

THE DEVELOPMENT OF AN INFORMATION-SEEKING SCALE
FOR DIFFERENT DOMAINS

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FOR DIFFERENT DOMAINS

by

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Brock Brothers

ABSTRACT

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Brock Brothers

Adviser: Jennifer Vonk, Ph.D.

I developed a novel measure - the Information-Seeking Strategy Scale (ISSS) - to investigate individual characteristics of information-seeking behavior in different domains. A pilot study was initially conducted to test the consistency of the domains assessed, and to test and improve its internal reliability. The primary study consisted of data from 290 participants who completed the ISSS along with four other psychometrically valid measures to test for concurrent validity of the ISSS and to identify associations in information-seeking tendency.

Although the results indicate that further reliability testing is needed of the ISSS, a lack of internal consistency within each domain of the ISSS suggests that information-seeking behavior is predominantly domain-general rather than domain-specific. Furthermore, differences in information-seeking behavior are influenced at least in part by individual religiosity. Specifically, religious individuals generally demonstrated less information-seeking behavior compared to individuals who were non-religious.

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CHAPTER 1

INTRODUCTION

Current conceptual approaches within a human evolutionary framework suggest that an information-seeking tendency is a product of our cognitive evolution (Eibi-Eibesfeldt & Strachan, 1996). Since our ancestral history, information-seeking was a way of integrating new data, thereby forming more accurate predictions of our surroundings (Spink & Cole, 2004). Accordingly, information-seeking has served as a significant adaptive mechanism to help validate our judgements, thereby contributing to our survival and cognitive development (Tooby & Cosmides, 2005). Interestingly, different persons placed in identical scenarios choose different information-seeking strategies to assist their decision-making, including trusting their own intuition versus exploring additional options and opinions (Evans, 2011).

These differences in individual behavior give rise to the following questions: 1. Do certain individual characteristics reflect a predominant cognitive tendency to rely on intuition rather than to investigate information? 2. If so, does this cognitive tendency remain consistent in other domains? My study attempts to investigate these questions through the development of a novel scale that measures information-seeking behavior in domain-specific contexts. I define a domain as a category of situations pertaining to a particular topic- i.e. situations regarding exercising strategies and medication options both pertain to a health domain. I aim to explore whether individuals engage in particular types of information-seeking behavior consistently across seven specific domains relevant to evolutionary adaptations.

Information-Seeking from a Dual Process Theory

The present literature in psychology introduces multifaceted factors contributing to individual differences in the information-seeking process. These factors can generally be classified into one of two contrasting cognitive systems (Cosmides & Tooby, 2000; Epstein, Pacini, Denes-Raj, & Heier, 1996; Evans, 2003; Sloman, 1996; Stanovich & West, 2000): system one (implicit) and system two (explicit). Together, they form what is referred to as the dual process theory of the modular mind (Evans, 2003).

System One: Implicit Mechanisms

System one encompasses a body of cognitive mechanisms that frequently apply automatic processes that we use little to no effort to initiate. It is naturally implicit and it is based on our intuition and beliefs that drive us to react without necessarily seeking information or reflecting on situations that require a decision to be made (Evans, 2011). This first system of reasoning does not apply formal logic to interpret information about outcomes; instead, it utilizes heuristics (Newstead, Handley, Harley, Wright & Farelly, 2004). When a given premise is not identified, inductive reasoning relies on personal or domain-specific examples to interpret information (De Martino et al., 2006). These simplified heuristics are a way for us to prevent cognitive overload when gathering complicated information by helping us create inferences based on probabilities of prior knowledge (also known as *bounded rationality*; see Garcia-Retamero, Takezawa, & Gigerenzer, 2009). However, the use of this “short-cut” in information-seeking may be subject to biases such as anchoring, confirmation biases, ambiguity, backfire, and framing effects (De Martino et al., 2006) that may distort our judgment in making

decisions regarding the information we choose to accept. Hence, research has suggested that this implicit system of reasoning is primitive and is a type of reasoning that we share with other animals (Evans, 2003). This system can be responsible for instinctive reactions and spontaneous or intuitive thought about domain specific knowledge.

In our evolutionary past when little was known about the intricacies of our environment, our intuitive beliefs were imperative for our survival in making sense of information that could not be understood. For example, when our ancestors survived in the wild and heard large bushes suddenly sway near them, it behooved them to assume that a predator was causing the movement and quickly run away (i.e. running the risk of a type one error) rather than take the time to investigate the bushes to see if there was a predator causing the movement before assuming so (i.e. increasing the risk of a type two error). The benefit of committing type one errors (believing something exists when it really does not) over type two errors (believing something does not exist when it really does) is that there is an increase in responsiveness to possible threats. Thus, type one errors exemplify a paradox: sometimes, requiring less information to make a decision is better than requiring more (known as the *less-is-more effect*; see Katsikopoulos, 2010).

The less-is-more effect operates in a similar context of automatic processing to that of the inference termed recognition heuristic (Goldstein & Gigerenzer, 2002). A recognition heuristic is an information-seeking strategy that uses familiarity to determine outcomes. An example would be a person who tends to buy a well-advertised product over an unknown product with the assumption that the advertised product is more effective. The benefits of this heuristic were confirmed in a study in which individuals were asked to determine between two cities which one was larger (Gigerenzer &

Hoffrage, 1995). Individuals who were unfamiliar with one city chose the familiar city due to the assumption that larger cities are more likely to be known than smaller ones. As a result, they were just as correct compared to individuals who were familiar with both cities. In a similar experiment, Ayton and Onkal (1997) allowed individuals to guess the results of soccer matches. Individuals favored certain teams winning strictly based on which teams were more popular or familiar to them, and they were equally correct compared to individuals that were familiar with all teams. These studies demonstrate that inferences based on familiarity can be as effective as deductive information-seeking strategies in certain contexts, but it is not certain how effective recognition heuristics are in other domains in which seeking more information is optional.

System Two: Explicit Mechanisms

An increasing complexity in cognition allowed for an increasingly complex understanding of the world (Evans & Stanovich, 2013). This increasing complexity shaped our second system of reasoning to the degree to which some authors propose qualitative differences in cognitive capacities between humans and non-humans- even our closest living relatives, the other apes (Penn, Holyoak, & Povinelli, 2008). System two comprises newer, explicit, analytic cognitive processes that utilize the ability to reason and think abstractly at a complex level. It facilitates critical and hypothetical thinking, higher-order learning, and rational information-seeking (Evans & Stanovich, 2013; Glöckner & Witteman, 2010). All of these characteristics demonstrate the use of logic to form accurate interpretations of information. As a result, it operates more slowly because it takes a conscious effort to utilize (Evans & Stanovich, 2013).

Competition Between Systems

These two distinct sets of cognitive modules- system one and system two- compete with each other during decision-making tasks to provide inferences about information we acquire (Goel & Dolan, 2003). Considerable neuroanatomical evidence of competition between these processes is confirmed in the belief bias effect on syllogistic reasoning (Goel & Dolan, 2003; Handley, Newstead, & Trippas, 2011; Tsujii, Masuda, Akiyama, & Watanabe, 2010). The belief bias effect is the tendency to accept a conclusion strictly based on prior knowledge or beliefs, regardless of the validity of the premises. For example, in the following syllogism: all snakes have arms; no reptiles have arms; \therefore no snakes are reptiles, the conclusion is valid according to the formal logic of the premises. Nevertheless, a belief bias occurs if one rejects the premises and considers the conclusion invalid because it is not consistent with commonly held knowledge or deeply held beliefs. This can affect the motivation for how one seeks certain information based on its degree of consistency with original inferences. For instance, individuals may display a bias of using one system over the other in real-world scenarios, such as determining the character of a stranger- one may make a conscious effort to seek more information about the stranger before judging them (use of system two) rather than rely on instinctive, automatic inferences of the present information given about them (use of system one).

Neuroanatomical studies using Repetitive Transcranial Magnetic Stimulation (Tsujii, Masuda, Akiyama, and Watanabe, 2010) and Near-Infrared Spectroscopy (Tsujii & Watanabe, 2010) on areas of the inferior frontal cortex showed that the use of explicit processes by inhibiting a belief bias engages the right inferior frontal cortex. However,

when this area is temporarily lesioned (stimulated) during these syllogistic tasks, the use of deduction becomes challenging and the probability of correctly answering the syllogisms decreases. When we lose the ability to inhibit extraneous beliefs that are detrimental to a task, we struggle with the ability to separate useful information from non-useful information, which in turn influences how we seek information based on what we find relevant. This filtering function of belief bias confirms that the inferior frontal cortex is essential to implementing deductive reasoning. This research suggests that there are neuroanatomical differences between individuals activating different processes when applying different information-seeking strategies. However, previous research did not investigate domain-specific behaviors under these syllogistic tasks. Thus, there may be many environmental or social determining factors that affect a person's decision-making and information-seeking tendencies such that their application may differ depending on the scenario. This possibility led to my interest in developing an information-seeking measure for different domains.

Development of the Information-Seeking Strategy Scale

Psychometrically valid measures have been developed to examine individual differences in information-seeking behavior in regards to a dual process theory (Bruine de Bruin, Parker, & Fischhoff, 2007; Epstein, Pacini, Denes-Raj, & Heier, 1996; Scott & Bruce, 1995), but a valid measure exclusively built upon assessing these differences within different domains has, to my knowledge, yet to be created. For example, will an individual continue to research different mechanics to service their car even if their intuition tells them to trust their original choice, just as much as they would attempt to

research another religion regardless of whether it is consistent with their beliefs? By evaluating domain-specific information-seeking behavior patterns, we can assess the consistency of such behavior and determine whether it constitutes a cognitive trait (in which behavioral responses should remain consistent over time and in different contexts), rather than a behavior that may be adopted flexibly at a given time and for a given context.

I developed a novel scale - the Information-Seeking Strategy Scale (ISSS) to assess the consistency of information-seeking behavior in five different domains: philosophical beliefs and traditions, mating and child care, social relationships, finance and business, and health. Items were introduced as hypothetical situations concerning choices when faced with new information. Previous studies have analyzed aspects of decision-making using inventories such as the Decision Outcomes Inventory (Bruine de Bruin et al., 2007) and General Decision Making Style Scale (GDMS) (Scott & Bruce, 1995), but my study is unique in the sense that it measures approaches to how one seeks or responds to situational information rather than how one generally makes decisions or rationalizes information. For example, a GDMS item, such as “I postpone decision making whenever possible” and an REI item, such as “I try to avoid situations that require thinking in depth about something” are similar in ambiguity in that they assess general concepts of rationalization and decision-making that can be applied to a range of situations. On the contrary, an ISSS item, such as “If my exercise routine doesn’t feel good, I would ask a trainer to make sure I’m doing it correctly” assesses the situation at hand and how information is sought solely within the domain being represented- in this

case, the item taps into a health domain as it pertains to information-seeking about exercise routines.

Evidence of Information-Seeking Differences Between Domains

The impetus to develop a domain-specific scale includes research indicating correlations of individual characteristics and information-seeking behavior within the scale's specified domains. For example, research on information-seeking in the health domain has shed light on individuals' increased information-seeking tendencies to personal health threats as a coping mechanism for uncertainty, regardless beliefs about well-being (Livneh, 2000; Shiloh, Sinai, & Keinan, 1999). Moreover, individuals who prefer involvement with their caretaker under health related duress tend to demonstrate more active information-seeking tendencies (Davison et al., 2002; Hack, Degner, & Dyck, 1994). Studies in the financial domain indicate that a fixed financial reward (such as receiving a discount for car repair) will bring about disappointment if preliminary expectations of the reward are unmet (i.e. paying the same price for the car repair without notification of a discount) (Bell, 1984; Loomes & Sugden 1982). This finding demonstrates that beliefs influence how we interpret fixed financial outcomes, which in turn may affect whether we seek more information that could change our financial strategies. This concept extends to a social domain addressing the availability of social support networks as a predictor of information-seeking tendency (Rogers, 1995). People are frequently more prone to rely on trusted sources in their personal networks before seeking new information from other unknown sources (Rogers, 1995). Of course, variations of this trustworthiness are applied in different social settings, so items in the

ISSS cover a broader social framework concerning child care, dating and mating, relationships with friends, and relationships with strangers.

Religiosity as a Framework for Information-Seeking Tendency

The domain of religious beliefs (a sub category within the philosophical beliefs and traditions domain on the ISSS) is of primary interest among all domains in the ISSS. This is due to the considerable amount of research specifying that religiosity derives from the implicit processes of system 1 of the dual process model of the modular mind (Atran & Norenzayan 2004; Bloom, 2007; Gervais & Norenzayan, 2012). For example, theories of the derivation of religious belief include intuitively dualistic concepts of the mind and body (Bloom, 2007) and teleogy (Willard & Norenzayan, 2013). Moreover, many implicit cognitive styles facilitates religious belief comprise types of mental and sensory-activated pattern perceptions, such as apophenia and anthropomorphism- a type of perspective-forming that dictates human attributions to different objects and natural entities (Barrett, 2004). Most religious beliefs are fundamentally driven by faith-based reasoning, suggesting overarching cognitive tendencies of trusting rather than investigating information when it comes to information-seeking. On the other hand, non-believers generally rely on explicit cognitive processes such as logic and rationalism to justify their lack of religious belief (Gervais & Norenzayan, 2012). The contrasting cognitive tendencies of believers and non-believers within a religious domain presents the question of whether religious individuals are inclined to accept information uniquely regarding religious “facts” on faith, or whether the inclination to accept rather than seek

further information is a general and pervasive personality or cognitive trait irrespective of the nature of the information sought.

Characteristics of inflexibility and enforcement, in addition to opposing threats to one's in-group orientation, are necessary to uphold rigid philosophies. Accordingly, previous research on religiosity shows that greater religious fundamentalism strongly predicts authoritative conservatism (Altemeyer, & Hunsberger, 1992) and ethnocentric tendency (Leibold & Kuhnel, 2012). These characteristics may suggest overarching cognitive patterns in trusting one's own beliefs rather than seeking information from other sources in different domains. Furthermore, individuals rated higher in religiosity tend to demonstrate less reflective thinking in certain cognitive tasks. Shenhav, Rand and Greene (2011) utilized the Cognitive Reflection Test (CRT) to measure reflective thinking from participants who believed in God and those who did not. Reflection refers to the time a person takes to think or "reflect" on a problem solving task to answer it correctly, such that reflection is considered roughly synonymous with greater analytic thinking. The CRT task is made up of three math problems that appear to have an obvious answer such that they can be answered intuitively without the need of further thinking, but if adequate time to reflect or "think twice" is not used to analyze the problems more thoroughly, the intuitive (incorrect) response will supersede the correct response. In the first and second part of the study, those who had a stronger belief in God (as determined by scores from six measures of religiosity) were more likely to answer problems using intuition rather than reflection, and thus scored poorly on the CRT compared to non-believers. The third part of the study manipulated cognitive style by randomly assigning participants to write about a time that their intuition, as well as their

reflection, led them to either a positive or negative outcome. Participants who had stronger religious beliefs favored writing about intuition leading them to positive outcomes while those who had weaker religious beliefs favored strategies of reflection as leading to a positive outcome. The results of this experiment indicated that more intuitive thinking (and less reflection) was a significant predictor of a higher self-reported degree of religiosity. Even after demographic variables such as personality, education, political orientation, socioeconomic status, cognitive ability, and sex were controlled, intuitive thinking still predicted greater religiosity. This link between intuitive behavior and degree of religiosity suggests that a causal relationship may exist between the two. Accordingly, my hypothesis is that religious belief will predict patterns of information-seeking behavior. Specifically, those who believe in a higher power, especially those with the strongest religious beliefs (e.g. higher in religious fundamentalism), will engage in less information-seeking compared to those who do not believe in a higher power or belong to an organized religion.

In a related study utilizing the CRT (Pennycook, Cheyne, Seli, Koehler & Fugelsang, 2012), the patterns were similar: those with lesser belief in God revealed the use of greater reflection and were more accurate at solving problems on the CRT tasks than those with greater belief in God. CRT scores also increased based on how one defined the God they believed in. That is, those with a conventional or traditional concept of God scored the lowest on the CRT tasks, whereas those who thought about their belief in God in more abstract and contemporary concepts [based on their answers gathered from completion of the Religious Engagement Scale (Pennycook, Cheyne, Seli, Koehler & Fugelsang, 2012), Religious Belief Scale (International Social Survey Program (ISSP),

1991, 1993, and the Theistic Belief Scale (Pennycook, Cheyne, Seli, Koehler & Fugelsang, 2012)] scored higher on the CRT tasks. Unlike a traditionalist approach, people who think more abstractly about God may not necessarily consider God to be defined as an omnipotent, omniscient, and judging entity as described and taught in a biblical sense, but rather as a broader definition of a creator that can affiliate with more spiritual concepts such as ‘Mother-Nature’ or ‘Karma’ that are not necessarily consistent with mainstream religions. In many cases, these people may describe themselves as spiritual rather than religious, while still believing in a creator (Morgon, 2014).

These findings from these CRT tasks indicate a link between information-seeking and intuitive thinking, suggesting that religious individuals will demonstrate less information-seeking behavior in scenarios of religious context on the ISSS. If this pattern holds true, it’ll be interesting to note if it remains consistent across all other domains. For instance, religious individuals may rely on intuition and faith to affirm their religious beliefs, but they may apply more inferential, analytic, or deductive processes in other domains. There is not sufficient evidence to claim that religious individuals engage in distinct patterns of decision-making or information-seeking when compared to non-religious individuals with regard to non-religious contexts or information. In an attempt to get at this question, I present religious and non-religious individuals with scenarios across several domains to assess the extent to which they engage in information-seeking. In addition to religious beliefs, I also include political affiliation and sex as predictors that might predict scores on the ISSS. I include sex in particular because prior studies have shown sex differences in degree of religiosity in that women are more religious than

men (Rosenkranz & Charlton, 2013), and so controlling for sex allows us to remove it as a potential confound.

Validating the ISSS

Because the ISSS is a novel measure that will require internal and external validation, this study will also include the Rational Experiential Inventory (REI) (Epstein, Pacini, Denes-Raj, & Heier, 1996) and the General Decision Making Scale (GDMS) (Scott & Bruce, 1995) so that concurrent validity can be established. The REI and GDMS are prevalent measures that assess information-processing and decision-making styles, respectively. The GDMS assesses five decision-making styles, including rational and spontaneous, which should relate to high and low levels of information-seeking respectively. The REI assesses rational and experiential information processing tendencies that reflect conscious, analytic versus pre-conscious, affective styles of processing. Therefore, higher rational scores should predict greater levels of information-seeking whereas higher experiential scores should predict lower levels of information-seeking.

An additional measure that might bear some relevance for external validation is the Need for Closure Scale (NFC; Webster & Kruglanski, 1994). An individual with a strong need for closure desire organization, predictability, and explanation (as opposed to the comfort of ambiguity) in light of newly acquired or unknown information. In regards to information-seeking, this is known as *uncertainty reduction* (Bradac, 2001). Therefore, I expect that those with a strong need for closure may engage in more information-seeking in order to reduce uncertainty. Furthermore, it is interesting to note that

individuals rated higher in religiosity and right-wing conservatism tend to demonstrate a greater need for closure than non-believers of flexible political orientation (Altemeyer & Hunsberger, 1992; Brandt & Reyna, 2010; Laurin, Kay, & Moscovitch, 2008; Saroglou, 2002). Need for closure or aversion to uncertainty could be a mediating cognitive component that drives the relationship between religiosity and information-seeking.

Finally I included the Situational Test of Emotional Management (STEM) (MacCann & Roberts, 2008) as an exploratory measure to identify potential associations between information-seeking behavior and emotion management. Research on emotion regulation supports the notion that feelings - particularly anger, fear, and uncertainty- promote different degrees of message processing (Nabi, 2002; Tiedens & Linton, 2001). The STEM focuses on three emotions to be managed (anger, fear, and sadness) and serves as a comparable measure of decision-making performance when individuals are faced with new information. Additionally, much of the STEM's structure is similarly designed to the ISSS in that the items present decision-making and information-seeking options in the context of practical, real-world based scenarios. This leads us to explore the potential convergence between the STEM and ISSS scale.

In essence, I aim to construct and validate the ISSS to identify cognitive patterns of information-seeking strategies; specifically, whether individuals are less likely to seek additional opinions or facts when making decisions or forming opinions across various contexts. Alternatively, the ISSS can be applied to determine if information-seeking style might be constrained to a particular context, such as personal belief systems within the domains of religion and politics.

CHAPTER 2

PILOT STUDIES

Methods

Two pilot studies were conducted in order to categorize 77 newly developed items into exploratory domains. The goal of the pilot study was to validate the classification of items into domains. For example, an item intended to belong to the philosophical beliefs domain (under the sub-category of religious beliefs) was, “*I need to seek real-world evidence to be certain that my religious beliefs are true.*” Items matched to a single category with a frequency of 80% of the total ratings were selected for inclusion in the ISSS.

Participants

Participants from both studies were recruited online from Oakland University’s undergraduate psychology pool using Sona Systems- a recruitment site where students can register to participate in research studies in exchange for course credits. 77 undergraduates participated in Study One and 94 participated in Study Two. No demographics or other information about the participants were collected. The only requirement from each participant was that they were at least 18 years of age for the purpose of consent.

Procedure

In Study One, the participants connected to the Survey Monkey website where they were first asked to read and sign a consent form electronically (Appendix A). Once

they gave their consent to participate in the study, they were asked to assign 77 items into a particular domain based on the scenario that the item presented. For example, the participant was shown the following item: “When I discuss politics with people who support a different political party than I do, I try hard to understand their points of view.” Then, the participant had to choose which category the item best belonged to from the following choices: beliefs and traditions, mating and child bearing, other relationships, business, and health. Items were ordered randomly but were the same for each participant. Lastly, participants were directed to the debriefing form (Appendix B) where they were thanked for their participation.

Based on the results of Study One, several of the items were reworded or deleted. Study Two followed an identical procedure categorizing only 63 of these revised items. In addition, to improve reliability of categorization, I used more descriptive and specific categories as response options in Study Two. Therefore, the multiple choice options expanded from 5 choices to 16 choices in order to explore the possibility of domain sub-categories. These options were as follows: religious beliefs, political beliefs, moral beliefs, cultural traditions, child care, sex/mating, dating, relationships with friends, relationships with family, relationships with strangers, financial decisions, work-related behaviors, purchased items, medical health, diet, and exercise.

Results and Discussion

In Study One, I counted the frequencies with which each item was assigned to the intended domain. Out of the 77 items, 40 items were rated to be consistent with their intended domain by $\geq 80\%$ of the participants, and 48 items were rated into the

appropriate domains by $\geq 70\%$ of the participants. In Study Two, 38 items were rated to be in agreement with their intended domains by $\geq 80\%$ of the participants, and 49 items by $\geq 70\%$ of the participants. All items from the sub-categories of diet, religion, and friends had $\geq 80\%$ agreement rate. Most of the items related to finance and business, medical, and dating had $\geq 80\%$ agreement rate. The domains that had the lowest categorical agreement rate were the “other relationships domain,” (especially the ‘strangers’ sub-domain) and all of the sub-domains of politics, morality, child-bearing, and family.

It is possible that participants mistakenly categorized items based on the stated occupational or personality characteristics of the subject(s) being represented in the item rather than the context of the scenario itself (or vice versa). For example, when an item that is intended to be about morality begins with a sentence such as, “a coworker was stealing from someone’s desk...”, the participant may focus on the word, “coworker” and want to categorize it in a business-related domain instead of focusing on the scenario (stealing from a desk). Items were modified to simplify contexts as a result, and items that were too ambiguous to be categorized to a domain (as determined by participants’ low levels of agreement) were discarded. The ISSS was finally modified to contain 60 items with the highest domain agreement ratings. The 60 items were further divided into 12 items for each of the five domains, in which each domain had two or three sub categories, as follows: 1. philosophical beliefs and traditions domain = religious beliefs, political beliefs, moral beliefs, and cultural traditions; 2. Mating, dating, and child care domain = child care, sex, and dating and romance; 3. social relationships domain = relationships with friends, family, and strangers; 4. finance and business domain =

financial decisions, work-related behaviors, and purchasing items and goods; 5. Health domain = medical health, dieting, and exercising habits. After modification, the ISSS was ready to be validated including assessing inter-rater reliability and convergence with established psychological scales.

CHAPTER 3

METHODS

Participants

Participants were recruited online from Oakland University's undergraduate psychology pool using Sona Systems. Each student was awarded two course credits in conjunction with the approximate hours it would take to complete the study (maximum two hours). 300 Oakland University students originally participated but data from 10 were discarded due to incomplete surveys or a failure to provide informed consent. Therefore data from 290 participants consisting of 51 males (18%), 239 females (82%) was analyzed. Of these, 227 identified as Christians and Catholics (78%), 47 affiliated with non-Christian religions (13%), and 24 as Atheists or Agnostic (8%). There were no restrictions on participation other than participants being at least 18 years of age (Mean age = 20.5; *SD* = 4.84).

Materials

This was an online study so the participants, at a location of their choice, used computers and an internet connection to access Sona Systems and the Survey Monkey website where the study was administered. The online materials included, in the following order, the consent form with the study description, demographics information form, the Information-Seeking Strategy Survey, the Rational Experiential Inventory (Epstein, 1990), the Situational Test of Emotional Management (MacCann & Roberts,

2008), The General Decision Making Scale (Scott & Bruce, 1995), the Need for Closure Scale (Webster & Kruglanski, 1994), and the debriefing form.

Measures

Demographics

The demographic measure (Appendix C) contained 11 items that asked about age, sex, relationship status, ethnicity, religious affiliation, annual income, sexual orientation, academic grade point average, geographic origin, political philosophy, and occupation. Collecting this information allowed further investigation of participant demographic variables that might play a role in differences in information-seeking behavior.

Information-Seeking Strategy Scale (ISSS)

The ISSS (Appendix D) is a novel scale developed for this study to assess the consistency of information-seeking behavior in five different domains: philosophical beliefs and traditions, mating and child care, social relationships, finance and business, and health. It is comprised of 60 items introducing hypothetical situations in regard to what an individual rates on a 5-point Likert scale format (highly agree/ disagree) the likelihood that he or she will seek out empirical and/or objective information to influence their decision before concluding a solution, belief, or opinion regarding each situation. Each of the five domains includes 12 items out of the 60 total items. Each of these five domains is further divided into three or four sub categories relating to the domain, as follows: 1. philosophical beliefs and traditions = religious beliefs, political beliefs, moral beliefs, and cultural traditions; 2. Mating, dating, and child care = child care, sex, and dating and romance; 3. social relationships = relationships with friends, family, and

strangers; 4. finance and business = financial decisions, work-related behaviors, and purchasing items and goods; 5. Health = medical health, dieting, and exercising habits. These items were carefully selected from the larger pool of items that were assessed in the two pilot studies. The sample indicated an acceptable Cronbach's alpha of .71 across all domains, but several domain subscales did not demonstrate good internal consistency (philosophical beliefs and traditions, $\alpha = .66$; mating and child care, $\alpha = .52$; social relationships, $\alpha = .30$; finance and business, $\alpha = .44$; and health, $\alpha = .66$).

Rational Experiential Inventory (REI)

The REI's (Appendix E) development was driven by Cognitive-Experiential Self-Theory (Epstein, 1990) to distinguish individual differences in analytical and intuitive thinking based on the dual process model of reasoning. It modifies and incorporates the existing Need for Cognition Scale (Cacioppo & Petty, 1982) to measure analytical processing preferences, and the Faith in Intuition Scale (Epstein, Pacini, Raj, and Heier, 1996) to measure experiential and pre-conscious processing preferences. The original REI contained 59 items, but I used a revised 40-item version (Pacini & Epstein, 1999) that was constructed with greater internal reliability, as validated in other studies (Bjorklund & Backstrom, 2008; Dane, Baer, Pratt, & Oldham, 2011; Handley, Newstead, & Wright, 2000; Ivan, 2011; Newstead, Handley, Harley, Wright, & Farrelly, 2004). The 40 item REI contains four subscales each representing specific rational and experiential thought processing. Item examples for each subscale are as follows: rational ability: I am not a very analytical thinker; rational engagement: I try to avoid situations that require thinking in depth about something; experiential ability: I don't have a very good sense of

intuition; experiential engagement: I generally don't depend on my feelings to help me make decisions.).

Comparable with the original scale ($\alpha = .87$), my sample indicated consistent reliability overall ($\alpha = .88$) and for each subscale (Rational ability, $\alpha = .85$; rational engagement, $\alpha = .82$; experiential ability, $\alpha = .82$; experiential engagement, $\alpha = .81$). The REI is an important scale to compare to the ISSS for concurrent validity due to its examination of intuitive and analytical thought processes and how these processes may exemplify potential patterns in information-seeking strategies that the ISSS is attempting to assess.

General Decision Making Style (GDMS)

The GDMS (Appendix F) was developed and validated with adequate internal consistency with Cronbach's alphas between .68 to .94 for each sub-scale (Scott & Bruce, 1995). It consists of 24 questions in a Likert scale format (*strongly agree/disagree*) designed to assess how individuals approach decision situations with five different styles; rational, avoidant, dependent, intuitive, and spontaneous. The Cronbach's alpha mean of each general decision-making style that was taken from four participant samples of the original scale were as follows: rational, $\alpha = .80$; avoidant, $\alpha = .93$; dependent, $\alpha = .79$; intuitive, $\alpha = .81$; and spontaneous, $\alpha = .87$. In my sample, the following alpha coefficients were reported: Rational, $\alpha = .86$; intuitive, $\alpha = .84$; dependent, $\alpha = .82$; avoidant, $\alpha = .91$; spontaneous, $\alpha = .88$; and $\alpha = .81$ overall. Along with the REI, the GDMS serves as a partial validity test for the Information-Seeking Strategy Scale because high levels of information-seeking on the ISSS should be expected to correlate

with the GDMS rational decision-making subscale. The ISSS should also negatively correlate with the spontaneous, avoidant, and intuitive decision-making subscales. In addition, the GDMS is known to correlate strongly with the Decision Outcomes Inventory (Bruine de Bruin et al., 2007). Example questions from the GDMS are, “I rarely make important decisions without consulting other people (Dependent)” and “When I make decisions, I tend to rely on my intuition. (Intuitive).”

Need For Closure Scale (NFC)

A person with a high need for closure tends to be uncomfortable with looking at things in ambiguous ways but rather as conclusive, certain, or with a sense of order. On the other hand, someone rated as low in need for closure will express more ideational flexibility. This scale (Appendix G) was designed by Webster and Kruglanski (1994) to measure the degree of an individual’s need for closure based on five sub scales: 1. A desire for predictability; 2. a preference for order and structure; 3. discomfort with ambiguity; 4. decisiveness; and 5. close-mindedness. It is important to note that I used the revised version of the need for closure scale developed by Roets and Van Hiel (2007) due to the previously questionable validity of the original scale, which may have only weakly tapped into the hypothesized motivational need behind the items. This limitation led to the development of more distinct answers for each item, which were psychometrically sound and demonstrated to be more internally consistent. Alpha coefficients for each subscale were .73 (decisiveness), .82 (structure), .78 (predictability), .66 (ambiguity), and .61 (close mindedness), and an overall Cronbach’s alpha of .73. The Cronbach’s alpha from my sample was consistent with these properties at .78. Alpha coefficients of its

subscales showing psychometric consistency in my sample were decisiveness ($\alpha = .70$), structure/order ($\alpha = .77$), and ambiguity ($\alpha = .68$); however, the two remaining subscales- close mindedness and predictability- demonstrated low consistency in my sample ($\alpha = .58$. and $\alpha = .31$ respectively). This revised scale is comprised of 41 items with responses on a 6-point Likert scale (*highly agree/disagree*). Two sample questions are “I don’t like situations that are uncertain” and “I dislike questions which can be answered in many different ways.” It is important to include a measure of need for closure to assess cognitive styles and information-seeking behavior that may associate with that of the Rational Experiential Inventory and the General Decision Making Scale. I anticipated that those high in need for closure would be especially likely to engage in information-seeking across domains.

Situational Test of Emotional Management (STEM)

The STEM (Appendix H) was developed by MacCann and Roberts (2008) to measure an individual’s capacity to regulate their emotions and/or their sense of changing attitudes when presented with different situations. This test is composed of 41 items in a 4-selection multiple choice format. Each item presents a unique scenario, such as “Pete has specific skills that his workmates do not and he feels that his workload is higher because of it. What action would be the most effective for Pete?” Participants are then asked to select which of four strategies they feel the person should apply in this scenario to improve emotions and manage issues. The possible selections in this item example would be; “Speak to his boss about this; start looking for a new job; be very proud of his

unique skills; speak to his workmates about this.” The items are related to both work and personal life and depict sadness, anger, or fear.

Upon its original creation, the STEM demonstrated an alpha coefficient of .69 overall, and it positively correlates with other emotion regulation scales such as the Situational Test of Emotional Understanding (MacCann & Roberts, 2008) and the Malovey-Salovey-Caruso-Emotional Intelligence Test (Mayer, Salovey, Caruso & Sitarenios, 2003). However, the STEM’s psychometric consistency per emotional domain is questionable (anger, $\alpha = .19$; sadness, $\alpha = .68$; fear $\alpha = .29$). My sample indicated a Cronbach’s alpha of .17 for anger, .68 for sadness, .53 for fear, and .69 overall. I used the overall score on the STEM to assess whether those with poor emotion regulation/management were less likely to engage in information-seeking behavior as measured by the ISSS.

Procedure

Upon signing up for the study online via Sona Systems, the participants were directed to the secure Survey Monkey website to complete the study online. On the website, they were given the department information and the electronic consent form in which the participants were informed that their participation was voluntary and that they could withdraw from the study at any time without penalty. The time to complete the study was approximately one hour, but participants did not have to complete the entire survey at once; they were allowed to take breaks or continue the study on another day. After providing an electronic signature of consent, the participants were given the general instructions and the procedure of the survey. Next, they completed a demographics

questionnaire that included gender, ethnic/racial background, age, marital status, sexual orientation, current GPA, income, occupation, political affiliation and religious affiliation. The remaining survey consisted of the five measures (ISSS, REI, STEM, GDMS, and the NFC). Once the participants completed the measures, they were redirected to the final debriefing form on the website where they were thanked for their participation and were notified that they would be awarded class credits.

CHAPTER 4

RESULTS

Reliability and Validity

Cronbach's alphas for each scale (ISSS, GDMS, REI, STEM, and the NFC), including each of their respective subscales were conducted to test for internal consistency. Cronbach's alpha of cumulative information-seeking strategies across all domains (the ISSS total score) was .80; however, Cronbach's alphas for information-seeking sub-scales within each of the five domains were lower: philosophical beliefs and traditions, $\alpha = .65$; mating, dating, and child care, $\alpha = .52$; relationships with friend family, and strangers. $\alpha = .41$; finance and business. $\alpha = .42$; and health and exercise, $\alpha = .65$.

Zero-order correlations were calculated between the total ISSS and each of its five domains, the four subscales of the REI, the five decision-making style subscales of the GDMS, the five controlling characteristic subscales of the NFC, the three emotion subscales of the STEM, sex, political orientation, and religious affiliation. Individuals' cumulative information-seeking strategies across all domains of the ISSS were moderately correlated with components from the REI, NFC, GDMS, and STEM (see Table 1). Particularly, information-seeking behavior positively correlated with rational decision-making styles from the GDMS ($r = .43, p < .01$), and rational ability ($r = .48, p < .01$) and rational engagement ($r = .53, p < .01$) from the REI. Information-seeking negatively correlated with intuitive ($r = -.15, p < .05$), spontaneous ($r = -.35, p < .01$), and avoidant ($r = -.37, p < .01$) decision-making styles from the GDMS. Each specific

domain of the ISSS did not yield any significant correlations with the other variables. Table 1 also includes the descriptive statistics for each subscale reported.

Data Reduction

In order to determine whether each item mapped on to the domain I originally assigned them to, a Principal Components Analysis (PCA) was performed on the ISSS to identify which items shared significant variance within my sample and to condense the items into underlying constructs consistent with their conceptual domains. Under these criteria, component extraction was analyzed using a varimax rotation based on the assumption of orthogonal components.

A total of 20 components were extracted with Eigenvalues greater than 1.0, indicating a multifaceted structure with most items cross loading across several domains in addition to the domain they were originally assigned to (see Table 2). There were no components that aligned well with their conceptual framework. Insufficient factor loadings indicated that information-seeking strategies in each domain did not represent specific components nor demonstrate internal reliability. The lack of potential communalities between each item in the ISSS led to the use of the cumulative ISSS (all domains combined) as a dependent variable for the following regressions.

Regressions

Demographics

Four hierarchical linear regressions were conducted (one for each scale) to verify if the subscales from the REI, GDMS, STEM, and NFC predicted information-seeking behavior. I controlled for religious affiliation, political orientation, and sex by entering

these variables in step one of each of the hierarchical linear regression models. The predictor for religious affiliation was based on two categories: 1. Religious- individuals who identified with any one of the ten religions selected in the demographics questionnaire, including individuals who claimed to believe in a higher power but did not affiliate with any of the religions presented as options (see Appendix C); 2. Non-religious- individuals who claimed to be either atheist or agnostic. The predictor for political orientation was based on three categories: 1. Conservative- individuals who claimed to be either moderately or extremely conservative 2. Liberal- individuals who claimed to be either moderately or extremely liberal; 3. Independent- individuals who claimed to be independent/non-Partisan.

The subscales from the given scale were entered in step two. Given the lack of internal reliability within each domain of the ISSS but internal consistency across all domains combined, the overall score of the ISSS (rather than domain-specific subscales) was used as the outcome variable. I adjusted alpha to .01 as a Bonferroni correction for multiple comparisons using the same outcome variable. The regression coefficients for all of the variables of the models are reported in Table 3-6.

Rational Experiential Inventory

A regression of information-seeking on to each of the four subscales of the REI (rational engagement, rational ability, experiential engagement, and experiential ability) revealed whether individual rational or experiential tendencies predicted information-seeking strategies of the ISSS. Individuals with greater rational ability on the REI reported more information-seeking behavior ($\beta = .201, t = 2.587, p = .010$), as did those

with greater rational engagement ($\beta = .370, t = 4.857, p < .001$). Religious affiliation also predicted information-seeking behavior ($\beta = .148, t = 2.911, p = .004$), in that those who identified as non-religious tend to seek more information than those who identified as religious. Experiential ability, experiential engagement, sex, and political orientation did not predict information-seeking (See Table 3).

General Decision Making Scale

Each of the five GDMS subscales (rational, avoidant, spontaneous, intuitive, and dependent decision-making styles) was examined as predictors of information-seeking behavior. Individuals who reported greater rational decision-making ($\beta = .300, t = 5.121, p < .001$) were more inclined to seek information. On the other hand, higher levels of avoidant decision-making ($\beta = -.194, t = -3.464, p = .001$) and spontaneous decision-making ($\beta = -.166, t = -2.750, p = .006$) predicted lower levels of information-seeking behavior on the ISSS. Dependent decision-making and intuitive decision-making, as well as the demographics of sex and political orientation, were not significant predictors of information-seeking behavior. In contrast, religious affiliation once again predicted information-seeking ($\beta = .205, t = 4.015, p < .001$), with non-religious individuals reporting seeking more information (Table 4).

Need for Closure Scale

The NFC represents five different aspects of an individual's need for closure: 1. an individual's desire for predictability; 2. close-mindedness; 3. discomfort with ambiguity; 4. decisiveness; and 5. a preference for order and structure. I wanted to determine if any of these specific constructs of a need for closure predicted information-

seeking. The results indicated that individuals who reported being close-minded also reported seeking less information on the ISSS ($\beta = -.414, t = -7.819, p < .001$). Individuals who reported being less decisive ($\beta = -.153, t = -2.796, p = .006$) and more likely to favor a preference for order and structure ($\beta = .152, t = 2.635, p = .009$) reported greater information-seeking tendencies. Furthermore, religious affiliation was a significant predictor ($\beta = .132, t = 2.565, p = .011$), indicating that religious individuals sought less information on the ISSS than non-believers. Demographic characteristics of sex and political orientation were not significant predictors. An individual's discomfort with ambiguity and desire for predictability also failed to predict information-seeking behavior (Table 5).

Situational Test of Emotional Management

The STEM measures an individual's ability to manage emotions in given situations, particularly those that bring about anger, sadness, and fear. The results showed that individuals with greater ability to manage anger ($\beta = .227, t = 4.051, p < .001$) as well as sadness ($\beta = .213, t = 3.224, p = .001$) in given situations tended to report more information-seeking behavior. Sex ($\beta = -.155, t = -2.799, p = .005$) and religious affiliation also predicted information-seeking behavior ($\beta = .189, t = 3.417, p = .001$), in that non-religious individuals and males reported engaging in more information-seeking. Political orientation and an individual's management of fear were not significant predictors (Table 6).

Table 1

Correlations and Descriptives of the Information-Seeking Strategy Scale and sub scales of the General Decision Making Scale, Rational Experiential Inventory, Need for Closure Scale, and the Situational Test of Emotional Management

	1	2	3	4	5	6	7	8	9	10	11
1. Information-Seeking	—										
2. Rational Decision-Making	.43**	—									
3. Intuitive Decision-Making	-.15*	.06	—								
4. Dependent Decision-Making	-.11	.08	.30**	—							
5. Avoidant Decision-Making	-.37**	-.33**	.14*	.23**	—						
6. Spontaneous Decision-Making	-.35**	-.40**	.32**	.10	.33**	—					
7. Rational Ability	.48**	.61**	-.09	-.26**	-.47**	-.38**	—				
8. Rational Engagement	.53**	.50**	-.06	-.23**	-.43**	-.32**	.74**	—			
9. Experiential Ability	-.04	.11	.57**	.06	-.08	.16**	.18**	.09	—		
10. Experiential Engagement	-.08	-.04	.04	.18**	-.03	.20**	-.03	.04	.71**	—	
11. Desire for predictability	-.11	.19**	-.00	.05	.04	.01	-.08	-.04	.12*	-.05	—
12. Close-mindedness	-.49**	-.33**	-.06	-.11	.30**	.17**	-.30**	-.41**	.05	-.04	.15*
13. Discomfort with ambiguity	.045	.28**	-.05	.21**	.10	-.06	.05	-.01	.06	.02	.36**
14. Decisiveness	-.22**	-.06	.18*	.06	.19**	.29**	-.20**	-.16**	.05	.11	.16**
15. Preference for order	.19**	.49**	-.10	.14*	-.27**	-.34**	.32**	.18**	.08	-.02	.35**

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Table 1. Continued

	1	2	3	4	5	6	7	8	9	10	11
16. Anger Management	.27**	.17**	.00	.00	-.17**	-.10	.19**	.22**	.02	.04	-.08
17. Fear Management	.22**	-.28**	.10	.16**	-.13*	-.14*	.22**	.01	.12*	.18**	.03
18. Depression Management	.30**	.31**	.13*	.07	-.22**	-.19**	.32**	.23**	.16**	.23**	.04
19. Gender	-.10*	-.05	.05	-.04	.03	-.01	-.13*	-.13*	.04	.14*	.09
20. Political Orientation	-.06	-.23**	-.04	-.04	.04	.24**	-.09	-.12*	-.09	-.01	-.04
21. Religious Affiliation	-.21**	.04	-.08	-.09	.02	.07	.06	.13*	-.14*	-.10	-.06
Mean	3.306	3.799	3.350	3.407	2.514	2.641	3.574	3.411	3.418	3.403	3.651
Std. Deviation	.2790	.7234	.7256	.7499	.9454	.8173	.6546	.6391	.5949	.5928	.5197

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

Table 1. Continued

	12	13	14	15	16	17	18	19	20	21
1. Information-Seeking										
2. Rational Decision-Making										
3. Intuitive Decision-Making										
4. Dependent Decision-Making										
5. Avoidant Decision-Making										
6. Spontaneous Decision-Making										
7. Rational Ability										
8. Rational Engagement										
34 9. Experiential Ability										
10. Experiential Engagement										
11. Desire for predictability										
12. Close-mindedness	—									
13. Discomfort with ambiguity	.02	—								
14. Decisiveness	.21**	.36**	—							
15. Preference for order	-.08	.43**	.05	—						
16. Anger Management	-.13*	.05	.04	.						
17. Fear Management	-.15*	.16**	-.07	.25**	.24**	—				

Table 1. Continued

	12	13	14	15	16	17	18	19	20	21
18. Depression Management	-.14*	.24**	-.06	.31**	.24**	.54**	—			
19. Gender	.11	.14*	.14*	.04	.12*	.08	.18**	—		
20. Political Orientation	.02	-.09	.01	-.16**	-.01	-.14*	-.19**	-.07	—	
21. Religious Affiliation	-.21**	.01	-.02	-.04	.01	.02	.09	-.09	.15**	—
Mean	3.226	4.292	3.788	4.391	1.973	2.433	2.604	1.82	1.98	1.082
Std. Deviation	.6114	.6283	.7866	.7428	.4688	.4929	.4672	.381	.852	.2759

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

Table 2

Principal components analysis factor loadings with varimax rotation for all items from the Information-Seeking Strategy Scale (N=290).

	1	2	3	4	5	6	7	8	9	10
Item 10	.547	—	—	—	-.413	—	—	—	—	—
Item 25	.546	—	—	—	-.455	—	—	—	—	—
Item 59	.532	—	—	—	—	—	—	—	—	—
Item 6	.510	—	—	-.318	—	—	—	—	—	—
Item 14	.492	—	—	—	—	—	—	—	—	—
Item 5	.479	—	—	—	—	—	—	—	—	—
Item 11	.475	—	—	—	—	—	—	—	—	—
Item 26	.471	—	—	—	—	—	—	—	—	—
Item 15	.468	-.303	—	—	—	—	—	—	—	—
Item 12	.446	—	.32	—	—	—	—	—	—	—
Item 17	.443	—	—	.333	—	—	—	—	—	—
Item 19	.442	—	—	—	—	—	—	—	-.380	—
Item 7	.441	.384	—	—	—	—	—	—	—	—
Item 32	.439	—	—	—	—	—	—	—	—	—
Item 55	.436	—	—	—	—	—	—	—	—	-.362
Item 3	.429	—	—	—	—	—	—	—	—	—
Item 56	.419	—	—	—	—	—	—	—	—	—
Item 60	.408	.333	—	—	—	—	—	—	—	—
Item 37	.380	—	—	—	—	—	—	—	—	.367
Item 46	.376	—	—	—	—	—	—	—	—	—
Item 18	.364	.329	—	—	—	—	-.304	—	—	—
Item 34	.362	—	—	—	—	—	—	—	—	—
Item 30	.359	—	—	—	—	—	—	—	—	—
Item 13	.359	—	—	—	—	—	—	—	—	—
Item 44	.344	—	—	—	—	—	—	—	—	—
Item 24	—	.471	—	—	—	—	—	—	—	—
Item 52	—	-.453	—	—	—	—	—	—	—	—
Item 22	—	-.438	.33	.358	—	—	—	—	—	—
Item 42	—	.432	—	—	—	—	—	—	—	—
Item 28	—	.400	—	—	—	—	—	—	—	—
Eigenvalue	6.942	3.465	2.690	2.254	2.191	1.987	1.826	1.721	1.597	1.536
Variance	11.57	5.774	4.483	3.757	3.652	3.312	3.043	2.869	2.661	2.560

Table 2 Continued

	1	2	3	4	5	6	7	8	9	10
Item 4	—	-.381	—	—	—	—	—	—	—	—
Item 54	—	.364	—	—	—	—	.302	—	—	—
Item 23	—	-.355	—	.325	—	—	—	—	—	—
Item 16	—	.324	—	—	—	—	—	—	—	—
Item 9	—	-.323	—	—	—	—	—	—	—	—
Item 21	—	—	.655	-.342	—	—	—	—	—	—
Item 1	—	—	.484	—	—	—	—	—	—	—
Item 36	.306	—	.419	—	—	—	—	—	—	—
Item 41	.352	—	.412	—	—	—	—	—	—	—
Item 8	—	—	.379	.319	—	—	—	—	—	-.312
Item 57	—	—	—	.316	—	—	—	—	—	—
Item 39	.403	—	—	—	.425	—	—	—	—	—
Item 20	—	—	—	—	.415	—	—	—	—	—
Item 53	.376	—	—	—	.411	—	—	—	—	—
Item 38	.323	—	—	—	—	.499	-.309	—	—	—
Item 33	—	—	—	—	—	.499	—	—	—	—
Item 29	—	—	—	—	—	—	.466	—	—	—
Item 43	—	.413	—	—	—	—	.435	—	—	—
Item 58	—	—	—	—	—	—	—	.458	—	—
Item 51	—	.342	.400	—	—	—	—	-.405	—	—
Item 31	—	—	.308	—	—	—	—	-.357	—	—
Item 48	—	—	—	—	—	—	—	-.307	.345	—
Item 27	.319	—	—	—	—	—	—	—	—	-.388
Item 40	—	—	—	—	—	—	—	—	—	.318
Item 50	—	—	—	—	—	—	—	—	—	—
Item 49	—	—	—	—	—	—	—	—	-.363	—
Item 2	—	—	—	—	—	—	—	-.382	—	—
Item 35	.353	—	—	—	—	—	—	—	—	—
Item 45	—	—	—	—	—	—	—	—	—	—
Item 47	.363	—	—	—	—	—	—	—	—	—
Eigenvalue	6.942	3.465	2.690	2.254	2.191	1.987	1.826	1.721	1.597	1.536
Variance	11.57	5.774	4.483	3.757	3.652	3.312	3.043	2.869	2.661	2.560

Table 2 Continued

	11	12	13	14	15	16	17	18	19	20
Item 10	—	—	—	—	—	—	—	—	—	—
Item 25	—	—	—	—	—	—	—	—	—	—
Item 59	—	—	—	—	—	—	—	—	—	—

Item 6	--	--	--	--	--	--	--	--	--	--
Item 14	--	--	--	--	--	--	--	--	--	--
Item 5	--	--	--	--	--	--	--	--	--	--
Item 11	--	--	--	--	--	--	--	--	--	--
Item 26	--	--	--	--	--	--	--	--	--	--
Item 15	--	--	--	--	--	--	--	--	--	--
Item 12	--	--	--	--	--	--	--	--	--	--
Item 17	--	--	--	--	--	--	--	--	--	--
Item 19	--	--	--	--	--	--	--	--	--	--
Item 7	--	--	--	--	--	--	--	--	--	--
Item 32	--	--	-.362	--	--	--	--	--	--	--
Item 55	--	--	--	--	--	--	--	--	--	--
Item 3	--	--	--	--	--	--	--	--	--	--
Item 56	--	--	--	--	--	--	-.320	--	--	--
Item 60	--	--	--	--	--	--	--	.332	--	--
Item 37	--	--	--	--	--	--	--	--	--	--
Item 46	--	--	--	--	--	--	--	--	--	--
Item 18	--	--	--	--	--	--	--	--	--	--
Item 34	--	--	--	--	--	--	--	--	--	--
Item 30	--	-.301	--	--	--	--	--	--	--	--
Item 13	--	--	--	--	--	--	--	.334	--	--
Item 44	--	--	--	--	--	.300	--	--	--	--
Item 24	--	--	--	--	--	--	--	--	--	--
Item 52	--	--	--	--	--	--	--	--	--	--
Item 22	--	--	--	--	--	--	--	--	--	--
Item 42	--	--	--	--	--	--	--	--	--	--
Item 28	--	--	--	--	--	--	--	--	--	--

Eigenvalue	1.438	1.368	1.292	1.265	1.210	1.194	1.144	1.121	1.060	1.052
Variance	2.397	2.280	2.153	2.109	2.017	1.989	1.907	1.869	1.767	1.754

Table 2 Continued

	11	12	13	14	15	16	17	18	19	20
Item 4	--	--	--	--	--	--	--	--	--	--
Item 54	--	--	--	--	--	--	--	--	--	--
Item 23	--	--	--	--	--	--	--	--	--	--
Item 16	--	--	--	--	--	--	-.319	--	--	--
Item 9	--	--	--	--	--	--	--	--	--	--
Item 21	--	--	--	--	--	--	--	--	--	--
Item 1	--	--	--	--	--	--	--	--	--	--

Item 36	—	—	—	—	—	—	—	—	—	—
Item 41	—	—	—	—	—	—	—	—	—	—
Item 8	—	—	—	—	—	—	—	—	—	—
Item 57	—	—	—	.309	—	—	—	—	—	—
Item 39	—	—	—	—	—	—	—	—	—	—
Item 20	—	—	—	—	—	—	—	—	—	—
Item 53	—	—	—	—	—	—	—	—	—	.341
Item 38	—	—	—	—	—	—	—	—	—	—
Item 33	—	—	—	—	—	—	—	—	—	—
Item 29	—	—	—	—	—	—	—	—	—	—
Item 43	—	—	—	—	—	—	—	—	—	—
Item 58	—	—	—	—	—	-.307	—	—	—	—
Item 51	—	—	—	—	—	—	—	—	—	—
Item 31	—	—	—	—	—	—	.332	—	—	—
Item 48	—	—	—	—	—	—	—	—	—	—
Item 27	—	—	.303	—	—	—	—	—	—	—
Item 40	—	—	—	—	—	—	—	—	—	—
Item 50	—	—	—	—	—	—	—	—	—	—
Item 49	—	.405	—	—	—	—	—	—	—	—
Item 2	—	—	.407	—	—	—	—	—	—	—
Item 35	—	—	—	-.379	—	—	—	—	—	—
Item 45	—	—	—	—	.397	—	—	—	—	—
Item 47	—	—	—	—	—	.375	—	—	—	—

Eigenvalue	1.438	1.368	1.292	1.265	1.210	1.194	1.144	1.121	1.060	1.052
Variance	2.397	2.280	2.153	2.109	2.017	1.989	1.907	1.869	1.767	1.754

Table 3

Hierarchical linear regression analyses of subscales from the Rational Experiential Inventory using total ISSS Score as the dependent variable (N=290).

	Total ISSS Score	
	R^2	β
<i>Step One</i>	.054***	—
Political Orientation	—	-.105
Religious Affiliation	—	.226***
Sex	—	-.083
<i>Step Two</i>	.317***	—
Political Orientation	—	-.030
Religious Affiliation	—	.148**
Sex	—	-.003
Rational Ability	—	.201
Rational Engagement	—	.370***
Experiential Ability	—	-.077
Experiential Engagement	—	-.027

Note: R^2 , adjusted R square; β , standardized beta.

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

Table 4

Hierarchical linear regression analyses of subscales from the General Decision Making Scale using total ISSS Score as the dependent variable (N=290).

	Total ISSS Score	
	R^2	β
<i>Step One</i>	.054***	—
Political Orientation	—	-.105
Religious Affiliation	—	.226***
Sex	—	-.083
<i>Step Two</i>	.301***	—
Political Orientation	—	.014
Religious Affiliation	—	.205***
Sex	—	-.055
Rational Decision-Making	—	.300***
Intuitive Decision-Making	—	-.055
Dependency	—	-.041
Avoidance	—	-.194**
Spontaneity	—	-.166**

Note: R^2 , adjusted R square; β , standardized beta.
 , $p < .01$; *, $p < .001$

Table 5

Hierarchical linear regression analyses of subscales from the Need for Closure Scale using total ISSS Score as the dependent variable (N=290).

	Total ISSS Score	
	R^2	β
<i>Step One</i>	.054***	—
Political Orientation	—	-.105
Religious Affiliation	—	.226***
Sex	—	-.083
<i>Step Two</i>	.299***	—
Political Orientation	—	-.066
Religious Affiliation	—	.132**
Sex	—	-.026
Need for order	—	.152**
Need for Predictability	—	-.099
Decisiveness	—	-.153**
Ambiguity	—	.061
Close mindedness	—	-.414***

Note: R^2 , adjusted R square; β , standardized beta.
 , $p < .01$; *, $p < .001$

Table 6

Hierarchical linear regression analyses of subscales from the Situational Test of Emotional Management using Total ISSS Score as the dependent variable (N=290).

	Total ISSS Score	
	R^2	β
<i>Step One</i>	.054***	—
Political Orientation	—	-.105
Religious Affiliation	—	.226***
Sex	—	-.083
<i>Step Two</i>	.177***	—
Political Orientation	—	-.057
Religious Affiliation	—	.189**
Sex	—	-.155**
Anger	—	.227***
Sadness	—	.213**
Fear	—	.048

Note: R^2 , adjusted R square; β , standardized beta.

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

CHAPTER 5

DISCUSSION

One goal of this study was to develop the ISSS by evaluating its internal consistency and reliability and concurrent validity with other related psychometrically sound scales. A second goal of the study was to investigate individual characteristics in information-seeking behavior and the extent to which this behavior varies across different domains. I focused on religious beliefs as a predictor of information-seeking behavior because I wished to determine whether religiosity was associated with this aspect of cognition.

I tested the notion that religious individuals would report less information-seeking on the ISSS. The results from the analyses confirmed this hypothesis, in line with previous research (Bloom, 2007; Gervais & Norenzayan, 2012; Pennycook, Cheyne, Seli, Koehler & Fugelsang, 2012; Shenhav, Rand & Greene, 2011). Additionally, non-religious individuals reported seeking more information and less reliance on intuition compared to religious individuals. Consistent with my expectations, these differences appeared reliable across domains, as I obtained this result using the total ISSS score as an outcome variable.

I had also allowed for the possibility that patterns of information-seeking may not reflect distinct cognitive traits that differed between religious and non-religious individuals, but that such differences might be restricted to thinking about religious and philosophical beliefs. However, I did not attempt to explore distinct patterns of information-seeking behavior within domains because psychometric consistency of the ISSS within each domain (philosophical beliefs and traditions, mating and child care, social relationships, finance and business, and

health) was insufficient to establish validity of domain-specific information-seeking tendencies. Until significant reliability can be established for each subscale of the ISSS (especially philosophical beliefs and traditions), the current results from the cumulative ISSS outcome variable suggest that individuals may behave differently across domains, but not in line with the perceived domains or categories that were anticipated. It is possible that consistency within the domains not conceptualized with the current version of the ISSS might emerge. I selected the domains in line with the a priori ideas about aspects of life important from an evolutionary point of view, such as health, parenting, mating, and relationships. However, other domains such as survival may be more germane.

Nevertheless, given the adequate reliability for responding to the ISSS as a whole, and clear, expected relationships with other measures of cognitive style and decision-making, I would argue that information-seeking tendency may be a stable cognitive style across domains, and one that differentiates religious believers from non-believers. Of course, given the correlational nature of the study I cannot draw any conclusions regarding the causal direction of this claim. It is possible that individuals who engage in less information-seeking are more apt to seek religion and religious explanations throughout their lives, but it is also possible that individuals that embrace religion become more likely to accept information at face value (i.e. operate on faith) rather than seeking empirical evidence for facts in various domains, not just with regard to religious beliefs.

Further evidence in support of the idea that information-seeking may be classified as a cognitive trait comes from the finding that rational engagement on the REI predicted information-seeking but experiential engagement did not. Also individuals with higher rational

tendencies as displayed on the REI and GDMS engage in more information-seeking, whereas individuals who are more avoidant and spontaneous in their decision-making on the GDMS tend to engage in low levels of information-seeking. Avoidance and spontaneity are considered automatic processes that do not evoke slower analytic decision-making exhibited in explicit cognitive systems. That is, individuals engaged in more information-seeking may be described as engaging in System Two processing from the dual process model (Evans, 1990) whereas individuals engaged in less information-seeking may be engaged in the more automatic, System One processing. Taken together with scores from the other measures included here, the results begin to paint a picture of two different styles of processing that may distinguish religious believers and non-believers, given that religious belief also differentiated individuals on the basis of information-seeking behavior.

Undoubtedly religious beliefs are not the only defining characteristic that differentiates those who engage in more or less information-seeking. My hypothesis that a strong need for closure will predict higher levels of information-seeking was verified in the regression models using NFC subscales as predictors. Individuals who were more close-minded, less decisive, and who preferred order and structure in their lives indeed tended to seek less information. This is consistent with previous research verifying the significance of reducing uncertainty to strengthen intuitive beliefs (Benson & Spilka, 1973; Brandt & Reyna, 2010), given that the individuals with close-minded tendencies in the study were also more likely to be religious. But despite these previous studies linking a greater need for closure to political conservatism as well, the results indicated no significant relationship between the two. The results of my study support the notion that religious belief is more likely when characteristics of closure and order are indicated. These

results complement the idea that individuals who believe in a controlling supernatural force that governs their existence would appeal to a structured lifestyle that is free from challenges to their beliefs. The current results also propose a greater likelihood for an external locus of control in regards to information-seeking tendency. Assessing the relationship between locus of control (Rotter, 1966) and information-seeking might be informative for future studies.

The goal in developing the ISSS was to provide a measure with satisfactory internal consistency, and one that accurately measures an underlying construct of information-seeking behavior in different domains. Insufficient data reduction from the principle component analysis suggests the possibility that information-seeking is, in fact, domain general (beyond philosophical beliefs and traditions) rather than domain specific. Alternatively, it is possible that I did not select appropriate domains within which to measure unique variance in information-seeking. Cronbach's alphas for each of the subscales were inadequate (philosophical beliefs and traditions and the health and exercise domains having the highest alphas equally at .65), suggesting that I did not select items that cohered in a fashion that accounted for individual variance in information-seeking behavior. When considering all items of the ISSS together, however, the scale provides a reasonable alpha (.80). Validity was also established with the appropriate components of the REI and GDMS, highlighting its potential as a tool with which to assess this cognitive style. Future directions include the continuous modification of the conceptual basis of items using factor loading, and experimenting with the categorization of items for each domain.

CHAPTER 6

CONCLUSION

My study indicates that information-seeking strategy is not domain-specific. This finding is most likely due to the strong connection between implicit cognitive processes and the need to believe. Due to the ongoing development of the ISSS, this investigation, of course, was a limited one. Much of our knowledge about the amount of information individuals seek in different domains may be tenuous at best. One limitation noted above is the correlational nature of the study and the reliance on self-report measures. Future research might investigate information-seeking behavior in laboratory experiments rather than relying on participants' reports of their own behavior. In addition, researchers might investigate the relationship of information-seeking behavior to the strength of religious beliefs rather than religious affiliation alone. This scale could be usefully applied to identify the variables influencing the use of intuitive versus information-seeking tendencies, which may in turn help to improve our reasoning strategies. Consequently, this would allow for the possibility of repressing unnecessary stereotypes and prejudices, and making better choices in social and decision-making contexts that extend to a wide range of real world applications and benefits.

APPENDIX A
CONSENT FORM

Consent to Participate in a Research Study

Introduction

You are being asked to participate in a research study that is being done by researchers from Oakland University. This study is being done by Brock Brothers under the direction of Dr. Jennifer Vonk, the research study advisor for this project. This study is being conducted as part of a research project for the requirements for a Master's degree. The purpose of this consent form is to let you know more about the study so you can decide whether to participate in the study or not. Please read the form carefully. You may ask questions about why the research is being done, what you will be asked to do, the possible risks and benefits, your rights as a participant, and anything else about the research or this form that is not clear. You may talk with your friends and family about this research study before making your decision. When all your questions have been answered, you can decide if you want to be in this study. This process is called 'informed consent.' If you decide to participate, you will be asked to sign this form and will receive a copy of the form.

Why is this study being done?

The purpose of this study is to assess and improve the consistency and reliability of a new scale, and in doing so, examine the association between various aspects of thinking styles and decision-making. The scale is planned for use in studies that will measure information-seeking strategies across different aspects of life (domains).

Who can participate in this study?

You are being asked to participate in the study because you are part of the Oakland University Psychology Pool and you are over 18 years of age.

Who is sponsoring this study? None

Where is this study being done? Online via Survey Monkey website

What procedures are involved with this study?

If you agree to take part in this research study, you will be asked to complete an online demographic form and five surveys measuring a multitude of psychological and cognitive characteristics relating to your thinking styles and decision-making styles.

How long will participation in this study last?

This study will approximately 1-2 hours. The researcher may stop your participation in this study at any time without your consent if you do not follow directions or attempt to use the study for purposes other than what has been stated. If this happens, you will be notified via email.

How many people will be participating in this study?

300 participants will participate in this study.

What are the risks, side effects or discomforts that can be expected from participating in this study?

Participants will encounter no more than minimal risks or discomfort such as the possibility of eye strain or anxiousness based on the longevity of sitting in front of a computer screen while taking the study. We encourage participants to take any breaks necessary while completing the study in order to minimize this risk.

A breach of confidentiality is also a possible risk. Breach of confidentiality means that it is possible that individuals not associated with this research may accidentally gain access to information that personally identifies participants. Appropriate safeguards are set in place to minimize a breach of confidentiality. For example, all data will remain fully confidential. Computerized and questionnaire data will be referenced by subject number only. All data will be stored on a password protected computer in the researcher's office and only the research team will have access to the records. In any sort of report we might publish, we will not include any information that will make it possible to identify a subject; but no researcher can ever guarantee that this sort of breach will not occur.

If you become distressed as a result of your participation in this study, then you should contact an agency on-campus, such as the Graham Counseling Center at (248) 370-3465, or the School of Education and Human Service Counseling Center at (248) 370-2633 or in the surrounding community that may be able to provide services for you.

Are there any known benefits from taking part in this study?

There are no direct benefits to you for participating in this study. However, the results of this study may benefit others in the future.

What are the alternatives to participation in this study?

You may choose not to participate in this study. You may choose to participate in other studies offering the same or a different amount of credits.

What are the costs of taking part in the study?

There is no cost to you for participating in this study.

What compensation is being provided for participation?

For taking part in this study, you will be paid for your time and inconvenience by 2 course credits being awarded toward your Psychology course requirements.

What are your rights if you participate in this study?

Your decision to participate in this study is voluntary. You may choose to leave the study at any time, or refuse to answer any questions that may be asked during the study. You will not lose any benefits to which you are otherwise entitled and your decision will not affect your present or future relationship with Oakland University, the researcher, and the Psychology department. If you are a student or employee at Oakland University, your decision about participation will not affect your grades or employment status.

If you would like to stop participating in this study, you should contact the researcher, Brock Brothers (XXX) XXX-XXXX, who will provide instructions on how to withdraw from the study and any potential consequences for withdrawal.

Any new information that may affect your willingness to participate in the study will be provided to you as soon as possible.

What will be done to keep my information confidential?

Every effort will be made to keep your study-related information confidential. Computerized and questionnaire data will be referenced by subject number only. Participants' identifying data will be removed and only their Monkey Survey code number will be kept with their survey data. All data will be stored on a password protected computer in the researcher's office and only the research team will have access to the records. In any sort of report we might publish, we will not include any information that will make it possible to identify a subject.

Personal information regarding your participation in this study may be disclosed if required by law. Also, your research records may be reviewed by the following groups:

- Regulatory authorities involved in the oversight of research (Office for Human Research Protections or other federal, state, or international regulatory agencies);
- Members or representatives of Oakland University Institutional Review Board (IRB) (in order to ensure that your rights as a research participant are being protected);

When study results are presented at professional conferences or published in professional journals, your name will not be used.

What do you do if you have questions about the study or the rights of research participants?
For questions about the study you may email: Bbrothe2@oakland.edu or Vonk@oakland.edu.

For questions regarding your rights as a participant in human subjects research, you may contact the Oakland University Institutional Review Board, 248-370-2762.

Signing the consent form

You have read (or someone has read to you) this form. You are aware that you are being asked to participate in a research study, and you understand the possible risks and potential benefits. You have had the chance to ask questions and have had them answered to your satisfaction. You voluntarily agree to participate in this study.

You are not giving up any rights by signing this consent form. You will be given a copy of this form.

- My give my consent to participate
 I do not give my consent to participate

APPENDIX B
DEBRIEFING

As a result of participating in this study, you have earned 2 credits. To complete your participation, you must click on the "Done" button below. Thank you very much for participating in this research! If you have any questions or concerns about this research, please contact Brock Brothers at bbrothe2@oakland.edu or Dr. Jennifer Vonk (vonk@oakland.edu).

Please note that your credits will not be automatically assigned to your SONA account. Rather, your credits should be assigned within the next 3-4 days IF you completed the measure.

APPENDIX C
DEMOGRAPHICS

1. Please state your age in years:

2. What is your gender?

- a. Male
- b. Female

3. What is your relationship status?

- a. Single
- b. In a relationship but not married
- c. Married

4. What is your predominate ethnicity?

- a. White/Caucasian
- b. African American
- c. Hispanic
- d. Native Indian
- e. Asian
- f. Other

5. What is your predominate religious affiliation?

- a. Christian- not Cathlic
- b. Catholic
- c. Mornon
- d. Buddhism
- e. Hinduism
- f. Judaism
- g. Muslim
- h. Jehovah
- i. Sikhism
- j. Wicca
- k. Atheist
- l. Agnostic
- m. I believe in a higher power but I don't affiliate with the religions listed

6. What is your average annual income?

- a. Less than 25000
- b. 26000-35000
- c. 36000-50000
- d. 51000-70000
- e. Above 70000

f. Prefer not to answer

7. What is your sexual orientation?

- a. Heterosexual
- b. Homosexual
- c. Bisexual
- d. Prefer not to answer

8. What is your current GPA?

- a. 4.0
- b. Between 3.0 and 3.9
- c. Between 2.0 and 2.9
- d. Between 1.0 and 1.9
- e. Less than 1.0

9. Where did you predominantly grow up (i.e spend most of your childhood)?

- a. Sothern US
- b. Northern US
- c. Midwestern US
- d. Eastern US
- e. Canada
- f. Europe
- g. Asia
- h. Other

10. What is your general political philosophy?

- a. very conservative
- b conservative
- c. independent
- d. moderately liberal
- e. very liberal

11. What is your major field of study and/or occupation?

APPENDIX D
INFORMATION-SEEKING STRATEGY SCALE

Instructions:

Below is a list of statements concerning scenarios you might find yourself in. Please rate each scenario on a scale of 1-5 based on the likelihood of how much you would agree or disagree with it. (1 being strongly disagree; 5 being strongly agree)

1. I need to seek real-world evidence to be certain that my religious beliefs are true.
2. I'm not interested in seeking other people's instruction on how I should raise my children
3. If my best friend told me that an acquaintance of mine was a liar, I would investigate the claim on my own.
4. I would seek other financial opportunities even if my current financial investments are successful.
5. If my doctor recommends a prescription, I would research more about the drug from other sources before taking it.
6. When I discuss politics with people who support a different political party than I do, I make a sincere effort to understand their points of view.
7. If my sexual partner suddenly lost interest in sex, I immediately assume they are seeing someone else.
8. If a member of my immediate family is accused of doing something terrible, I do not need outside information to know that they are innocent.
9. I answer job interview questions based on information about the company's expectations rather than my instincts.
10. Even if a food item is advertised as a diet food, I would still investigate its nutritional value from other sources.
11. If new research emerged that was contrary to my moral views about stem cell research, I would be interested in reading more about it.
12. I would immediately end the relationship with my boyfriend/girlfriend if someone I respected told me that my partner was cheating on me.
13. If I heard from an anonymous person via e-mail that someone I know has been bad-mouthing me, I would decide to ask other opinions before I believe the rumor to be true.

14. If a company advertises a rare half-off sale on the latest cell phone and only three are left, I would still take the time to research and compare the phone to other options before thinking about buying it.
15. If my exercise routine doesn't feel good, I would ask a trainer to make sure I'm doing it correctly.
16. I am not interested in what others think about my cultural traditions if they are not from a similar background.
17. If my child was suspended for fighting at school, I would want to know the details of the incident from other sources before punishing him/her.
18. If I'm told by a good friend not to befriend someone because others don't like that person, I immediately take their advice.
19. If I read an article on the internet foreshadowing a serious drop in value for stock shares that I currently own, I would sell my shares right away.
20. I do not see my doctor for my annual physical if I feel healthy.
21. My religious faith is all I need to confirm that God is real.
22. I look for clues from my sexual partner about the best ways to sexually please them rather than relying on my own experiences.
23. If my sibling insists that they do not have something that belongs to me, I would be inclined to look among their belongings for it anyway.
24. If I heard informal rumors that the company I work for is going to lay people off, I would start searching for other jobs as soon as soon as possible.
25. Even if a food item is advertised as a diet food, I would still investigate its nutritional value from other sources.
26. If a political candidate that I admire is proposing a new policy that aims to reform the education system, I would support the program without questioning it.
27. If my date never showed up to a scheduled meeting place, I would attempt to contact him/her before assuming that I was stood up.
28. When I meet a person for the first time, I judge their character based on what my instincts tell me about them rather than solely by their actions.

29. If I am comparing three different laptops that are offered at the same price and have similar specifications, I would rely on my intuition to decide which one to buy.
30. When confronted with a new piece of exercise equipment, I would start using it based on how I think it should be used without reading through instructions.
31. I don't need to hear details about specific cases to decide whether the death penalty is right or wrong.
32. If I noticed an appliance wasn't working shortly after I saw my child touching it, I would search for other possible causes before blaming it on my child.
33. If my friends insist that I meet them at a fun party, I would explore information about the party instead of just trusting my friends.
34. If my bank introduces me to a new online account system that I am not familiar with, I would research more about it before deciding to switch to the new system.
35. If my doctor informs me that I have a fairly serious medical condition, I would look for second opinions from other medical sources before following the recommended treatment plan.
36. I follow cultural traditions of my family without questioning whether they make sense
37. If my sexual partner can't have an orgasm with me, I automatically conclude that it is because of their own issues.
38. If an immediate family member insists that I take their word for something, I still search for additional sources of information.
39. If I was offered a new job in a distant city, I would spend several days in the new city investigating the area before seriously considering the new position.
40. An unfamiliar website reported that a specific food causes weight gain, so I stop consuming that food.
41. When learning about a new religion, I want to explore its validity even if it contradicts my own religious beliefs.
42. I listen to my gut feeling when deciding the right time to flirt with someone I'm attracted to.
43. If I decide to invite a stranger to my home, I would do so based on only my intuitive feelings about them.

44. Before making a large purchase of an item at a store that is advertising having the best price, I will always check out comparison prices at other stores.
45. If my knees get sore from running daily, I investigate different ways I can alleviate the problem rather than waiting to see if it will clear up on its own.
46. I don't investigate the legitimacy of the political stories I read if they are consistent with my points of view.
47. I will decide the school I want my child to attend based on researching the candidates rather than by my own intuition.
48. When my friend gives me advice about something they are knowledgeable about, I have no intention of searching for advice elsewhere.
49. My long-term invested stock shares are plummeting, so I sell them off immediately.
50. If doctor puts me on an antibiotic plan but I'm not getting better, I would start looking into other ways to get better on my own.
51. From a moral standpoint, I have clear ideas about the use of recreational drugs so I am not interested in different opinions from others.
52. I would be open to investigating new sexual activities even if my sex life was already satisfying.
53. When family members are having a disagreement about something I already have an opinion about, I would seek out both points of view before taking sides.
54. If I receive two job offers, I would rely on my intuition in deciding which to choose.
55. If I heard that processed foods can cause cancer, I'd look at the research before eliminating frozen dinners from my diet.
56. Instead of accepting popular customs I am comfortable with, I would like to explore traditions from other cultures.
57. If a new romantic partner behaves jealously or too clingy, I try to see if they've been through something that would explain their behavior before determining them to be too "needy."
58. I don't judge strangers based on the first things I hear them say.

59. If I hear that a new TV company offers the lowest rates available for a limited time, I would purchase the TV immediately.

60. If someone suggests a way to break a bad health habit, I would try the new method immediately, no matter how crazy it sounds.

APPENDIX E
RATIONAL EXPERIENTIAL INVENTORY

Instructions:

Please rate the following statements on a scale from 1 = Definitely not true of myself strongly disagree to 5 = Definitely true of myself

1. I try to avoid situations that require thinking in depth about something.
2. I like to rely on my intuitive impressions.
3. I'm not that good at figuring out complicated problems.
4. I don't have a very good sense of intuition.
5. I enjoy intellectual challenges.
6. Using my gut feelings usually work well for me in figuring out problems in my life.
7. I am not very good at solving problems that require careful logical analysis.
8. I believe in trusting my hunches.
9. I don't like to have to do a lot of thinking.
10. Intuition can be a very useful way to solve problems.
11. I enjoy solving problems that require hard thinking.
12. I often go by my instincts when deciding on a course of action.
13. Thinking is not my idea of an enjoyable activity.
14. I trust my initial feelings about people.
15. I am not a very analytical thinker.
16. When it comes to trusting people, I can usually rely on my gut feelings.
17. Reasoning things out carefully is not one of my strong points.
18. If I were to rely on my gut feelings, I would often make mistakes.
19. I prefer complex problems to simple problems.
20. I don't like situations in which I have to rely on intuition.

21. Thinking hard and for a long time about something gives me little satisfaction.
22. I think there are times when one should rely on one's intuition.
23. I don't reason well under pressure.
24. I think it is foolish to make important decisions based on feelings.
25. I am much better at figuring things out logically than most people.
26. I don't think it is a good idea to rely on one's intuition for important decisions.
27. I have a logical mind.
28. I generally don't depend on my feelings to help me make decisions.
29. I enjoy thinking in abstract terms.
30. I hardly ever go wrong when I listen to my deepest gut feelings to find an answer.
31. I have no problem thinking things through carefully.
32. I would not want to depend on anyone who described himself or herself as intuitive.
33. Using logic usually works well for me in figuring out problems in my life.
34. My snap judgments are probably not as good as most people's.
35. Knowing the answer without having to understand the reasoning behind it is good enough for me.
36. I tend to use my heart as a guide for my actions.
37. I usually have clear, explainable reasons for my decisions.
38. I can usually feel when a person is right or wrong, even if I can't explain how I know.
39. Learning new ways to think would be very appealing to me.
40. I suspect my hunches are inaccurate as often as they are accurate.

APPENDIX F
GENERAL DECISION MAKING SCALE

Instructions:

Rate the following statements on a scale from 1= strongly disagree to 5= strongly agree

I double-check my information sources to be sure I have the right facts before making decisions.

I make decisions in a logical and systematic way.

My decision making requires careful thought.

When making a decision, I consider various options in terms of a specific goal.

When making decisions, I rely upon my instincts.

When I make decisions, I tend to rely on my intuition,

I generally make decisions that feel right to me.

When I make a decision, it is more important for me to feel the decision is right than to have a rational reason for it.

When I make a decision, I trust my inner feelings and reactions.

I often need the assistance of other people when making important decisions.

I rarely make important decisions without consulting other people.

If I have the support of others, it is easier for me to make important decisions.

I use the advice of other people in making my important decisions.

I like to have someone to steer me in the right direction when I am faced with important decisions.

I avoid making important decisions until the pressure is on.

I postpone decision making whenever possible.

I often procrastinate when it comes to making important decisions.

I generally make important decisions at the last minute.

I put off making many decisions because thinking about them makes me uneasy.

I generally make snap decisions.

I often make decisions on the spur of the moment.

I make quick decisions.

I often make impulsive decisions.

When making decisions, I do what seems natural at the moment.

APPENDIX G
NEED FOR CLOSURE SCALE

Instructions:

Rate the following statements on a scale from 1= strongly disagree to 5= strongly agree

1. I think that having clear rules and order at work is essential for success.
2. Even after I've made up my mind about something, I am always eager to consider a different opinion.
3. I don't like situations that are uncertain.
4. I dislike questions which could be answered in many different ways.
5. I like to have friends who are unpredictable.
6. I find that a well ordered life with regular hours suits my temperament.
7. When dining out, I like to go to places where I have been before so that I know what to expect.
8. I feel uncomfortable when I don't understand the reason an event occurred in my life.
9. I feel irritated when one person disagrees with what everyone else in a group believes.
10. I hate to change my plans at the last minute.
11. I don't like to go into a situation without knowing what I can expect from it.
12. When I have made a decision, I feel relieved
13. When I am confronted with a problem, I'm dying to reach a solution very quickly.
14. When I am confused about an important issue, I feel very upset.
15. I would quickly become impatient and irritated if I would not find a solution to a problem immediately.
16. I would rather make a decision quickly than sleep over it.
17. Even if I get a lot of time to make a decision, I still feel compelled to decide quickly.
18. I think it is fun to change my plans at the last moment.
19. I enjoy the uncertainty of going into a new situation without knowing what might happen.
20. My personal space is usually messy and disorganized.

21. In most social conflicts, I can easily see which side is right and which is wrong.
22. I almost always feel hurried to reach a decision, even when there's no reason to do so.
23. I believe that orderliness and organization are among the most important characteristics of a good student.
24. When considering most conflict situations, I can usually see how both sides could be right.
25. I don't like to be with people who are capable of unexpected actions.
26. I prefer to socialize with familiar friends because I know what to expect from them.
27. I think that I would learn best in a class that lacks clearly stated objectives.
28. When thinking about a problem I consider as many different opinions on the issue as possible
29. I like to know what people are thinking all the time.
30. I dislike it when a person's statement could mean many different things.
31. It's annoying to listen to someone who cannot seem to make up his or her mind.
32. I find that establishing a consistent routine enables me to enjoy life more.
33. I enjoy having a clear and structured mode of life.
34. I prefer interacting with people whose opinions are very different from my own.
35. I like to have a place for everything and everything in its place.
36. I feel uncomfortable when someone's meaning or intention is unclear to me.
37. I always see many possible solutions to problems I face.
38. I'd rather know bad news than stay in a state of uncertainty.
39. I do not usually consult many different opinions before forming my own view.
40. I dislike unpredictable situations.
41. I dislike the routine aspects of my work (studies).

APPENDIX H
SITUATIONAL TEST OF EMOTIONAL MANAGEMENT

Instructions:

For the following statements, please choose the best response available.

1. Pete has specific skills that his workmates do not and he feels that his workload is higher because of this. What strategy would be the most effective for Pete?
 - a. Speak to his boss about this.
 - b. Start looking for a new job.
 - c. Be very proud of his unique skills.
 - d. Speak to his workmates about this.

2. Mina and her sister-in-law get along quite well, and the sister--in-law regularly babysits for a small fee. Lately she has also been cleaning away cobwebs, commenting on the mess, which Mina finds insulting. What strategy would be the most effective for Mina?
 - a. Tell her sister-in-law these comments upset her.
 - b. Get a new babysitter.
 - c. Be grateful her house is being cleaned for free.
 - d. Tell her only to babysit, not to clean.

3. A demanding client takes up a lot of Jill's time and then asks to speak to Jill's boss about her performance. Although Jill's boss assures her that her performance is fine, Jill can't put it out of her mind. What action would be the most effective for Jill?
 - a. Talk to her friends or workmates about it.
 - b. Ignore the incident and move on to her next task.
 - c. Calm down by taking deep breaths or going for a short walk.
 - d. Think that she has been successful in the past and this client being difficult is not her fault.

4. Hannah's access to essential resources has been delayed and her work is way behind schedule. Her progress report makes no mention of the lack of resources. What strategy would be the most effective for Hannah?
 - a. Tell her boss that the progress report is unfair.
 - b. Learn that she should plan ahead for next time.
 - c. Document the lack of resources in her progress report.
 - d. Don't worry about it.

5. Lee's workmate fails to deliver an important piece of information on time, causing Lee to fall behind schedule also. What action would be the most effective for Lee?
 - a. Work harder to compensate.
 - b. Get angry with the workmate.
 - c. Explain the urgency of the situation to the workmate.
 - d. Never rely on that workmate again.

6. Blair and Flynn usually go to a cafe after the working week and chat about what's going on in the company. After Blair's job is moved to a different section in the company, he stops coming to the cafe. Flynn misses these Friday talks. What action would be the most effective for Flynn?
- Go to the cafe or socialize with other workers.
 - Don't worry about it, ignore the changes and let Blair be.
 - Not talk to Blair again.
 - Invite Blair again, maybe rescheduling for another time.
7. Andre moves away from the city his friends and family are in. He finds his friends make less effort to keep in contact than he thought they would. What action would be the most effective for Andre?
- Try to adjust to life in the new city by joining clubs and activities there.
 - Make the effort to contact them, but also try to meet people in his new city.
 - Let go of his old friends, who have shown themselves to be unreliable.
 - Explain to his friends he is hurt by their lack of contact.
8. Shona has not spoken to her nephew for months, whereas when he was younger they were very close. She rings him but he can only talk for five minutes. What strategy would be the most effective for Shona?
- Realize that he is growing up and might not want to spend so much time with his family anymore.
 - Make plans to drop by and visit him in person and have a good chat.
 - Understand that relationships change, but keep calling him from time to time.
 - Be upset about it, but realize there is nothing she can do.
9. Julie hasn't seen Ka for a long time and looks forward to their weekend trip away. However, Ka has changed a lot and Julie finds she is no longer an interesting companion. What strategy would be the most effective for Julie?
- Leave the trip early and go home.
 - Realize that it is time to give up the friendship and move on.
 - Move on, realizing that people change, but remember the good times.
 - Concentrate on her other, more rewarding friendships.
10. Mallory moves from a small company to a very large one, where there is little personal contact, which she misses. What strategy would be the most effective for Mallory?
- Talk to her workmates, try to create social contacts and make friends.
 - Start looking for a new job so she can leave that environment.
 - Just give it time, and things will be okay.
 - Concentrate on her outside-work friends and colleagues from previous jobs.
11. Clayton has been overseas for a long time and returns to visit his family. So much has changed that Clayton feels left out. What strategy would be the most effective for Clayton?
- Nothing, it will sort itself out soon enough.

- b. Tell his family he feels left out.
- c. Spend time listening and getting involved again.
- d. Reflect that relationships can change over time.

12. Mei Ling answers the phone and hears that close relatives are in hospital critically ill. What strategy would be the most effective for Mei Ling?

- a. Let herself cry and express emotion for as long as she feels like.
- b. Speak to other family to calm herself and find out what is happening, then visit the hospital.
- c. There is nothing she can do.
- d. Visit the hospital and ask staff about their condition.

13. Greg has just gone back to university after a lapse of several years. He is surrounded by younger students who seem very confident about their ability and he is unsure whether he can compete with them. What strategy would be the most effective for Greg?

- a. Focus on his life outside the university.
- b. Study hard and attend all lectures.
- c. Talk to others in his situation.
- d. Realize he is better than the younger students as he has more life experience.

14. Juno is fairly sure his company is going down and his job is under threat. It is a large company and nothing official has been said. What strategy would be the most effective for Juno?

- a. Find out what is happening and discuss his concerns with his family.
- b. Try to keep the company afloat by working harder.
- c. Start applying for other jobs.
- d. Think of these events as an opportunity for a new start.

15. Alan helps Trudy with a difficult task, working as hard as he can. Trudy complains that Alan's work isn't very good, and Alan responds that Trudy should be grateful he is doing her a favor. They argue. What strategy would be the most effective for Alan?

- a. Stop helping Trudy and don't help her again.
- b. Try harder to help appropriately.
- c. Apologize to Trudy.
- d. Diffuse the argument by asking for advice.

16. A junior employee making routine adjustments to some of Talia's equipment accuses Talia of causing the equipment malfunction. Talia has only ever used the equipment in the correct fashion. What strategy would be the most effective for Talia?

- a. Reprimand the employee for making such accusations.
- b. Ignore the accusation, it is not important.
- c. Explain that malfunctions were not her fault.
- d. Learn more about using the equipment so that it doesn't break.

17. Phuong is having a large family gathering to celebrate her moving into her new home. She wants the day to go smoothly and is a little nervous about it. What strategy would be the most effective for Phuong?

- a. Talk to friends or relatives to ease her worries.
- b. Try to calm down, perhaps go for a short walk or meditate.
- c. Prepare ahead of time so she has everything she needs available.
- d. Think that she just has to get through the day, it doesn't have to be perfect.

18. Mark has an exam in two days time that he really wants to do well on, but he is worried about how he will go. He has regularly done all required work and often reviews his notes. What strategy would be most effective for Mark?

- a. Review the notes a few more times and do some practice papers.
- b. Take these two days as some time out to relax before the exam.
- c. Find out whether he can re-take the course.
- d. Be better prepared by studying more the next time he has an exam.

19. Gladys experiences some chest pain that she thinks could be heart problems. What strategy would be the most effective for Gladys?

- a. Keep a close watch to see how it develops over the next month and then see the doctor.
- b. Prepare for the worst, making sure that her affairs are in order.
- c. Change her lifestyle so that she can avoid scared like this in the future.
- d. Find out about any family history and then see the doctor as soon as possible.

20. Dorian needs to have some prostate surgery and is quite scared about the process. He has heard that it is quite painful. What strategy would be the most effective for Dorian?

- a. Look up information about the procedure at the library or on the internet.
- b. Keep busy in the meantime so he doesn't think about the impending surgery.
- c. Talk to his family about his concerns.
- d. Talk to his doctor about what will happen.

21. Wai-Hin and Connie have shared an office for years but Wai-Hin gets a new job and Connie loses contact with her. What action would be the most effective for Connie?

- a. Just accept that she is gone and the friendship is over.
- b. Ring Wai-Hin and ask her out to lunch or coffee to catch up.
- c. Contact Wai-Hin and arrange to catch up but also try to make new friends around the office.
- d. Spend time getting to know the other people in the office, and strike up new friendships.

REFERENCES

- Altemeyer, R., & Hunsberger, B. (1992). Authoritarianism, religious fundamentalism, quest, and prejudice. *International Journal for the Psychology of Religion*, 2, 113–133.
- Atran, S. & Norenzayan, A. (2004). Religion's evolutionary landscape: Counterintuition, commitment, compassion, communion. *Behavioral and Brain Sciences*, 27, 713-770.
- Ayton, P., & Onkal, D. (1997). Forecasting football fixtures: Confidence and judged proportion correct. Unpublished manuscript, Department of Psychology, The City University of London.
- Barrett, J. L. (2004). Why would anyone believe in God? Walnut Creek, CA: AltaMira Press.
- Bell, D. E. (1985). Disappointment in decision making under uncertainty. *Operations Research*, 33, (1), 1-27.
- Benson, P. & Spilka, B. (1973). God image as a function of self-esteem and locus of control. *Journal for the Scientific Study of Religion*, 12, (3), 297-310
- Bjorklund, F., & Backstrom, M. S. (2008). Individual differences in processing styles: Validity of the Rational-Experiential Inventory. *Scandinavian Journal of Psychology*, 49 (5), 439-446.
- Bloom, P. (2007). Religion is natural. *Developmental Science*, 10 (1), 147-151.
- Bradac, JJ. (2001). Theory comparison: uncertainty reduction, problematic integration, uncertainty management, and other curious constructs. *J Commun*, 3, 456–76.
- Brandt, M. J. & Reyna, C. (2010). The role of prejudice and the need for closure in religious fundamentalism. *Personality and Social Psychology Bulletin*, 36 (5), 715-725.
- Bruine de Bruin, W., Parker, A. M., & Fischhoff, B. (2007). Individual differences in adult decision-making competence. *Journal of Personality and Social Psychology*, 92, 938-956.
- Cacioppo, J. T., & Petty, R. E. (1982). The need for cognition. *Journal Of Personality and Social Psychology*, 42, 116-131.

- Cosmides, L., & Tooby, J. (2000). Consider the source: The evolution of adaptations for decoupling and metarepresentations. In D. Sperber (Ed.), *Metarepresentation: A multidisciplinary perspective* (pp. 53-117). Oxford: Oxford University Press.
- Dane, E., Baer, M., Pratt, G. M., & Oldham, R. G. (2011). Rational versus intuitive problem solving: How thinking “off the beaten path” can stimulate creativity. *Psychology of Aesthetics, Creativity, and the Arts*, 5 (1), 3-12
- Davison, B. J., Gleave, M. E., Goldenberg, S. L., Degner, L. F., Hoffat, D., & Berkowitz, J. (2002). Assessing information and decision preferences for men with prostate cancer and their partners. *Cancer Nursing*, 25 (1), 42-49.
- De Martino, B., Kumaran, D., Seymour, B., & Dolan, R. J. (2006). Frames, biases, and rational decision-making in the human brain. *Science* 313, 684 (2006);
- Eibi-Eibesfeldt, I., & Strachan, G. (1996). *Love and Hate: The Natural History of Behavior Patterns (Foundations of Human Behavior)*. Aldine de Gruyter: Berlin.
- Epstein, S., Pacini, R., Denes-Raj, V., & Heier, H. (1996). Individual differences in intuitive-experiential and analytical-rational thinking styles. *Journal of Personality and Social Psychology*, 71 (2), 390-405.
- Epstein, S. (1990). Cognitive-experiential self-theory. In L. Pervin (Ed.), *Handbook of personality theory and research* (pp. 165-192). New York: Guilford Press.
- Evans, J. St. B.T. (2003). In two minds: dual-process accounts of reasoning. *Trends in Cognitive Sciences*, 7 (10) 454-459.
- Evans, J. St. B. T. (2011). Dual-process theories of reasoning: Contemporary issues and developmental applications. *Developmental Review*, 31, 86-102.
- Evans, J. St. B.T. & Stanovich, K. E. (2013). Dual-process theories of higher cognition: Advancing the debate. *Perspectives of psychological science*, 8 (3), 223-241.
- Garcia-Retamero, R., Takezawa, M., & Gigerenzer, G. (2009). Does imitation benefit cue order learning? *Experimental Psychology*, 56, 307-320
- Gervais, W. M. & Norenzayan, A. (2012). Analytic thinking promotes religious disbelief. *Science*, 336 (27), 493-496.
- Gigerenzer, G., & Hoffrage, U. (1995). How to improve Bayesian reasoning without instruction. Frequency formats. *Psychological Review*, 102, 684–704.

- Glöckner, A & Witteman, C. (2010). Beyond dual-process models: A categorization of processes underlying intuitive judgment & decision making. *Thinking & Reasoning*, 16, 1-25. *Psychology*, 92, 938-956.
- Goel, V. & Dolan, R. J. (2003). Explaining modulation of reasoning by belief. *Cognition*, 87 (1), B11-22.
- Goldstein, D. G. & Gigerenzer, G. (2002). Models of ecological rationality: The recognition heuristic. *Psychological Review*, 109 (1), 75-90.
- Hack, T. F., Degner, L. F., & Dyck, D. G. (1994). Relationship between preferences for decisional and illness information among women with breast cancer: A quantitative and qualitative analysis. *Social Sciences & Medicine*, 39 (2), 279-289.
- Handley, S. J., Newstead, S. E., & Wright, H. (2000). Rational and experiential thinking: A study of the REI. In R. J. Riding & S. G. Rayner (Eds.), *International perspectives on individual differences*, 1, 97–113.
- Handley, S. J., Newstead, S. E., & Trippas, D. (2011). Logic, Beliefs, and Instruction: A Test of the Default Interventionist Account of Belief Bias. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 37 (1), 28-43.
- International Social Survey Program (ISSP), 1991, 1993, <<http://www.Chass.utoronto.ca/datalib/major/issp.htm>>.
- Ivan, L. (2011). Cognitive style and nonverbal sensitivity: Cognitive-experiential self theory validation. *Romanian Journal of Communication and Public Relations*, 13 (2), 31-49.
- Katsikopoulos, K. V. (2010). The less-is-more effect: Predictions and tests. *Judgment and Decision Making*, 5 (4), 244-257.
- Laurin, K., Kay, A.C., & Moscovitch, D.A., (2008). On the belief in god: Towards an understanding of the emotional substrates of compensatory control. *Journal of Experimental Social Psychology*, 44 (6), 1559–1562.
- Leibold, J. & Kuhnel, S. (2012). *The Relationship of Religious Fundamentalism, Right-Wing Authoritarianism, Social Dominance Orientation, and Prejudice Against Homosexuals – An Empirical Test of a Causal Model*. In Salzborn, S., Davidov, E., & Reinecke, J. (eds.). *Methods, Theories, and Empirical Applications in the Social Sciences*, Springer VS.

- Livneh, H. (2000). Psychosocial adaptation to cancer: The role of coping strategies. *Journal of Rehabilitation, 66* (2), 40-49.
- Loomes, G. & Sugden, R. (1982). Regret theory: An alternative theory of rational choice under uncertainty. *Econ. J. 92*, 805-824.
- MacCann, C., & Roberts, R. D. (2008). New paradigms for assessing emotional intelligence: Theory and data. *Emotion, 8*, 540–551.
- Mayer, J. D., Salovey, P., & Caruso, D. R. (1999). Instruction manual for the MSCEIT: Mayer-salovey-caruso emotional intelligence test. Toronto: Multi-Health Systems.
- Morgon, J. (2014). Religion and dual process cognition: A continuum of styles or distinct types? *Religion, Brain, and Behavior*. Doi: 10.1080/2153599X.2014.966315.
- Nabi, R. L. (2002). Anger, fear, uncertainty, and attitudes: A test of the cognitive functional model. *Communication Monographs, 69*, 204-216.
- Newstead, S. E., Handley, S. J., Harley, C., Wright, H., & Farrelly, D. (2004). Individual differences in deductive reasoning. *The Quarterly Journal of Experimental Psychology Section A: Human Experimental Psychology, 57* (1), 33-60.
- Pacini, R. & Epstein, S. (1999). The relation of rational and experiential information processing styles to personality, basic beliefs, and the ratio-bias phenomenon. *Journal of Personality and Social Psychology, 76* (6), 972-987
- Penn, D. C., Holyoak, K. J., & Povinelli, D. J. (2008). Darwin's mistake: Explaining the discontinuity between human and nonhuman minds. *Behavioral and Brain Sciences, 31*, 109–178.
- Pennycook, G., Cheyne, A. J., Seli, P., Koehler, J. D., & Fugelsang, A. J. (2012). Analytic cognitive style predicts religious and paranormal belief. *Cognition, 123*, 335-346.
- Roets, A., & Van Hiel, A. (2007). Separating ability from need: Clarifying the dimensional structure of the need for closure scale. *Personality and Social Psychology Bulletin, 33*, 266-280.
- Rogers, E. (1995). *Diffusion of Innovations*. New York: Free Press.

- Rosenkranz, P. & Charlton, G. B. (2013). Individual differences in existential orientation: Empathizing and systemizing explain the sex difference in religious orientation and science acceptance. *Archive for the Psychology of Religion* 35, 119-146.
- Rotter, J. B. (1966). Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs: General and Applied*, 80, 1-28.
- Saroglou, V. (2002). Beyond dogmatism: the need for closure as related to religion. *Mental Health, Religion & Culture*, 5 (2) 183-194.
- Scott, S. G. & Bruce, R. A. (1995). Decision-making style: the development and assessment of a new measure. *Educational and Psychological Measurement*, 55, 818-831.
- Shenhav, A., Rand, D. G., & Greene, J. D. (2011). Divine intuition: Cognitive style influences belief in god. *Journal of Experimental Psychology: General*. Advance online publication. doi: 10.1037/a0025391
- Shiloh, S., Sinai, R. B., & Keinan, G. (1999). Effects of controllability, predictability, and information-seeking style on interest in predictive genetic testing. *PSPB*, 25(10), 1187-1195.
- Sloman, S. A. (1996). The empirical case for two systems of reasoning. *Psychological Bulletin*, 119, 3-22.
- Spink, A., & Cole, C. (in press). Human information behavior: Integrating diverse approaches and information use. *Journal of the American Society for Information Science and Technology*.
- Stanovich, K. E., & West, R. F. (2000). Individual differences in reasoning: Implications for the rationality debate? *Behavioral & Brain Sciences*, 23, 645-665.
- Tiedens, L. Z., & Linton, S. (2001). Judgment under emotional certainty and uncertainty: The effects of specific emotions on information processing. *Journal of Personality and Social Psychology*, 81, 973-988.
- Tooby, J., & Cosmides, L. (2005). Conceptual foundations of evolutionary psychology. In D. Buss (Ed.), *The handbook of evolutionary psychology* (pp. 5–67). Hoboken, NJ: John Wiley & Sons, Inc..
- Tsujii, T., Masuda, S., Akiyama, T., & Watanabe, S. (2010). The role of inferior frontal cortex in belief-bias reasoning: A rTMS study. *Neuropsychologia*, 48 (7), 2005-2008.

Webster, D. M., & Kruglanski, A. W. (1994). Individual differences in need for cognitive closure. *Journal of Personality and Social Psychology*, *67*, 1049-1062.

Willard, A. K. & Norenzayan, A. (2013). Cognitive biases explain religious belief, paranormal belief, and belief in life's purpose. *Cognition*, *129*, 379-3