition was quite effective when the cue was intended to lead them astray. Essentially, by disregarding the accurate cue, participants in the conscious thinking condition were less likely to make the right choice. In contrast, those who did not think carefully (meaning they either thought unconsciously or did not think at all) were more likely to rely on the ideological cues, leading to a better decision when the cue was accurate and a worse decision when the cue was inaccurate. The pattern of results for the snap judgment condition and the unconscious thinking condition were essentially the same. This suggests that unconscious thinking is simply a special case of heuristic processing rather than a separate phenomenon.

Evidence that supports the unconscious thinking hypothesis is the most unstable finding throughout the current research program. The unconscious thinking hypothesis is strongly supported in the initial study so long as the participants' recognition memory is taken into consideration. Further, the unconscious thinking hypothesis is weakly supported in the first trespassing study when memory is ignored. In all of the other studies, the unconscious thinking hypothesis receives no support. Because of this inconsistent support for the unconscious thinking hypothesis, it is not possible to conclude that unconscious thinking actually helped participants make better decisions. It is also not possible to conclude that unconscious thinking was detrimental to the quality of decisions that people made.

**Table 6-1: Summary of the Support for the Primary Hypotheses across all of the Studies**

		Support for the Hypothesis							
		Conscious Thinking		Heuristics		Unconscious Thinking		Information Complexity	
		AT	WA	AT	WA	AT	WA	AT	WA
Initial Study	No Memory	X	X	-	-	X	X	√	√
	Memory	X	X	-	-	√	√	√	√
Trespassing 1	No Memory	X	X	-	-	√	√	X	X
	Memory	X	X	-	-	X	X	X	X
Trespassing 2	No Memory	X	X	-	-	X	X	X	X
	Memory	X	X	-	-	X	X	X	X
Trespassing 3	No Memory	X	X	-	-	X	X	X	X
	Memory	X	X	-	-	X	X	X	X
Heuristics	No Memory	X	X	√	√	X	X	√	√

Note: X denotes the failure to support the hypothesis, √ denotes the support of the hypothesis and - denotes where the hypothesis was not fairly tested. Highlighted boxes denote marginal support for the hypothesis.

The more consistently supported hypothesis is the complexity hypothesis, where participants were less likely to vote correctly when the decisions were more complex. Specifically, when the candidates were ideologically similar, participants were less likely to vote correctly. This is obvious. People made better choices when the information was relatively easy. This hypothesis received no support from the trespassing studies. Although this may suggest a failure of the manipulation to adequately manipulate the

complexity of the information, it may also indicate that people paid more attention to the information if it violated their ideological expectations (Lodge and Hamill, 1986). The effects of the other conditions were highly variable in the trespassing studies, suggesting that the lack of support for the complexity hypothesis is not all that anomalous.

Finally, the decision-rule hypothesis received virtually no empirical support. The magnitude of the effect was approximately the same when I calculated correct voting using the affective tally rule or the weighted additive rule. In direct contrast to the decision rule hypothesis, the minor differences in the effect sizes that did emerge between the two models tended to show that the effects were slightly more reliable in the affective tally rule. Thus, the decision rules did not meaningfully influence the results. This suggests that unconscious processes are not more capable of weighing the issues by the personal importance of that issue to the citizen. This conclusion is highly questionable because it is impossible to determine the mechanism by which an unconscious process works when there is no evidence that the unconscious process is actually occurring in the first place.

In sum, the results from the current series of studies are mired in null results making any conclusions highly speculative and very tentative.

### **Potential Explanations of the Null Effects**

Assuming that the effects of unconscious thinking in prior research are not simply a Type I error, it is necessary to reconcile the supportive evidence for unconscious thinking presented by previous researchers with the present findings. There are several possible problems with the current data that may decrease the probability of finding support for the unconscious thinking hypothesis.

#### *Sample Size*

First, it is possible that the sample size was not large enough to effectively test the unconscious thinking hypothesis. With larger samples, the standard errors of the estimates would be smaller, making it easier to reject the null hypothesis. This is particularly important with maximum likelihood estimators that rely on asymptotic assumptions to estimate the models.

However, there are two reasons that sample size may not be the central reason for failing to find support for the unconscious thinking hypothesis. First, the sizes of the samples in this study are approximately equal to the size of the samples in other related studies that find statistically significant results. Moreover, experimental studies routinely rely on relatively small samples. The sample sizes in the studies presented herein are approximately the same size as the samples used in other related work that has found supportive evidence for unconscious thinking.

Second, and more importantly, the effect of unconscious thinking was highly variable across the various studies: sometimes increasing the probability of correct voting, while at other times decreasing the probability of correct voting. Therefore, it is not clear that increasing the number of observations would necessarily increase the support for the unconscious thinking hypothesis.



### *Defining a Correct Choice*

Another reason why unconscious thinking worked better with the stimuli that Dijksterhuis et al (2004; Dijksterhuis and Nordgren, 2007) used was that the “correct choice” in their case was objective. Some cars and apartments are clearly better than others and some people make better roommates. The correct cars, apartments and roommates that Dijksterhuis and colleagues used were consensually judged as superior. This consensual superiority is impossible to establish with high levels of certainty in political decisions. Classic proximity models based on rational assumptions suggest that a conservative and a liberal should prefer different political candidates (Downs, 1957). To combat this obvious shortcoming, throughout the project I used two different decision rules that varied in the strenuousness of the cognitive requirements. These rules create a common metric that allows me to assess the accuracy of the participants’ vote choice.

The use of these decision rules is consistent with the calculation of correct voting in other studies (Lau and Redlawsk, 2006). Moreover, the determination of the correct candidate is consistent with the normative assumptions regarding how people should make political decisions. People should incorporate all of the information into the decisions that they make as the weighted additive and affective tally decision rules indicate. Further, people should weigh the importance of the candidates’ preferences on an issue by the importance of that issue in their own beliefs, as is done by the weighted additive decision rule. That people routinely fail to conform to this version of rationality suggests that perhaps this normative ideal is too lofty. To account for this a simplified decision rule was used that incorporates the simple agreement or disagreement with the candidates across the entire range of issues that the candidates discussed. Thus, even though there is no objective manner of determining correct voting, the processes used herein align with the basic assumptions about effective decision making that are currently present in the literature.

### *Lack of Participant Engagement*

Alternatively, it is possible that because hypothetical candidates were used in this study, participants were not engaged in the task to a sufficient extent that would enable unconscious thinking to be superior to conscious thinking. Essentially, this suggests that one would find more support for the unconscious thinking hypothesis in more realistic settings. Because the participants knew that the experimental situation was not real, they did not try hard enough to make the right choice.

While plausible, there are also several reasons that the lack of effort on the part of the participants across all of these studies was not the reason why there was very little support for the unconscious thinking problem. Most importantly, the participants were overwhelmingly able to vote for the right candidate. In fact, participants voted for the correct candidate 75 - 80 percent of the time in most of the studies. It seems more logical that if the participants were simply not invested that the probability of voting for the correct candidate would be approximately at chance levels.

Furthermore, the use of hypothetical candidates has worked very well in other related studies of candidate evaluation (Lau and Redlawsk 2006, Lodge Steenbergen and Brau, 1995; Verhulst, Lodge and Taber, 2008), with a variety of different samples and a plethora of experimental procedures.

Some might argue that the use of hypothetical candidates in the current study should maximize the probability of finding significant results. Because the candidates were explicitly constructed for the purpose of the specific experimental studies, the participants could not possibly have pre-formed evaluations of these candidates. As such, they had to form their preferences while in the study. Although this may detract from the generalizability of the findings to actual political candidates, it ensures that we are able to focus on the specific process and exclude alternative explanations for the effects.

### *Ceiling Effects*

The fact that participants did very well on the voting task suggest that ceiling effects may have limited the possibility that unconscious thinking would be able to outperform conscious thinking. Essentially, it is possible that because most people voted correctly, the differences between the conditions were muted. Again, there are several reasons why this is not likely to be the case. First, Lau and Redlawsk (1997) demonstrated that most people vote correctly, most of the time, even if they do not have all of the information available to them. They suggest that approximately 70 percent of the time average citizens vote for the correct candidate (Lau and Redlawsk, 2006). This estimate is approximately equal to the observed proportion of correct voting in the present studies. Therefore, even though most people voted correctly, the probability of voting correctly was still within a reasonable range. More importantly, enough people made errors that the parameter estimates are reasonable.

### *Memory-Based Processing*

People are used to evaluating other people, political candidates included. In fact, research suggests that they do so automatically. From an online processing perspective, people instantaneously integrate the affective or evaluative component of information into their summary evaluation of an object, like a political candidate, and fail to integrate the specific pieces of information into long term memory that underscore this evaluation (Lodge Steenbergen and Brau, 1995).

One central issue with the experimental design is that it relied on memory-based processing (Zaller and Feldman, 1992). The expectation that conscious thinking will result in sub-optimal decisions assumes that people are sampling considerations from long-term memory while they are thinking consciously and that a similar process is happening when people think unconsciously. Specifically, for both conscious and unconscious thinking, the current design assumes that the information people integrate into their judgments is information that is stored in memory and not a summary evaluation as would be expected by the online processing model (Lodge Steenbergen and Brau, 1995). The differential effectiveness of conscious and unconscious thinking, therefore, results from incorrectly weighting the considerations that can be brought into working memory, or the unconscious equivalent of working memory.

Although the current studies do not formally test the online processing hypothesis, expectations that are derived from it are consistent with the current findings. If people form opinions about political candidates as they learn about them in the first place, as the online model suggests, subsequent thinking – conscious or unconscious – would not alter their decisions. Accordingly, the amount of information that is encoded in long-term memory would be irrelevant for the judgments that people make.

This suggests that the critical stage for candidate evaluations is the period of time that citizens are learning about the candidates and that subsequent thinking is relatively inconsequential. This explanation is consistent with the empirical evidence presented in this dissertation. Because there were no consistent differences between the thinking conditions, it is likely that people formed their opinions about the candidates prior to being explicitly asked to think about them, and these crystallized attitudes were unaffected by the thinking manipulations.

### *Measuring Unobservable Cognitive Processes*

It may be that unconscious thinking is simply an un-measurable construct. Because there is no apparent way to direct one's unconscious to think harder, one simply has to wait until the unconscious processing comes to a solution. If unconscious thinking has not converged on a solution by the time that the person is required to make a decision, then it seems reasonable that the person would not be aided by this style of thinking.

Furthermore, unconscious processes are, by definition uncontrollable. As such, there is nothing that can speed up the process. The length of time it takes to engage in unconscious thinking can range wildly between people and in different domains. In some situations, the length of time required to engage in unconscious thinking could be very short while very long in others. Furthermore, there is likely to be a considerable heterogeneity in the time that it takes unconscious processes to come to an optimal solution, even within the same person. Accordingly, it is possible that for the current studies, unconscious thinkers did not have enough time to allow their unconscious processes to mull over all of the relevant information.

Although potentially true, the implied solution would be to simply to give the participants more time. The question then becomes how much time is required? Ultimately, even if unconscious processing comes to superior decisions relative to conscious thinking, if unconscious processes are not given enough time to process the relevant information, it would be impossible for them to produce superior decisions. This procedure is highly unscientific as it defines the effectiveness of the independent variable by whether it produces a desired effect on the dependent variable.

The choice of time allocated to unconscious thinking processes in the current studies was the same amount of time spent consciously thinking. If unconscious thinking takes more time than conscious thinking to come to a superior decision the comparison between the two styles of thinking becomes more convoluted. Specifically, people would then have to incorporate the amount of time that unconscious processes require into their decision calculus.

### *Methodological Problems behind the Lack of Empirical Support*

It is also possible that there is a disconnect between the theory, the method and the experimental design. Although prior research conducted by Dijksterhuis and his colleagues using the current design found results that strongly support the unconscious thinking hypothesis (Dijksterhuis, 2004; Dijksterhuis et al 2004; Dijksterhuis and Nordgren, 2006), other research using the same design – which just recently came to my attention – has failed to find any support for the hypothesis (Waroquier et al 2009; Acker 2008; Thorsteinson and Withrow, 2009; Newell, 2009). Some research actually finds

support for the exact opposite of the unconscious thinking hypothesis: conscious thinking improves the quality of decision making in complex situations (Acker, 2008).

In particular, other research teams have attempted to replicate the unconscious thinking effects to no avail. For example, using exactly the same stimuli as Dijksterhuis et al (2006), Acker (2008) found the opposite pattern of effects. Specifically, while Dijksterhuis et al (2006) demonstrated that unconscious thinking improved the quality of decisions relative to conscious thinking. In contrast, Acker (2008) found that conscious thinking resulted in better decisions. Thus, just as the hypotheses in the current project receive occasional support, the empirical results from other research teams in the same research area also receive occasional support.

Importantly, evidence from a recent though limited meta-analysis suggest that most of the supportive evidence for the theory of unconscious thought has come from Dijksterhuis and his colleagues, while other research teams have had a great deal of trouble replicating any of the support for unconscious thinking (Acker 2008).

In the current project, although the stimuli theoretically replicate the stimuli used by Dijksterhuis and his colleagues, the slight differences between the stimuli may explain the lack of support for the unconscious thinking hypothesis. Importantly, Acker (2008) used the same stimuli that Dijksterhuis (2004) used in the previous studies that found supportive evidence for unconscious thinking. If I was the only person who was unable to replicate the study, then it is possible that my interpretation of the theory or my operationalization of the variables was somehow flawed. However, because other researchers failed to replicate the results using exactly the same measures, the current results are less likely a function of the modified experimental materials and more likely a problem with the theory. While the theory is not necessarily false, this criticism of the current experimental materials seems unfounded based on the fact that other research has also failed to replicate the unconscious thinking results.

### **Conclusion**

People often get hung up on difficult problems, be they in mathematics, politics, or any complicated decision that they may have to make in their everyday lives. The unconscious thinking hypothesis suggests that one solution to this problem is to simply take a break – to stop trying to solve the problem for a little while – and that this may actually improve the quality of the decisions that a person makes. With the current empirical evidence it is not possible to support this suggestion.

The goal of my dissertation was to find a quick and easy way of increasing the quality of decisions that average citizens make. The focus on unconscious thinking was, in some ways, analogous to a magic pill that would allow people to not change a single thing in terms of their interest in politics and still be able to make much better decisions. There probably is no magic pill that will improve decision making, at least the evidence from the studies presented here do not suggest any reliable support for a judgmental short cut. Furthermore, the fact that people already vote for the correct candidate most of the time suggests that even without this magic pill they make decent decisions. This does not suggest that there is not room for improvement. People can always make better decisions. However, the improvement in accurately voting for political candidates who support a citizen's ideological preferences is likely to be hard fought and incremental.

Interestingly, conscious thinking did not help either. This utter lack of empirical support for the conscious thinking hypothesis is very consistent across all of the studies. Although unconscious thinking does not seem to be very effective, neither is conscious thinking. The most effective style of information processing seems to be heuristic information processing, but there are myriad published volumes demonstrating the limitations of heuristic processing (Eagly and Trope, 1999). Furthermore, in the real world, heuristics are relatively idiosyncratic to both the choice and the individual, making it impossible to claim that a given heuristic would increase the probability of correct voting.

As such, the title of this dissertation is rather misleading. Instead of suggesting that thinking can be dangerous, a more representative title would be thinking is useless. Although this conclusion is extremely nihilistic, it accurately captures the thrust of the results that have been presented.

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