

THE INFLUENCE OF INTUITION ON THE
DEVELOPMENT OF SPIRITUALITY

By
Sheryl Attig

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As members of the Dissertation Committee, we certify that we have read the dissertation prepared by Sheryl Attig entitled The Influence of Intuition on the Development of Spirituality and recommend that it be accepted as fulfilling the dissertation requirement for the Degree of Doctor of Philosophy

Gary E. Schwartz Date: 6/27/10

Aurelio Jose Figueredo Date: 6/27/10

W. Jake Jacobs Date: 6/27/10

Final approval and acceptance of this dissertation is contingent upon the candidate's submission of the final copies of the dissertation to the Graduate College. I hereby certify that I have read this dissertation prepared under my direction and recommend that it be accepted as fulfilling the dissertation requirement.

Dissertation Director: Gary E. Schwartz Date: 6/27/10

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SIGNED: Sheryl Attig

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DEDICATION

This dissertation is dedicated to Skyler Thomas Buotte,
my son who I love with all my heart,
who was conceived at the same time the idea for this dissertation was conceived
and who has grown up alongside it.
Skyler, this is your twin.

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ABSTRACT

Intuition is a way of perceiving the world that is fast, automatic, associative, and emotionally driven. In its most extreme form intuition is psychic ability, a sixth sense. Intuitive persons prefer to use intuition across many situations and do so consistently over time. Prior research links intuition with spirituality, yet fails to define a causal pathway. This dissertation aims at determining a causal connection through Structural Equation Modeling that shows that intuition influences spiritual experience, then spiritual belief or religious belief, or religious belief through spiritual belief, and then finally religious fundamentalism. It also tests a causal connection from intuition to schizotypy (mild, non-clinical schizophrenia-like symptoms).

A first model shows how intuition leads to spiritual experience, then to spiritual belief, then to religiousness, and finally to religious fundamentalism. The relationship between intuition and schizotypy proved not significant, yet not trivial. A second model, developed to account for more of the data and to use more generally accepted statistical procedures that are not “data based”, shows similar relationships (intuition leads to spiritual experience and spiritual experience leads to spiritual belief) with some minor variations and more detail about the mediating factors involved in these relationships. And it shows how a new factor, contemplative, mediates the relationship between intuition and spiritual experiences, intuition and religiousness, openness and religiousness, and openness and spiritual experiences. In this second model the path from

intuition to schizotypy is significant. Intuition in both models, although defined by different constructs, leads to spiritual experience. The type of spiritual belief and experience determined by intuition is decidedly spiritual, not just unusual experiences which one could interpret as spiritual.

We created a new intuition scale, the Attig Intuition Scale, for this research. It proved to be reliable and valid. Intuition in both models, although defined by different constructs, leads to spiritual experience. The type of spiritual belief and experience determined by intuition is decidedly spiritual, not just unusual experiences which one could interpret as spiritual.

CHAPTER I

INTRODUCTION

Spirituality and religion are common throughout the world, yet why this is so remains inadequately understood. Evolutionary psychologists speculate about the natural selection value of religion and whether it is genetically influenced. Evidence from the field of behavior genetics supports the claim that religiosity is substantially heritable by mechanisms that cannot be categorized according to existing categories of personality traits (D'Onofrio, Eavas, Murrelle, Maes, & Spilka, 1999; Kendler, Gardner, & Prescott, 1997; Waller, Kojetin, Bouchard, Lykken, & Tellegen, 1990). It could be that religion helps to maintain social order, particularly in large groups, and in doing so has become an adaptive trait such that those people who are religious have passed on their religious genes (Shariff, Norenzayan, & Henrich, 2010). Religiousness correlates with Agreeableness and Conscientiousness in a meta-analytic review (Saroglou, 2002). Groups that exhibit such pro-social behavior tend to out-survive and out-reproduce those groups which lack these traits (Wilson, 2002). Terror management theory suggests that religion is a useful coping mechanism, a way to help ward off the fear of death by believing in immortality (Vail, Rothschild, Weise, Solomon, Pyszczynski, & Greenberg, 2010).

Maybe religion and spirituality are useless vestiges that we have inherited from our ancestors, a naïve superstitious belief system that modern man in his wisdom can do without. Or perhaps the world of Spirit is in fact real and people all over the world are

able to perceive that reality and this is why it is so prevalent and enduring throughout history. This study seeks to contribute to the understanding of how it is that individuals become spiritual and religious by looking at the contribution that intuition, seen as a personality variable (a way of perceiving the world that is fairly constant over time and a variety of situations), may provide.

Intuition and how it relates to spirituality has not been carefully studied. Considerably more research has been conducted on religion and personality type, but typically only within specific religions, not with religion in general or with regard to strength of religious beliefs. Schizotypy, having some of the aspects of schizophrenia without being so dysfunctional that one is diagnosed with schizophrenia, has been found to correlate with spiritual experience and belief (Hathaway & McKinley, 1983; Jackson, 1997; Kaldor, Francis, & Fisher, 2002; Thalbourne, 1985, 1994; Tobacyk & Wilkinson, 1990). I suggest here that this relationship is spurious, such that both spirituality and schizotypy are the result of having an intuitive personality. Some have even argued that religiousness/spirituality forms a “sixth factor” of personality (MacDonald, 2000; Piedmont, 1999). Perhaps understanding the personality of spiritual and religious people could shed some light on this relationship.

Religion has not been integrated into mainstream psychotherapy (Vande Kemp, 1996). Several texts advocate addressing religious and spiritual issues in therapy and recommend screening for these dimensions (Kelly, 1995; Miller, 1999; & Shafranske, 1996). Counselors could optimize their work with clients by more fully understanding

their client's personality variables that correlate with religiousness and spirituality. In fact, 85% of clinical psychologists report having little or no training in psychology as it relates to religion (Shafranske, 2000; Shafranske & Malony, 1990). Most therapists do not systematically ask clients about their religiosity and spirituality (Richards & Bergin, 1997). Chirban (2001) recommends addressing religion and spirituality in therapy because 1) health research indicates a positive outcome of religion and spirituality for physical, emotional and spiritual illness, 2) religion and spirituality are vital in determining one's goals and in creating meaning and purpose, 3) the clinician addresses an area of great concern and passion of the client by doing so, 4) it aids in diagnosis and can be a source of stress or of support, and 5) spiritual activity and interest has increased in America, yet psychologists remain less interested than most in religion and spirituality. Wahass and Kent (1997a) described two case studies in which normal religious behaviors were misinterpreted as being indicative of schizophrenia, highlighting the importance of understanding what constitutes normal religious and spiritual experience and what constitutes mental illness. Furthermore, religious coping methods have proved to be effective in treating those with schizophrenia (Wahass & Kent, 1997b).

Understanding the relationship between and among personality, spirituality, and religion may shed light on the common finding that being religious contributes to physical and psychological health. For example, in one study the association between religion and psychological well-being vanished when personality was taken into account (Francis, Hills, Schludermann, & Schludermann, 2008).

To understand how the concepts of intuition, spirituality, and religiousness relate to one another and to personality, it is first necessary to understand the concepts. This dissertation will examine whether intuition (as a personality trait) predicts the development of spirituality, religion, religious fundamentalism, and schizotypy. This study is grounded in Thalbourne's theory of transliminality (Thalbourne & Delin, 1994) which purports that individuals who are more sensitive to external stimuli are more likely to be spiritually inclined as a result. Similarly, this dissertation research is based on the theoretical perspective that intuitive individuals (those who are more aware of external stimuli, more sensitive to others' emotions as well as their own, and more likely to report psychic type phenomena) detect more subtle external stimuli than individuals that are not intuitive. In doing so, I believe that the intuitive individuals are more likely to tap into the spiritual dimension of reality.

I believe that the spiritual realm is not readily accessible to the ordinary five senses and that a heightened level of awareness is necessary to detect and connect to this aspect of reality. This idea is found in Buddhist beliefs and practices in which meditation is done daily to heighten levels of awareness as a way of becoming more spiritual (Ekman, Davidson, Ricard, & Wallace, 2005). My theory is that those individuals who are intuitive would have a heightened level of awareness and therefore be more likely to detect and connect to the spiritual realm. As a result they are more likely to have spiritual experiences and beliefs. I further postulate that intuitive people are unlikely to become religious because religion is based on authority, on others' experiences of the supernatural world. I believe that intuitive individuals experience direct access to this

realm so they find it unnecessary to rely on someone else's stories and interpretations about this reality. Religious fundamentalism, in particular, is characterized by highly traditional religious beliefs, so intuitive individuals would be especially unlikely to be religious fundamentalists.

I believe that intuitive individuals are more likely to perceive subtle stimuli since it seems that inherent in intuition is a heightened sensitivity to stimuli. I believe that this heightened sensitivity could cause intuitive individuals to perceive more than they can handle, like sitting quietly on a beach hearing fifteen different radio stations playing. I have experienced this during highly intuitive states in which I have seen layer upon layer of visual images simultaneously and have seen sounds (synesthesia). I have found it very difficult to process so much incoming information and hold my center during these experiences, yet have developed that skill through practice and through guidance from spiritual mentors I have had.

For the person who has heightened sensitivity, but lacks the maturity, emotional stability, or the mental ability to integrate all of the incoming information I believe there is an increased risk of developing schizotypy or schizophrenia. Edgar Allen Poe in "The Tell-Tale Heart" has one of his deranged characters proclaim; "Have I not told you that what you mistake for madness is but the over acuteness of the senses?" Furthermore, I have heard first-hand accounts of people having kundalini experiences which significantly destabilize them for quite some time. A kundalini experience is a profound spiritual and energetic experience in which it is often reported that an individual feels as

though strong energy like lightening is traveling through the spinal column. This initial experience is often followed by a heightened sensitivity to external and internal stimuli in which it is said that the “third eye” opens up and psychic experiences become common. One person I knew said he could see energy and the spirits of dead people after having had his first kundalini experience. Another person I knew had her first kundalini experience while doing kundalini yoga in the park with a group of people. She could not move for several hours and remained there alone lying down on her yoga mat in the park. The others had assumed that she was resting and left her there. She said that her senses were so heightened and there was so much information coming in that it overwhelmed her and she became dysfunctional for several months. Eventually others who were more experienced in working with kundalini energy guided her in methods designed to handle it and she became functional once again. Thus, it is proposed that intuitive individuals are more likely than nonintuitive individuals to have schizotypal aspects that may or may not manifest as schizotypy or schizophrenia depending on personal characteristics and environmental characteristics such as the presence or lack of support and understanding for what is occurring.

Another potential way of explaining why some intuitive individuals become spiritual and others develop mental illness (if this in fact proves to be the case) is a spiritual explanation. I once heard a deeply spiritual person say that, “the blooming flower attracts the bees” in reference to the development of schizophrenia in the person who is spiritually waking up. What I understood this to mean was that as someone was waking up, becoming more sensitive to the spiritual realm, more capable of sensing it and

communing with it, the bees, i.e. negative spirits, would go to commune with the person and could disrupt them as they are mere novices. My Aunt told me that when she was young she pursued spiritual experiences and was able to induce out-of-body experiences and had a number of profound spiritual experiences. However, she reports, some of them were quite frightening. She will not even talk about them because she says it's too horrible to remember. She indicated that she encountered some very evil and frightening spirits that she believed were trying to trick her and mislead her down a dark path. She felt like she was getting in over her head, so she stopped inducing these experiences and began going back to church, which she believed would offer her more spiritual safety. Perhaps she would have developed schizophrenia had she taken another course in her life. If schizophrenia is in fact a spiritual illness, then this could explain why the cure rate for schizophrenia is higher in undeveloped countries, in which schizophrenia is often seen as a spiritual illness, than it is in Westernized nations which do not see it as a spiritual illness.

The theories tested in this dissertation have grown out of personal experience, hearing stories of others' personal experiences, and from reading others' theories and about the research that they have done. In the next section I will tell my personal story, per request of my dissertation committee, which was the initial inspiration for this research. I will use "I" when appropriate (for clarity) and the third person when appropriate.

My Story

Ever since I can remember I have had a curiosity about all things spiritual and religious. As early as age four I can remember wondering if there really was a God, what happens after death, if angels really exist, if this whole world was just a dream that someone was having, and many other questions. I was a curious agnostic. I would not believe anything unless I could experience it first-hand myself, yet I experienced nothing spiritual, except for some unusual dreams which I did not interpret as being particularly spiritual at the time. I remember when I was about four or five years old going outside after a long rainstorm while the sky was still clouded over. I stood in the backyard in about a foot of water and noticed that everything around me felt different, as though it had been bathed in fairy dust. Everything felt more alive, like it glowed. It felt as though time stood still. It was a profoundly different experience, yet it was hard to say what it really meant, if anything. It was a different side of reality I had not perceived before, but I still was not sure about God, the angels, and life after death.

I was always “sensitive” growing up. I could read people really well and was particularly attuned to others’ feelings. I was very quiet most of the time and just took in everything around me. Looking back I would say that I was likely born with intuitive abilities for reading others’ character and emotions. However, I do not think I was born with the psychic type of intuition. I sought answers to my questions in the only ways I knew how. I began going to church when I was about 13, after a friend invited me to go with her. I thought that this was my answer, so I began going to church as much as I

could, usually twice per week. I went to an Assembly of God church and a Congregational church. I also went to Bible studies and on summer mission trips. My church friends would tell me about their spiritual experiences such as having visions of Jesus or feeling the love of the Holy Spirit overtake them, but I never experienced anything like that. I could not figure out why so many others were having such profound experiences while I experienced nothing. I was baptized in water. I was baptized in the Holy Spirit. I prayed. I sang worship songs. I read the Bible. Still nothing. Was I wasting my time? Was there really no God? If there was a God, why would he not reveal himself to me?

Soon I was off to college at the University of Arizona where I studied philosophy. I had a teacher who presented some very strong logical arguments against the existence of God. Maybe he was right. I began writing to my Grandfather, who was a theologian, telling him what this teacher was saying. He would, in turn, give equally good counterarguments which I would then bring up in class. "Surely God exists. Socrates argued for the existence of God saying that there must be an intelligent creator who designed us. God must have created our eyelids, because if he had not, then they could have gone on in the other direction and they would have filled up with water every time it rained." My teacher was impressed, but I was not. After much study of philosophy I realized that it's possible to create strong arguments for God's existence, but that does not necessarily make it so. I was, however, able to develop my analytic skills more fully. I was approaching metaphysical questions logically and getting nowhere and approaching it through church (still) and getting nowhere.

I decided to study with my Grandfather, Bernard Ramm, for a summer during college. He had a Masters of Divinity and a Ph.D. in the Philosophy of Science. He was and still is one of the most intelligent people I have ever encountered. He knew five languages, history, philosophy, science, the natural world, and, of course, theology and he knew them all exceptionally well. He had published 23 theology books including one about the integration of science and Christianity. We read through his book on Biblical interpretation as part of my studies with him. We also had many talks where I brought him the most difficult questions I could think of that no one else had been able to address including, of course, “How do you know that God exists?” and “How do you know what God wants you to do with your life?”. I was surprised to find that a man who had devoted his entire life to God and theology, the wisest person I knew, responded by saying that you believe on faith and that in his whole life he was really only certain that God had directed him twice, once into his profession, and the other into marrying Grandma. Maybe, knowing God in the way I wanted to know God and wanting answers to all of my questions was not a realistic goal. Grandpa told me that some mysteries are not meant to be solved and that we have to live with mystery as part of life. In the Bible it tells us that God is veiled to us, he said. Still, Grandpa must have had stronger faith than me for some reason.

Finally, some strange, but not necessarily spiritual, things began to occur. I began to dream about things in great detail before they happened or while they were happening at a distance from me. At first I did not believe it, so I began keeping dream journals to be sure I remembered dreams accurately and sure enough it really was occurring. But why?

And how? I began reading Jungian dream interpretation books, hoping to find insight there. I found some, but not really what I was looking for. Over time and diligent observation I was able to distinguish “real” dreams from “ordinary” dreams. I still do not know how it happens or why it started happening to me at that time.

Coincidentally, at the time that this was occurring I began dating someone who was highly spiritual. He had been having out-of-body experiences since he was a small boy and could see spirits, detect energy, and just like me he had psychic type dreams. He never discussed these things with me very much. He had been kicked out of his Mormon church and had been divorced as a result of telling people in that church about his experiences, so he was reluctant to tell anyone about them. However, one day I noticed he was reading a book called The Way of the Shaman by Michael Harner (1980). I had never heard of shamanism. He did not want to discuss the book with me, except to say it was interesting. Soon we broke up and I was off to Boston to get a Masters in Theological Studies at Boston University School of Theology. Surely, I would find answers there.

I expanded my search for answers and experiences beyond the scope of Christianity for the first time while at theology school. I studied a number of other religions including Celtic Paganism, Tibetan Buddhism, Hinduism, and Confucianism. I began taking Hatha Yoga and Zen Meditation classes. For one of my classes I decided to do research on shamanism, so I read Mircea Eliade’s classic treatise on it, Shamanism: Archaic technique of ecstasy (1964). The mystical person I had dated who also had the psychic

dreams found shamanism to be of value, so I thought maybe it would have something to offer me as well. After reading the book, I began to think that shamanic techniques lead to spiritual experiences. Eliade described different aspects of shamanic experience from places all around the world where it has been practiced for thousands of years in isolation from other parts of the world, yet the experiences described were all quite similar. Cultural beliefs colored the experiences, yet at their core they were astonishingly similar. I was intrigued. Then I read Michael Harner's The Way of the Shaman (1980) and realized that this was something which I could potentially learn to do myself. Soon after this I came across an advertisement for a shamanic weekend workshop. I called the host of the workshop, Roy Bauer, and asked him if I could sign up and if I could have my money back if I did not in fact "meet my power animal and travel to the lower and upper realms" as the advertisement claimed I would learn to do. He laughed and registered me.

I attended the workshop, hopeful I would in fact learn how to do something really spectacular. Instead, I sat in the basement listening to a lot of drumming and got really frustrated. However, the other participants who came to the workshop were having profound experiences, and it was inspiring to observe Roy's exceptional shamanic skills at work. I spoke with one of Roy's assistants afterwards and she encouraged me to keep practicing until I got it and that I did. I practiced on my own. I went to workshops offered by a number of different shamans from a variety of traditions. It was just as frustrating as church had been for me. I experienced nothing while those around me were having profound experiences. I could not understand why it was that I, an educated, smart, analytical, person who succeeded at most ventures I took on was so bad in this one area.

It seemed that a number of the people who really excelled in the spiritual domain were not well educated. In fact, many seemed downright illogical, even the teachers, who said things like “We are all one”. Really, what does that mean? That struck me as logically impossible. We cannot all be one when we are clearly all separate beings with our own individual bodies. I sat there mulling over the logical inconsistencies of what was being taught and of experiences that people were reporting to have had. My Grandfather had nicknamed me “the female Socrates” because I have always loved to question everything. Little did I realize that this was not an entirely beneficial attribute.

Eventually one of my Shamanic teachers identified the problem, the reason I was having trouble learning shamanic techniques. I thought too much. He said that by constantly analyzing experiences I was blocking myself from fully experiencing them in the moment and was interfering with their natural progression. He suggested that I postpone analytic thinking until after the experience had occurred. I tried it, and with some practice, it eventually worked. I was able, using Shamanic techniques, to have out-of-body experiences, to feel energy, to commune with spirits, everything. I have learned that by altering my state of mind, by turning off that analytical aspect of it, I can tune into the spiritual realm and perceive those things which are around me all the time which I normally miss because I am not in the right state of mind to perceive them. It’s just like my Grandpa told me-they are veiled. From my experience I have learned that the spiritual realm is more subtle than our three dimensional reality and that the only way to detect it is by quieting all the noise in the mind to heighten that sixth sense. A number of shamanic practices facilitate this process, including meditation, drumming, dancing,

doing spiritual work at night when it is dark, going on pilgrimage to sacred sites in nature, and the use of various sacraments. These techniques are often combined to produce a stronger effect. One of the most memorable spiritual experiences I have had was of dancing with 70 other shamans at the Big Horn Medicine Wheel in Wyoming. Two days of spiritual practice (meditation, singing, storytelling, and drumming) culminated in a traditional Medicine Wheel ceremony led by local Native Americans. We walked in silence to the sacred site, circumambulated three times, gave offerings, created a wheel formation, and made music while we danced around the wheel. This generated an enormous amount of energy which spun around the wheel and into the earth. It was so powerful that even someone as challenged as myself could feel it.

I have since noticed through many experiences that there is a strong correlation between having a quiet mind and having spiritual experiences. The quieter my mind was, the more profound the experiences were. I went on to be a hospital chaplain for a year after completing theology school. I had witnessed several people die while working as a chaplain, but never had any particularly unusual experiences. Then one night an elderly woman was admitted into the Emergency Department after being resuscitated from a heart attack. It was determined that she was brain dead and they would have to let her go. I stood at the end of her bed while her family and a Catholic Priest, and I waited about half an hour for her to die. I decided to try something different to help this woman transition. It was a form of Tibetan Prayer that I had heard about. I visualized (with my eyes open) Mary (since the patient was Catholic) a few feet above the patient with light coming down from her. I held this visualization for quite some time, until all of a sudden

I saw the woman's spirit go out of her body and up. I jerked my head so fast to watch her go that I almost threw my neck out. The man next to me immediately said, "She's gone" and I whipped my head around to look at him. He must have seen her go too. No, he was looking at the monitors which had just all gone to zero. I looked around the room. No one else had seen her go. No one else was smiling and excited.

There was life after death. I had just seen it and it was no hallucination. It occurred at the precise moment that all the monitors went to zero (which they did rather suddenly, not in a gradual decline which would make it predictable). I told my chaplain supervisor and the other chaplains about this. My supervisor, who had been supervising chaplains for twenty years, said this was the first time he had heard of a chaplain having this type of experience. Most of the chaplains that I have met are highly religious, not highly spiritual, and as such I suspect they have fewer spiritual experiences like this. The mystical Emergency Department Nurse working that night knew what I had seen before I even told him. He told me the next day over lunch, where no co-workers could overhear, that he always saw spirits go when people died. A nursing supervisor, who happened to also be a shaman, told me he saw this happen all the time as well, yet none of the chaplains had ever experienced this. As I reflected on the experience I wondered why I saw her go, but not anyone else whose death I had been present for. I realized it was probably because my state of mind was different. I was in deep meditation with a clear mind when she died, but had not been when I had been at others' deaths.

Like any good story, this one ends where it began, at church. For the last 13 years I have been apprenticing in a branch of Peruvian shamanism called the Pachakuti Mesa Tradition with Oscar Miro-Quesada. As part of this tradition it is recommended that practitioners do an annual vision quest. I did one for the first time just before I began work on this dissertation. I chose to do it just before the fall semester began in August so it would not interfere with school. It seemed like a good idea at the time, however August in the desert with temperatures every day around 100°F-105°F was unpleasant at best. Most of the vision quest involved going back and forth all day between being outside in the shade of a tree where flies would surround me and then retreating to my nearly unbearably hot tent where there were no flies. I was still able to follow all of the prescribed protocols. I was alone out in the desert by a sacred mountain, Babo Quivari. I barely ate anything, but a little rice. I meditated and prayed quite a bit under a large tree. I communed with nature and visited a number of sacred sites. I spoke to no one for three days and nights. I had some profound insights and received spiritual guidance while on the quest.

The last part of this ritual was to go participate in an organized religious service. By the time I got back to Tucson Sunday night nearly every church service in the area had already begun, except for one service at 7:30pm at an Assembly of God Church, so that is where I went. It was a profoundly different experience than all those times I had gone as a teenager and young adult. I was now going as an awakened adult. I jumped right in and did everything they did and sang every song with them to get the full experience. I lifted my hands as they did when they sang. I used to think this was a peculiar symbolic act of

reaching towards God, but now I realized what it really was, reaching out to receive energy from the heavens. I could feel it pour into my hands and through my body. I noticed when I was singing the same song over and over again with the congregation that this energized me and put me in a trance. The pastor invited us to come up front to be anointed with oil on our foreheads, another ritual I never quite understood. But this time, when I was anointed with oil on my forehead I felt a powerful surge of energy ripple through my body. The pastor invited people who needed prayer to come up front and kneel before God. I observed these people and was able to feel, to intuit, what their problems were, and was compelled to go up and pray for those who seemed the most troubled.

The entire experience was very moving and energizing, something I had never felt in church before, because I had never really been “awake” before to detect all that was going on around me. I saw that the path that I had taken was necessary for me, but was not the only path a person could take. If someone else was already “awake”, church could be a great place for them to grow spiritually and have spiritual experiences. However, I wonder how many people in church are “awake” and how many are just going through the motions like I had for years. I am skeptical of religious rituals as far as their ability to awaken someone, since they never worked for me. I wonder how many other people are like me, requiring very specialized training to wake up. I wondered if my path to spirit (achieving a clear mind and tuning into subtle stimuli) was the typical path to spirit or just the one that I took. I’ve wondered if there are people who are just naturally intuitive and less analytical than me who “wake up” with much less effort. Maybe there are people

who are born “awake” or others who are awoken through other paths that involve quieting the analytic mind and becoming more intuitive.

On my path I only went to church (was religious) when I was not particularly intuitive. Once I became more intuitive through training I began to have spiritual experiences. These experiences led to the formation of many spiritual beliefs for me. I have lost nearly all interest in religion, as I feel I have outgrown it in many ways and am able to learn more through my own first-hand experiences than anything I have ever learned by going to church. However, I respect people who are on that path. What I value now is participating in shamanic and Buddhist traditions in which I have similar experiences to the other participants and where I am able to learn more techniques to become more intuitive, more aware, and more compassionate. These experiences I have gone through in my life and my understanding of them have been the inspiration for this research.

The Purpose of this Study

The main purpose of this study is to determine whether or not intuition influences spirituality and if so, how it influences it. My theory is that intuitive individuals are more likely to notice and attend to more subtle stimuli. As a result these intuitive individuals are more likely to have spiritual experiences. I think that the spiritual realm is somewhat veiled and difficult to perceive and that only those with heightened perception are able to connect with and perceive this realm. It seems that intuitive individuals would have a heightened sense of perception for just such things. Thalbourne has created a theory, transliminality, which is similar in nature to the thinking which underlies the model created in this dissertation (Thalbourne & Delin, 1994). His theory is that individuals high in transliminality, those with heightened perception of external stimuli, have a resulting constellation of features in common, one of which is belief in and experience of the paranormal (Thalbourne & Delin, 1994). His research and that of his colleagues has supported this theory by demonstrating that those high in transliminality are more sensitive to visual, acoustic, and olfactory input (Thalbourne & Delin, 1994; Thalbourne, Bartemucci, Delin, Fox, & Nofi, 1997), have thinner boundaries (Houran, Thalbourne, & Hartman, 2003), are more influenced by subliminal priming on a card-guessing task (Crawley, French, & Yesson, 2002), and are higher on a measure on synesthesia (Thalbourne, Houran, Alias, & Brugger, 2001).

Although not explicitly tested in the current research, it is supposed that intuition is similar to transliminality in both function and subsequent correlates. The model in this dissertation is based on the idea that high levels of intuition are likely to lead to spiritual experiences which then lead to spiritual beliefs or to religious belief and practice, depending on how the experience is interpreted. In my experience it led to spiritual beliefs, but I have known others for whom spiritual experience has led to religious belief and practice. If a person becomes religious it is also supposed that this individual will then become high in religious fundamentalism, strong adherence to traditional religious beliefs, as a result.

I think that a person low in intuition (and presumably also low in spiritual experience) is likely to become religious out of a need for religious authority. They need someone else to tell them about spiritual realities since they themselves have no direct access to it. Sometimes religious people are no longer welcome at their religious institutions when their personal spiritual experiences reveal truths that challenge the traditions of that particular religion. My mystical boyfriend was ostracized from the Mormon Church after he started talking about his spiritual experiences. The first shaman I ever learned from, Roy Bauer, was a Bishop in the Old Roman Catholic Church until they ostracized him for having a direct connection to the spiritual realm. Highly spiritual people are not always welcome within traditional religions where it is typically the exclusive domain of the religious leaders to have direct contact with the spiritual realm. It challenges their authority when someone who is a mere parishioner claims to have the same capabilities. Religious leaders are also thought to understand sacred text well

(which are typically thought to be directly from God, inspired by God, or written by or about those who had a special connection to God).

Another prediction in this study is that those high in intuition are prone to schizotypy, (i.e. non-clinical schizophrenia-like symptoms). It is thought that those who are more tuned into subtle stimuli may not always benefit from this. It could be overwhelming for someone who is too young or immature to handle these experiences. As a result, some of the characteristics of schizophrenia may manifest.

Finally, an important component of this research is the development of a new scale to measure intuition. In searching for a good intuition scale, it was found that each scale was limited in how intuition was defined and that no scale captured all of the elements of intuition thought to be of central importance to this construct. An extensive literature review was performed to determine what type of items should be included. Much of the scale's items were based on what highly intuitive persons self-report about their intuitive abilities. Other items were based on the author's extensive background and involvement in parapsychology and various spiritual traditions (i.e. Christianity, Shamanism, and Buddhism) as well as her own intuitive experiences. This scale intended to measure a variety of aspects of intuition including intuition as it is used in social situations, psychic ability and experience, and intuition as it is used in the decision making process.

CHAPTER II

REVIEW OF THE LITERATURE

Defining Intuition

Intuition has been defined in several ways. According to the Concise Oxford Dictionary (1964) intuition is, “immediate apprehension by the mind without reasoning, immediate apprehension by a sense, and immediate insight.” Intuition has also been characterized as fast, automatic, effortless, associative, and as implicit thought which is not available to introspection. It occurs immediately, has an emotional aspect to it, and the person experiencing it may not be conscious of it or able to use language to describe his or her experience (Hogarth, 2001). Intuitive thought processes have been explained as instances of subliminal priming (Schooler & Dougal, 2005), face recognition judgments (Dunning & Stern, 1994) implicit memory, instant emotions, learned behaviors that become automatic, holistic thought processes, access to information outside of normal consciousness perceived through psychophysiological systems, and as instances of pattern recognition. The ability to correctly solve insight problems has been highly correlated with the ability to identify out-of-focus pictures, indicating that intuition may be just another type of basic perceptual pattern recognition processes (Schooler, Fallshore, & Fiore, 1995). Intuition here is seen as a particular way of processing perceptions.

Types of Intuition

Vaughn (1979), a transpersonal psychologist, has developed a theory that there are four types of intuition: physical, emotional, mental, and spiritual. She says that physical intuition is a strong bodily sensation in response to stimuli that are otherwise unconscious. It may manifest as a headache or felt tension. She speculates that this provides useful information about individuals and their environment, especially in primitive jungle dwellers that are surrounded by danger. Intuition on the emotional level comes to consciousness through feelings especially in response to social situations. Intuition, she claims, on the mental level comes through inner visions in which patterns are suddenly recognized, such as when an individual has been logically approaching a problem for quite some time and suddenly, it all comes together to make sense. According to Vaughn (1979) many scientific discoveries have been made in this way. Spiritual intuition is intuition in its most pure form according to Vaughn (1979). It is associated with mystical experience and is thought to be separate from sensations, feelings, and thoughts. It is knowledge of God, ultimate self-knowledge, transcending personal separateness, peak experiences, and a holistic perception of reality.

The Intuitive Process

Goldberg (1983) claims that intuition, especially in the realm of scientific discovery, comes only after a great deal of rational thinking has occurred. He also points out that a series of small intuitions may take place in the process of discovery or a large, sudden intuition may occur. The intuitive mind needs the raw material of rational

thought, he claims. Goldberg explains that this same sort of reasoning can be applied to creativity in which the sudden intuition is not a solution to a problem but rather the ability to see a new possibility. Goldberg also recognizes an evaluative function of intuition in which there is a voice in one's head or an urging which guides the person to make a particular decision in response to evaluating something. Goldberg also defines another type of intuition, operative intuition, in which a person feels an urge to do something for no reason whatsoever and without any evaluations, such as when, a person feels he or she should not get on a plane and then later learns that the plane crashed and everyone aboard was killed. This conception of intuition is as a sixth sense.

Intuition as Spiritual Experience

Some view intuition as predictive, a type of extra-sensory perception, often about something bad which could happen. Intuition is a warning device in these instances. Goldberg (1983) believes that illumination, also known as Samadhi, nirvana, satori, and cosmic consciousness, is the highest form of knowing or intuition. It is pure awareness. In this experience, individuals become aware of their true nature and the nature of the cosmos which may be a fleeting experience or a permanent state into which one enters. This description is comparable to descriptions of mystical experiences in which awareness is heightened and there is an increased clarity of thought, so perhaps intuition in its most extreme form is a mystical experience.

Limitations of Intuition

Another common characteristic of intuition is that individuals place confidence in their intuitions. Several researchers (Agor, 1989; Behling & Eckel, 1991; Bowers et al., 1990) report that inherent in intuition is an extreme confidence in its validity. However, despite having high confidence in the accuracy of one's intuition, it sometimes proves to be wrong as can be seen in research on problem-solving (Nisbett & Ross, 1980; Ross, 1977, Tversky & Kahneman, 1983) and in the fact that many visual illusions lead us to jump to false conclusions through the use of our intuition (Myers, 2002).

The Use of Intuition

Research on intuition involves an assortment of measurements and definitions that span numerous fields of research including psychology, parapsychology, philosophy, business management, and neuroscience. It can be seen as a personality trait or a skill that one possesses. It is commonly thought that intuition has an important role in spiritual growth, medical diagnosis, healing, learning, creativity, in business, in scientific discoveries, and overall well-being (Myers, 2002). Biologist Rupert Sheldrake has explained intuition as the body's connection to fields of information that are beyond conscious awareness in his theory of morphic resonance (1999). An example is the ability of animals to have accurate premonitions about impending natural disasters, a well documented phenomenon (Sheldrake, McKenna, & Abraham, 1998).

Measuring Intuition

Measuring intuition is a difficult task. Many task-oriented intuitive measures are narrowly focused on things such as gambling tasks, intuitions about how words are related to one another or about the physical properties of objects. These measures do not focus on social situations which are the context in which most highly intuitive people self-report that they most often use their intuition and is the arena in which they report having the most accuracy with their intuition. Self-reports of highly intuitive individuals reveal that the most common accurate intuitions have to do with quick and accurate judgments of strangers' thoughts, feelings, or personalities, knowledge of future events, and knowledge that something bad was about to happen. For the purposes of this study, intuition is regarded as a relatively stable personality construct. Intuition is a generally preferred way of processing information constant across many situations. It is a preferred way of perceiving the world and as a result is also likely to be more developed in those who prefer this mode of perception than in those who do not. Those with stronger intuitive capacities should be more likely to be more sensitive to the spiritual domain.

The Myers-Briggs Type Inventory

Intuition can be seen as a personality trait, a way of generally preferred way of perceiving and approaching the world that is relatively consistent over time and a variety of situations. This is precisely how Jung conceived of intuition, as a personality trait (Jung, 1926). He refers to intuition as perceiving holistically so that the unconscious perceives new possibilities, ideas, and new relationships within existing knowledge

(Jung, 1933). Jung described intuition as, "a basic psychological function...that mediates perceptions in an unconscious way...it is neither sense perception, nor feeling, nor intellectual inference, although it may appear in these forms" (1971, p. 767). He also believed that intuition is used to infer meaning when there is inadequate knowledge and that intuitive people have greater access to their own unconscious or to the collective unconscious with its archetypes and symbols. Jung also believed that the person using his or her intuition does not understand how he or she knows something; this phenomenon is similar to the sudden knowing found in religious and spiritual traditions, such as when individuals feel guided by God or experience a sudden heightened level of awareness such as with kundalini awakening.

A personality measure which has been used frequently in the study of personality and religion is the Myers-Briggs Type Indicator (MBTI). The MBTI is based on Jung's conception of personality types in which intuition is the immediate and unconscious perception of possibilities, internally or externally. Intuition is seen as the opposite of sensing which is consciously perceived knowledge of information accessed through the five senses (Myers & Meyers, 1980). Intuition is concerned with possibilities, relationships, and meaning while sensing is concerned with immediate experience. Intuition is thought to originate in the unconscious while sensing involves conscious perception. Sensing is concerned with what is real and immediate experience, while intuition is concerned with the best of what can be. The MBTI items are targeted at assessing preferences, rather than actual behavior. The instructions in the MBTI (Myers & McCaulley, 1986) indicate that respondents should describe "how you usually feel or

act". The MBTI is only a moderate predictor of actual behavior (McCrae & Costa, 1988; Furnham & Stringfield, 1993), perhaps because it is a self-report measure.

There is further evidence that the MBTI measure of intuition which is a measure of preference may correspond with intuitive ability and use. The number of premonitions which had come true corresponded to high scores in intuition on the MBTI in a study of 53 college freshmen such that those high in intuition were more likely than those low in intuition to have reported having had a premonition come true with no differences found between sex or ethnicity (Langdon-Fox & Shirley, 2003). The subjects high in intuition also reported using their intuition more frequently than those scoring low on intuition as measured by the MBTI. This study also revealed a significant positive correlation between intuition as measured by the MBTI and extroversion and openness as measured by the NEO (a personality measure which assesses the Big Five personality constructs). This correlation is evidence that it could be appropriate for us to combine the MBTI and the NEO-PI-R Openness to Experience as part of the larger construct of intuition.

While the MBTI is primarily a means of assessing preferred ways of perceiving and acting, the personality types it characterizes have also been found to be moderate predictors of behavior. The MBTI construct of intuition has been found to correlate with originality and private self-consciousness (Hill, 1987). Those who score high on MBTI intuition report having had premonitions that have come true, that they use their intuition frequently when facts are limited (Rogers & Wiseman, 2006), and are better at implicit learning tasks (Woolhouse & Bayne, 2000).

Intuition as a Personality Trait

This study measures intuition primarily as a personality trait, according to the general disposition to use this mode of thinking. There are no tasks used in this study to measure how accurate intuition is. Instead, the focus is on preference, attitude towards intuition, and self-perception of accuracy of intuition. Two of the scales used to measure intuition are personality scales including the Sensing-Intuition dimension of the Myers-Briggs Type Indicator (MBTI) (Meyers & Briggs, 1998) and the Openness to Experience dimension of the Revised NEO Personality Inventory (NEO-PI-R) (Costa & McCrae, 1992). The other two scales used to measure intuition include the Revised Rational Experiential Inventory (RREI) (Pacini & Epstein, 1999) and the Attig Intuition Scale (AIS) (Buotte, 2009). The RREI distinguishes between preferences for experiential (intuitive) engagement and ability; and rational (logical) engagement and ability. The AIS assesses intuition as it applies to social competency especially with regard to reading others' emotions accurately, decision making, and psychic abilities. These four measures capture standard conceptions of intuition as a personality trait as well as explore the possibility that this construct should be broadened to include the dimensions of ability, actual use of intuition, psychic ability, and social, and emotional intelligence.

The Usefulness of Intuition

Intuition has been used to make first impressions when meeting someone new, to predict the outcome of romantic relationships, to form unconscious stereotypes, to perform tasks in experimental situations such as in gambling tasks, pattern recognition

tasks, social judgments, and in basic physics tasks (Myers, 2002). Intuition seems to be most useful when an individual is forced to make decisions in ambiguous situations, when a problem is poorly structured, or when inadequate information is available (Myers, 2002). The use of intuition is largely determined by problem characteristics, decision characteristics, personal disposition, and by the decision-making context. Those who describe themselves as highly intuitive report that their intuitions are usually accurate except for when they are tired, ill, or overcome with emotion (Rogers & Wiseman, 2006). Many say they can enhance their intuition by quieting their mind, removing stress or negative emotions, and through meditation or spiritual development (Rogers & Wiseman, 2006). According to noise reduction theory psychic ability (a form of intuition) is a weak signal that can only be picked up when other sensory input is a minimum (Bem & Honorton, 1994; Radin, 1997). Most highly intuitive people hold metaphysical worldviews (Zusne & Jones, 1989). Could it be that intuition leads a person towards a spiritual path in life? This is a question which has been inadequately addressed in the literature, which is precisely why this research in this dissertation is necessary.

Intuition vs. Insight

Intuition which typically occurs immediately without a lengthy mulling over of information is distinguished from insight where, for some time, an individual considers the information at hand experiencing an “aha” moment in which a problem is suddenly solved or the method of solving the problem is suddenly understood (Knoblich, Ohlsson, & Raney, 2001; Schooler, Ohlsson, & Brooks, 1993). Goldberg (1992) did not

distinguish between intuition and insight, yet there is good reason for making this distinction based on the experimental evidence. Insight usually occurs after a person has focused on a problem for a period of time and feels stuck, unable to make any further progress at arriving at the solution. In contrast, intuition does not involve rational thought and is often accompanied by a bodily sensation which affects decision making although the person may not necessarily be conscious of the influence of the bodily sensation (Mayer, 1996; Nisbett & Wilson, 1977). Lending credence to this theory, McCraty and colleagues (2004) demonstrated that individuals had a physiological response to emotional stimuli seconds before the stimulus was actually presented (McCraty, Atkinson, & Bradley, 2004). Highly intuitive individuals report that certain feelings are often associated with intuitions including a sense of certainty, stomach cramps, chills, feeling light-hearted, serenity, spiritual calmness, and increased emotional sensitivity, so perhaps some are aware of the accompanying physical sensations (Rogers & Wiseman, 2006). This description fits well with Vaughn's theory which states that intuition has mental, emotional, physical, and spiritual aspects (1979). Metcalfe reports that incorrect insight problem solving is characterized by a gradually increasing feeling of getting closer to a solution while correct insight problem solving occurs suddenly (Metcalfe, 1986). Research has revealed that individuals can have correct hunches just before something becomes clear to them (Bowers, Regehr, Baltazard, & Parker, 1990). Intuition can occur with very little information, while insight requires a great deal of background information and expertise in a field combined with intuition.

This study does not involve subjects with any particular expertise, so it is intuition, not insight, which is measured. Both the NEO-PI-R and the AIS used in this study have items which assess physical sensations which are often reported by those experiencing intuition. The NEO-PI-R item, “Sometimes when I am reading poetry or looking at a work of art, I feel a chill or wave of excitement”, reveals a heightened emotional response to aesthetic stimuli which could be indicative of an overall heightened sensitivity to emotional stimuli (Costa & McCrae, 1992). The AIS item concerning physical sensations, “When I know something in my gut I often have a physical sensation that accompanies this “knowing” such as a chill up my spine or a knot in my stomach”, more directly addresses what the highly intuitive individuals self-report about their experiences (Attig, 2009).

Intuition is distinct from instinct, the immediate, reflexive reaction that allows organisms to respond to a threat quickly to enhance its survival capabilities (Carlson, 2004). Both may involve somatic responses to something in the environment, but instinct does not rely on prior knowledge or expertise (Carlson, 2004). Intuition involves the use of prior experience and expert knowledge which is automatically accessed as needed in response to the environment (Reber, 1993).

Implicit knowledge occurring below consciousness may lead up to the experience of intuition (Dienes & Berry, 1997; Reber, 1989). Bower et al (1990) described intuition as a perception of coherence in which information is at first not consciously perceived, but eventually is. As intuition guides thought to a greater level of coherence, it can then

be consciously perceived (Bowers et al., 1990). Reber (1989) conducted an experiment in which subjects were required to learn a complex fictitious grammar system and then apply it. Subjects were able to apply a number of complex rules even though they could not verbalize what those rules were. Perhaps this unconscious ability to recognize patterns is part of intuition.

It has been speculated that intuition is a process in which external stimuli are matched with non-conscious patterns, categories, or features (Dane & Pratt, 2007). Chase and Simon (1973) found that when chess grand masters and novices were shown the layout of a chessboard from a real game, the masters could recall it afterwards with 95% accuracy while novices could only recall it with about 25% accuracy. When they were shown a chessboard with pieces placed randomly there was no difference in memory recall, with each group only being able to recall 25% accurately. Clearly the chess players do not have photographic memory, but instead are able to recognize familiar patterns that may actually be relevant to something that they would care about. This idea that intuition is simply pattern recognition which is domain-specific limits the use of intuition to experts. However it could be that non-experts have their own sort of intuition which arises from the fact that there is no analytical knowledge to interfere with the creation of novel insights (Baylor, 2001).

Intuition may involve reliance on information which is unconscious. Research has shown that individuals can correctly identify information which is not yet at a conscious level of awareness. Researchers had subjects participate in a remote association

paradigm (Mednick & Mednick, 1967) in which they were shown a three word triad (e.g. playing, credit, report) in which a fourth word is related to all three words (cards) or there is no fourth word which relates to all three. The subjects were asked to identify which type of triad they were observing before they had sufficient time to figure out what the solution word could be if in fact there was a solution word. Subjects performed above chance, despite not having conscious awareness of what made their answer correct. This finding was replicated by Bowers, et al. (1990).

The Source of Intuition

Speculation about the source of intuition is that it comes from gut instinct, nonconscious information processing, extrasensory perception, or spiritual guidance. The New Oxford American Dictionary explains the origin of the word as coming from the late Middle English denoting spiritual insight or immediate spiritual communication (Jewell & Abate, 2001, p. 891). Freud associated intuition with divination when he stated; "Intuition and divination...may safely be reckoned as illusions, the fulfillments of wishful impulses...science takes notice of the fact that the human mind produces these demands and is ready to examine their sources; but it has not the slightest reason to regard them as justified" (Freud in Gay, 1989, p. 784).

Intuition as Evolutionarily Adaptive

Intuition may be an adaptation that allows humans to respond appropriately to emotionally laden stimuli. Epstein (1994) reports through his and others' research that people tend to respond more with the experiential (intuitive) system when exposed to

stimuli that produces strong emotions. For example, in two experiments (Denes-Raj & Epstein, 1994) subjects were given a choice of two bowls from which to draw a red jelly bean in order to win money. In the large bowl there was a 9% chance of drawing a red jelly bean. In the smaller bowl, there was a 10% chance. Most subjects drew from the larger bowl even though they knew this was not a logical decision. Some (20%-30%) drew from an even larger bowl that provided only a 5% chance instead of the smaller bowl with its 10% chance. Those who chose the small bowl often reported doing so against the temptation to draw from the large bowl. Most subjects were unable to use rational thought to overcome their intuitive feelings. This research shows that the use of intuition can be affected by situation variables. Even though individuals may exhibit a preferred way of perceiving and decision making in general, there are exceptions to this.

Faith in intuition as measured by the Rational-Experiential Inventory correlates with an increased likelihood for men to be in significant, romantic relationships and for both men and women to report having secure relationships, while those with a stronger need for cognition are more likely to report having been abused as a child and having poor relationships with their parents (Epstein, Pacini, Denes-Raj, & Heier, 1996). This finding supports the theory that intuition has an evolutionary advantage since it may facilitate significant relationships vital for mating and survival. Epstein et al., (1996) theorized that those who were abused as children developed their cognitive thinking style more so than others as a way of learning to cope with their emotions. This is contrary to the popular belief that people turn to religion, a form of experiential thinking, to cope with difficult emotions. Further research linked the experiential thinking style preference

with favorable relationship beliefs, extraversion, and overall favorability of basic beliefs, trust, and emotional expressivity, all things which likely contribute to better relationships (Pacini & Epstein, 1999). Experiential thinking is different from intuition as defined by Jung and measured by the MBTI. Experiential thinking is primarily about relying on intuition and gut feelings when making decisions while Jung's notion of intuition is primarily about being creative and open to new possibilities.

Faith in intuition is also associated with superstitious and occult beliefs (Epstein et al., 1996). The model proposed in this dissertation seeks to clarify the relationship between intuition and occult beliefs by determining if it is intuition which leads to spiritual beliefs (which includes measures of occult beliefs).

Intuition: Unipolar vs. Bipolar Dimension

There is some debate as to whether intuition and sensing should be related as two poles of the same bipolar dimension or as two orthogonal factors which should be measured separately. The MBTI is constructed on Jung's theory that intuition and sensing are two opposite poles on the same spectrum. This conception has been criticized by those who claim that forced choices on this measure are too limiting and that people are not necessarily sensing or intuitive, but could be a combination of both (Girelli & Stake, 1993). Costa and McCrae (1989) found no support for the typological theory on which the MBTI is based. They found no true dichotomies. They further pointed out that many people could easily be misclassified if they were near the cut-off point and that there could be large within-type differences depending on how weak or strong a particular

preference was. This study uses the MBTI, but does not score it in a dichotomous way. Individual's actual numerical scores are used to better represent just how intuitive they are.

Experimental evidence supports the two system theory. My discovery that analytical thinking disrupts the intuitive capacity has also been supported in research. Verbal self-report tends to disrupt the intuitive process (Schooler, Fiore, & Brandimonte, 1997) as does thinking out loud (Schooler, Ohlsson, & Brooks, 1993). Thinking out loud, however, does not disrupt logical analytical problem solving (Schooler et al., 1993) which gives some weight to the theory that logical thinking and intuitive thinking are separate, distinct processes.

Hayes and Allison (1994) defined intuition and analytic thought (rational thought) as two opposite poles on one spectrum in their cognitive style index that categorizes intuition as involving immediate judgment which is feeling-based and global in its perspective and analysis as cognitive-based judgment which is focused on detail. Their scale has been found to have good test-retest reliability (Allinson & Hayes, 1996; Armstrong, Allinson, & Hayes, 1997) and good internal consistency (Allinson & Hayes, 1996; Sadler-Smith, Spicer, & Tsang, 2000), yet the theory has been challenged through factor analytic analysis (Hodgkinson & Sadler-Smith, 2003a, 2003b) which indicates that there are in fact two separate unipolar scales for intuition and for analysis. This is further evidence for a dual-process theory.

Epstein and his colleagues developed a two factor theory called cognitive-experiential self-theory (CEST) in which it is thought that individuals can switch back and forth between analytic-rational and intuitive-experiential thinking styles as needed at will, while allowing for the possibility that individuals may exhibit a preferred style of thinking (Epstein, 1991; Epstein, Pacini, Denes-Raj, & Heier, 1996). The analytic-rational system is described as being analytic, conscious, verbal, relatively slow, logic-based, effortful, and free of emotion while the intuitive-experiential system is thought to be preconscious, automatic, non-verbal, effortless, rapid, holistic, imagistic and is 'emotionally driven' (Epstein, 1994, p. 715). Epstein (2000) argues that these two systems usually work together and only occasionally compete with one another. Epstein's measure for analytic-rational thought has been found to not correlate with intelligence as measured by GPA (Epstein et al., 1996; Handley, Newstead, & Wright, 2000). The Rational-Experiential Inventory (REI) was made up of 31 items designed to distinguish between preferences and use of either or both of these two systems (Epstein et al., 1996). Analysis revealed that the two scales, 'need for cognition' (analytic-rational) and 'faith in intuition' (intuitive-experiential) were in fact orthogonal (i.e. two distinct, unrelated dimensions) (Epstein et al., 1996). The Revised Rational-Experiential Inventory, a refined version of the original REI, is a measure used for intuition in this study (Pacini & Epstein, 1999). The theory it is based on is supported by research evidence which shows that intuition and rationality are best thought of as orthogonal and subject to situational influences.

Neural Basis for a Two-Process system

Lieberman, Jarcho, and Satpute (2004) have done studies examining the two-process system using functional magnetic resonance imaging. They have identified two distinct systems, the reflective (analytic) known as 'the C-system' and the reflexive (intuitive) system known as 'the X-system'. The X-system is thought to be the first that was formed in humans. It uses parallel processing, is fast, spontaneous, slow in its learning, and non-reflective in its thinking process. It is found in the basal ganglia, nucleus accumbens, amygdala, ventro-medial prefrontal cortex (VMPC), and lateral temporal cortex (structures associated with learning abstract relationships, determining affective significance of external stimuli, and social intuition) The C-system uses reflective consciousness, is relatively slower, learns quickly, is intentional, and use serial processing. It is found in the lateral prefrontal cortex, posterior parietal cortex, and hippocampus along with surrounding medial temporal lobe structures (structures associated with working and episodic memory, deductive reasoning, explicit categorization, and aspects of social cognition).

The 'Iowa gambling task' experiments revealed evidence in support of intuition being non-conscious and having a somatic component (Bechara, Damasio, Tranel, & Damasio, 1997; Bechara, Tranel, & Damasio, 2000). In these experiments, normal subjects (those without damage to the ventro-medial prefrontal cortex (VMPC)), and experimental subjects, those with damage to the VMPC, were asked to choose from decks of cards, some of which produced greater rewards over time and some of which

included some large rewards, but also large punishments, which over time proved to be the worst decks to choose from. The subjects without damage to the VMPC began to choose cards from the best decks before they were consciously aware of their strategy and they showed large skin conductance responses (called 'somatic markers') in anticipation of choosing from the bad decks. However, those subjects who had damage to the VMPC did not display this skin conductance response, nor did they learn how to choose from the better stack of cards even once they became consciously aware that this could be the best strategy. This is evidence that the VMPC plays a role in intuitive thought and that bodily responses may also play a role in signaling individuals of knowledge which is not yet conscious, another reason for including bodily sensations as an item on the AIS. These research findings further support the role of the VMPC in intuition which supports the theory of Lieberman and colleagues (2004) in which this structure is part of the "X" system.

Myers (2002) believes it is intuition that allows split-brain patients to correctly identify objects presented to the right half of the brain. Intuition has been linked with brain activity in the right-hemisphere through research using a split visual field paradigm in which stimuli is presented to either the left brain or the right brain, but not both simultaneously, in split-brain individuals (Fiore and Schooler, 1997). Split-brain individuals who have had their corpus callosum severed cannot verbalize what they have seen with their right brains since language production is controlled primarily by the left half of the brain, but they can correctly identify words and objects by pointing at them or by feeling them which is precisely what they did in this study. Myers points out that the

right brain, associated with intuition, is also superior to the left brain in facial recognition, noticing differences, and in expressing emotion. This is one of the reasons for including scales such as the RREI and the AIS which include items that measure social and emotional intuitive abilities.

Hot System vs. Cool System

Metcalf, Jacobs, and Mischel (Metcalf & Jacobs, 1998, 2000; Metcalf & Mischel, 1999) have proposed a dual system of memory, the "hot/cool system" that has parallels to the intuitive/rational distinctions found in the other theories just discussed. The "hot" system is, "the basis of emotionality, fears as well as passions, impulsive and reflexive, initially controlled by innate releasing stimuli (and thus literally under "stimulus control"), and fundamental for classical conditioning" while the "cool" system is, "cognitive, emotionally neutral, contemplative, flexible, integrated, coherent, spatio-temporal, slow, episodic, and strategic" (Metcalf & Jacobs, 2000, pgs. 233-234). Brain lesion studies and studies in which emotional mechanisms of the brain are interfered with provide evidence of their being a neural basis for this division into two systems (Metcalf & Jacobs, 2000). Systems are shown to work differently, the cool system according to Yerkes-Dodson law with the hippocampus becoming dysfunctional at high levels of stress (Jacobs & Nadel, 1985), but not the hot system which is actually facilitated by stress. This is thought to be an adaptive mechanism so that humans can respond quickly to dangerous stimuli. There is considerable research cited to justify associating the "cool" system with the hippocampus and episodic memories, and the "hot" system with the

amygdala and fear conditioning (Metcalf & Jacobs, 1998). These systems are thought to often work together, but not always, and not necessarily to the same degree. The "hot" system is thought to develop early, while the "cool" system does not develop until later (Metcalf & Mischel, 1999). There are parallels here to the "X" system which includes the amygdala much like the "hot" system which includes the amygdala; and the "C" system which includes the hippocampus much like the "cool" system which includes the hippocampus (Lieberman, et al., 2004).

Activating aspects of the "cool" system has been shown to facilitate delayed gratification while activating aspects of the "hot" system has been shown to make it almost impossible to delay gratification (Metcalf & Mischel, 1999). Different systems are able to affect decision making. The hot system parallels many of our ideas here about the intuitive system, while the cool system is comparable to the rational system. There is in fact research which links intuitive ability with the lateral portion of the amygdala (Volz & von Cramon, 2006). Perhaps, if intuition is in fact part of the "hot" system this can lend insight into the role that intuition plays in decision making. This research further supports the construct validity of the RREI used in this study. Both are grounded in the theory that there are two distinct thought processing systems which interact to varying degrees.

The Intuitive Personality

Many of the measures used for this study were chosen because of the prior research conducted on intuitive individuals. Research has discovered that the intuitive

person tends to be creative (Dollinger, Palaskonis, & Pearson, 2004; Wolfradt & Pretz, 2001; Marie-Helene & Lubart, 2000-2001). The MBTI has elements of creativity as part of the measure of intuitiveness because the two are so closely related. The intuitive individual is also intellectually gifted (Sak, 2004) and high in moral reasoning capacities (Redford, McPherson, Frankiewicz, & Gaa, 2001), evidence that a person can be both high in intuition and rationality as the RREI presumes. The intuitive individual is able to read others' emotions well (Higgs, 2001; Rogers & Wiseman, 2006), further evidence that it is appropriate to measure reading others' emotions as part of intuition as is done on the AIS.

Intuitive individuals report having paranormal beliefs, experiences, and abilities (Wolfradt, Oubaid, Straube, Bischoff, & Mischo, 1999) and are more likely to endorse a metaphysical world view (Zusne & Jones, 1989). There is a clear link between intuition and spirituality, the main relationship under investigation in this study. Those who claim to be highly intuitive say they can usually predict the outcome of their own relationships and often experience love at first sight. (Sprecher & Metts, 1989). Two items were created for the AIS based on these self-reports; 1) "I can accurately predict the outcome of my relationships." and 2) "When I fall in love it's usually an experience of love at first sight" (Attig, 2009). Intuitive individuals are more open to new experiences (Furnham, Moutafi, & Crump, 2003). This association supports the use of "Openness to Experience" (NEO-PI-R) as a valid measure of intuition.

There is conflicting evidence about the ability of intuitive people to read

emotions better than non-intuitive people. Harman (1985) found that those who prefer intuition to sensing were no better at discerning the affective states of others. Higgs (2001) found that those who were high on Myers-Briggs Type Inventory (MBTI) intuition were also high on a scale that measures emotional intelligence, while those high on sensing were low in emotional intelligence. The dominant MBTI function on intuition was the most heavily positively correlated function with both the overall emotional intelligence score as well as with the dimensions of influence, interpersonal sensitivity, and intuitive decision making. Kalliopuska (1983) found that those high in empathy with high levels of moral reasoning prefer intuitive approaches, not rational, for solving moral dilemmas. McPherson, Frankiewicz, and Gaa (2001) found that those who scored high on the MBTI intuition dimension had higher levels of moral reasoning than those who preferred the sensing dimension. This is further support for the association between both moral reasoning and social competency with intuition.

Virginia Miller, in her meta-analysis of qualitative research about nurses who regard themselves as highly intuitive has discovered they share six common features (Miller, 1993). First, they report having had meaningful intuitive experiences. Second, they are confident that their intuitions are accurate. Third, they self-identify as being highly competent in their clinical practice. Fourth, they are more open to nontraditional methods of treatment. Fifth, they report having a good “sense” of their client’s experience. Sixth, they express interest in abstract issues such as philosophy and aesthetics.

For Cappon (1994), intuition is composed of many skills including but not limited to making associations, estimating time, understanding the meaning of things, having hindsight or foresight, perceiving an object that is only displayed for 1/25 of a second, finding things in a crowd, and recognizing patterns. In his research of 3,000 subjects using an intuition scale he developed, the IQ2, he found that the most intuitive people had successful home and work lives while people who failed to use their intuition in either of these domains failed to function well in that particular domain. The least intuitive people had poor work lives and home lives. This attests to the association between intuition and social competency.

Petetmengin-Peugeot (1999) has found that intuitive individuals typically describe intuitive experiences as a "dissolution of the limits usually perceived between the body and the exterior space" (pp. 63) which sounds much like what is experienced in mystical states when individuals report that "all is one". Items on Hood's (1975) Mysticism Scale (used in this study as a measure of spiritual experience) capture this idea in this way; "absorbed as one with all things", and "realized the oneness of myself with all things".

Learning to be Intuitive

Speculation exists about whether or not intuition can be learned and many books have been written about how individuals can improve their intuition. Myers (2002) has speculated that intuition is something which has aided in survival and has been passed on to us through our ancestors' genes, but is it only genetic or can environmental factors influence it?

To test this idea of whether or not intuition is learned Fall (2002) did an experiment to determine if more experienced police officers were more intuitive than their rookie counterparts. Intuition was measured with the Archer's Social Intelligence Quotient (S.I.Q.) in which subjects were asked to guess what is occurring in various photos of people (Archer, 1980). For example, subjects are shown a picture of two men and told that they have just arm wrestled and are asked to guess who won. Items assessed whether or not subjects could accurately identify lovers from strangers, signs of power, intimacy, and kinship. The police officer cadets, experienced uniform officers, and detectives, all were found to be higher in intuition than the controls. Yet the police officer cadets scored as high on intuition as the experienced officers, an unexpected effect if intuition is learned.

Fall (2002) concludes that it would be expected that many years working as a police officer would sharpen one's intuitive capacity if it were possible to do so. However, it could be that intuition is not sharpened just by having a certain job which could potentially benefit from the use of intuition. It may not even be valued in this context. An officer may value rational thought and devalue emotion (necessary for social intuition) as interfering with the job. My husband was a police officer for many years and he was taught by his superiors that emotions were bad and dangerous and that rational control over emotions was essential. Perhaps there are other ways in which intuition can be developed.

The most likely explanation for the finding that there was no difference in intuition levels is that part of what drew these people to law enforcement was the fact that they had strong intuitive abilities which could be put to good use at this particular job. However, we should be cautious in drawing conclusions because the S.I.Q. is limited as a measure in that it only provides photos, while intuition may be best elicited through real life experiences. Furthermore, no research has been done to establish the reliability or validity of this scale.

Agor (1989) reports that in multiple samples of business people taking his intuition survey, the AIM survey, top managers have scored higher than their subordinates in underlying intuitive ability, yet only 10% of these high level executives scored high enough to be considered highly intuitive. Agor (1986) further reports that from all samples (n=3,157) he has found that women scored significantly higher than men. Asians scored higher than Caucasians who scored higher than African Americans who scored higher than Hispanics. He also notes that positions within management that require high levels of thinking such as engineering and law enforcement typically are filled by those low in intuition while those high in intuition are in roles such as marketing and policy making that have more uncertainty and experience more rapid changes. Agor (1986) found that intuitive individuals who were in thinking roles and vice versa reported being unhappy in their jobs. The intuitive executives in his study reported using meditation, prayer, reading scripture, using guided imagery, fasting, dream analysis, and solitude to activate intuitive decision making. Only one third of the executives reported using these techniques on a regular basis. Here is evidence that spiritual practices may

enhance intuitive ability. The idea upon which this dissertation is based is that intuition leads to spirituality, yet it also seems that once involved in spirituality, intuition may be strengthened through spiritual practices. Why would religions be concerned with practices that enhance intuition unless intuition was valuable to spiritual development?

Meditation is a spiritual practice used to enhance attentional capacities and thereby intuition. Ricard and Wallace (Ekman, Davidson, Ricard, & Wallace, 2005) are Buddhists who have summarized their understanding of the Buddhist path to happiness after “an extraordinary meeting” (p.59) with the Dali Lama

Buddhists believe that the radical transformation of consciousness necessary to realize sukha (sustained happiness and flourishing which arises from mental balance and insight into the nature of reality) can occur by sustained training in attention, emotional balance, and mindfulness, so that one can learn to distinguish between the way things are as they appear to the senses and the conceptual superimpositions one projects upon them. As a result of such training, one perceives what is presented to the senses, including one’s own mental states, in a way that is closer to their true nature, undistorted by the projections people habitually mistake for reality. (p. 60)

Within the Buddhist meditative tradition it is believed that meditation creates a “reflexive” awareness which heightens sensitivity to the body and the environment, enhances the emotional tone (by reducing emotional reactivity), and enhances the active cognitive schema (Lutz, Slagter, Dunne, & Davidson, 2008). Davidson, Goleman, and

Schwartz (1976) found in a study on non-meditators, beginning meditators, short-term meditators, and long-term meditators, that the more a person meditated the more their attentional absorption increased as measured by Tellegen's Absorption Scale (Tellegen, 1974) and the Shor Personal Experience Questionnaire (Shor, Orne, & O'Connell, 1962).

More recent research (Slagter, Lutz, Greischar, Francis, Nieuwenhuis, Davis, et al, 2007) has revealed that intensive mental training (a three month long meditation retreat in which participants meditated 10-12 hours per day) in Vipassana meditation increased the ability of practitioners to detect the second of two targets presented in close succession, something that is usually unlikely to occur since most people are thought to still be processing the first target. An fMRI study performed on Zen meditators found a reduction in conceptual processing in a lexical decision making task (Pagnoni, Cekic, & Guo, 2008). Subjects in this study were instructed to return to focusing on their breath after the lexical decision task was complete. The meditators were able to do this right away, while the non-meditators were caught up in making more word associations than was necessary. The meditators were able to stay more in the moment than the non-meditators.

Other areas of attention are also affected by meditation. Mindfulness based stress reduction meditation has been shown to improve orientation, detection of exogenous stimuli, and improved conflict monitoring performance (Jha, Krompinger, J. & Baime, 2007). A 20-minute meditation practice was shown to reduce habitual responding on the Stroop task (Wenk-Sormaz, 2005). Lutz, Greischar, Rawlings, Ricard, & Davidson

(2004) found a pattern of high-amplitude gamma synchrony in long-term meditation practitioners which corresponded to the number of years of practice indicating that meditation synchronizes distributed neural assemblies with high temporal precision, which could reflect an increase in the moment-to-moment awareness which the Buddhist strive for. Meditators also exhibited more gamma activity during baseline measures than did the controls showing that meditation changes the resting state of the brain, not just mental processes during meditation. In an fMRI study, in response to distracter sounds, expert, long-term meditators, in comparison to novices, exhibited less brain activation in areas that correspond to discursive thought and emotion while regions associated with attention and response inhibition were more active (Brefczynski-Lewis, J.A., Lutz, A., Schaefer, H.S., Levinson, D.B., & Davidson, R.J. (2007).

One criticism of this research has been that it mostly involved long-term meditators who have self-selected into this group, therefore we cannot be sure that what we observe in them is the effect of meditation or not, although the amount of meditation typically corresponds with amount of changes observed which is a strong argument that the meditation is responsible for the effect observed. One study has tested this criticism by randomly assigning undergraduate students either to a relaxation group or to a meditation group for five days of 20 minutes per day practice (Tang, Ma, Wang, Fan, Feng, Lu, et al, 2007). Those students in the meditative group did significantly better on the Attention Network Test showing an increased ability to resolve conflict, part of executive attention. Here is evidence that it is the meditation and not pre-existing

characteristic of individuals who are drawn to meditate that are responsible for having heightened attentional capabilities.

Research on meditation and emotion reveals that meditation enhances emotional capacities. Nielsen and Kaszniak (2006) found that experienced meditators reported greater emotional clarity than controls when presented with masked emotional stimuli. Those reporting greater emotional clarity (the ability to discriminate between emotions and be able to label them) also has reduced arousal and were better able to determine valence (pleasant or unpleasant) level of masked stimuli. An fMRI study on compassion meditation found that expert meditators, as compared to non-meditators, in response to emotional sounds during compassion meditation had greater activation in brain areas that are used to read other's mental states, in brain areas whose activation predict self-reported altruistic behavior, and in brain structures used in the appraisal of emotional stimuli (Lutz, Brefczynski-Lewis, Johnstone, & Davidson, 2008).

The Fall (2002) study argued against the possibility of learning to be intuitive, however it was limited to one study of one particular group of people, police individuals, and one type of training, learning to be intuitive on the job. However, the meditation research draws on many studies done in a variety of ways. Furthermore meditation is designed to enhance skills necessary for intuition including increased attentional capacities, the reduction of unnecessary analytical thinking (i.e. "monkey mind"), an increased sensitivity to environmental and bodily stimuli, and an enhanced compassion for others which necessarily includes an increased capacity to understand their feelings

and their perspectives. Also, through my own experience, I have been able to increase my intuitive abilities through a variety of spiritual practices, including meditation. Clearly, intuition can be enhanced through meditation and perhaps with further research it will be revealed that other spiritual practices enhance this as well.

Defining Religion and Spirituality

Religion and spirituality are two closely related, yet distinct concepts. It is especially important to this study to understand the difference between these two since subjects are categorized according to each construct, not as one construct lumped together, and different predictions are made based on these categories. Religion involves a social or institutional aspect, whereas spirituality does not necessarily have this dimension. Religion has an important social aspect in that it brings people together as a community through shared beliefs and rituals. Religion includes theological beliefs about God, a Higher Power, a Transcendent reality, gods and goddesses, and about morality. Not all religions have belief in a Higher Power, such as in Buddhism and Taoism. Religion is concerned with religious authority as found in various scripture, institutions, and authority figures within those institutions. Spirituality may or may not be an aspect of being religious.

A person can be religious and spiritual or religious without being spiritual, although most religious people tend to also be spiritual. Some individuals self-identify as highly religious extrinsic types, meaning they regularly attend religious meetings and take part in religious rituals, but the primary reason is for secondary gains such as the

social rewards of being part of a religious community (Hood, 1985). These individuals may not strongly believe in their religion or that religious beliefs are of central importance to their lives.

This research operationally defines religiousness in two ways; first with an item from the Openness for Spiritual Beliefs and Experiences Scale (OSBES) (Schwartz & Russek, 1999) 1) “Do you consider yourself to be a “religious” person (e.g. do you follow a particular organized religion)?”, and 2) using all ten items on the Santa Clara Strength of Religious Faith Questionnaire (SCSORF) (Plante & Boccaccini, 1997) which includes questions about how important one’s religious faith is, how often a person prays, the extent to which a person’s faith gives them meaning, inspiration, guidance, and comfort, how active a person is in their religious institution, how important God is to that person, and how important it is to be around others with the same faith. Neither of these questionnaires asks questions that are specific to any one faith, but rather are worded to address most faith traditions, but not all. Items about God and prayer may exclude traditions such as Buddhism.

Religious fundamentalism is traditional religious belief that is strongly adhered to. It usually involves the belief that one's religion is the only one true religion, that one's religious text is the only true one, a distinct line exists between good and evil and other such beliefs. Scores on a religious fundamentalism scale have been found to correlate positively with Christian Orthodoxy (Altemeyer & Hunsberger, 1992). The model of this dissertation proposes that being low in intuitiveness will lead to an increased likelihood

of being religious and that being religious subsequently leads to an increased chance of religious fundamentalism. I predict that when a person gets involved in a religion, they will gradually become more entrenched in its beliefs and rituals and will therefore more strongly adhere to that religion's beliefs and traditions.

This study uses the Revised Religious Fundamentalism Scale (Altemeyer & Hunsberger, 2004) to measure religious fundamentalism. Items assess traditional religious beliefs including that there is only one true religion, it is essential to believe in this one true religion, there is literal truth in scriptures, "Satan" exists, the Righteous will be rewarded by God, and religious beliefs are to be endorsed over scientific explanations when there is conflict between them.

Emmons (1999) explains spirituality as "a search for meaning, unity, connectedness to nature, humanity, and the transcendent" (p. 877). Spirituality is more focused on a person's individual, subjective, intuitive, experience of spirit, the sacred, or of God. Spirituality is concerned with one's personal beliefs, not that of the institution. This dissertation seeks to further understand the relationship between spiritual experience and belief by postulating that beliefs grow out of experience such that a person may develop spiritual beliefs or religious beliefs subsequent to having spiritual experiences. There are different ways of interpreting spiritual experiences and it is likely that depending on what framework is used for interpretation, different beliefs will follow.

Spirituality is not concerned with conformity or social norms. Because spirituality is a personal experience, it need not be concerned with religious authority. I believe that

the individual having a spiritual experience has a direct connection to the spiritual realm and does not need to rely on texts and religious authorities to teach them about the realm of spirit. If they are able to experience it first-hand why would they bother trying to learn about it second-hand through a religious institution? It seems unlikely that they would. That is why I predict that those low in intuition are less likely to have spiritual experiences and as a result need someone else to teach them about the world of spirit through a religious tradition and are hence more likely to be religious, especially traditionally so as measured by religious fundamentalism.

Spirituality is broken down into spiritual experience and spiritual belief in this dissertation as a way of clarifying this relationship and predicting that experience leads to belief. Spiritual experience is operationally defined by 1) OSBES (Schwartz & Russek, 1999) items 8-12 which ask if the person has ever experienced decidedly spiritual things including the presence of “God” or a “Higher Power”, the presence of someone who has passed away, the presence of “angels” or “guides”, “ESP”, and prayer promoting health and well-being; 2) the Weird Coincidence Scale-2 (WCS-2) (Coleman & Beitman, In press) interpersonal and agentic items which assess how often and what type of weird coincidences individuals report having; 3) Tellegen’s Absorption Scale (Tellegen, 1993) which assesses the level of awareness with one perceives the external environment; and 4) Hood’s (1975) Mysticism Scale which assesses whether or not someone has had mystical experiences of varying sorts such as feeling a sense of timelessness and spacelessness and feeling one with everything. The OSBES is used in this study because it assesses spiritual beliefs not particular to any one tradition. The WCS-2 is used because

it is possible that people may interpret weird experiences as being spiritual experiences or being from God. The Absorption Scale is used because it seems plausible that being fully attentive to the environment and responding emotionally to it could also be a form of spiritual experience. The Mysticism scale is used because the experiences described on it could easily be described as spiritual experiences such as feeling as though everything is animate, feeling at one with everything, having an experience which feels holy, or feeling as though one has experienced something divine.

Spiritual beliefs are assessed by 1) the OSBES (Schwartz & Russek, 1999) items 2-7 which ask if the person considers themselves to be spiritual and if they believe in “God” or a “Higher Power”, the survival of consciousness after death, the existence of “angels” or “guides”, “ESP” or “parapsychology”, and the ability of prayer to promote health and well-being, 2) WCS-2 (Coleman & Beitman, In press) analysis and interpretation items which assess how individuals assess the meaning of weird experiences such as pointing to a connection between inner and outer worlds, the interconnection of human minds, fate, God speaking to us, and analysis, the likelihood that an individual analyzes weird coincidences for meaning and spiritual growth.

Research evidence confirms the distinction between spirituality and religiousness. In research, spirituality, as compared to religiousness, is relatively more associated with mystical experiences and New Age practices, such as yoga and meditation, and beliefs while religiousness, as compared to spirituality, has been found to be relatively more associated with church attendance, authoritarianism, and orthodoxy (Zinnbauer,

Pargament, Cole, Rye, Butter, & Belavich, 1997). Saucier and Skrzpinska (2006) compared those who orient themselves to a tradition-oriented religiousness (who we simply refer to as “religious” here) to those oriented towards subjective spirituality (what we simply refer to as “spiritual” here). They surveyed a community sample in Eugene-Springfield consisting of Protestant, Catholic, Spiritual but not religious, No affiliation, and a few Mormon, Jewish, and “other” subjects. Results indicate being traditionally religious correlated significantly ($\alpha=.87$) with seeing oneself as religious and the importance of attending religious services, while being subjectively spiritual was significantly correlated ($\alpha=.78$) with leaving one’s body, transcending space and time, communicating with the dead, and psychokinesis (Saucier & Skrzpinska, 2006). Substantial correlations were also found between subjective spirituality and absorption, superstitious beliefs, magical ideation, and fantasy-proneness (Saucier & Skrzpinska, 2006). Quest orientation, “religion as quest” characterized by “an open-ended active approach to existential questions that resists clear-cut, pat answers” (Batson & Schoenrade, 1991, p. 416) was found to correlate negatively with the traditionally religious and positively with the subjectively spiritual (Saucier & Skrzpinska, 2006).

The traditionally religious were more likely to believe in the power of God, supernatural forces, and miracles and have respect for religious leaders, scriptures, and those who abide by the Ten Commandments, and to identify with a religious denomination, while the subjectively spiritual were more likely to endorse superstitious beliefs, a strong regard for psychics, and belief in the power of destiny (Saucier & Skrzpinska, 2006). The traditionally religious tended to be low in Openness to

Experience as measured by the NEO-PI-R (a revised version of the NEO personality inventory) (Costa & McCrae, 1992) while the subjectively spiritual tended to be higher in Openness to Experience (Saucier & Skrzypinska, 2006). Our model goes a step further by postulating that it is Openness to Experience that causes spirituality, but not religiousness.

Another difference between spirituality and religion is in the reporting of mystical experiences. Mystical experience has been found to be more highly associated with spirituality than with religiosity, one of the reasons for using it as a measure of spiritual experience in this study. Thalbourne (as quoted in Thalbourne & Delin, 1994) describes mystical experience as an experience of "ecstatic oneness with creation (or with God) and as being characterized by a profound sense of peace and an apparent illumination about the meaning of existence" (p.4). Several studies have found that individuals who identify themselves as spiritual, rather than religious, report more frequent mystical experiences (Spilka, Hood, Hunsberger, & Gorsuch, 2003). This research is consistent with my theory that religious people are not necessarily having spiritual experiences. In a community sample of 375 adults who self-identified on a scale from 1-7 as religious, spiritual, and/or mystical, a strong correlation was found between "Religious" and "Spiritual" (.68) while there was only a small correlation (.26) between "Spiritual" and "Mystical" and virtually no correlation (.09) between "Religious" and "Mystical" (Saucier & Skrzypinska, 2006). The self-report of mystical experience has also been found to correlate with the tendency to report having experienced paranormal phenomena

(Thalbourne & Delin, 1994), yet another reason for classifying mystical experience as spiritual experience.

A Neural Basis for Religion and Spirituality

Michael Persinger (1983, 1984a) has argued that religious, paranormal, and mystical experiences are all the result of temporal lobe symptomatology. In fact, temporal lobe epileptics are often obsessed with religiosity (Bear & Fedio, 1977). Temporal lobe symptoms and absorption have been found to correlate positively with each other and with reports of spiritual experiences (Kennedy, Kanthamani, & Palmer, 1994), another reason for using absorption as a measure of spiritual experience. MacDonald and Holland (1999, as referenced in MacDonald, Friedman, & Kuentzel, 1999) have found a subscale of the PPI, Complex Partial Epileptic-Like Signs, correlates strongly and consistently with non-ordinary experience and has the weakest correlation with a religion variable.

Brain structure underlying intuition may be different from that underlying spirituality and religion. Lieberman, Jarcho, and Satpute (2004) proposed “the C system” for analytic thinking which included areas of the temporal lobe, while “the X system” for intuition was associated with other brain areas. Other research (Bear & Fedio, 1977; Kennedy, Kanthamani, & Palmer, 1994; Persinger, 1983, 1984a) links the temporal lobe to religious and spiritual experience. It could be that certain parts of the brain are responsible for intuition which then leads to religious or spiritual experience which occurs in another part of the brain, oddly enough associated with analytic thought.

Perhaps it is the interpretation of experiences done with the analytic mind which determines their spiritual significance.

Evolution and the need for Intuition and Religion

Epstein (1994) argued that the presence of religion throughout recorded history in almost every society is some of the strongest evidence for his Cognitive-Experiential Self-Theory (a view that individuals have two separate, distinct ways of processing information: cognitive and experiential) because this strong need for religion shows the need for experiential thinking. Rational thinking alone fails to provide people with a full understanding of the world and how they should behave in it, but religious teaching provides this and religion is better suited to the experiential system. Epstein further points out just how prevalent superstitious and psychic beliefs are as evidence of the prevalence of thinking in non-rational ways. Epstein (1994) argues that evolutionarily the experiential system is older because humans have always needed it for survival and still do, while the rational system is a newer adaptation which further facilitates survival with its ability to manipulate symbols and make logical inferences. Epstein, Pacini, Denes-Raj, and Heier (1996) developed the Rational Experiential Inventory to measure the cognitive and experiential modes of processing information. This scale was later revised to better measure these processes (Pacini & Epstein, 1999).

The Revised Rational Experiential Inventory (RREI) (Pacini & Epstein, 1999) is based on a dual process theory known as Cognitive-Experiential Self-Theory (CEST) in which it is understood that there are two distinct modes of thinking: 1) the rational, which

is analytical, verbal and affect free and 2) the experiential, which is automatic, preconscious, non verbal, and emotionally driven (Pacini & Epstein, 1999). The two different information-processing systems are independent of one another and may work together or alone. A person can be high in both, low in both, or high in one and low in the other. This theory was born out of common sense, people knowing that they cannot think well when under emotional duress and feeling a conflict between the head and the heart, as well as experimental evidence which reveals emotionally driven, automatic, preconscious thought which is separate from the relatively slower deliberative, sequential, analytical thinking style (Epstein, 1994). The attitude towards and use of these two different modes of thinking is assessed with this self-report inventory. Situational differences and individual differences have been shown to affect the balance between the two modes of processing (Pacini & Epstein, 1999). The RREI measures affective and behavioral aspects of intuition that are not assessed by the MBTI, which is mostly concerned with assessing preferences. This is why both constructs are used in this study to measure intuition. They each assess different aspects of intuition. Since this study is only concerned with intuition, only the experiential items of the RREI are used as a measurement of intuition.

Experientiality has been found to have a positive correlation with weak significance to Openness to Experience as measured by the NEO-FFI (Pacini & Epstein, 1999), evidence that there is reason to group this together with the Openness subscale as part of the intuitive factor.

The Religious Personality and Intuition

Considerable research has been done linking personality type to religion, while little research has examined the relationship between personality and spirituality. Personality type has been shown to be a determining factor in religious practice. Personality type can influence the ways in which people choose to pray (Francis & Robbins, 2008). Personality type is also linked with religious belief. High faith as measured by The Santa Clara Strength of Religious Faith Questionnaire (SCSORF) (Plante & Boccaccini, 1997) has been found to correlate positively with hope, belief in exaggerated control, perceived coping, and negatively correlated with depression, low self-esteem, God control (belief in God as a mediator of control in life), interpersonal sensitivity, and relatively lower levels of repression and anxiety (Plante & Boccaccini, 1997). Those who are highly religious are low in interpersonal sensitivity while those high in intuition are high in interpersonal sensitivity (Higgs, 2001; Rogers & Wiseman, 2006). This helps establish the link between low intuition and high religiousness. The model proposed in this study explores this relationship further by postulating that it is low intuition which leads to high religiousness.

The MBTI sensing-intuition dimension correlates with various religious types. Keirsey (1998) reported that individuals involved with conservative religions that emphasize institutional religious authority and tradition are often sensing types. He found that those individuals who are liberal and have a subjective, experiential approach to religion in which they are able to tolerate uncertainty are more likely to be intuitive types.

Francis and Jones (1998) similarly found that Christians with traditional beliefs prefer sensing to intuition. Furthermore, Francis and Jones (1999) found that Christians who prefer intuition are more tolerant of religious uncertainty. As further evidence of this association, a group of Male Anglican Clergy (a religiously conservative group) were found to be predominantly sensing (Francis, Payne, & Jones, 2001). Research consistently indicates a negative relationship between intuition and traditional, conservative religion, just as I hypothesize in this dissertation.

The MBTI sensing-intuition dimension correlates with specific religious beliefs and traditions. Those traditions in which there are a high number of sensing types include Catholicism and Anglicanism (both conservative and traditional denominations), while Evangelical Protestants (a more liberal and less traditional denomination) have relatively lower numbers of sensing types in their congregations (Ross, 1993, 1995). Other populations found to prefer sensing to intuition include a group of Bible College students (Francis, Penson, & Jones, 2001), male Anglican clergy (Francis, Penson, & Jones, 2001), male Evangelicals in missionary personal training (Craig, Horsfall, & Francis, 2005), male Vergers (Craig, Duncan, & Francis, 2006), church musicians (Shuter-Dyson, 2006), members of the Redeemer Lutheran Church (Rehak, 1998), members of Catholic and Protestant Churches (Delis-Bulhoes, 1990), and women members of the Anglican church (Francis, Butler, Jones, & Craig, 2007). Sensing types tend to have a more positive attitude towards Christianity than do intuitive types (Fearn, Francis, & Wilcox, 2001). Perhaps this is because they find it to be limiting and unnecessary since I suspect they are more likely to have a direct link to the world of spirit. These findings support the

association between religion, especially traditional religion, and sensing. This study seeks to build on this research by not only establishing this association, but by also looking at the direction of this relationship by postulating that it is low intuition which leads to high religiousness.

Religious individuals who prefer sensing to intuition tend to be higher in religious fundamentalism, i.e. strong adherence to traditional religious beliefs (Francis & Jones, 1999). Religious dogmatism (strong beliefs not subject to change), which is part of religious fundamentalism, is associated with a preference for sensing (Ross, Francis, & Craig, 2005). Christians who prefer sensing are more likely to hold traditional religious beliefs than those who prefer intuition (Francis & Jones, 1998). Intuitive types are common in liberal Christian denominations (Ross, 1993). Religious certainty and rule following is characteristic of religious fundamentalism. Religious doubt is more upsetting and rules more important for sensing types while intuitive types are more open to religious change (the antithesis of religious fundamentalism) (Ross, Weiss, & Jackson, 1996). Christians who are intuitive types are more tolerant of uncertainty (Francis & Jones, 1999). There is a clear link between religious fundamentalism and sensing. This study goes a step further than previous research by postulating that it is a lack of intuition which leads to religiousness. Once religious, a person becomes more entrenched in belief and adherence to religious rules and is then more likely to adhere to the beliefs of religious fundamentalism.

Spirituality as it relates to Intuition

Mysticism

Mysticism is an ineffable experience of the transcendent, the divine, or ultimate reality which often involves a sense of joy, peace, timelessness, and a dissolving of the usual boundaries between self, others, and the universe. The results of two studies, one in an American population and the other in an Iranian Muslim population, indicate a correlation between extrovertive mysticism (feeling at one with the universe) and greater intrinsicness (Hood, Ghorbani, Watson, Ghramaleki, Bing, Davison, et al., 2001). Intrinsicness involves being more inclined to be part of a religious group because of the deep conviction that following this religion is the right thing to do and of very high importance rather than being extrinsic in orientation, in which a person is religiously active because of the religion's secondary benefits such as how it contributes to their social lives. The introvertive factor of mysticism in which individuals feel a unity with a void (rather than with the divine) correlates positively with slightly higher levels of Depression, Somatization, Psychoticism, and Obsessive-Compulsiveness (Hood et al., 2001). However, participants who were more likely to interpret their experiences religiously were found to be healthier in their psychological functioning in the Iranian population, but not in the American population, perhaps because, as the authors concluded, the Iranian culture is more outwardly religious and accepting of such phenomenon (Hood et al., 2001).

Positive correlations have been reported between self-reported mystical experience and poorer mental health (Hood, Spilka, Hunsberger, & Gorsuch 1996:410-411; Jackson, 1997). Hood and his colleagues (2001) reported that the desire to interpret mystical experiences in religious terms (the interpretation factor of Hood's mysticism scale) correlated positively with greater religious interest and intrinsicness. This supports the claim in this dissertation that spirituality may lead to religiousness. Individuals have mystical experiences, and out of a desire to understand them, and be around others who understand them these individuals may become religious. In a study by Thalbourne and Delin (1994) mystical experience correlated with depression, magical ideation (believing that thoughts can affect reality), and mania. Lange and Thalbourne (2007) replicated the finding that mystical experience correlates significantly with magical ideation, an indicator of schizotypy. In a follow-up study, Thalbourne and Bassett (1998) reported mystical experience correlated positively with mania and positive affect. The model in this dissertation proposes that being intuitive leads to both mystical experience and schizotypal experience as a result of being more open to experience and a heightened sense of awareness and emotional responsiveness. The possibility that schizotypal experience leads to spiritual experience is also tested in this model.

Paranormal Belief and Experience as it relates to Intuition

Another line of research has investigated the relationship between personality type and belief in the paranormal. This is of interest here since many paranormal beliefs and experiences overlap with spiritual and beliefs and experiences. In Thalbourne's

(1995) survey of 247 students, neither religious upbringing nor religious affiliation (at the time of his study) was predictive of belief in the paranormal, evidence that spiritual belief is separate from religiousness, as postulated in this study's model. Further, Thalbourne (1995) reported a significantly negative correlation between belief in the paranormal and traditional religious belief. In a later study, this researcher (Thalbourne & Hensley, 2001) reported small, but significant, correlations between belief in the paranormal and religiosity, however some of the items measuring religiosity were actually measuring what we would consider to be aspects of spirituality in this dissertation.

Having a high belief in the paranormal is linked with high participation in paranormal activities (such as tarot card reading, astrology, and astral projection) and an increased likelihood of reporting having had paranormal type experiences (such as knowing things before they happen or being able to move objects through the power of the mind) (Irwin, 1993). Individuals who believe in the existence of precognition, clairvoyance, and telepathy are more likely to report having had these experiences themselves (Rhine-Feather & Schmicker, 2005). Self-reported experience of ESP has been found to correlate with accurate estimates of energy sensing ability, actual sensitivity to feeling energy, and to ability to detect energy in a variety of tasks such as when someone's hand is placed a few inches above their own or when someone looks at one of their ears from behind them (Nelson & Schwartz, 2005). Those with paranormal beliefs typically do not reject science as a valid way of obtaining truth. Paranormal belief is part of spiritual belief and paranormal experiences are sometimes viewed as spiritual experiences. The links here between paranormal experience and belief are further

evidence that spiritual experience and belief are highly associated. Paranormal belief and experience are often associated because believers in the paranormal report that paranormal experiences led to their belief and further interest in the paranormal (Kennedy & Kanthamani, 1995). This is further evidence to support the model in this dissertation which proposes that spiritual experience leads to spiritual belief.

Belief in the paranormal correlates with schizotypal traits (Day & Peters, 1999; McCreery & Claridge, 2002; Peltzer, 2003). This shows a link from one type of spiritual belief to schizotypy. The theoretical model in this dissertation proposes that intuition leads to spiritual experience, spiritual belief, and schizotypy.

Belief in the paranormal correlates with intuitive preference as measured by the MBTI (Lester, Thinschmidt, & Trautman, 1987). Individuals who report having had paranormal experiences and who have a strong belief in the paranormal have been found to be high in absorption, fantasy proneness, and high in intuition and feeling as measured by the MBTI (Kennedy, 2005). Here again is a link between intuition and spiritual experience and belief.

Personality has not been found to be a strong predictor of paranormal belief. Thalbourne and Haraldsson (1980) suggested that personality may predict or be a potential confounding variable for belief in the existence of extra-sensory perception (ESP), a type of paranormal belief. Individuals who believe in ESP tend to be more extraverted and more conservative than those who do not, while the non-believers tend to be more introverted and more intellectually skeptical, although overall personality only

predicts 7% of the variance in ESP belief making it a not very strong predictor (Thalbourne & Haraldsson, 1980). The construct of spirituality in this dissertation is broader in scope, so perhaps a stronger relationship will be found between personality and spiritual belief. Belief in or experience of the paranormal has been found to correlate with a variety of measures of mystical experience (Palmer, 1979; Kohr, 1980; van Quekelberghe, Altstotter-Gleich, & Hertweck, 1991). The proposed model in this dissertation includes items in spiritual belief and experience which are paranormal in nature and as such can help clarify the relationship between paranormal belief and experience with mysticism.

Absorption as it relates to Intuition and Spirituality

Absorption is a measure of the level of awareness that one has for external and internal stimuli, including fantasy proneness and fascinations with images. Absorption in this study is seen as a type of spiritual experience since spiritual experience often involves a heightened awareness of external stimuli. Several studies have shown that intuitive types, as measured by the MBTI, are much more interested in fantasy and imagery than are sensing types (Edmunds, 1982; Ireland & Kernan-Schloss, 1983; O'Haire & Marcia, 1980; Palmiere, 1972). This offers support to the prediction that intuitive individuals will be more likely to become spiritual, part of which includes being high in absorption.

Absorption correlates modestly with hypnotic susceptibility such that those who are high in absorption are also highly susceptible to hypnosis (Tellegen, 1974). Based on

his review of nine studies, Wickramasekera (1991) noted that all of the research linked susceptibility to hypnotic induction with reporting of belief in or experience of the paranormal. Absorption has been found to correlate positively with the report of paranormal and mystical experiences (Irwin, 1985; Nelson, 1989; Spanos & Moretti, 1988; Kennedy, Kanthamani, & Palmer, 1994). In a study of 115 subjects a high positive correlation (.64, $p < .001$) was found between transliminality and absorption as measured by Tellegen's absorption scale (Thalbourne et al., 1997) Moderate correlations were found between absorption and each of the constituent variables of transliminality. Thalbourne et al. (1997) interpret this to mean that absorption is in fact one of the core variables of transliminality, a measure which is primarily an indicator of increased sensitivity to external and internal stimuli, but also includes spiritual aspects (to be explained more fully below).

Religious people are probably less likely to be high in absorption than are spiritual people. Thalbourne (1995) has found that believers in traditional religious ideas score significantly lower in imaginativeness, which is one aspect of absorption. This is one reason why absorption is included as part of spiritual experience in the present model and not as part of religiousness.

Weird Coincidences as a Measure of Spirituality

The Weird Coincidence Scale is a measure of how often individuals experience weird coincidences and how they interpret the meaning of these experiences. The authors of the Weird Coincidence Scale, Coleman, Beitman, and Celebi (2009), suggest that this

measure should relate to spirituality and religion since; “Both involve a feeling of connectedness to the universe as well as to other individuals” (p. 16). In fact a study they conducted measured this relationship by giving subjects the Weird Coincidence Scale and The Multidimensional Measure of Religiousness/Spirituality for use in Health research (Fetzer Group/National Institute on Aging Working Group, 1999) which measures five factors: 1. daily spiritual experiences, 2. religious meaning, 3. religious and spiritual coping, and 4. overall self ranking of how spiritual and 5. overall ranking of how religious participants believe themselves to be. Although this scale was created for health research, in this study it was not used for health research. It was used to determine if there were correlations between religiousness and weird coincidences in healthy subjects. Nearly all five factors were found to correlate significantly at the .01 level with all six factors from the Weird Coincidence Scale. Experience of weird coincidences was more strongly correlated (two to three times as much) with spirituality than with religiousness. Within traditional religions, experiences like these are often interpreted as the work of the devil, so perhaps this is why we see the lower numbers of weird coincidences being reported amongst religious people than amongst the spiritual people (Coleman et al., 2009). This scale is part of the construct of spiritual belief and experience in this model since there is evidence that it correlates more strongly with spirituality than it does religion. Weird coincidences may in fact be spiritual experiences or they may be misperceptions. There is evidence that those high in paranormal belief have a misconstrued perception of randomness such that they misunderstand just how often weird coincidence occur according to random probabilities (Dagnall, Parker, & Munley,

2007) and perhaps this misperception leads to attaching more importance to these phenomena than is warranted. A misinterpretation of weird coincidences may lead to spiritual beliefs.

In a follow-up study, Coleman and Beitman (in press) found a significant, positive correlation between the Interpersonal factor of the WCS-2, which emphasizes thought-environment parallels (e.g. I think of an idea and hear or see it on radio, TV, or the Internet), and the faith in intuition factor (now known as the Experiential factor) on the revised version of the Rational-Experiential Inventory. The Agentic factor, composed of action-environment coincidences (e.g. I am introduced to people who unexpectedly further my work/career/education), positively and significantly correlated with faith in intuition and religious commitment as measured by the Religious Commitment Inventory (Worthington, Wade, Hight, et al., 1999). This links intuition, weird coincidences, and aspects of religiousness together. In the regression analysis, faith in intuition was a significant predictor for only the Agentic Factor, not for the Interpersonal factor. Faith in intuition positively correlated with the search for and presence of meaning in life. Intuition is linked through this research to weird coincidences in a number of ways, including indications that it is intuition that causes one type of weird coincidence to occur and be noticed as having occurred. Coleman and Beitman (in press) measured faith in intuition because they believe that the importance assigned to coincidences and the conclusions drawn from them usually occur through the use of intuition and rarely through rational means. Surely, spiritual experiences are also best understood through intuition, not rationality.

Another finding from this study (Coleman & Beitman, in press) was a large correlation between referential thinking (something often found to occur in schizophrenia) as measured by the Referential Thinking Scale (Lenzenweger, Bennett, & Lilienfeld, 1997) and both the Interpersonal and the Agentic factors of the Weird Coincidence Scale-2. Referential thinking occurs when events, objects, or actions have a particular and unusual meaning for the person experiencing them. Coleman and Beitman did not use a clinical sample in this study, so it is surprising that this correlation was still large enough to be detected. Here, the experience of weird coincidences is linked with an aspect of schizophrenia. The model proposed in the current study is that schizotypy leads to weird coincidences. As Coleman and Beitman (in press) have theorized, those with schizotypy have much looser associations and as such are more likely to see meaningful associations even when there are none.

Weird coincidences are often instances of synchronicities. Jung viewed synchronicities as “the simultaneous occurrences of a certain psychic state with one or more external events, which appear as meaningful parallels to the momentary subjective state, and, in certain cases, vice versa.” (Jung, 1952, p. 25). He saw synchronicities as “acausal” in nature, not following the typical laws of cause and effect. Jung acknowledged everyday experiences as well as psychic type experiences such as clairvoyance, precognition, and telepathy as belonging to this category. Usually one of the events is a thought or image while the other event occurs in the environment within a short span of time and is perceived as unexpected by the person to whom it is happening. Jung thought that experiences like this contributed to individuation (i.e. personal growth).

Synchronicities were ways of making people take notice of certain things occurring around them and in their minds. If a person stopped to analyze the meaning of such odd occurrences there was an opportunity for insight and growth. Some spiritual people believe that there is a casual connection in synchronicities. They may believe that God communicates to them through these experiences and is therefore causing these events to occur. Others believe in the “Law of Attraction” (Byrne, 2007) which is the belief that what an individual thinks and feels will determine the types of experiences that occur in his or her life. I have heard a Peruvian-born Shaman (my teacher), Oscar Miro-Quesada, say many times “Mind structures reality”, meaning that everything is first a thought before it is manifest in physical form. In this type of belief structure, much like magical ideation, thoughts may cause synchronicities.

Coincidences are also interpreted as an indication that individuals are more connected to their environment than they generally believe themselves to be (Beitman, Celebi, & Coleman, in press). Sheldrake (2003) offers supporting evidence in demonstrating that many people are able to detect at above chance levels when they are being stared at. For another example, recent research on twins has discovered that when one twin is injured or ill the other twin often feels the pain as well even though they are separated by great distances (Mann & Jaye, 2007). Both studies support the idea that humans are intimately connected in ways that are hard to understand.

Taking an evolutionary perspective, Beitman (in press) suggests that we have evolved to seek patterns in coincidences as a survival trait. He hypothesizes that those who

recognized a potential predator at a distance likely survived while those who merely perceived the predator as a fallen log that just happened to resemble the shape of the predator might not have lived long enough to pass on their genes. Beitman (in press) further suggests that being able to detect a pattern calms the brain (one's emotions) by reducing amygdala activity. Activity in the amygdala is associated with anger and anxiety. Coincidence detection is also the first step on the road to discovering causal relationships and perhaps, "coincidences may be pointing towards realms of order outside our current scientific visual spectrum" (Beitman, in press, pg.8). Beitman also postulates that coincidence detection may arise from over activity in the right hemisphere where associations are made and/ or under activity in the left hemisphere which is more logical. This same imbalance could also explain the "loose associations" and "uncommon" associations had by schizophrenics (Beitman, in press). Some psychotic people and some normal ones as well have been observed to have a tendency to find patterns in random data to which they attribute special meaning, another link associating schizophrenia with spirituality (Brugger, 2001).

The experience of synchronicities has been linked to schizophrenia. Psychiatrist Diane Henneey Powell has noticed that when her schizophrenic patients are experiencing acute schizophrenia they tend to report having more instances of synchronicities as well as paranormal experiences (2009). This effect is even more pronounced when the patients are also sleep deprived (Powell, 2009). This link between experiencing weird coincidences and schizophrenia is yet another reason for postulating that having

schizotypy may lead to experiencing weird coincidences, as is postulated in the current model.

Transliminality

Theory and Construct Development

In this section, transliminality will be described according to its chronological development as research has helped to refine the construct and shed light on its significance.

Transliminality theory was developed and tested by Michael A. Thalbourne and his colleagues (Thalbourne & Delin, 1994). The theory postulates that a number of dispositions and experiences tend to occur together including: 1. belief in and experience of the paranormal, 2. creative personality, 3. mystical experience, 4. magical ideation (the belief that thoughts create reality), and 5. history of manic-like experiences.

Transliminality is based on the theory that spiritual experience as well as a number of other experiences and beliefs occur together as the result of an increased sensitivity to subtle stimuli in which unconscious (or subliminal or preconscious) contents are more likely to cross over into consciousness. Thalbourne postulates that through this increased level of awareness, found to varying degrees amongst individuals, persons are more likely to experience psychic phenomena, believe in the paranormal, have an increase in creative thinking, and are more likely to have mystical experiences and psychotic-like symptoms (Thalbourne & Delin, 1994). Thalbourne, Bartemucci, Delin, Fox and Nofi (1997) further describe transliminality as a, "cognitive/personality dimension presumably

characterized at the high end by psychosis (a condition of excessive and disruptive transliminality), and at lower levels by borderline disorders and a normal range of manifestations" (p. 306).

Part of the construct of transliminality is psychic belief. Thalbourne and Delin (1994) suggest that those high in transliminality may in fact just be prone to experiencing more coincidences that are due to chance because there is more opportunity for their inner life to match their outer life since they are subject to more material from dreams, hunches, and the like. They may misinterpret mere coincidences as something more than they actually are and develop a belief in the paranormal or they may in fact be, "more open to veridical information not accessible by normal means at that time and place" (Thalbourne and Delin, 1994, p. 24.).

Thalbourne and Delin (1994) conducted a study involving 241 students at the University of Adelaide, including 86 manic-depressives (most of whom were well at the time of the study), and 38 schizophrenics (most of whom were well at the time of the study) to test the Transliminality theory. The subjects filled out a series of questionnaires including 1) the Australian Sheep-Goat Scale (Thalbourne & Delin, 1993), a measure of paranormal belief and experience; 2) The Magical Ideation Scale (Eckblad & Chapman, 1983), a true-false assessment of magical thinking; 3) a specially constructed (for this study) scale to measure mania; 4) a specially constructed (for this study) scale to measure creativity; 5) 46 true-false items which make up the MMPI Hypomania scale (Dahlstrom, Welsh, & Dahlstrom, 1972); 6) a specially designed (for this study) scale to assess

depression; 7) a twenty-five item mystical experience scale constructed for this study; 8) a series of single-item variables thought to be relevant to this research; and 9) a combined score on the Manic-Experience and Depressive Experience scales which were added to give a score on the Manic-Depressive scale. Principle component analysis revealed that there was indeed a single factor underlying belief in the paranormal, magical ideation, mystical experience, creative personality, depressive experience, and manic experience.

There are parallels here with the model being proposed in this study.

Transliminality postulates that heightened sensitivity to the subconscious produces belief in the paranormal, mystical experience, and mental health problems, namely mania and depression. The model in the current study proposes that being intuitive may lead to schizotypy. Heightened sensitivity to information processing is thought to cause both transliminality and intuitiveness. The underlying factor of intuition, part of which is heightened sensitivity to external and internal stimuli, is what could make a person more likely to experience much of the same phenomena including mystical experience, belief in the paranormal (included in spiritual belief measures in this study), and mental health problems, namely schizotypal issues.

Increased Sensitivity

Transliminality theory predicts that individuals high in transliminality are more interested in the inner workings and subconscious contents of their minds as well as more sensitive to external stimuli. Thalbourne has conducted a number of studies to determine if there is increased sensitivity in those high in transliminality. A survey by Thalbourne

and Delin (1994) supports this prediction. They reported a mean T score of +.33 for 125 students who agreed with the statement, "A person should try to understand his or her dreams and be guided by or take warnings from them" and for the 99 students who disagreed with this statement, a score of -.43 (a highly significant difference of $p < .001$). Students who agreed with the statement also scored significantly higher on belief in the paranormal, magical ideation, and mystical experience.

With regard to increased sensitivity to external stimuli, students who answered "yes" to the question, "Have you ever gone through a time when smells seemed stronger and more overwhelming than usual?" scored significantly higher on transliminality than those who said "no" (Thalbourne & Delin, 1994). Furthermore, believers in the paranormal have been found to score higher on a measure of hyperaesthesia (increased visual, acoustic, and olfactory sensitivity) including items such as reporting that sometimes their hearing was so sensitive that ordinary sound became uncomfortable; sometimes they heard so well that it bothered them; and that often indoor lights seemed so bright that it bothered their eyes (Thalbourne & Delin, 1994, Thalbourne, Bartemucci, Delin, Fox, & Nofi, 1997). In a study of highly intuitive individuals, one person reported the ability to hear animate and inanimate beings that are normally inaccessible to the human ear while others reported the ability to physically feel what others were feeling, and others a heightened sense of taste and smell (Petitmengin-Peugeot, 1999). As a result of the Thalbourne studies the concept of transliminality grew to include not only heightened sensitivity to subconscious material but also heightened sensitivity to external stimuli.

Now this theory is even more similar to ours, both including a heightened sensitivity to internal and external stimuli.

Enhanced Creativity

Further evidence for the transliminality theory is provided by other researchers who report correlations between paranormal belief and creativity such as in the Joesting and Joesting (1969) study which used The Torrance Creative Motivation Inventory (Torrance, 1963) to measure creativity. Davis, Peterson, and Farley (1974), using two questionnaires and ratings of actual creativity, similarly reported that creativity positively correlated with paranormal belief. This relationship was further supported by Moon (1975) who found that students of the visual arts were significantly more likely to believe in ESP than students in other areas of study.

Transliminality correlates significantly ($p < .001$) with scores on the Creative Personality Scale, but does not correlate significantly with the Revised Barron-Welsh Art Scale, so it seems transliminality only relates to some aspects of creativity, but not to others (Thalbourne, 2000a). A small but significant ($p = .05$) correlation has been found between transliminality and openness to experience in a group of 40 psychology undergraduates (Thalbourne, 2000b). The MBTI and NEO-PI-R openness to experience used in the current study include items related to creativity as part of the larger construct of intuition (since intuition and creativity have been positively correlated) (Dollinger, Palaskonis, & Pearson, 2004; Wolfradt & Pretz, 2001; Marie-Helene & Lubart, 2000-2001).

Refining the Construct

Thalbourne, Bartemucci, Delin, Fox and Nofi (1997) conducted a series of follow-up experiments to refine the transliminality theory. Data was combined from five studies for a total N of 379 including 70% who were university students and 30% who were from the general population. A principal components analysis using the Kaiser criterion suggested two factors that best accounted for the variance, such that factor one included paranormal belief, magical ideation, manic experience, creative personality, and mystical experience while the second factor only had one variable which loaded on it, that of depressive experience, showing that depression is not part of transliminality as previously suggested. While depressive experience has correlates with transliminality, it fails to correlate with creative personality and is therefore not in fact a constituent part of transliminality. This provides evidence for associating paranormal belief (part of spiritual belief), magical ideation (common in schizophrenia), creativity (associated with intuition), and mystical experience (a type of spiritual experience). The model in the current study links all of these ideas together and makes predictions about causal relationships.

To replicate and extend earlier findings, Thalbourne (1998a) administered all of the usual measures (as defined by Thalbourne & Delin, 1994) that combine to create transliminality in a group of 301 psychology students. He also included measures for several other factors known to correlate with transliminality. He used principle component factor analysis using the Kaiser criterion and found that absorption, fantasy proneness, hyperaesthesia, and attitude toward dream interpretation could be considered

part of one single factor, transliminality. The theory was refined by choosing to also include all of these constructs as part of transliminality in addition to the previous constructs included within transliminality. Absorption is included in the model proposed here as part of spiritual experience. There is evidence from Thalbourne's research that it is linked to spiritual experience, but it is not yet clear if it can in fact be viewed as a form of spiritual experience.

Scale Construction

Thalbourne created and refined a scale to measure transliminality so that it would not be necessary to administer such a large number of questionnaires in each study of the phenomenon (Thalbourne, 1998b). Factor analysis was used to identify the appropriate items from each of the following scales including items taken from the Absorption Scale (Tellegen & Atkinson, 1974), the Inventory of Childhood Memories and Imaginings-Children's Form (Myers, 1983), the Magical Ideation Scale (Eckblad & Chapman, 1983), the Australian Sheep-Goat Scale (Thalbourne & Delin, 1993), the Mystical Experience Scale (Thalbourne, 1991), the Hyperaesthesia Scale (Thalbourne, 1996), the Creative Personality Scale (Thalbourne & Delin, 1994), the Manic Depressive Scale (Thalbourne, Delin, & Bassett, 1994) and one item that assesses attitudes towards dream interpretation. This item came from the Minnesota Multiphasic Personality Inventory (Dahlstrom et al, 1972). A large sample (n=234) was given these measures to identify which items should be retained for the Transliminality Scale. 29 items were retained and a Cronbach's alpha of .87 was computed. There were no significant sex or age differences found. The test-

retest reliability over an average of seven weeks was reported as 0.88 (Thalbourne, 2000a).

The 29-item true/false Transliminality Scale (Thalbourne, 1998b) was refined through “top-down purification” using Rasch scaling with a Rasch reliability of .82 in a group of 318 individuals (Lange, et al., 2000). Rasch scaling is an analytic method which assumes that the probability with which a person endorses an item depends solely on that person’s position on an underlying latent variable, in this case transliminality. It is effective for eliminating items that are affected by age or gender. Given the research on this construct, transliminality came to be thought of as, “a hypothesized tendency for psychological material (later clarified as perception, imagery, ideation, and affect) to cross thresholds into or out of consciousness” (Thalbourne, 2000c, p. 31). When this scale was refined 29 items were retained for the scale although only 17 items are actually scored. The items which are not scored remain as part of the scale to provide context.

In a study using the newly revised Transliminality Scale Thalbourne (1999) surveyed 301 psychology university students and found that a high belief that one is psychic correlated with transliminality, high levels of absorption, being older, having a tendency to not read the Bible, being higher in general religiosity and in creative personality, engaging in more dream interpretation, and being lower in dissociation. Here, a form of intuition (believing one’s self to be psychic) is correlated with an increased awareness of external and internal stimuli (high absorption and interest in dream interpretation).

Relation to Dreams

Thalbourne and Delin (1999) have found that those high in transliminality tend to have better recall of their dreams, more frequently interpret their dreams, are more likely to identify with a religious group, report having had more spiritual experiences, are more likely to report reading about Eastern religions and theosophy and are less likely to report reading the Bible often. A study using a sample of 98 students, 16 manic-depressives, and 2 schizophrenics, showed positive significant ($p < .05$) correlations between transliminality and seven different types of dreams (archetypal, control, fantastic nightmare, posttraumatic nightmare, lucid, prelucid, and night terrors) remembered by participants, evidence that those high in transliminality actually do have thinner boundaries between the conscious and the subconscious (Lange, Thalbourne, Houran, & Storm, 2000).

Kundalini and Drug Use Correlates

In a study of 125 university students moderate correlations (.31-.59) were found between transliminality, having traditional paranormal beliefs, seeing life as a play or a dream in the mind of the Creator, and finding the world to be an overwhelming place, so much so that retreat is needed to recover (Thalbourne, 2001). A strong correlation (.69) was found between transliminality and a measure of Kundalini experience, the experience of spiritual energy moving from the base of the spine to the top of the head which is said to lead to heightened states of awareness and produce paranormal type experiences. The experience of Kundalini, often the result of doing specific spiritual practices such as Kundalini Yoga, is considered to be a profound spiritual experience. This research

(Thalbourne, 2001) supports the idea that being more open and more sensitive to external stimuli (transliminality) correlates with spiritual experience (Kundalini). The current model in this dissertation postulates that intuition (thought to be similar to transliminality) causes spiritual experience, although not Kundalini experience in particular.

In this same group transliminality was weakly related ($p < .30$) to taking illicit drugs and taking prescription medicines for things such as panic attacks, obsessive-compulsive disorder, depression, migraines, and schizophrenia (Thalbourne, 2001). Post-hoc analysis of results indicated weak (.20 - .27) correlations between transliminality and the use of mind-altering substances, marijuana use, LSD use, cocaine use, and heroin use, but not for alcohol use. Thalbourne (2001) postulates that people may use drugs to 1) cope with the experience of transliminality which can be difficult 2) encourage the occurrence of psychic phenomena, or 3) this could be a spurious correlation due to openness to experience leading to both the transliminality and the drug use. Further research (Thalbourne & Cochrane, 2002) has found a small (.23), yet significant, correlation between transliminality and the overall score on a Sensation Seeking scale, further evidence that a desire for new experiences, part of being open to experience, may be the underlying factor contributing to both transliminality and the taking of illicit drugs. Individuals may view their experiences with mind altering drugs as genuine spiritual experiences. Perhaps this is another way by which intuition leads to spirituality. As an intuitive individual, a person is more open to new experiences and as a result tries various

mind altering drugs which then lead to profound experiences that the person interprets as having spiritual significance.

Thin Boundaries and Synesthesia

Strong correlations (.66 and .75) were found between transliminality and thin boundaries, as measured by the Hartmann (1991) Boundary Questionnaire (Houran, Thalbourne, & Hartman, 2003; Thalbourne & Maltby, 2008 respectively) indicating that transliminality may in fact be a true indicator of having thin boundaries.

Crawley, French, and Yesson (2002) attempted to determine if individuals high in transliminality were more sensitive to external stimuli. Subjects (100 students and staff) were instructed to complete the Transliminality Scale (Form B) (Thalbourne, 1998b) and then they were presented with images of ESP cards with Zener symbols (circle, star, square, wavy lines, and a cross) on a monitor. The computer was set to randomly select from amongst these cards. Half of the time there was a subliminal prime of the target card shown (presence trials). The other half of the time there was no subliminal prime (absence trials). The subjects were told that they were taking part in an experiment on ESP card guessing. They were instructed to guess which card they would see next after the masked card (intended to mask the subliminal card when shown). A significant positive correlation was found between transliminality scores and correct identifications on the presence trials, but none was found in the absence trials. Those high in transliminality were more sensitive to subconscious stimuli as shown by this research. It could be that these individuals are not using a "sixth sense", but instead are able to better

use their five senses than others because they have a lower objective threshold for sensory stimuli.

Another instance of heightened sensitivity in the five senses is that of synesthesia. Synesthesia is an experience that reflects thin boundaries or high connectedness between the senses such that when someone is exposed to an external stimulus that person perceives it in the usual modality as well as one other one such as seeing a color in response to a sound. Abraham (2000) speculates that synesthesia is the result of heightened connectivity between adjacent cerebral regions. Thalbourne, Houran, Alias, and Brugger (2001) surveyed a group from the general population including those who suffer from panic attacks and their caregivers and a group of university students by measuring transliminality and synesthesia using a six-item synesthesia scale derived from Tellegen's Absorption Scale (Tellegen & Atkinson, 1974). The first group exhibited a .47 ($p < .001$) correlation while the second group exhibited a .57 ($p < .001$) correlation. However, genuine synesthesia occurs in only 1 in 2000 individuals and has a genetic component (Groffman, 1999) so it is unlikely that very many subjects truly had genuine synesthesia. Instead, those scoring high on this synesthesia scale were likely having "pseudosynesthesia" (Thalbourne et al., 2001), including things such as artistic metaphor and experiences had through the use of drugs. This is further evidence that the construct of transliminality actually measures a heightened sensitivity to sensory stimuli.

A study on the telepathic transmission of emotional state found that those high in transliminality, as compared to those low in transliminality, had a significantly higher hit

rate of reading the emotions that someone was transmitting from another room (Sanders, Thalbourne, & Delin, 2000). A study which measured the ability to detect a vibration with the non-dominant hand found that those high in transliminality performed significantly better than those low in transliminality by 1) detecting the stimulus at lower thresholds and by 2) taking less time to obtain a threshold (Houran, Hughes, Thalbourne, & Delin, 2006).

Potential Brain Correlates

It is speculated that transliminality results from hyperconnectivity between temporal-limbic structures and sensory association cortices as well as ungated processing related to temporal lobe functioning (Thalbourne, Crawley, & Houran, 2003). Another strong correlation of transliminality is temporal lobe lability as measured by the well validated Personal Philosophy Inventory (PPI) (Persinger, 1984a) with reports of correlations of .70 (Persinger, 1984a), .72 (Thalbourne, Crawley, & Houran, 2003) and .73 (Thalbourne & Maltby, 2008). The temporal lobes process sensory input, balance, touch, memory, learning, language interpretation, and the sense of self (Neppe, 1990). There may be a brain basis for transliminality that relates to the temporal lobe.

Schizotypy Defined

Kraepelin and Bleuler were the first to notice the existence of schizophrenia-like, yet not psychotic features and behaviors in relatives of those with schizophrenia (Lenzenweger, Maher, & Manschreck, 2005). Later, a number of clinicians noticed schizophrenia-like symptoms, which were not schizophrenia but seemed related to it, that

clustered together in clients, (Kendler, 1985). Then Rado (1953, 1960) created an integrative model that linked genetic influences for schizophrenia to schizotypic personality. He believed that schizotypal behavior was the result of an underlying liability to schizophrenia. He thought that this same genetic underlying vulnerability could result in a range of disorders from mild schizotypy to severe schizophrenia. Paul Meehl (1962) proposed a model of schizophrenia that included genetic factors, social learning influences, and clinical symptomatology. Meehl (1962, 1989, 1990) developed a model of schizotypy based on the idea that one major gene (the "schizogene") is responsible for affecting brain development by creating a neural integrative defect in neural transmission. Meehl termed this synaptic dysfunction, neuronal slippage, schizotaxia (1990; p.14). This schizotaxia is thought to be the underlying genetic defect which predisposes an individual to schizophrenia. Meehl (1962, 1989, & 1990) theorized that nearly all schizotaxic individuals would develop schizotypy, a schizotypal personality organization, unless they were reared in a particularly good environment, while only a few would develop full blown schizophrenia. A person who displays schizotypy is called a schizotype.

Meehl's schizotypy is not the same as the Axis II schizotypal personality disorder found in the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV; American Psychiatric Association, 1994). Schizotypes, as defined by Meehl, may or may not develop this disorder, depending on how protective and nurturing their environment is. Meehl's concept is broad and theoretically based, while the DSM definition is narrowly defined by observable signs and symptoms which tend to occur

together and this disorder is not theoretically based. Another factor in development is the presence of other genes (polygenic potentiators) for things such as social introversion or for anxiety proneness which could make a person more vulnerable to the development of schizotypal personality disorder. Meehl (1962, 1990) believed that schizophrenia was the result of a schizotaxic brain, social learning experiences, and polygenic potentiators. For Meehl (1962), the clinical signs of schizotypy included mild associative loosening, social fear, anhedonia, and ambivalence. It manifests behaviorally and psychologically to varying degrees dependant on the amount of compensation an individual is capable of (Meehl, 1962). Not all schizotypes will develop schizophrenia (Meehl, 1962).

Schizotypes can be identified in three ways (Lenzenweger, 1998). First degree relatives of those with schizophrenia are more likely to have schizotypy. Those displaying symptoms of schizotypal personality disorder according to the DSM-IV can be considered schizotypes (Lenzenweger, 1998). Reliable and quantitative measures of schizotypy include things such as sustained attention, eye tracking, and schizotypy questionnaires (Lenzenweger, 1998).

Schizotypy as it Relates to Intuition, Spirituality, and Religion

Some have postulated that the schizophrenic and the mystic both perceive the same reality, but one is mature and healthy enough to integrate the experience while the other is not and suffers as a consequence. Joseph Campbell said it well; "The schizophrenic is drowning in the same waters in which the mystic is swimming with delight" (Lee, 1985, p. 40). The term "happy schizotype" has been coined to describe the

person who has some of the potentially enjoyable and functional features of schizotypy, but not the dysfunction of schizophrenia (McCredry & Claridge, 1995). They may report having superstitious beliefs or spirit communication, for example.

There is evidence that believers in the paranormal may be more prone to affective disorders. Windholz and Diamant (1974) found that believers in the paranormal scored significantly higher than non-believers on the MMPI's Hypomania scale. However, Haraldsson and Houtkooper (1991) found that people who report having had more psychic experiences also report having more of a "positive affect", but not to the degree that it would be considered detrimental to functioning.

Empirical evidence that such individuals exist comes from a study conducted by Thalbourne (2004) in which subjects were found to have significant correlations between mystical experience (which shares common features with schizophrenia) and affect balance (.22, $p < .001$) and positive affect (.29, $p < .001$). In a follow-up study of a group who scored high in transliminality a median split procedure was done which showed 35 to be unhappy and 44 to be happy as measured by the Oxford Happiness Questionnaire (Thalbourne & Houran, 2005). These studies provide evidence between emotional stability and 1) mystical experience and 2) transliminality.

Williams and Irwin (1991) found that schizophrenics and controls scored about the same on the Revised Scale of Paranormal Belief (Tobacyk, 1988). However, findings from the Thalbourne and Delin (1994) study link schizophrenia to spiritual experience. Thalbourne and Delin (1994) found that schizophrenics scored about the

same as university students on a paranormal scale, yet scored significantly higher on two items, one for reporting to have seen the dead and the other for claiming to have healing powers. Wolfradt and Watzke (1999) found that individuals who are able to deliberately induce out-of-body experiences scored significantly higher in schizotypy and in intuitive thinking than those who did not deliberately induce OBEs. The features of schizotypy they displayed included perceptual anomalies, but not social anhedonia or interpersonal deficits. McCreery and Claridge (1995) found similar results in OBEers who proved to be more sensitive to synesthetic and perceptual-anomalous experiences, but were not more neurotic or psychotic as measured by the Eysenck dimensions. A group of distant healers, also likely to hold paranormal beliefs, scored significantly higher than controls on schizotypy measures for perceptual and interpersonal thinking, but not for disorganized thinking (Hergovich & Arendasy, 2007).

Manic depressives and schizophrenics both scored significantly higher ($p < .0001$) on a mystical experience questionnaire (validated through a .72 correlation with Hood's Mysticism scale) than did a group of university students (Thalbourne & Delin, 1994). This effect was replicated when the scores were compared to a group of 52 support givers of those with anxiety attacks, only this time the results were only marginally significant (Thalbourne, 1998). The schizophrenics scoring highest on transliminality were those who self-reported experiencing hallucinations, hearing voices, and suffering from paranoid ideation. The total number of psychiatric hospitalizations was found to correlate significantly with the degree of mystical experience reported ($r = .43$). The subjects who had been out of the hospital longer and were presumably less mentally ill reported lower

Magical ideation, less belief in the paranormal, and were less creative. The students who reported belief in the paranormal were more likely than those who did not to report having had manic and manic-depressive experience. This research shows strong links between schizotypy and transliminality. This is in line with the model proposed in this dissertation which indicates that part of being high in intuition is being more open to experience, including schizotypal experiences.

In a follow-up study, Thalbourne, Bartemucci, Delin, Fox, and Nofi (1997) sought to distinguish between schizotypy and psychoticism. They describe schizotypy as an individual difference dimension "continuous with (schizophrenia) in the personality domain but without any obvious sign of psychotic illness" (Claridge, Pryor, & Watkins, 1990, p. 17, as cited in Thalbourne et al., 1997, p. 311). This follow-up study measured schizotypy (STA) using a specialized 37-item scaled created by Claridge and Broks (1984) and psychoticism as measured by the P scale of the Eysenck Personality Questionnaire-Revised (EPQ) (Eysenck & Eysenck, 1991). The schizotypy measure, STA, was found to correlate to a highly significant degree with the transliminality factor score and with every one of the constituent variables of transliminality while the correlations with psychoticism (P) as measured by the EPQ were significant, but to a lesser degree. Furthermore psychoticism was found to only correlate with two of the transliminality constituent variables, those for creative personality and manic experience. Another study done with 301 university students also found a similar pattern, transliminality correlating most strongly with STA, .63, and less so with P, .45. A strong correlation (.78) was found between transliminality and a schizotypy scale known as

Unusual Experiences, taken from the Oxford-Liverpool Inventory of Feelings and Experiences (Thalbourne, Keogh, & Witt, 2005). A strong correlation (.63) was again found between these two variables in a subsequent study (Thalbourne & Maltby, 2008). This study measures schizotypy with the P scale which has been shown here to correlate with transliminality, a similar construct to intuition. We go a step further by trying to determine not just correlation, but causation by postulating that being intuitive can cause a person to be higher in schizotypy.

Windholz and Diamant (1974) found that people who held paranormal beliefs scored significantly higher on the Schizophrenic Scale of the Minnesota Multiphasic Personality Inventory (MMPI: Hathaway & McKinley, 1983). A few researchers (Thalbourne, 1985; Tobacyk & Wilkinson, 1990) have found correlations between paranormal belief and scores on the Magical Ideation Scale (Eckblad & Chapman, 1983), a scale which measures one aspect of schizotypy. Thalbourne (1994) found a significant correlation between belief in ESP and scores on the Magical Ideation Scale, the Perceptual Aberration Scale, and on the combined Perceptual Aberration-Magical Ideation Scale: measures all thought to be signs of schizotypy. Only males were found to have a significant correlation between belief in ESP and scores on the MMPI Schizophrenia Scale. Jackson (1997) has found an association between schizotypy and spiritual experience. However, in research conducted by Williams and Irwin (1991) there was no difference found for paranormal belief between schizophrenics and controls. Prayer has been associated with low psychoticism while Eastern meditation has been associated with high psychoticism (Kaldor, Francis, & Fisher, 2002). This shows a link

between psychoticism and a practice that is spiritual, while the low psychoticism is associated with traditional religion, just as our model suggests. This evidence indicates a correlation between spirituality and schizotypy, however I believe this correlation is spurious, both being caused by being intuitive.

Schizotypy and religion do not seem to be correlated. Psychoticism was found to have a -0.15 correlation with self-reported church attendance and a -0.15 correlation with self-reported prayer (Francis & Wilcox, 1996). A study of mid-career Anglican Clergy found that their levels of psychoticism were no different than those of men in general (Francis & Pearson, 1990). Other studies have shown that there is no relationship between psychoticism and religiousness (Francis & Katz, 1992; Hills, Francis, Argyle, & Jackson, 2004). Several studies have found an inverse relationship between psychoticism and attitude towards Christianity such that those who have a positive attitude towards Christianity are less psychotic than those who do not (Francis, Lankshear, & Pearson, 1989; Francis & Montgomery, 1992; Francis, Lewis, Brown, Philipchalk, & Lester, 1995; Carter, Kay, & Francis, 1996; Francis, 1997; Francis & Bolger, 1997). A recent meta-analysis (Saroglou, 2002) found that religiousness is consistently associated with low psychoticism. However, there are exceptions to these findings. Francis and Pearson (1991) found clergy members had higher psychoticism and neuroticism.

CHAPTER III

RESEARCH MODEL

Overview

This chapter describes the framework of this research including the conceptual research model and the research hypotheses.

Research Model

The conceptual research model with the associated research hypotheses is presented in Figure 1.

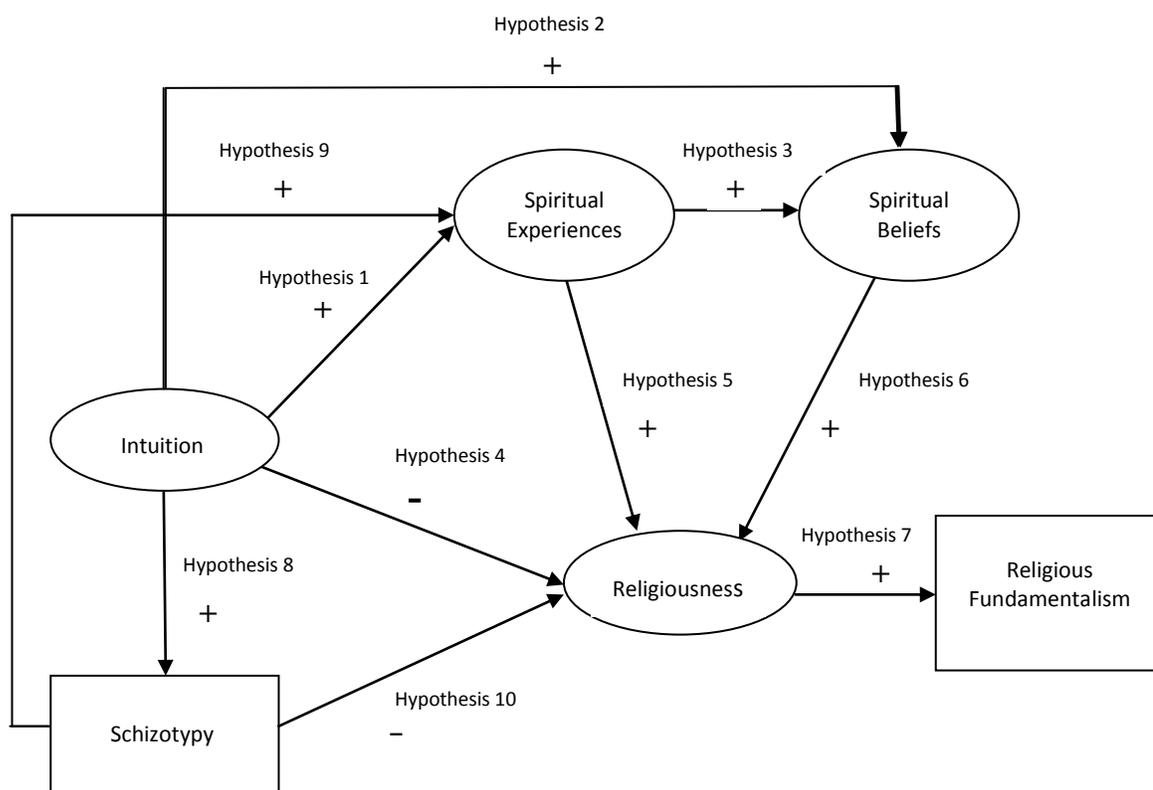


Figure 1. Conceptual Research Model

Research Hypotheses

We hypothesize that intuition will predict spiritual experiences, spiritual beliefs, and religiousness and that religiousness will predict religious fundamentalism. We also hypothesize that spiritual experiences and spiritual beliefs will have an indirect effect upon religious fundamentalism by first affecting religiousness. Thus, we predict that intuition will have an indirect effect on religious fundamentalism by first affecting spiritual experiences and spiritual beliefs and religiousness. It is also predicted that intuition will predict schizotypy and that schizotypy will predict both spiritual experiences and religiousness. The detailed hypotheses are presented below.

Hypotheses

Hypothesis 1. Intuition will influence spiritual experiences such that as the level of intuition increases, the level of spiritual experiences will increase.

$$H1_0: \rho = 0, H1_A: \rho > 0$$

The development of intuitive capacities that I experienced led to my personal spiritual awakening through a number of spiritual experiences. As such, I wonder if this process occurs in this same fashion in others. Also, it is thought that intuition is similar to transliminality, and as such will likely lead to spiritual experiences.

Hypothesis 2. Intuition will influence spiritual beliefs such that as the level of intuition increases, the level of spiritual beliefs will increase.

$$H2_0: \rho = 0, H2_A: \rho > 0$$

It seems that as intuition increases individuals will prefer to use intuitive thought processes to perceive the world and will care more about things which are perceived in this manner, namely spiritual beliefs.

Hypothesis 3. Spiritual experiences will influence spiritual beliefs such that as the level of spiritual experiences increases, the level of spiritual beliefs will increase.

$$H3_0: \rho = 0, H3_A: \rho > 0$$

This is another path that could lead to spiritual belief. It seems reasonable to think that people will base their beliefs on their experiences and as such would develop spiritual beliefs as the result of spiritual experiences. Schwartz & Russek, (1999) have found a correlation between energy detection, spiritual belief, and spiritual experience. Irwin (1993) has found a correlation between high participation in paranormal activities and an increased likelihood of having paranormal experiences. People who believe in psychic phenomenon often report having experienced it themselves (Rhine-Feather & Schmicker, 2005). Kennedy and Kanthamani (1995) report that paranormal experiences often lead to paranormal beliefs. The measures used for spiritual experience in this dissertation include a number of paranormal experiences and the spiritual beliefs measures include a number of paranormal beliefs so I expect that we will find similar results to Kennedy and Kanthamani (1995) that spiritual/paranormal experience will lead to spiritual/paranormal belief.

Hypothesis 4. Intuition will influence religiousness such that as the level of intuition increases, the level of religiousness will decrease.

$$H_{4_0}: \rho = 0, H_{4_A}: \rho < 0$$

From my personal experience I found that the more intuitive I became the less religious I was. Through intuition I was able to access the world of spirit directly and no longer needed to learn about others' second-hand experiences. Furthermore, several studies have linked religion with low intuitiveness (Craig, Duncan, & Francis, 2006; Craig, Horsfall, & Francis, 2005; Delis-Bulhoes, 1990; Francis, Butler, & Craig, 2007; Francis & Jones, 1998; Francis, Payne, & Jones, 2001; Francis, Penson, & Jones, 2001; Keirse, 1998; Rehak, 1998; Shuter-Dyson, 2006).

Hypothesis 5. Spiritual experiences will influence religiousness such that as the level of spiritual experiences increases, the level of religiousness will increase.

$$H_{5_0}: \rho = 0, H_{5_A}: \rho > 0$$

In my experience once I began having more spiritual experiences I found that church was a much richer experience for me. I could perceive and appreciate what was happening during the religious rituals at church. I suspect that it is this way for many people. As a chaplain I once had a patient who was clinically dead for about ten minutes. During this time he experienced himself as leaving this earthly realm and going to a place that was extraordinarily unpleasant in which everyone there was experiencing the worst imaginable pain. He raised his hands to Jesus and prayed for forgiveness of his sins and asked that he be allowed to return to earth, to his body. Instantly, he was back. After this

profound spiritual experience he became incredibly interested in religion to try to understand what exactly it was he had experienced. He felt that Jesus had saved him and as such he wanted to honor Jesus by being religiously active. For him, spiritual experience led him to religion as a way of understanding and of honoring his experience. These motivations may be there for others as well.

Hypothesis 6. Spiritual beliefs will influence religiousness such that as the level of spiritual beliefs increases, the level of religiousness will increase.

$$H6_0: \rho = 0, H6_A: \rho > 0$$

It seems that those with spiritual beliefs would want to be with others of similar beliefs, just as I enjoy being with other shaman folk, and that a religious institution would be the most well known and easily accessible place for this to occur. If a person believes that prayer promotes well-being they are likely to want to be around people who will offer to pray for them as is commonly done at religious institutions.

Hypothesis 7. Religiousness will influence religious fundamentalism such that as the level of religiousness increases, the level of religious fundamentalism will increase.

$$H7_0: \rho = 0, H7_A: \rho > 0$$

It seems likely that those who become involved with religious institutions will gradually become more involved with them over time and indoctrinated into their belief structures and mythologies. As such, individuals would be more likely to endorse traditional religious beliefs and develop a strong adherence to them. They would also be

likely to experience an ingroup bias in which they begin to prefer their group to those not in their group and as such may endorse religious fundamentalism beliefs such as that their group is righteous, while all others are unrighteous, or that there is only one true religion.

Hypothesis 8. Intuition will influence schizotypy such that as the level of intuition increases, the level of schizotypy will increase.

$$H_{8_0}: \rho = 0, H_{8_A}: \rho > 0$$

Intuition seems to be similar to transliminality which has been associated with both schizophrenia and schizotypy. Schizophrenics score higher on transliminality than non-schizophrenics (Thalbourne, 1998). Schizotypy also correlates with transliminality (Thalbourne, Bartemucci, Delin, Fox, & Nofi, 1997; Thalbourne & Maltby, 2008). Eastern meditation, thought to increase intuition, correlates with high psychoticism (Kaldor, Franics, & Fisher, 2002). Intuition, in the way that I conceive of it, is an opening up to a different way of perceiving that results in being more sensitive to external and internal stimuli. If this process happens too quickly or to someone who is unprepared to handle it, I suspect that schizotypy or even schizophrenia could result.

Hypothesis 9. Schizotypy will influence spiritual experiences such that as the level of schizotypy increases, the level of spiritual experiences will increase.

$$H_{9_0}: \rho = 0, H_{9_A}: \rho > 0$$

Schizotypy could be a way of opening up to spiritual experience through the loosening of associations in the mind and as such could lead to an increase in spiritual

experiences or an increased likelihood to interpret normal experiences as spiritual since they may have delusions of reference in which special significance is attributed to normal events, objects, and actions. Acute schizophrenia has been associated with the occurrence of paranormal experiences (Powell, 2009).

Hypothesis 10. Schizotypy will influence religiousness, such that as the level of schizotypy increases, the level of religiousness will decrease.

$$H10_0: \rho = 0, H10_A: \rho < 0$$

Those with schizotypy may have rigid thinking just as those with schizophrenia do and as a result may not be open to other ways of thinking such as in religious ways. Furthermore, several studies have found an inverse relationship between psychoticism and attitudes towards Christianity, that is the more psychotic someone is the more negative their attitude towards Christianity (Francis, Lankshear, & Pearson, 1989; Francis & Montgomery, 1992; Francis, Lewis, Brown, Philipchalk, & Lester, 1995; Carter, Kay, & Francis, 1996; Francis, 1997; Francis & Bolger, 1997).

CHAPTER IV

METHODOLOGY

Overview

One of the purposes of this investigation was to evaluate the reliability and validity of the Attig Intuition Scale (AIS) by 1) assessing the internal consistency reliability of the AIS with split-half reliabilities, an overall Cronbach's alpha coefficient, and item-whole correlations, and 2) assessing the construct validity by conducting an exploratory factor analysis, calculating split-half consistencies, examining correlations between items and constructs, and correlating the score on the AIS to scores from similar intuition scales which have already been validated.

The primary purpose of this investigation was to test the predicted causal relationships between intuition, spirituality (experiences and beliefs), religiousness, schizotypy, and religious fundamentalism as stated in the research hypotheses. These predicted relationships were tested using a latent variable path analysis that includes both a confirmatory factor analysis and a model generating path analysis.

Participants

Participants for this study were recruited from undergraduate courses at the University of Arizona in the spring of 2009 and included students from a psychology of spirituality and religion course, a health psychology course, and a psychology of law course. The students were offered extra credit for their participation in this study. This was primarily a sample of convenience because the researcher is a graduate student at the University of Arizona, yet the types of classes were purposefully chosen so that some of

the respondents were likely to be highly spiritual and/or religious while others were less likely to be so. The study was briefly explained to each class and an opportunity to ask questions about the study was provided. Students wishing to participate were given an envelope with all of the questionnaires included in it as well as a disclosure form to complete and return. (See Appendix A for questionnaires.)

Of the 123 participants 71.5% were female (n = 88) and 28.5% were male (n = 35). The age range of subjects was from 18 - 49 with the average age being 23. Participants' self-reported ethnicity was as follows: 63.4% White (n = 78), 15.5% Hispanic (n = 19), 6.5% Asian/Pacific Islander (n = 8), 6.5% Mixed Ethnicity (n = 8), 4.1% American Indian/Alaskan Native (n = 5), and 4.1% Black (n = 5). Participants identified with the following religions and traditions: 33.3% Christianity (n = 41), 27.6% Catholicism (n = 34), 13.8% Agnosticism (n = 17), 9.8% Judaism (n = 12), 4.9% Other (n = 6), 3.3% Native American Traditional Religion (n = 4), 2.4% Mormonism (n = 3), 2.4% Atheism (n = 3), 2.4% Spiritual (n = 3), 1.6% Universalist Unitarian (n = 2), 1.6% Buddhism (n = 2), 0.8% Hinduism (n = 1), 0.8% Native American Church (n = 1), 0.8% Discordianism (religion based on the idea that chaos is all there is) (n = 1), and 0.8% Hopi/Sitchinism (n = 1).

Procedures

The procedures for the current study were approved by the University of Arizona's Institutional Review Board (IRB). The IRB determined that disclosure forms, rather than subject consent forms needing to be signed by students, would be appropriate for this study since there was minimal risk to students. The principal investigator attended

each of the classes listed previously to recruit students for this study. The investigator arrived shortly before the end of each class and was introduced to the class by the class instructor. The investigator then briefly explained the study and invited individuals to participate, but emphasized that participation was voluntary. Students were told that they would be awarded extra credit points for each of their respective classes for their participation in this study. Envelopes containing packets of questionnaires, instructions, and disclosure forms were given to those students interested in participating with instructions to return them in the envelopes (sealed) with no identifying information listed on the forms, only their names written on the sealed envelopes (for the purpose of assigning extra credit properly). Both the investigator and the instructors returned to the classes over the next two weeks to collect the returned packets.

Measures

Scales Used to Measure Intuition

Four scales were chosen to measure intuition. Three were needed to create a common factor model. Three of the scales were known to be reliable and valid and the fourth, the Attig Intuition Scale, was a new scale whose reliability and validity were unknown.

The Revised Rational Experiential Inventory (RREI)

The Revised Rational Experiential Inventory (RREI) (Pacini & Epstein, 1999) includes subscales for both rational and experiential ability and engagement. The revised version on this instrument is an improvement on the original version because unlike the original there are an equal number of positive and negatively worded items for the

rational and experiential categories, an equal number of social and nonsocial items for each category, an equal number of items in each category, and it is considerably more reliable than the first version (Pacini & Epstein, 1999). The 40 items included on this scale were rated on a 5-point scale ranging from 1 (definitely not true of myself) to 5 (definitely true of myself). The rationality scale has a reliability of $\alpha = .90$ while the experiential scale has an alpha value of $.87$ (Pacini & Epstein, 1999) indicating adequate internal consistency reliability which is appropriate for use in group research (Nunnally & Bernstein, 1994). Factor analysis has confirmed that the two constructs being measured are independent and orthogonal (Pacini & Epstein, 1999). Only scores derived from the 20 experiential items on this scale were used since this is the only factor of interest for this study.

Myers-Briggs Type Inventory (MBTI)

The Meyers-Briggs Type Assessment is a Jungian based personality measurement in which one bipolar dimension is sensing-intuition. Intuition is defined as discerning possibilities which are not immediately obvious. Intuitive individuals focus on perception of possibilities, relationships by way of insight, and knowledge that comes through hunches. The MBTI consists of forced choice word pairings and questions designed to determine the subject's preferences. Four poles are measured: Sensing Intuition (SN); Extroversion-Introversion (EI); Thinking-Feeling (TF); and Judgment-Perception (JP). Typically each dimension is dichotomized to show a preference such that each individual is classified by four letters which indicates 1 of 16 possible types. However, there is also

a continuous numerical score which can be calculated to indicate the strength of preference amongst each type.

The bipolarity of the MBTI as well as its predictive power has been questioned, however there is evidence that this is a valid measure suitable for use in research. Brain research indicates the validity of the SN subscale. Newman (1985) found greater activity in the left hemisphere of Intuitive-types and greater right hemisphere activity in Sensing-types in an EEG study. A similar finding occurred when Wilson and Languis (1989) observed Extraverted Intuitive-types and Extraverted Sensing-types. Wilson, Laposky, and Languis (1991), in their study of middle school students, found a pattern of generalized posterior arousal in Intuitive-types. Several studies have found that Intuitive types are more interested in both imagery and fantasy (Edmunds, 1982; Ireland & Kernan-Scloss, 1983; O'Haire & Marcia, 1980; and Palmiere, 1972). Hall and MacKinnon (1969) found that the proportion of Intuitive types as well as the actual intuition score increased as the level of creativity increased. Intuitive-types more easily visualize further into the future than Sensing-types (Harrison, 1984; Nightingale, 1973; Seidan, 1970; Smith, 1976). Edwards, Lanning, and Hooker (2002) found that Sensing correlated with the Rational Experiential Inventory measure of Need for Cognition. The MBTI SN dimension has also been strongly correlated with NEO-PI Openness (MacDonald, Anderson, Tsagarakis, & Holland, 1994). In men, significant correlations have been found between MBTI Intuition and the NEO-PI Openness facets of Fantasy, Aesthetics, Feelings, and Ideas (MacDonald, Anderson, Tsagarakis, & Holland, 1995).

McCrae and Costa (1989) have suggested that the MBTI merely represents four of the big five factors found in their personality measure and that therefore the MBTI should no longer be used. However between 26% and 68% of the reliable variance in each MBTI subscale is not shared with its NEO-PI-R analogue indicating that there may be conceptual interest in the MBTI beyond that found in the NEO-PI-R (Edwards, Lanning, & Hooker, 2002). In fact, their study (Edwards, Lanning, & Hooker, 2002) showed that the unique variance in the MBTI (as separate from the NEO-PI-R) was responsible for predicting social information processing and attributional adjustment while the NEO was not.

The MBTI-Form M, the most recent version of this scale, was used in this study (Meyers & Briggs, 1998). Internal consistency for the Sensing/Intuitive factor of this measure ranges from .86 to .95 with split-half correlations ranging from .91 to .93 and test-retest reliabilities at four weeks ranging from .89 to .97 (Myers, McCaulley, Quenk, & Hammer, 2003). In a study of over 32,000 participants the Sensing/Intuitive (SN) factor had a reliability of .84 (the highest of any of the dimensions on the MBTI) (Myers & McCaulley, 1985).

Continuous scores of subjects on this measure were assessed rather than dichotomous scores for three reasons. First, the bimodality of this measure has been questioned (Hicks, 1985; Wiggins, 1992). Second, the MBTI manual suggests using continuous scores in research that includes correlations (Myers et al., 2003). Third, statistical power is increased by the use of continuous scores rather than dichotomous scores (Cohen, 1983).

The Revised NEO Personality Inventory (NEO-PI-R)

The Revised NEO Personality Inventory (NEO-PI-R) was used to assess Openness to Experience, which is one of the five factors measured by this scale (Costa & McCrae, 1992). Aspects of this dimension include six facets: 1) Fantasy: active imagination and fantasy life; 2) Aesthetics: aesthetic sensitivity for things such as emotionally evocative poetry, dance, music, and patterns found in nature; 3) Feelings: more deeply felt emotions, concern for emotion and empathy for others; 4) Actions: preference for variety such as a desire to try a variety of foreign foods or visit new places; 5) Ideas: an intellectual and philosophical curiosity ; and 6) Values: independence of judgment with regard to social, political, and religious values (Costa & McCrae, 1992). The internal consistency is strong for the six facets of Openness (coefficient alpha ranges from .69 to .87) (Costa & McCrae, 1992). Reliability for the Openness domain scale has been measured at .86 (McCrae & Costa, 1983).

Construct validity has been established for this measure by comparing observer ratings to NEO-PI-R scores such that single peer ratings correlated (.48, $p < .001$) as well as spouse ratings (.65, $p < .001$) (Costa & McCrae, 1992). Openness has been found to correlate positively with Intuition as measured by the MBTI (.72 in men, .69 in women, at $p < .001$ for both men and women) (Costa & McCrae, 1992). Openness has been found to correlate (.22) consistently with education level (Costa & McCrae, 1992). More current research continues to show evidence of test-retest reliability and validity as assessed by convergent correlations with Goldberg's (1992) Bipolar Adjective Scale (a list of trait adjectives grouped as antonym pairs to select from to describe a person)

scores and through inter-rate reliability (between the person's self-assessment and the rating done twice by a close friend or relative with a six month interval in-between) (Kurtz & Parrish, 2001). This research replicated findings from a similar study done by McCrae and Costa in 1987. Cross-cultural research has validated the factor structure of the NEO-PI-R in other cultures including Russia and the Czech Republic (McCrae, Costa, Martin, Oryol, Rukavishnikov, Senin, et al., 2004), Belgium (Saroglou & Fiasse, 2003), Italy (Barbaranelli, Caprara, Rabasca, & Pastorelli, 2003), Poland (Szarota, Zawadski, & Strelay, 2002) and Canada (Paunonen & Ashton, 2002).

The Attig Intuition Scale (AIS)

The Attig Intuition Scale (AIS) is a 25-item self-report tool designed by Sheryl Attig to assess intuition. Items developed for this scale were inspired from a lengthy review of the literature on intuition as well as from the authors' personal experiences. There are items designed to assess actual use of intuition, the preference for intuition, the accuracy experienced when using intuition, and the emotional and physical aspects of intuition. There are items assessing the use of intuition in interpersonal interactions such as, "I can read other's emotions easily and accurately", other items assessing intuition in the sense of psychic abilities such as, "Sometimes I dream about things before they happen", and other items specifically dealing with the use of intuition in making decisions such as, "If logic tells me one thing and my intuition tells me another, I go with what my intuition tells me." The final set of items on the AIS include a combination of items from various other intuition assessments as well as new items developed specifically for this study. Items are scored on a 7-point Likert scale ranging from 1

(strongly disagree) to 7 (strongly agree). All items on the scale are worded positively such that answering “strongly agree” on an item indicates a level of intuitiveness, as measured by that item, while answering “strongly disagree” indicates a lack of intuitiveness. None of the items are reverse coded since research indicates that reverse coding does not provide consistent information (Wright & Masters, 1982), can potentially confound the factor structure (Deemer & Minke, 1999), and may reduce reliability (Weems & Onwuegbuzie, 2001).

Scales used to Measure Spirituality and Religiousness

Tellegen’s Absorption Scale (AS)

Tellegen’s Absorption Scale (Tellegen, 1993) was used to assess how fully engaged people tend to become with their perception of external stimuli, their own imagination, and with their ideas (Tellegen, 1974). Absorption is a state of “total attention” towards one focal point (Tellegen, 1974). Absorption has been found to correlate modestly with hypnotic susceptibility (Tellegen, 1974). Absorption is described by Tellegen and Atkinson (1974) as a tendency to experience things deeply and as more real, a decreased likelihood of being distracted by competing stimuli, and as a way of processing information in unconventional or idiosyncratic ways. The Absorption Scale has acceptable test-retest reliability, internal reliability, and construct validity (Tellegen, 1981; Roche & McConkey, 1990). It has been measured as having an internal reliability of $r = .88$ and a 30-day test-retest reliability of $r = .91$ (Tellegen, 1982) and elsewhere as having a test-retest reliability of $r = .85$ (Kihlstrom, Register, Hoyt, Albright, Grigorian, Heindel, & Morrison, 1989).

This scale was used as a measure of spirituality because the construct of absorption so closely resembles the descriptions of what occurs in mystical experiences and by those who meditate regularly. In mystical experiences people often feel as though they are experiencing a deeper level of reality, and through the experience and after the experience the person often has a changed view of reality. In meditation people are able to attain high levels of focused attention and have a heightened awareness to stimuli, yet are less likely to be distracted by external stimuli in this state. In fact, absorption has been correlated with hypnotic depth for meditators, but not for nonmeditators (Spanos & McPeake, 1975) and has been significantly correlated with meditation in another study such that the more people reported meditating (none, beginners, short term and long term) the higher the person scored on the Tellegen Absorption Scale (Davidson, Goleman, & Schwartz, 1976).

Some of the items assess paranormal experiences that can be a part of a person's spiritual experience. These items include understanding what a mystical experience is, sensing a person's presence before seeing them, and knowing what someone will say before they actually say it. Research confirms the correlation between absorption and paranormal experiences. In one particular study a correlation of .51 was found between absorption and a self-report measure of paranormal experiences (Nadon & Kihlstrom, 1987). A number of studies have found absorption to be correlated with parapsychological phenomena including things like reporting having had an out-of-body experience (Irwin, 1981, 1985; Mathes, 1982; Myers & Austrin, 1985; Myers, Austrin, Grisso, & Nickeson, 1983; Reid, Steggles, & Fehr, 1982; Stanford & Angelini, 1984).

The Openness to Spiritual Beliefs and Experiences Scale (OSBES)

The Openness to Spiritual Beliefs and Experiences Scale (OSBES) was used to assess how spiritual and/or religious a person is as well as various religious and spiritual beliefs and experiences, traditional and non-traditional, that the subjects have had (Schwartz & Russek, 1999). This is a twelve item questionnaire which assesses how spiritual and how religious the person considers himself or herself to be as well as about beliefs in God or a Higher Power, the survival of consciousness after death, the existence of angels, ESP, and the power of prayer on health. It also assesses a variety of experiences including the presence of God, the presence of someone who has died, the presence of angels, the experience of ESP, and the experience of prayer in promoting health. A Likert scale of 1-7 is used from 1 (Definitely No) to 7 (Definitely Yes). The average Cronbach alpha for this measure is .85 and the split-half reliability is .80 (Schwartz & Russek, 1999).

Construct validity for this scale has been demonstrated through its predictive power. In a study of 40 subjects, the subjects attempted to detect whether someone who was behind them was staring at the back of their head, their lower back, or was closing their eyes and intending to stare at one of these sites (Schwartz & Russek, 1999). Overall performance which combined the stare and intention condition correlated significantly ($p < .005$) and positively with the person's overall openness to spiritual beliefs and experiences as measured by the OSBES. The highest positive correlation was between total performance and endorsement for the items "belief in survival of consciousness after death", belief in "ESP", experience of "someone who has passed away", and experience

of “ESP”. The items which were the lowest (positively correlated, but not significantly so) were the belief and experience of “God or a Higher Power” and “prayer”.

Furthermore, subjects who did not perform well in the stare or intend conditions had the lowest OSBES scores.

There was a similar study conducted which measured energy detection through 1) a hand being placed near the subject’s hand, ear, or the lower back, 2) intention being focused on the subject’s face, stomach, or back, and 3) the subject guessing which hand (of the experimenter’s) that the experimenter was focusing on. It was found that subjects’ estimates of their performance scores, their energy sensitivity, and their overall behavioral performance correlated significantly only with the experience of ESP item from the OSBES, and not with any other items from this scale (Nelson & Schwartz, 2005).

The Santa Clara Strength of Religious Faith Questionnaire (SCSORF)

The Santa Clara Strength of Religious Faith Questionnaire was used to assess how strongly an individual is dedicated to their religious faith, whatever faith that may be (Plante & Boccaccini, 1997). It is not limited to a specific faith tradition which makes it an ideal measure for a population which is likely to represent a variety of faith traditions or lack thereof which can all be measured with this scale. Many other scales used to assess religiousness are specific to a certain faith tradition, whereas this one is not. It is more open-ended and vague by referring to “faith”, “my religious faith”, and “God”, not to faith-specific practices or beliefs. Subjects are asked to respond to ten questions about how much they value their faith, rely on it, and are actively involved in it. A four point

Likert system ranging from 1 (Strongly Disagree) to 4 (Strongly Agree), is used. Items include things such as; "I pray daily" and "My faith impacts many of my decisions". The scale has been found to have high internal reliability (Cronbach Alpha = .94-.97) and split-half reliability ($r = .90-.96$) as well as adequate validity (Plante & Boccaccini, 1997a; 1997b; Plante et al., 1999; Lewis, Shevlin, McGunckin & Navratil, 2001). Confirmatory factor analysis supports the one-factor structure of this scale (Lewis, et al., 2001).

The Mysticism Scale (MS)

The Mysticism Scale was used to assess the variety of mystical experiences (not particular to any one religious tradition or culture) which individuals have experienced (Hood, 1975). Mystical experience is usually defined as an ecstatic experience of oneness with God or creation accompanied by a strong sense of peace and profound insights into the meaning of existence (Thalbourne, 1991). Hood's scale is a 32 item measure which asks subjects if they have ever 'felt as if all things were alive', had an experience which was "timeless and spaceless" and other such questions meant to capture ego quality, unifying quality, inner subjective quality, temporal/spatial quality, noetic quality, ineffability, positive affect, and religious quality. Hood's scale is based on Stace's eight categories of mysticism which include inner subjective quality, temporal/spatial, noetic quality, ineffability, positive affect, religious quality, ego quality, and unifying quality (Hood, 1975; Stace, 1960). A four point Likert scale ranging from -2 (Definitely Not True of my own experience or experiences) to +2 (Definitely True of my own experience or experiences) with the option of "?" (I cannot decide) was used to assess how well the

item fit with the subject's prior experience(s). The scale has been shown to have adequate internal consistency and construct validity (Hood, 1975). Items are worded both positively and negatively. Reverse scoring is necessary on several items. The scale is scored by adding "+3" to each number that is listed with the "?" being treated as a "0" that three is added to. Final scores on this scale range from 32 to 160, with the higher numbers indicating greater levels of mysticism.

Three factors have been identified within this measure including: 1. Extrovertive Mysticism, 2. Religious Interpretation, and 3. Introvertive Mysticism (Hood, Morris, & Watson, 1993; Reinert & Stifler, 1993; Hood & Williamson, 2000, Hood, Ghorbani, Watson, Ghramaleki, Bing, Davidson, Morris, & Williamson, 2001). Extrovertive mysticism is the experience of feeling as if everything including oneself is one with the universe (Hood et al., 2001). Introvertive mysticism is the experience of losing oneself in a unity in which only a void is perceived (Hood et al., 2001). Religious interpretation is separate from both of these experiences. It is how a person makes sense of their experience after having had it.

The Weird Coincidence Scale-2 (WCS-2)

The first version of The Weird Coincidence Scale was included in the set of questionnaires administered to students for this study, but ultimately only those items retained for the second version of the scale, The Weird Coincidence Scale-2, were used in scoring this scale.

The Weird Coincidence Scale was used to assess how often subjects experience meaningful coincidences as well as how those coincidences are interpreted and analyzed

for meaning (Coleman, Beitman, & Celebi, 2009). This scale was designed to measure synchronicity, a Jungian word created to mean “meaningful coincidence.” This scale was designed to describe those incidents which are “weird”, “out of the ordinary”, and “coincidence,” of low probability (Coleman et al., 2009). Meaning occurs if the person notices what has occurred and has an emotional reaction to it. The scale consists of a short story about a woman who has had a synchronistic experience as a way of providing an example of what is meant by synchronicity, followed by 36 items, all but one of which is a statement about a particular type of coincidence occurring such as; “I have dreams that predict future events” and “I think of calling someone, only to have that person unexpectedly call me.” These items were rated on a five-point Likert scale ranging from 1 (Never) to 5 (Very Frequently). Then there are six items used to assess the analysis and interpretation of the experiences with a Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). Some of the items include attributing meaningful coincidences to God, fate, the laws of probability or chance, and the interconnectedness of minds. The initial research on this scale produced a six factor structure that accounted for 54.9% of the variance in the survey questions (Coleman et al., 2009). Those factors were: 1) Change and direction, 2) Love connection, 3) Thinking of it and it happens/people oriented, 4) Analysis/Interpretation, 5) Dreams, and 6) Thinking of it and it happens/thought oriented. Alpha values ranged from .76 to .88 for the various factors (Coleman et al., 2009).

The Weird Coincidence Scale has been refined into a newer version known as The Weird Coincidence Scale-2. (Coleman & Beitman, in press). Beitman (in press)

suggests that researchers use this version of the measure rather than the previous version since this one has been statistically refined. This newer version of the scale is a subset of the items from the earlier scale (the one we used in our study). In order to have the most accurate scores for this measure we have chosen to score only those items from the Weird Coincidence Scale we administered that were kept for the Weird coincidence Scale-2. A three factor structure has been identified in this scale using confirmatory factor analysis. The factors include: 1) The Interpersonal subscale that mostly includes items of a telepathic nature (7 items including 3,4,6,7,8,9, and 21) , 2) The Agentic subscale which includes items having to with action and progress (5 items including 10,16,17,19,and 36), and 3) The Analysis/Interpretation subscale including items about how a person interprets the synchronicities which have occurred for them (6 items including 37,38,39,40,41,and 42). The Interpersonal items have been shown to have an alpha of .70, the Agentic items an alpha of .69, and the Analysis items an alpha of .70, indicating modest reliability (Coleman & Beitman, in press). Only those items included in these three factors were retained for the Weird Coincidence Scale-2.

Scale used to Measure Religious Fundamentalism

The Revised Religious Fundamentalism Scale (RRFS)

The Revised Religious Fundamentalism Scale was used to assess the degree to which individuals hold dogmatic, fundamental, traditional religious beliefs (Altemeyer & Hunsberger, 2004). Many of the twelve items are specifically theistic or Christian in nature, however it has been shown in its unrevised version (The Religious Fundamentalism Scale) (Altemeyer & Hunsberger, 1992) to effectively measure

fundamentalism in Hindus, Jews, and Muslims (Altemeyer, 1996) An eight point Likert scale is used ranging from -4 (Very Strongly Disagree) to +4 (Very Strongly Agree). An example of an item on this scale is; "To lead the best, most meaningful life, one must belong to the one, fundamentally true religion". This scale has been shown to be internally consistent and empirically valid (Altemeyer & Hunsberger, 2004).

The first version of the Religious Fundamentalism Scale was published by Altemeyer and Hunsberger in 1992. In a large university sample it produced a mean inter-item correlation of .37 and an alpha coefficient of .92 (Altemeyer & Hunsberger, 2004).

Altemeyer and Hunsberger (2004) have noted that religious fundamentalism as assessed by this earlier version of the scale used in a number of different studies has been found to correlate with a number of other constructs including dogmatism (.57 to .78), belief in a dangerous world (.44 to .59), right-wing authoritarianism (.62 to .82), zealotry (.44 to .55), self-righteousness (.52 to .54), prejudice towards women (.23 to .40) and hostility towards homosexuals (.42 to .61). They also noted that those who score high on religious fundamentalism typically come from traditionally fundamentalist denomination including Mennonites, Pentecostals, Baptists, Evangelicals, and Jehovah's Witnesses.

The new, revised twelve item version, reduced from the original twenty item version, was analyzed for reliability and validity after a group of 354 Manitoba introductory psychology students and 424 parents took this scale (Altemeyer & Hunsberger, 2004). An alpha of .91 and .92 were found respectively, and mean inter-item correlations of .47 and .49 respectively. Factor analysis was run for each group producing one factor for each accounting for 51.3% and 53.5% of the variance respectively. Validity

was established by comparing this scale to ten other related scales such as those on dogmatism, religious ethnocentrism, and belief in creation “science”, all producing coefficients greater than .70.

Scale used to Measure Schizotypy

Eysenck Adult Personality Questionnaire (EAPQ)

The psychoticism items from the Eysenck Personality Questionnaire were used to assess levels of schizotypy (Eysenck & Eysenck, 1975). This is a well validated personality measure. Those who are in fact more psychotic, engaging in more criminal behavior and in more antisocial behavior score higher on this measure (Eysenck, 1977). Twenty items were used from this scale to assess psychoticism including items that indicate no concern for others’ feelings, little concern for safety or responsibility, little concern for animals, and others, all of which indicate psychoticism. High scorers on this scale have been seen as “cold, impersonal, lacking in sympathy, unfriendly, untrustful, odd, unemotional, unhelpful, antisocial, lacking in insight, strange, with paranoid ideas that people were against him” (Eysenck & Eysenck, 1976, p. 47). Although we only used 20 items from this scale, we administered all 90 items since those high in psychoticism are more likely to lie about it if it is obvious what is being measured by only being given the psychoticism subscale (Eysenck, 1977). Those who have been found to have relatively high scores on psychoticism include schizophrenics, drug abusers, prisoners, and children with anti-social behaviors (Eysenck & Eysenck, 1976).

Data Management

The data from all respondents ($N = 125$) was entered into a database by two undergraduate psychology research assistants using Microsoft Excel software. The data was cleaned after entry. Checks were made to look for invalid data. The data for two participants was immediately discarded for missing or invalid responses for most of the items on all scales. One item response was missing for one subject on the AIS, but rather than discard the questionnaire, a value for the missing data item was imputed. A total of 123 valid questionnaires (98% of the total sample) were used in the data analyses to assess the reliability and validity of the AIS. In exploratory factor analysis, Hatcher suggests the minimum number of subjects should be the larger of 100 subjects or five times the number of items on the scale (1994). With 25 items on the AIS and 123 subjects, the minimum number of subjects was missed by just two. However, large samples are often harder to obtain in the social sciences, and studies with fewer subjects have been reported in the literature (Hatcher, 1994).

For the second set of analyses, one participant's data was discarded because the participant did not respond to any of the questions on one of the scales. For these analyses, the responses from 122 subjects were used. Ignoring the demographic items, participants were asked to respond to 306 total items of interest from all of the scales. A total of 64 items across all remaining participants ($N = 122$) were missing, making the percentage of missing data less than one percent. Data was imputed for the 64 missing values and checked for reasonableness. For confirmatory factor analyses and structural equation modeling, Hatcher suggests at least 200 subjects (1994). However, according to

Schumacker and Lomax (2004), researchers found numerous studies that agreed that 100 to 150 subjects is the minimum sample size needed for structural equation modeling. They also cited research by Benter and Chou (1987) who proposed that, for normal and elliptical distributions which have multiple indicators per latent variable, as few as 5 subjects per variable is sufficient (Schumacker & Lomax, 2004).

Statistical Analyses

All statistical analyses were performed using SAS® version 9.1. Missing data imputations were performed with PROC MI. PROC CORR was used to calculate Cronbach's alphas, split-half reliabilities, item whole reliabilities and bivariate correlations. An exploratory factor analysis on the AIS was performed using PROC FACTOR. PROC CALIS was used to do structural equation modeling with a model building approach.

Scale Reliability and Validity

Internal Consistency Reliability

When the items on a scale are highly correlated with one another, the items appear to be measuring the same trait. Internal consistency reliability is the degree to which the individual items on a scale intercorrelate and correlate with the entire scale (Nunnally & Bernstein, 1994). According to Kline (2005), if the items on a scale measure the same concept, the scale is internally consistent. It is important to demonstrate that scales are reliable, since otherwise research results using the scale would not be replicable (Hatcher, 1994). There are several indices that are commonly used to measure

reliability and they include split-half reliability, Cronbach's coefficient alpha, and item-whole correlation.

Split-half reliability calculations involve splitting the items on a questionnaire into two halves, scoring the two halves, and then correlating them. The method has some problems in that there are many ways the items on a scale could be split, and the method produces a measure of the reliability of only half of the scale. However, there is a statistical method for estimating the reliability of the whole scale based on the correlation of the two halves—the Spearman-Brown Prophecy formula (Mueller, 1986).

Cronbach's coefficient alpha is the average of all possible split-half reliabilities. Scales with a coefficient alpha of .70 or higher are thought to demonstrate adequate consistency among the items (Cronbach, 1951). Nunnally and Bernstein (1994) suggested an upper limit on coefficient alpha—the alpha should be higher than 0.70 but not much higher than 0.90. Scales with a Cronbach's alpha that exceed .90 demonstrate high levels of item redundancy.

Another measure used to determine if scale items are measuring the same characteristic or trait is called item-whole correlation. Each item on the scale is statistically correlated with the sum of the remaining items. Items that do not correlate well (e.g., weak ($p < .01$) or negatively correlate) are clearly not measuring the same trait and should be amended or discarded (Nunnally & Bernstein, 1994).

Construct Validity

Hatcher defines validity as “the extent to which an instrument measures what it is intended to measure” (Hatcher, 1994). Exploratory factor analysis is used to investigate

the latent structure of a set of variables by determining which sets of observed variables share common variance-covariance characteristics that make up theoretical constructs. It is recommended as a precursor to confirmatory factor analysis when a substantive theoretical model has not been developed (Schumacker & Lomax, 2004). It is one method used to assess construct validity. Construct validity can also be assessed with split-half consistencies and by showing that scale scores are statistically correlated with independent measures of the same construct and uncorrelated with measures that are dissimilar.

This dissertation will use the techniques mentioned above to assess the reliability and validity of the Attig Intuition Scale developed by the researcher to measure intuition levels.

Hypothesis Testing

Structural Equation Modeling/Path Analysis

Researchers who hypothesize a theoretical model which predicts how a set of observed variables define constructs and how these constructs relate to one another can quantitatively test these relationships using structural equation modeling (SEM). SEM tests several types of models: regression, path, and confirmatory factor models (Schumacker & Lomax, 2004).

To better understand SEM, several terms need to be defined. There are two major types of variables: latent variables and observed variables. Latent variables, also called constructs or factors, are variables that are not directly observed or measured. Rather than being observed, they are inferred from a set of variables that have been observed with

tests or surveys, for example. Observed variables, therefore, are those variables used to define latent variables. Observed variables also called measured, indicator, or manifest variables (Hatcher, 1994; Schumacker & Lomax, 2004).

Variables, observed or latent, can be either dependent or independent.

Independent variables are not influenced by any other variable in the model. They are also known as exogenous variables. Dependent variables, or endogenous variables, are influenced by at least one other variable in the model. Latent and manifest variables can both be either exogenous or endogenous (Hatcher, 1994; Schumacker & Lomax, 2004).

Regression and path models are specified entirely with observed variables.

Regression models use one or more independent variables to predict one dependent variable. Path models are more complex than regression models in that they allow for multiple dependent variables. Confirmatory factor models are made up of manifest variables which theoretically measure one or more constructs. SEM consists of both types of variables, observed and latent, which can be independent or dependent. Structural equation analysis combines path and factor-analytic models. The basic steps of SEM are model specification, model identification, model estimation, model testing, and model modification (Schumacker & Lomax, 2004)

Schumacker and Lomax (2004, p. 7) state the following reasons to explain why structural equation modeling has become so popular: 1) researchers have recognized the need to use a larger number of variables to understand complex phenomena; 2) SEM techniques specifically account for measurement error, which has become an issue in many fields; 3) advances in SEM techniques have better provided researchers the

capability of testing sophisticated models; and 4) SEM software has become more user-friendly.

Structural equation modeling is often referred to as path analysis with latent variables. Path analyses with latent variables are often performed using a two-step approach, as recommended by Anderson and Gerbing (1988). The first step entails using a confirmatory factor analysis to develop a measurement model that displays an acceptable fit. A measurement model describes the relationships between latent, hypothetical constructs and the observed variables intended to measure them. It does not test causal relationships. Modifications are often made to a measurement model until an acceptable fit has been reached. The second step of the procedure involves adapting the measurement model to specify the causal relationships between the latent variables. The resulting model is the structural model and it is used to test the causal associations. The measurement model and structural model together make up the combined theoretical model (Hatcher, 1994).

There are three main approaches of going from a theory to a model that can be analyzed with SEM or path analysis with latent variables (Schumacker and Lomax, 2004). The first approach is the confirmatory approach, and in this approach the researcher develops a theoretical model with specific hypotheses and gathers data to see if the data fit the model. The researcher uses a chi-square statistical test to accept or reject the fit of the theoretical model. The second approach is the alternative model approach. In this method, the researcher creates a small number of models, theoretically different from one another, to determine which of the models is best fit by the data. The models are

compared with chi-square difference tests. Model generating is the third approach, and it is conducted when the researcher specifies an initial model and then adds or deletes causal pathways in the model to arrive at a best and final model. The objective in the model generating approach is to find a model that not only fits the data well, but also has a theoretical meaning which is both practical and substantive (Schumacker & Lomax, 2004).

This dissertation used structural equation modeling according to the two-step approach for path analysis with latent variables as suggested by Anderson and Gerbing (1988) to test the hypothesized model at the beginning of this chapter. The confirmatory approach is limited in that if the model does not precisely describe the data it is rejected. The approach employed first was the model generating one. This allows for creating one theory, yet being able to refine it as necessary. A model with ten hypotheses is likely to be in need of refinement. In order to make the model work this way a number of measures had to be dropped from the constructs. This is not a commonly acceptable way to generate a model. It can be seen as forcing a model to fit the data which may produce results which are not replicable. While this approach failed to account for about half of the data, it did reveal some interesting findings about which measures fit best within this model. However, results from this model should be interpreted cautiously, as this is generally not an acceptable way of performing data analysis. The preferred method is the alternate model approach, which was the next approach used. It accounted for most of the data and is a generally acceptable way of analyzing data. Therefore, this model is more

statistically sound and reveals more about the relationships between the various constructs.

CHAPTER V

RESULTS

Overview

This chapter discusses the results of the reliability and validity testing for the Attig Intuition Scale and the results of the methods used to test the research hypotheses. The results for the scale validation are presented first.

Attig Intuition Scale

Internal Consistency Reliability

Split-half Reliability

The split-half reliability of the Attig Intuition Scale was assessed twice. First, the even-numbered items on the scale were assigned to one group and the odd-numbered items to another group, and the scores from each of the two halves were correlated. Second, each of the 25 items was assigned a random number using a uniform distribution then sorted according to the random number and assigned to one of two groups by their new order (1-12 and 13-25). The scores from these two halves of the data were also correlated. The Spearman-Brown Prophecy formula was used to adjust the correlations since, for example, a 6-item score will have more consistency than a 3-item score. The resulting correlations were .91 for the even-odd split and .80 for the random split.

Cronbach's alpha

The internal consistency reliability of the AIS was also measured using Cronbach's alpha coefficient. The scale showed high internal consistency and lack of item redundancy with $\alpha = .89$.

Item-whole Correlations

Item-whole correlations were also calculated as a final measure of overall scale reliability, and no weak ($p < .01$) or negative correlations were found. The item-whole correlations ranged from .25 to .61, and the average item-whole correlation was .47.

Construct Validity

Exploratory Factor Analysis

Responses to the 25 items on the AIS were subjected to an exploratory factor analysis using squared multiple correlations as prior communality estimates. The principal factor method was used to extract the factors, and the factor solution was rotated using a promax (oblique) rotation since it was hypothesized that the underlying factors were correlated. The eigenvalue-one criterion and a scree test suggested three meaningful factors. Furthermore, since only three factors accounted for at least 10% of the common variance (with a cumulative total of 83% of the variance), only three factors were retained for rotation.

An item was said to load on a given factor if the factor loading from the rotated factor pattern was .40 or greater for that factor and was less than .40 for the others. Using these criteria, six items were found to load on the first factor, which was subsequently named the "premonitions/psychic tendencies" factor. Five items loaded on the second factor, which was labeled the "intuition about others" factor. Six items loaded on the third

factor, which was described as “intuitive decision-making”. Scale items and corresponding factor loadings are presented in Table 1.

Split-half Consistency

In a method similar to the calculation of the split-half reliability for the AIS, the consistencies of the items in measuring a construct were calculated by splitting the items for each construct into two groups and correlating the sub-scores from the two groups. The Spearman-Brown corrected correlations coefficients for three AIS constructs were as follows: 1) Premonitions/psychic tendencies, .89, 2) Intuition about others, .85 and 3) Intuitive decision making, .75.

Correlations between Items and Constructs

Correlation analyses between the individual items and the AIS constructs showed that items within a single dimension on the AIS were more highly correlated with the total score of the dimension to which they were conceptually related than to the other dimensions (Table 2). Furthermore, the Cronbach’s alpha for each of the constructs, also presented in Table 2, were all above .7. Specifically, the alphas were .84 for the premonitions/psychic tendencies construct, .79 for the intuition about others construct, and .73 for the intuitive decision making construct.

Correlations to Similar, Validated Scales

The scores from the AIS were correlated to scores from the other intuition scales used in this study. The correlations are presented in Table 3. The AIS correlated well with the RREI (Experiential Items) with a correlation coefficient of .50 ($p < .0001$). The AIS also correlated with the MBTI (Sensing-Intuition Items), but with a smaller

correlation coefficient of .21 ($p < .05$). The correlation coefficient between the AIS and the NEO was positive but not statistically significant at the $\alpha = .05$ level ($\rho = .16$, $\alpha = .0701$). Given the high correlation coefficient between the AIS and the RREI (Experiential Items), the weaker correlations with the MBTI (Sensing-Intuition Items) and the NEO were not surprising. The RREI measures aspects of intuition that are not measured by the MBTI, and Experientiality has a positive correlation with weak significance to Openness to Experience as measured by the NEO.

All of these findings support the reliability and validity of the Attig Intuition Scale.

Reliability Checks for Published Scales

Cronbach's coefficient alphas were calculated on all published scales as a preliminary check for reliability in this study. The coefficients are presented in Table 4. All of the scales proved reliable with internal consistencies ranging from .73 to .96.

Research Hypotheses Testing

Confirmatory Factor Analysis

Hatcher (1994, p. 259-260) states the following as necessary conditions for confirmatory factor analysis and path analysis with latent variables:

- 1) Interval- or ratio-level measurement for all indicator variables. (Hatcher defines indicator variables and manifest variables that are used to measure latent factors.)
- 2) Minimal number of values (4) for each indicator.
- 3) Normally distributed data.
- 4) Linear and additive relationships. (Hatcher mentions this condition is not always necessary.)
- 5) Absence of multicollinearity.
- 6) Inclusion, within the model, of all nontrivial causal variables.
- 7) Overidentified model. (An overidentified model includes more equations than unknowns.)
- 8) Minimal number of observations.
- 9) At least three indicator variables per latent factor. (A latent construct may be assessed with two indicators under certain conditions.)
- 10) A maximum of 20-30 indicator variables.

Testing of Assumptions

The data used in this study met conditions 1-2, 4, 6-8, and 10. Conditions 3 and 5 were tested. Condition 9 was not met in that only two indicator variables were used to measure the religiousness construct and the spiritual beliefs construct; however, as stated, a construct can be assessed with two indicators under certain conditions. Religious fundamentalism and schizotypy were not measured as latent constructs in the confirmatory

model. Instead they were included in the model as manifest variables. In the alternative model manifest variables included spiritual experience, faith, schizotypy, and openness.

The data was examined to see if the assumptions of univariate and multivariate normality were met and to ensure a lack of multicollinearity between the independent variables. Univariate normality was assessed by calculating the skewness (symmetry of the distribution) and kurtosis (flatness or peakedness of the distribution) for each of the scales used in the model. According to the appropriate ranges of skewness (± 3) and kurtosis (< 8) proposed by Kline (2005), the values of both were satisfactory for all scales used in the model. See Table 4.

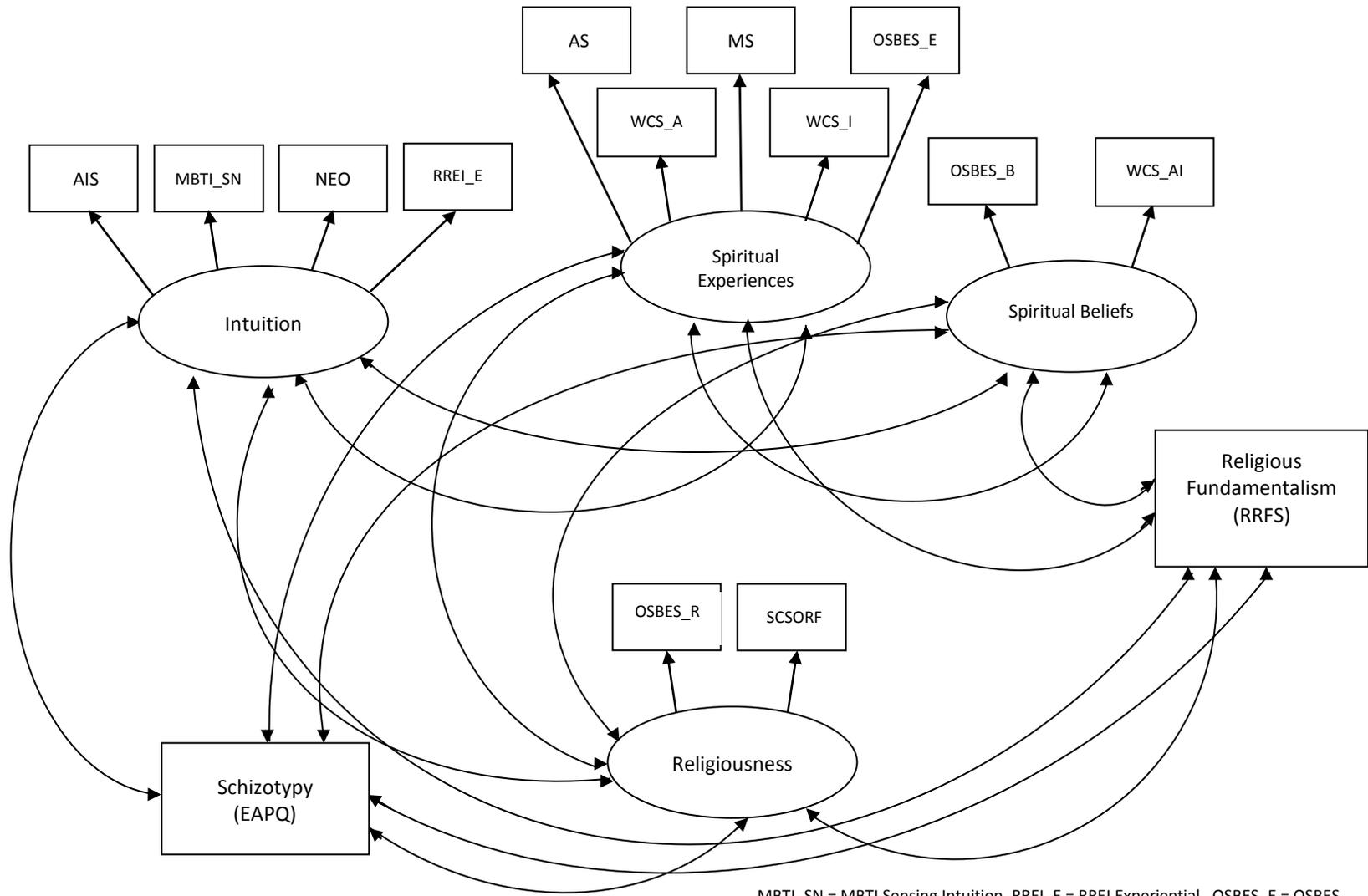
Multivariate normality was assessed by examining Mardia's Multivariate Kurtosis statistics. There is no widely accepted cutoff for Mardia's statistic; however, the larger the value of the kurtosis statistic, the greater the departure from multivariate normality (Byrne, 1994). Mardia's Multivariate Kurtosis statistic was 7.49 and the Normalized Multivariate Kurtosis statistic was 1.83 for the initial measurement model in this study; and the values were 3.52 and 1.54 respectively for the final measurement model.

Bivariate correlations between all of the predictor variables in the model were performed to ensure the assumption of lack of multicollinearity was not violated. The bivariate correlations between all scales used in this research are presented in Table 5. None of the correlations were above .80, the value above which Hatcher (1994) suggests variable redundancy could obscure results.

Measurement Model

The first step, in the two-step approach used in this study, involved developing a measurement model that fits the data. The initial measurement model used for testing

hypotheses 1 – 10 is presented in Figure 2. The measurement model investigated in this study included four latent variables corresponding to the following constructs: intuition, spiritual experiences, spiritual beliefs, and religiousness. Religiousness and spiritual beliefs were both measured by two manifest indicator variables; intuition was measured by four indicator variables; and spiritual experiences were measured by five. The model also consisted of two manifest endogenous variables, religious fundamentalism and schizotypy, making the model a nonstandard one.



MBTI_SN = MBTI Sensing Intuition, RREI_E = RREI Experiential, OSBES_E = OSBES Experiences, OSBES_B = OSBES Beliefs, WCS_A = WCS Agentic, WCS_I = WCS Interpersonal, WCS_AI = WCS Analysis/Interpretation OSBES_R = OSBES Religious

Figure 2. Initial Measurement Model

The measurement model was estimated using the maximum likelihood method, and the chi-square value for the model was statistically significant, χ^2 (77, N = 122) = 332.63, p-value < .0001. This chi-square statistic may be used to test the null hypothesis that the model fits the data. However, given that this statistic is sensitive to sample size, Hatcher (1994) references research that suggests that the statistic be used as a goodness of fit index, with smaller values, relative to the degrees of freedom, suggesting a better model fit.

This statistic and other results indicated that the initial model did not fit the data well. Large normalized residuals and Lagrange multiplier tests showed that the following manifest indicators needed to be removed from the model: AS, MS, WCS (Agentic Items), and WCS (Interpersonal Items), from the spiritual experiences construct; WCS (Analysis/Interpretation Items) from the spiritual beliefs construct; and NEO and MBTI (Sensing Intuition) from the intuition construct. The indicators were removed one at a time in an iterative process of taking out the indicator with the largest normalized residuals until an acceptable level of fit was attained. It is generally acceptable to remove one measure to improve fit, but not seven as we did. This was done as a way of learning more about the measures and the validity of the theory. The fit statistics for the modified measurement models are presented in Table 6, and the chi-square difference tests are presented in Table 7. The final measurement model is presented in Figure 3.

The goodness of fit indices for the final (re-specified) measurement model (M_m) are presented in Table 8. These indices show that the final measurement model had an

acceptable fit, according to Bentler & Bonett (1980), with a non-normed-fit index (NNFI) and comparative fit index (CFI) both greater than .90.

The standardized factor loadings for the predictor variables from the final measurement model are presented in Table 9. The t-values from the t-tests used to test the null hypotheses that the coefficients are equal to zero ranged from 5.58 to 14.04, indicating that all factor loadings were significant with $\alpha < 0.001$. According to Anderson & Gerbing (1988), this finding supports the convergent validity of the indicators.

The reliability of the indicators and the composite reliability of each of the constructs are also presented in Table 9. Composite reliability, like Cronbach's coefficient alpha, is a measure of internal consistency. The two constructs left in the model displayed acceptable reliability. The coefficients were .710 and .891 for intuition and religiousness respectively. The coefficients for spirituality and religiousness were both above the recommended level of .70 (Hatcher, 1994).

The last column in Table 9 presents the variance extraction estimates. These estimates measure the amount of variance that is captured by each of the constructs, relative to the amount of variance due to random measurement error (Fornell & Larcker, 1981). Both constructs exceeded the recommended level of .50.

The discriminant validity of the two constructs was supported using the confidence interval test and the variance extracted test. The confidence interval test is performed by calculating a confidence interval around the correlation coefficient between two factors. The interval is computed by adding and subtracting two standard errors of

the correlation coefficient. If the interval does not include 1, discriminant validity is confirmed (Anderson & Gerbing, 1988). With a correlation coefficient of .285 between intuition and religiousness and a standard error of .096, the confidence interval of (.092, .478) did not include 1. The variance extracted test involves comparing the square of the correlation between the two factors to the variance extracted estimates for each factor. If both variance extracted estimates are greater than the squared correlation, the factors demonstrate discriminant validity (Hatcher, 1994). The square of the correlation between intuition and religiousness was .081. The variance extracted estimates each exceeded .50. Thus, intuition and religiousness demonstrated discriminant validity.

All of these findings support the reliability and validity of the constructs and their indicators. Thus, the measurement model in Figure 3 was accepted as the final measurement model for the first model, the confirmatory model.

Structural Model

The initial theoretical model is presented in Figure 4. The analysis of this model can be described as a latent variable path analysis or as structural equation modeling. The goodness of fit indices for this model (M_1) are presented in Table 8. The model showed acceptable fit with NNFI and CFI both in excess of .90. However, some of the normalized residuals were relatively large (above 2, with some residuals above 3). In addition, five of the path coefficients were not statistically significant. The standardized path coefficients from the initial theoretical model are presented in Table 10.

A chi-square difference test can be performed to test the nomological validity of a theoretical model compared to the measurement model. If the test is not statistically

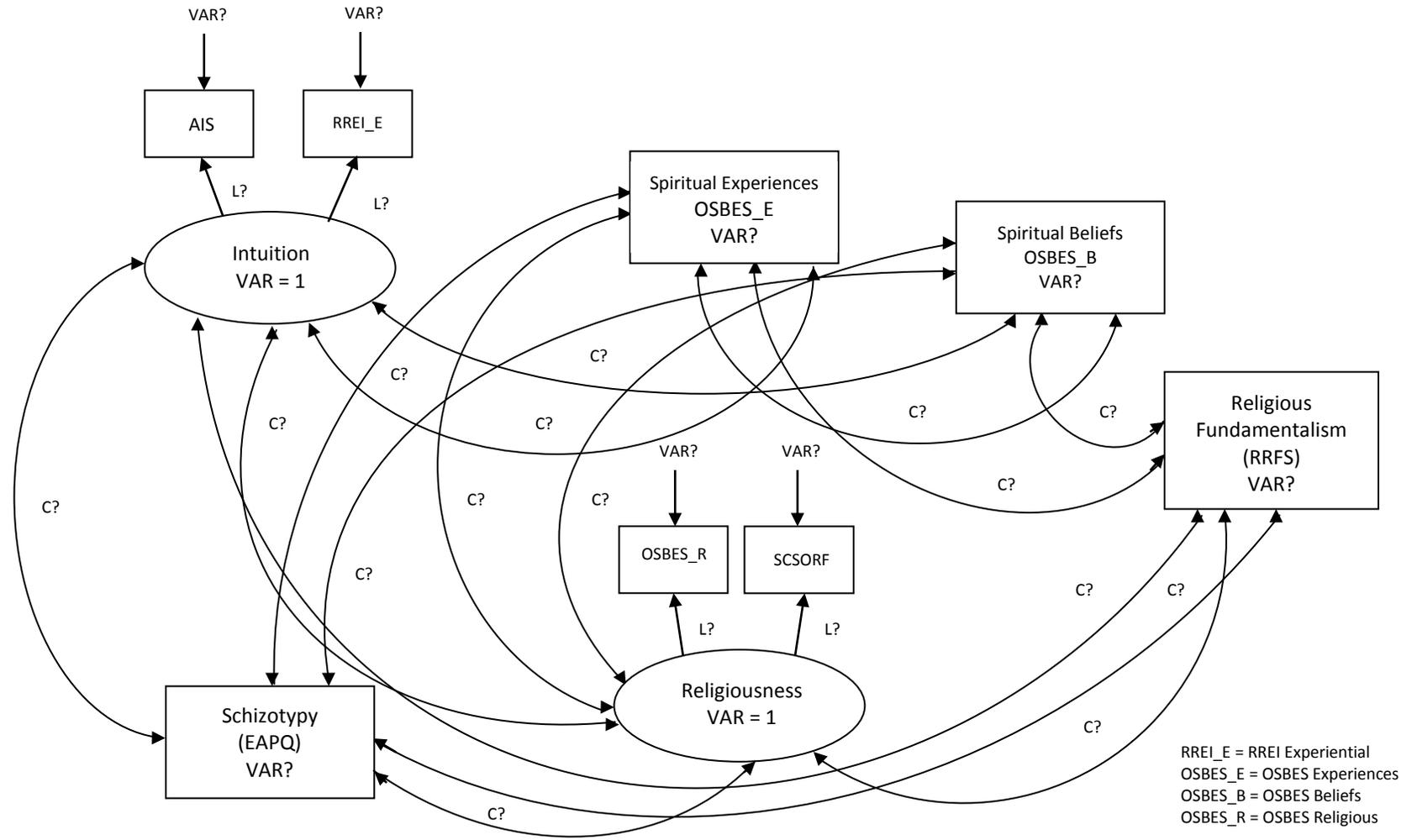


Figure 3. Final Measurement Model, after Identification of All Parameters to be Estimated

significant, the theoretical model is considered successful in accounting for the observed relationships between the variables (Anderson & Gerbing, 1988). The chi-square difference between the theoretical model and the measurement model was 20.58 with 5 degrees of freedom. The critical chi-square value with 5 degrees of freedom is 20.515 (p -value $< .0001$), so this chi-square difference was significant indicating that the theoretical model was unsuccessful in accounting for the relationships between the constructs and between the constructs and the manifest endogenous variables.

These results indicated that the initial theoretical model did not fit the data well, so a specification search was performed to find a better-fitting model despite the small relatively sample size ($N = 122$). With small samples there is the danger of forcing a model to fit the data that results in a model that is not generalizable to other samples or the population (Hatcher, 1994). Thus, the search for a better-fitting model began with identifying parameters that could be dropped without hurting the fit of the model, since it is generally safer to drop parameters rather than add new ones when modifying models (Bentler & Chou, 1987).

Wald tests from the PROC CALIS procedure were used to identify paths that could potentially be deleted. These tests indicated that the following paths could be removed from the model: from schizotypy to spiritual experiences, from schizotypy to religiousness, from intuition to schizotypy, and from intuition to religiousness. These paths were deleted one at a time and the resulting revised models were labeled M_{r1} , M_{r2} , M_{r3} , and M_{r4} , respectively. Each time a path was deleted, the goodness of fit indices were examined and indices of parsimony were calculated. Parsimony refers to the simplicity of

a model and is based on a principle that states, when several explanations are equally satisfactory, the preferred one is the one that is the least complicated (Hatcher, 1994).

Some of these indices are for the combined model, while others measure only the structural portion of the model; however, with all of these measures of parsimony, higher values represent a more parsimonious model (Hatcher, 1994). These models and their indices are presented in Table 8. The standardized path coefficients from the revised models are presented in Table 10 with those from the initial theoretical model. In addition to these measures, a chi-square difference test was performed with each revision to the model. Revised models were compared to both the measurement and initial theoretical models. With these tests, a finding of nonsignificance is an indication of a better fitting model (Hatcher, 1994).

With all of these models and indices it is often difficult to know which model is best. Hatcher (1994, p. 393) identifies characteristics of a theoretical model which displays an ideal fit. They are:

- The p value of the model chi-square is not significant ($p < .05$), with values closer to 1 being better.
- The ratio of the chi-square to the degrees of freedom should be less than 2
- The CFI and NNFI should both exceed .90; the closer to 1, the better.
- The absolute value of the t values from the t-test for each factor loading and path coefficient should exceed 1.96, and the standardized factor loadings should be nontrivial in size—they should exceed .05 in absolute value.

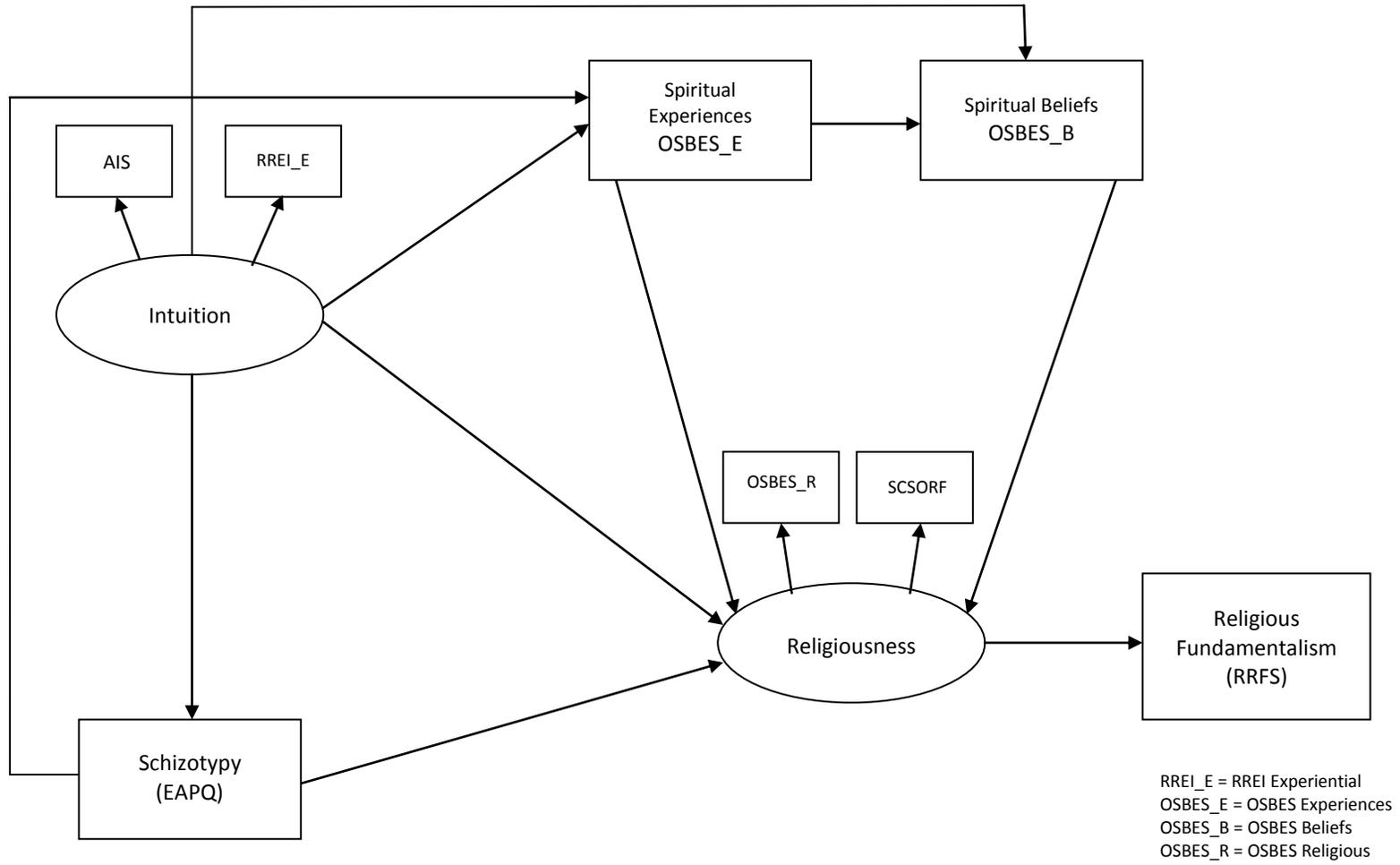


Figure 4. Initial Theoretical Model

- The R^2 values for the latent endogenous variables should be relatively large, compared to what is typically obtained for these variables in research.
- The distribution of normalized residuals should be symmetrical, centered around zero, and relatively few (or none) that exceed 2.0 in absolute value.
- The combined model should demonstrate relatively high levels of parsimony and fit, as indicated by the PR and PNFI.
- The structural portion of the model should demonstrate high levels of parsimony and fit, as verified by the RNFI, RPR, and RPF1.
- A chi-square difference test should reveal no significant difference between the theoretical and the measurement model.

These characteristics, which measure ideal fit, are not very often all satisfied, but were used in this study to identify the best theoretical model. Most of these characteristics are quantified with the indices and statistics presented in Tables 6 and 8. Though revised model one (M_{r1}) and revised model two (M_{r2}) each passed both of the chi-square difference tests, M_{r2} displayed the better measures of fit and parsimony. Therefore, it was chosen as the best fitting and final theoretical model.

R-squared (R^2) values specify the percent of variance in each of the endogenous variables that is accounted for by its direct antecedents (Hatcher, 1994). R^2 values for this model showed that intuition accounted for 27% of the variance in spiritual experiences; intuition and spiritual experiences accounted for 53% of the variance in spiritual beliefs; intuition, spiritual experiences and spiritual beliefs accounted for 51% of the variance in religiousness; religiousness accounted for 36% of the variance in religious

fundamentalism; and intuition accounted for 2% of the variance in schizotypy. The final theoretical model with the standardized path coefficients is presented in Figure 5.

Summary

The predictions set forth by the researcher in Chapter 3 were generally supported in the final structural equation model. As predicted, higher levels of intuition led to higher levels of spiritual experiences. Spiritual experiences led to higher levels of spiritual beliefs. Higher levels of both spiritual experiences and spiritual beliefs led to higher levels of religiousness. Higher levels of religiousness led to higher levels of religious fundamentalism.

Hypothesis 1

The first hypothesis stated that intuition would influence spiritual experiences, such that as the level of intuition increases, the level of spiritual experiences would increase ($H1_0: \rho = 0$, $H1_A: \rho > 0$). The standardized path coefficient from intuition to spiritual experiences was .522 with a p-value $< .001$, thus the null hypothesis was rejected and it was concluded that as the level of spiritual experiences increases, the level of intuition increases.

Hypothesis 2

It was also hypothesized that intuition would influence spiritual beliefs, such that as the level of intuition increases, the level of spiritual beliefs would also increase ($H2_0: \rho = 0$, $H2_A: \rho > 0$). With $\rho = .149$ and associated t-value = 1.8125, the null hypothesis could not be rejected.

Hypothesis 3

The third hypothesis stated that spiritual experiences would influence spiritual beliefs, such that as the level of spiritual experiences increased, the level of spiritual beliefs would also increase (H3₀: $\rho = 0$, H3_A: $\rho > 0$). The standardized path coefficient was .638 with $p < .001$, thus the null hypothesis was rejected in favor of the alternative hypothesis, that higher levels of spiritual experiences lead to higher levels of spiritual beliefs.

Hypothesis 4

It was predicted that intuition would also influence religiousness, such that as the level of intuition increased, the level of religiousness would decrease (H4₀: $\rho = 0$, H4_A: $\rho < 0$). With $\rho = -.140$ and $t\text{-value} = -1.6458$ the null hypothesis could not be rejected. While there was no statistical significance in this finding, that the standardized path coefficient was negative gives some practical significance to the hypothesis.

Hypothesis 5

The fifth hypothesis stated that spiritual experiences would influence religiousness, such that as the level of spiritual experiences increased, the level of religiousness would increase (H5₀: $\rho = 0$, H5_A: $\rho > 0$). The alternative hypothesis was supported with the standardized path coefficient = .262 with $p\text{-value} < .01$.

Hypothesis 6

Another prediction of this research was that spiritual beliefs would influence religiousness, such that as the level of spiritual beliefs increased, the level of

religiousness would increase ($H_{6_0}: \rho = 0$, $H_{6_A}: \rho > 0$). With $\rho = .568$ and $p\text{-value} < .001$, the null hypothesis was rejected in favor of the alternative hypothesis.

Hypothesis 7

The next hypothesis stated that religiousness would influence religious fundamentalism, such that as the level of religiousness increased, the level of religious fundamentalism would increase ($H_{7_0}: \rho = 0$, $H_{7_A}: \rho > 0$). The standardized path coefficient from religiousness to religious fundamentalism was .603 with a $p\text{-value} < .001$, thus the level of religious fundamentalism increased as religiousness increased.

Hypothesis 8

It was hypothesized that intuition would influence schizotypy, such that as the level of intuition increased, the level of schizotypy would increase ($H_{8_0}: \rho = 0$, $H_{8_A}: \rho > 0$). The null hypothesis could not be rejected with $\rho = .142$ and the associated $t\text{-value} = 1.4642$.

Hypothesis 9

It was further hypothesized that schizotypy would influence spiritual experiences, such that as the level of schizotypy increased, the level of spiritual experiences would increase ($H_{9_0}: \rho = 0$, $H_{9_A}: \rho > 0$). This null hypothesis could not be rejected, as this causal path was removed from the final theoretical model.

Hypothesis 10

The final hypothesis stated that schizotypy would influence religiousness, such that as the level of schizotypy increased, the level of religiousness would decrease ($H_{10_0}: \rho = 0$, $H_{10_A}: \rho < 0$). Like the previous hypothesis, this causal pathway was

removed from the final theoretical model; therefore, this hypothesis was not supported either.

Alternative Model Approach

As mentioned previously, there are three main approaches of going from a theory to a model that can be analyzed with SEM or path analysis with latent variables (Schumacker & Lomax, 2004). The three approaches are 1) the confirmatory approach, 2) the alternative model approach, and 3) the model generating approach. The model generating approach is conducted when the researcher specifies an initial model and then adds or deletes causal pathways in the model to arrive at a best and final model with the objective of finding a model that not only fits the data well, but also has practical and substantive theoretical meaning (Schumacker & Lomax, 2004). Because a model of the relationships between intuition, spirituality, and religiousness was hypothesized from the beginning, the approach employed thus far in this dissertation was the model generating approach.

The proposed model makes assumptions not only about the causal relationships, but also about the latent constructs being captured by each of the scales. For example, it was proposed, based on previous research and literature reviews, that spiritual experiences could be measured by the MS, AS, WCS (Agentic and Interpersonal Items), and the OSBES (Spiritual Experiences Items). Given that the theoretical model proposed

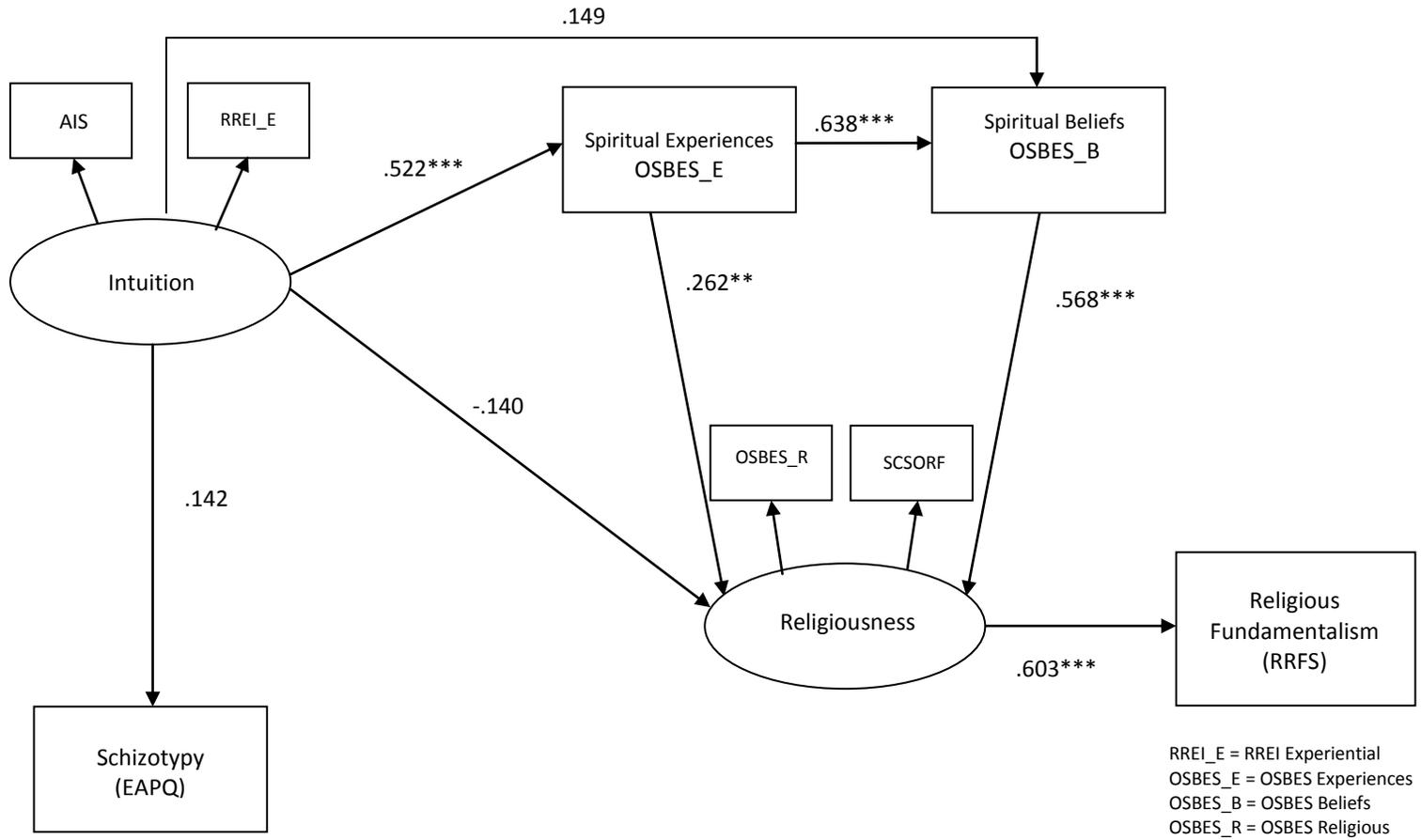


Figure 5. Final Theoretical Model: Standardized Path Coefficients Appear on Arrows, * $p < .05$; ** $p < .01$; *** $p < .001$

in this dissertation has not been previously tested, despite the support of the research predictions presented thus far in the results, the model generating approach alone does not fully demonstrate the validness of the original hypothesized theory. One way to confirm or disprove the soundness of the theory is to test alternate theories by using the alternative model approach to structural equation modeling.

Exploratory Factor Analysis

The alternative model approach can be guided in part by an exploratory factor analysis to examine the relationships between the scales which might suggest alternative groupings of the scales and constructs than was proposed in the original model. The fifteen scored scales or subscales used in this research were subjected to an exploratory factor analysis using squared multiple correlations as prior communality estimates. The principal factor method was used to extract the factors, and the factor solution was rotated using a promax (oblique) rotation. Four factors were retained using the variance proportion criterion.

A scale was said to load on a given factor if the factor loading from the rotated factor pattern was .40 or greater for that factor and was less than .40 for the other factors. Using these criteria, five scales were found to load on the first factor: RRFS, OSBES (Experiences), OSBES (Beliefs), OSBES (Religiousness), and SCSORF. Five scales also loaded on the second factor: WCS (Agentic), WCS (Interpersonal), WCS (Analysis/Interpretation), AIS, and RREI (Experiential). Four scales loaded on the third factor: AS, MS, MBTI (Sensing-Intuition), and NEO. Two scales loaded on the fourth factor: WCS (Interpersonal) and EAPQ. WCS (Interpersonal) loaded on factors two and

four and was therefore not used to identify the factors. Factor one appeared to be measuring religiousness and spirituality; factor two, intuition; factor three, openness or disposition; and factor four, schizotypy.

Alternative Models

These results along with theory based on the literature review for this dissertation suggested new groupings of the scales and constructs. For example, intuition had been thus far measured by the AIS, MBTI (Sensing-Intuition), RREI (Experiential) and the NEO. Using the results of the exploratory factor analysis along with the investigator's theory, an alternate way to measure intuition was discovered: with the AIS, RREI (Experiential), WCS (Agentic), and WCS (Interpersonal). The results from the factor analysis also suggested grouping spirituality and religiousness. A new factor, openness or disposition, also emerged. Using theory and the exploratory factor analysis ten alternative models were developed using all of the data elements used to test the original hypothesized theory. After these ten models were examined with respect to the literature to ensure each could be theoretically justified, only five alternative models were selected for reporting. These five alternative models are presented in Table 12.

Factors for these alternative models were created as follows. Several factors were created by eliminating an item(s) from a factor from the original measurement model with the idea that maybe that measure was not a good measure for that factor and perhaps fit somewhere else better. For all of the alternative models the AIS and RREI_E were retained as part of the intuition factor because these two exhibited the highest correlation (.501), while the AIS correlated less with the MBTI (.207) and the NEO (.165), which

were dropped from the intuitive factor in the alternative models. The AIS and RREI_E both contain a number of items having to do with decision making, while the MBTI is more about interest in new possibilities and the NEO is more about feelings, imagination, and interest in trying new things. Alternative models two through five added the WCS_A and WCS_I to the factor of intuition because items from these scales measure psychic experience, decision making, and sensitivity to emotions, all of which could be considered aspects of intuition.

Spiritual experiences originally included the AS, MS, OSBE_E, WCS_A, and WCS_I. Since items from the WCS_A and WCS_I were not specifically religious in nature, but could be interpreted that way or not depending on the individual's perspective that is experiencing the weird coincidences, it was thought that they did not necessarily belong with spiritual experience. The spirituality construct of model one was composed of the OSBES_B, the OSBES_E, the MS, and the WCS_AI. This construct did not differentiate between experience and belief, the idea being that maybe they are not really separable. The MS was the next to fall out of this factor since it is not decidedly spiritual, but is also open to interpretation as potentially spiritual or not by the person experiencing it. Spiritual beliefs remained the same throughout the models, except for model one in which it was combined with spiritual experience. It was consistently defined as OSBES_B and WCS_AI, scales that are decidedly spiritual in nature, measuring things such as belief in God, angels, prayer, and the spirituality of meaningful coincidences.

Religiousness in the original model was defined by the OSBES_R and the SCSORF, by someone reporting that they are religious and by being committed to that

belief. Model one added the RRFS to religiousness to create a more traditional type of religiousness that included traditional religious beliefs and strong adherence to them with the thought that religiously fundamentalistic individuals would also likely be strong in religious faith. Subsequent models grouped self-report of religiousness (OSBES_R) with religious fundamentalism (RRFS) since religiously fundamentalistic individuals would seem likely to describe themselves as also being highly religious. It was thought that religious faith could be seen as a separate construct such that level of religious commitment is separate from beliefs, the idea with which the SCSORF scale was developed.

A new factor called Contemplative emerged. It was named this since it describes someone who is meditative and thoughtfulness, especially within religious traditions. It was defined by the AS, MBTI_SN, and NEO in the second model as a sort of openness and interest in new things coupled with a heightened sense of awareness. In model five it was defined by the AS, MS, and MBTI_SN as an interest in new possibilities and heightened states of consciousness and emotion.

Openness was defined in a number of ways. In model one it was a broad understanding which included openness to attending to stimuli internally and externally (AS), openness to new possibilities (MBTI_SN), openness to feelings, music, art, and new thoughts and experiences (NEO), and openness to seeing connections between one's inner world and outer world (WCS_A and WCS_I). This definition proved to be too broad. For model three, the weird coincidence items were removed because they stood out as being different from the other types of openness. In model four the MS was added

with the thought that mystical experience was a type of openness to profound experience and to the divine. Ultimately only the NEO was used to define openness in model five since these other measures proved to fit better with other constructs. Openness was ultimately best understood as a narrower construct, defined solely by the NEO.

In all models schizotypy was defined in the same way, by the EAPQ. There was no theory, nor statistical evidence to support grouping others manifest variables with the EAPQ.

PROC CALIS was used to determine how well the data fit each of these new measurement models. Fit statistics for the five models are presented in Table 13. When models are nested, they are often compared with chi-square difference tests. When models are not nested, chi-square difference tests should not be used to compare them. The RMSEA, ECVI, AIC, NNFI, and CFI statistics are often used to compare models that are not nested (Tanaka, 1993). According to Kelloway (1998), RMSEA values less than .10 represent a good fit of the data, while values below .05 represent a very good fit. Moreover, well-fitting models should have CFI and NNFI values above .90. The ECVI and AIC are relative measures such that the model with the smaller value of each has the better fit (Kelloway, 1998). Based on these indices, alternative model five (M_{A5}) was the best fitting alternative model and it was retained for further analysis and is referred to as the final alternative model henceforth.

Confirmatory Factor Analysis

The data used for the alternative model was the same data used for the confirmatory factor analysis for the original hypothesized model. Having already met the

necessary conditions as stated by Hatcher (1995), a confirmatory factor analysis was performed using the alternative model.

Alternative Measurement Model

The alternative model was a non-standard model with four latent constructs and four manifest variables. The four latent constructs were 1) intuition, measured by AIS, RREI_E, WCS_A, and WCS_I; 2) spiritual beliefs, measured by OSBES_B and WCS_AI; 3) religiousness, measured by OSBES_R and RRFS; and 4) contemplative, measured by AS, MS, and MBTI_SN. The four manifest variables were spiritual experiences (OSBES_E), faith (SCSROF), openness (NEO), and schizotypy (EAPQ).

The measurement model for the alternative model was estimated using the maximum likelihood method. Several of the fit indices indicated the fit of the model could potentially be improved. The chi-square value for the model was statistically significant, χ^2 (66, N = 122) = 139.38, p-value < .0001. Values of the other indices were: GFI = 0.8758, RMSEA = 0.0959, NNFI = 0.8747. The rank order of the ten largest normalized residuals showed that the RREI_E could be removed from the model. The RREI_E was used to measure the intuition construct, which was measured by three other indicator variables. A chi-square difference test demonstrated that there was a statistically significant (p < .001) decrease in the chi-square value after removing RREI_E, as compared to the degrees of freedom. This is desired when making modifications to a measurement model (Hatcher, 1994).

Since the RREI_E was removed, all of the original alternative models were re-estimated. The fit statistics for the five models after having removed the RREI_E from all

models are presented in Table 14. Alternative model five still exhibited the best fit after removing the RREI_I from all of the models.

The goodness of fit indices for the final (modified) alternative measurement model (M_m) are presented in Table 15. These indices show that the final measurement model had an acceptable fit, according to Bentler and Bonett (1980), with a non-normed-fit index (NNFI) and comparative fit index (CFI) both greater than .90.

The standardized factor loadings for the predictor variables from the modified alternative measurement model are presented in Table 16. The t-values from the t-tests used to test the null hypotheses that the coefficients are equal to zero ranged from 6.95 to 11.10, indicating that all factor loadings were significant with $\alpha < .001$. This supports the convergent validity of the indicators (Anderson & Gerbing, 1988).

The reliability of the indicators and the composite reliability of each of the constructs are also presented in Table 16. The four constructs in the model displayed acceptable reliability. The coefficients were all above the recommended level of .70, with values of .784 for intuition, .766 for spiritual beliefs, .733 for religiousness, and .760 for contemplative (Hatcher, 1994). The variance extracted estimates also all exceed the recommended value (.50), with .551 for intuition, .622 for spiritual beliefs, .579 for religiousness, and .520 for contemplative.

The discriminant validity of the four constructs was supported using the confidence interval test and the variance extracted test. The correlation coefficients with their confidence intervals and squares, along with the variance extracted estimates are presented in Table 17. The confidence interval test is performed by calculating a

confidence interval around the correlation coefficient between two factors. None of the confidence intervals included one, and all of the variance extracted estimates were greater than the squares of the respective correlations. Thus, the factors demonstrated discriminant validity (Hatcher, 1994).

All of these findings support the reliability and validity of the constructs and their indicators. Thus, the modified alternative measurement model was accepted as the final measurement model.

Structural Model

The initial theoretical model is presented in Figure 6. The goodness of fit indices for this model (M_t) are presented in Table 15. Several results indicated that the initial theoretical model did not fit the data well. The NNFI and CFI were both slightly below .90, eight of the path coefficients were not statistically significant, and the chi-square difference between the theoretical model and the measurement model was statistically significant, suggesting that the theoretical model was unsuccessful in accounting for the relationships between the constructs and between the constructs and the manifest endogenous variables. Therefore, a specification search was performed to find a better-fitting model. The standardized path coefficients from the initial theoretical model are presented in Table 18, and the chi-square difference tests are presented in Table 19. The search for a better-fitting model began with identifying parameters that could be dropped without hurting the fit of the model. Wald tests from the PROC CALIS procedure were used to identify paths that could potentially be deleted. These tests

indicated that the following paths could be removed from the model: from schizotypy to spiritual experiences, from schizotypy to religiousness, from intuition to spiritual beliefs, from intuition to openness, from spiritual beliefs to religiousness, and from intuition to religiousness. These paths were deleted one or two at a time and the resulting revised models were labeled M_{r1} - M_{r5} , respectively. Each time a path was deleted, the goodness of fit indices were examined and indices of parsimony were calculated. The models and their goodness of fit and parsimony indices are presented in Table 15. The standardized path coefficients from the revised models are presented in Table 18. A chi-square difference test was performed with each revision to the model. See Table 19. Revised models were compared to both the measurement and initial theoretical models. With these tests, a finding of nonsignificance indicates the revised model is a better fitting model (Hatcher, 1994).

Once the Wald tests revealed no additional causal paths between constructs that could be deleted without affecting the model's fit, the Lagrange multiplier tests were reviewed to identify new causal paths that should be added to the model. Lagrange multiplier tests estimated that the model chi-square could be reduced if causal pathways were added from schizotypy to openness, openness to religiousness, and from openness to faith. Since the researcher felt these additions could be justified on theoretical grounds, the pathways were added and the resulting model, M_{r6} , was estimated. The fit indices are presented in Table 15, and the path coefficients are presented in Table 18. Furthermore, a chi-square difference test comparing M_{r6} and M_{r5} revealed a significant difference value of $158.78 - 136.14 = 22.64$ ($df = 2, p < .001$). This finding showed that

revised model six provided a statistically significant better fit than revised model five provided, justifying the addition of the three new pathways. A chi-square difference test was also used to compare the fit of M_{r6} to the measurement model. See Table 19. A nonsignificant chi-square ($p < .001$) indicated that the causal relationships described in revised model six were successful in accounting for the observed relationships between the constructs. The Wald test for M_{r6} suggested that the path from contemplative to religiousness could be deleted; however, the model without this causal pathway (M_{r7}) did not prove to be as good a model as M_{r6} in terms of the fit and the chi-square difference tests.

Given these findings, and the comparisons of the measures of fit and parsimony, M_{r6} was chosen as the best fitting and final alternative theoretical model. R^2 values for this model showed that intuition and contemplative accounted for 35% of the variance in spiritual experiences; spiritual experiences accounted for 61% of the variance in spiritual beliefs; spiritual beliefs and openness accounted for 63% of the variance in faith; faith, contemplative, and openness accounted for 99% of the variance in religiousness; intuition and openness accounted for 78% of the variance in contemplative; intuition accounted for 6% of the variance in schizotypy; and schizotypy accounted for 8% of the variance in openness. The final alternative theoretical model with the standardized path coefficients is presented in Figure 7.

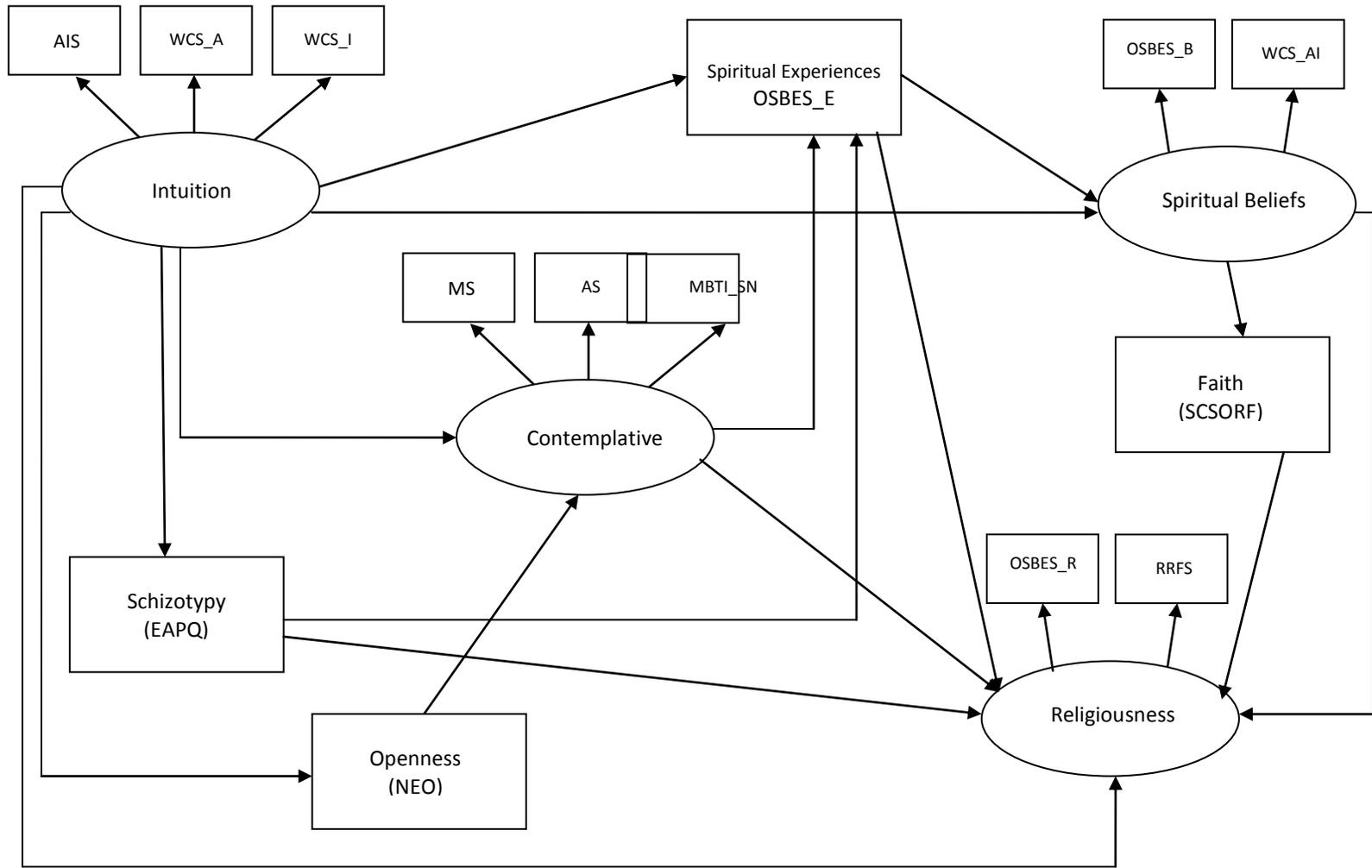


Figure 6. Initial Alternative Theoretical Model (M_{r6})

Paths were then reversed one by one, gradually reversing a number of pathways to test the alternative hypotheses that spiritual experience leads to intuition that spiritual belief leads to spiritual experience, that schizotypy leads to intuition, and that contemplative leads to intuition. This was done to ensure that our ideas about the direction of causation were in fact accurate and that the data was not better accounted for by reversing the causal pathways. Pathways were only reversed in those instances in which it could theoretically make sense. The fit was not harmed by reversing the arrow between intuition and spiritual experience. The model fit was reduced in all other instances. These results are summarized in Table 20.

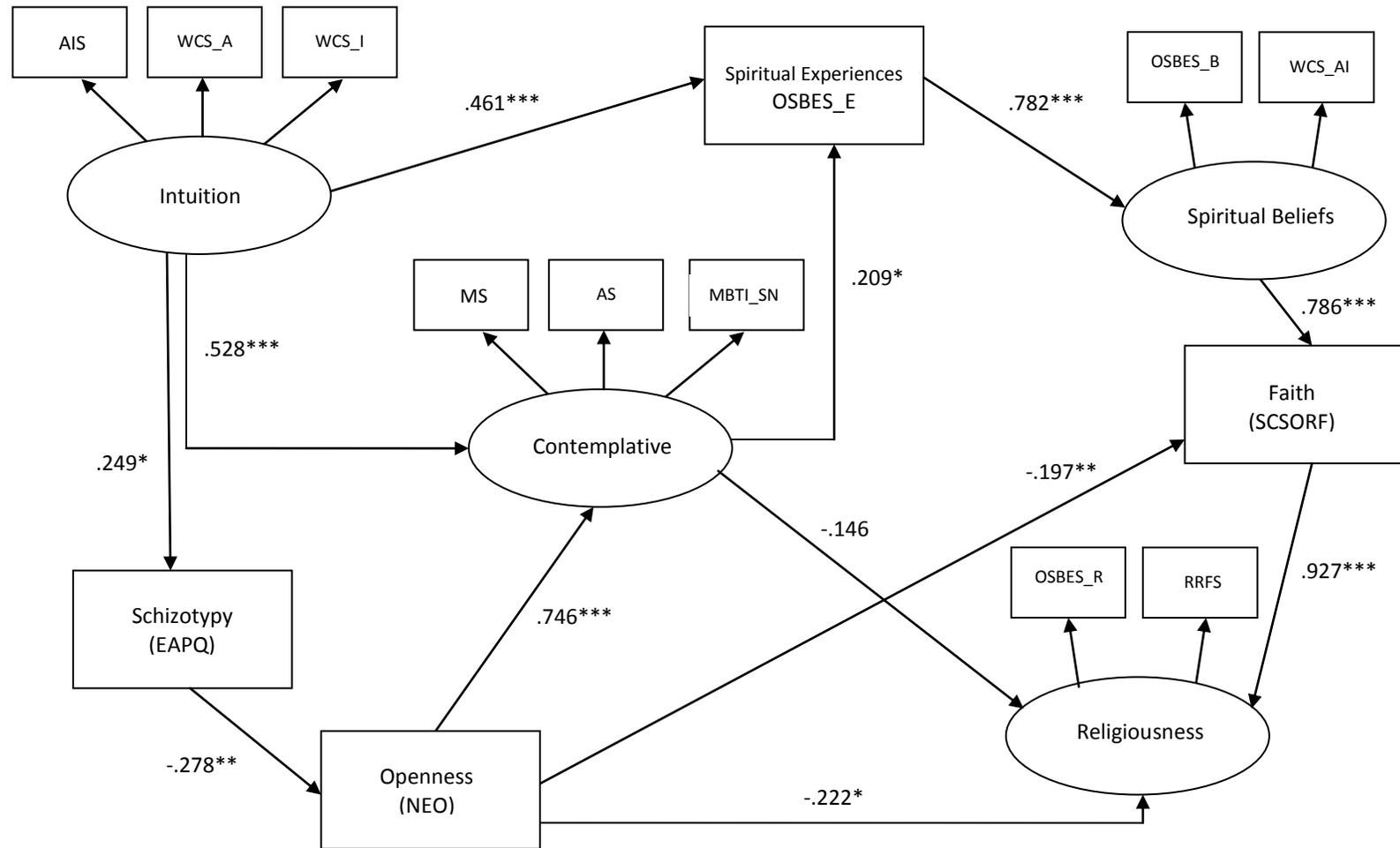


Figure 7. Final Alternative Theoretical Model (M_{r6}): Standardized Path Coefficients Appear on Arrows, *p<.05; **p<.01; ***p<.001

Table 1. Attig Intuition Scale Items and Corresponding Factor Loadings from the Rotated Factor Pattern Matrix and Factor Structure Matrix, Decimals Omitted

<u>Factor Pattern</u>			<u>Factor Structure</u>			Item
1	2	3	1	2	3	
17	-9	49	31	19	51	1.If logic tells me one thing and my intuition tells me another I go with what my intuition tells me.
-1	-14	66	17	13	59	2. My first impressions of people are always accurate.
-28	26	38	-3	31	39	3. I can read other's emotions easily and accurately.
-5	8	36	11	21	38	4. When I fall in love it's usually an experience of love at first sight.
-11	11	38	7	23	38	5. I can accurately predict the outcomes of my relationships.
1	49	11	25	55	33	6. Sometimes when I meet someone for the first time I feel as if I already know them.
-11	20	44	13	35	49	7. I can always tell when people are not getting along well even if they try to keep it a secret.
15	2	31	27	21	37	8. I can get an accurate sense of who someone is just by seeing a photograph of them.
2	31	40	29	49	54	9. When I know something in my gut I often have a physical sensation that accompanies this "knowing" such as a chill up my spine or a knot in my stomach.
36	35	13	54	55	41	10. I often know who is calling on the phone even before I get to the phone (without looking at caller ID or having a special ring tone.)

<u>Factor Pattern</u>			<u>Factor Structure</u>			Item
1	2	3	1	3	3	
60	-1	21	68	32	43	11. Sometimes I have a bad mood for no known reason and later find out that at that same point in time something bad was happening to someone I care about.
75	-21	4	68	11	22	12. Sometimes I dream about things before they happen.
87	-3	-9	82	28	21	13. Sometimes I dream about things which are actually happening at a distance.
74	-2	7	75	30	33	14. Sometimes I dream about someone I haven't seen for a long time and then that person ends up contacting me the next day.
23	5	57	46	38	67	15. My intuition is always accurate.
4	-3	60	25	25	60	16. For important decision in life I lead with my heart, not my head.
0	68	10	31	72	39	17. Sometimes I know what someone is thinking even before they speak.
-11	76	-3	18	71	26	18. Sometimes I feel other's emotions as if they were my own.
1	79	-12	28	74	22	19. Sometimes I feel other's physical pains as if they were my own.
68	19	-23	68	37	11	20. Sometimes I dream about someone I have never met and then meet them shortly afterwards.
35	52	-5	54	64	30	21. I can often sense when someone is feeling ill even if there are no obvious symptoms.
51	24	-8	58	42	22	22. I often know when a woman is pregnant before she tells people that she is pregnant.
12	37	26	37	53	46	23. I can always detect when someone is telling a lie.

<u>Factor Pattern</u>			<u>Factor Structure</u>			Item
1	2	3	1	3	3	
30	35	18	50	54	43	24. I can often tell when someone's spouse or boyfriend/girlfriend is cheating on him or her.
21	33	25	43	52	46	25. Sometimes I get a bad feeling about someone I've just met and later learn that this person is in fact dangerous or untrustworthy in some way.

Factors: 1-Premonitions/psychic tendencies, 2-Intuition about others, 3-Intuitive decision making

Table 2. Correlations between the AIS Items and Constructs

Item	Premonitions /psychic tendencies (alpha=.84)	Intuition about others (alpha=.79)	Intuitive decision making (alpha=.73)
11. Sometimes I have a bad mood for no known reason and later find out that at that same point in times something bad was happening to someone I care about.	.729**	.338**	.468**
12. Sometimes I dream about things before they happen.	.747**	.142	.239**
13. Sometimes I dream about things which are actually happening at a distance.	.834**	.291**	.269**
14. Sometimes I dream about someone I haven't seen for a long time and then that person ends up contacting me the next day.	.806**	.319**	.337**
20. Sometimes I dream about someone I have never met and then meet them shortly afterwards.	.731**	.388**	.133
22. I often know when a woman is pregnant before she tells people that she is pregnant.	.646**	.423**	.287**
6. Sometimes when I meet someone for the first time I feel as if I already know them.	.252**	.668**	.329**

Item	Premonitions /psychic tendencies (alpha=.84)	Intuition about others (alpha=.79)	Intuitive decision making (alpha=.73)
17. Sometimes I know what someone is thinking even before they speak.	.286**	.763**	.393**
18. Sometimes I feel other's emotions as if they were my own.	.195*	.792**	.324**
19. Sometimes I feel other's physical pains as if they were my own.	.284**	.785**	.275**
21. I can often sense when someone is feeling ill even if there are no obvious symptoms.	.528**	.689**	.336**
1. If logic tells me one thing and my intuition tells me another I go with what my intuition tells me.	.289**	.199*	.663**
2. My first impressions of people are always accurate.	.152	.090	.627**
7. I can always tell when people are not getting along well even if they try to keep it a secret.	.127	.310**	.511**

Item	Premonitions /psychic tendencies (alpha=.84)	Intuition about others (alpha=.79)	Intuitive decision making (alpha=.73)
9. When I know something in my gut I often have a physical sensation that accompanies this “knowing” such as a chill up my spine or a knot in my stomach.	.259**	.469**	.659**
15. My intuition is always accurate.	.443**	.376**	.738**
16. For important decision in life I lead with my heart, not my head.	.242**	.277**	.709**

*p < .05, **p < .01, N = 123

Table 3. Bivariate correlations between factors on the Attig Intuition Scale

	Premonitions/psychic tendencies	Intuition about others	Intuitive decision making
Premonitions/psychic tendencies	1	.415***	.389***
Intuition about others	—	1	.445***
Intuitive decision making	—	—	1

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

Table 4. Descriptive Statistics, Measures of Normality and Cronbach's Alphas for Scales

Latent Variable	Scale	Range	M	SD	Skewness	Kurtosis	Alpha
Intuition	AIS	42-149	96.61	23.16	-0.05	-0.61	0.89
	MBTI_SN	1-26	15.98	6.50	-0.62	-0.44	0.89
	NEO	123-228	172.03	22.18	0.10	-0.51	0.90
	RREI_E	30-100	68.94	13.28	-0.07	0.29	0.92
Spiritual Experiences	AS	1-34	19.72	7.20	-0.39	-0.20	0.88
	MS	59-160	108.93	23.36	-0.07	-0.58	0.91
	OSBES_E	5-35	19.09	8.34	0.07	-0.95	0.80
	WCS_A	5-24	13.29	4.06	0.30	0.09	0.76
	WCS_I	7-29	17.31	4.58	0.33	-0.50	0.77
Spiritual Beliefs	OSBES_B	10-42	31.08	7.71	-0.88	0.15	0.84
	WCS_AI	6-30	19.50	5.03	-0.25	-0.13	0.76
Religiousness	OSBES_R	1-7	4.11	2.33	-0.13	-1.62	
	SCSORF	10-40	25.08	9.01	0.02	-1.01	0.96
Schizotypy	EAPQ	0-13	4.18	2.93	1.34	1.53	0.73
Religious Fundamentalism	RRFS	12-100	45.34	20.70	0.50	-0.26	0.89

N = 122, MBTI_SN = MBTI Sensing Intuition, RREI_E = RREI Experiential, OSBES_E = OSBES Experiences, OSBES_B = OSBES Beliefs, WCS_A = WCS Agentic, WCS_I = WCS Interpersonal, WCS_AI = WCS Analysis/Interpretation, OSBES_R = OSBES Religious

Table 5. Bivariate Correlations between Scores from All Scales

	AIS	MBTI _SN	NEO	RREI _E	AS	MS	OSBES _E	WCS _A	WCS _I	OSBES _B	WCS _AI	OSBES _R	SCSORF	EAPQ	RRFS
AIS	1	.207*	.165	.501**	.450**	.359**	.498**	.480**	.627**	.453**	.570**	.117	.256**	.156	.078
MBTI_SN	—	1	.542**	.136	.504**	.397**	.201*	.195*	.082	.089	.116	-.188*	-.102	.035	-.288**
NEO	—	—	1	.327**	.639**	.494**	.200*	.175	.022	.204*	.264**	-.202*	-.022	.278**	-.432**
RREI_E	—	—	—	1	.333**	.251**	.263**	.257**	.163	.386**	.518**	.086	.189*	-.091	.013
AS	—	—	—	—	1	.601**	.404**	.355**	.362**	.307**	.384**	-.146	.097	-.007	-.200*
MS	—	—	—	—	—	1	.461**	.298**	.241**	.359**	.390**	.010	.207*	.008	-.013
OSBES_E	—	—	—	—	—	—	1	.349**	.378**	.716**	.523**	.406**	.595**	.056	.298**
WCS_A	—	—	—	—	—	—	—	1	.544**	.323**	.509**	.134	.283**	.123	-.005
WCS_I	—	—	—	—	—	—	—	—	1	.280**	.450**	.127	.212*	.239**	.077
OSBES_B	—	—	—	—	—	—	—	—	—	1	.615**	.495**	.688**	-.163	.367**
WCS_AI	—	—	—	—	—	—	—	—	—	—	1	.326**	.497**	-.065	.247**
OSBES_R	—	—	—	—	—	—	—	—	—	—	—	1	.788**	-.076	.578**
SCSORF	—	—	—	—	—	—	—	—	—	—	—	—	1	-.060	.602**
EAPQ	—	—	—	—	—	—	—	—	—	—	—	—	—	1	.102
RRFS	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1

*p < .05, **p < .01, N = 122, MBTI_SN = MBTI Sensing Intuition, RREI_E = RREI Experiential, OSBES_E = OSBES Experiences, OSBES_B = OSBES Beliefs, WCS_A = WCS Agentic, WCS_I = WCS Interpersonal, WCS_AI = WCS Analysis/Interpretation, OSBES_R = OSBES Item 1

Table 6. Fit Statistics for the Original (Confirmatory) Modified Measurement Models

Model	Variable Removed	Chi-square	df	RMSEA	ECVI	AIC	NNFI	CFI
M _m		332.63	77	0.1656	3.5681	178.6314	0.6259	0.7257
M _{m1}	AS	257.63	64	0.1581	2.9028	129.6317	0.6632	0.7631
M _{m2}	WCS_I	200.65	52	0.1537	2.3872	96.6497	0.6982	0.7988
M _{m3}	NEO	106.99	41	0.1153	1.5694	24.9935	0.8316	0.8954
M _{m4}	MBTI	78.09	31	0.1120	1.2876	16.0872	0.8617	0.9220
M _{m5}	MS	64.20	22	0.1259	1.1306	20.2021	0.8486	0.9260
M _{m6}	WCS_A	39.52	15	0.1162	0.8671	9.5164	0.8866	0.9527
M _{m7}	WCS_I	18.48	9	0.0933	0.6349	0.4792	0.9316	0.9780

Table 7. Chi-square Difference Tests for the Modified Measurement Models

Model	Variable Removed	Chi-square	df	Chi-square Difference	df Difference	Critical Value $p < .001$	Significant Difference?
M_m		332.63	77				
M_{m1}	AS	257.63	64	74.70	13	34.528	Yes
M_{m2}	WCS_I	200.65	52	131.68	25	52.620	Yes
M_{m3}	NEO	106.99	41	225.34	36	67.985	Yes
M_{m4}	MBTI	78.09	31	254.24	46	81.400	Yes
M_{m5}	MS	64.20	22	268.13	55	93.168	Yes
M_{m6}	WCS_A	39.52	15	292.81	62	102.166	Yes
M_{m7}	WCS_AI	18.48	9	313.85	68	109.791	Yes

Table 8. Goodness of Fit and Parsimony Indices

Model	Combined Model						Structural Model			
	Chi-square	df	NFI	NNFI	CFI	PR	PNFI	RNFI	RPR	RPFI
M ₀ Null model	459.29	28	--	--	--	--	--	--	--	--
M _u Uncorrelated factors	307.03	18	0.332	-0.043	0.33	0.643	0.213	0	1	0
M _t Theoretical model	39.06	14	0.915	0.884	0.942	0.500	0.458	0.945	0.556	0.525
M _{r1} Revised model 1	39.12	15	0.915	0.896	0.944	0.536	0.490	0.948	0.667	0.632
M _{r2} Revised model 2	39.53	16	0.914	0.908	0.945	0.571	0.522	0.950	0.778	0.739
M _{r3} Revised model 3	17.35	10	0.96	0.963	0.982	0.357	0.343	1.007	0.111	0.112
M _{r4} Revised model 4	39.06	14	0.915	0.884	0.942	0.500	0.458	1.000	0.222	0.222
M _m Measurement model	18.48	9	0.960	0.932	0.978	0.321	0.309	1	0	0

N = 122. NFI = normed-fit index; NNFI = non-normed-fit index; CFI = comparative fit index; PR = parsimony ratio; PNFI = parsimonious normed-fit index; RNFI = relative normed-fit index; RPR = relative parsimony ratio; RPFI = relative parsimonious-fit index.

Table 9. Properties of the Final Measurement Model

Construct and Indicators	Standardized Loading	t-value ^a	Reliability	Variance Extracted Estimate
Intuition			.710 ^b	.565
AIS	.909	8.18	.826	
RREI_Experiential	.552	5.58	.304	
Religiousness			.891 ^b	.805
OSBES_Religious	.800	10.29	.640	
SCSORF	.984	14.04	.969	

a All t-tests were significant at p-value < .001.

b Denotes composite reliability.

Table 10. Standardized Path Coefficients

Dependent Variable/ Independent variable	Theoretical Model	Revised Model 1	Revised Model 2	Revised Model 3	Revised Model 4
Spiritual Experiences					
Intuition	.524***	.523***	.522***	.560***	.558***
Schizotypy	-.020				
Spiritual Beliefs					
Intuition	.147	.151	.149	.215*	.210*
Spiritual Experiences	.639***	.637***	.638***	.595***	.598***
Religiousness					
Intuition	-.150	-.152	-.140	-.173	
Spiritual Experiences	.249*	.249*	.262**	.271**	.212*
Spiritual Beliefs	.586***	.587***	.568***	.590***	.534***
Schizotypy	.044	.044			
Schizotypy					
Intuition	.145	.141	.142		
Religiousness					
Fundamentalism					
Religiousness	.607***	.607***	.603***	.604***	.598***

*p < .05, **p < .01, ***p < .001

Table 11. Chi-square Difference Tests

Model	Chi-square	df	Chi-square Difference	df Difference	Critical Value $p < .001$	Significant Difference?
Comparisons to M_m						
M_0 Null model	459.29	28	440.81	19	43.820	Yes
M_u Uncorrelated factors	307.03	18	288.55	9	27.877	Yes
M_t Theoretical model	39.06	14	20.58	5	20.515	Yes
M_{r1} Revised model 1	39.12	15	20.64	6	22.458	No
M_{r2} Revised model 2	39.53	16	21.05	7	24.322	No
M_{r3} Revised model 3	17.35	10	1.13	1	10.828	No
M_{r4} Revised model 4	39.06	14	1.97	2	13.816	No
Comparisons to M_t						
M_{r1} Revised model 1	39.12	15	0.06	1	10.828	No
M_{r2} Revised model 2	39.53	16	0.47	2	13.816	No
M_{r3} Revised model 3	17.35	10	21.71	4	18.567	Yes
M_{r4} Revised model 4	39.06	14	18.61	3	16.266	Yes

Table 12. Alternative Measurement Models

Model	Intuition	Spirituality/ Spiritual Experiences	Spiritual Beliefs	Religious- ness	Religious Fundament -alism	Faith	Contemplative	Openness	Schizotypy
M _m ^a	AIS MBTI_ SN_ NEO RREI_E	<i>Experiences</i> AS MS OSBES_E WCS_A WCS_I	OSBES _B WCS_A I	OSBES_R SCSORF	RRFS				EAPQ
M _{A1}	AIS RREI_E	<i>Spirituality</i> OSBES_B OSBES_E MS WCS_AI		OSBES_R RRFS SCSORF				AS MBTI_S N NEO WCS_A WCS_I	EAPQ
M _{A2}	AIS RREI_E WCS_A WCS_I	<i>Experiences</i> MS OSBES_E	OSBES_ B WCS_AI	OSBES_R RRFS SCSORF			AS MBTI_SN NEO		EAPQ
M _{A3}	AIS RREI_E WCS_A WCS_I	<i>Experiences</i> OSBES_E MS	OSBES_ B WCS_AI	OSBES_R RRFS		SCSORF		AS MBTI_ SN NEO	EAPQ
M _{A4}	AIS RREI_E WCS_A WCS_I	<i>Experiences</i> OSBES_E	OSBES_B WCS_AI	OSBES_R RRFS		SCSORF		AS MS MBTI_ SN NEO	EAPQ

Model	Intuition	Spirituality/ Spiritual Experiences	Spiritual Beliefs	Religious- ness	Religious Fundament -alism	Faith	Contemplative	Openness	Schizotypy
M_{A5}	AIS RREI_E WCS_A WCS_I	<i>Experiences</i> OSBES_E	OSBES_B WCS_AI	OSBES_R RRFS		SCSOR F	AS MS MBTI_SN	NEO	EAPQ

a M_m is the original measurement model developed for testing the hypothesized conceptual model.

Table 13. Fit Comparisons for the Alternative Measurement Models

Model	Chi-square	df	RMSEA	ECVI	AIC	NNFI	CFI
M _m ^a	332.63	77	0.1656	3.5681	178.6314	0.6259	0.7257
M _{mm} ^b	18.48	9	0.0933	0.6439	0.4792	0.9316	0.9780
M _{A1}	319.61	81	0.1560	3.3842	157.6070	0.6681	0.7439
M _{A2}	232.55	76	0.1305	2.7600	80.5518	0.7679	0.8320
M _{A3}	198.02	71	0.1216	2.5699	56.0225	0.7984	0.8637
M _{A4}	179.00	72	0.1108	2.3937	35.0036	0.8325	0.8852
M _{A5}	139.38	66	0.0959	2.1805	7.3826	0.8747	0.9212

a M_m is the original measurement model developed for testing the hypothesized conceptual model.

b M_{mm} is the modified (final) measurement model developed for testing the hypothesized conceptual model.

Table 14. Fit Statistics for the Alternative Measurement Models (Without RREI)

Model	Chi-square	df	RMSEA	ECVI	AIC	NNFI	CFI
M _m ^a	332.63	77	0.1656	3.5681	178.6314	0.6259	0.7257
M _{mm} ^b	18.48	9	0.0933	0.6439	0.4792	0.9316	0.9780
M _{A1}	288.59	69	0.1622	3.0643	150.5391	0.6696	0.7494
M _{A2}	192.89	63	0.1305	2.3865	66.8852	0.7859	0.8518
M _{A3}	158.32	58	0.1196	2.1952	42.3191	0.8204	0.8855
M _{A4}	138.80	59	0.1057	2.1050	20.8015	0.8596	0.9089
M _{A5}	97.59	53	0.0834	1.7876	-8.4129	0.9127	0.9491

a M_m is the original measurement model developed for testing the hypothesized conceptual model.

b M_{mm} is the modified (final) measurement model developed for testing the hypothesized conceptual model.

Table 15. Goodness of Fit and Parsimony Indices for the Modified Alternative Model (M_{A5})

Model	Combined Model						Structural Model			
	Chi-square	df	NFI	NNFI	CFI	PR	PNFI	RNFI	RPR	RPFI
M ₀ Null model	967.42	91	--	--	--	--	--	--	--	--
M _u Uncorrelated factors	660.13	75	0.318	0.190	0.332	0.824	0.262	0	1	0
M _t Theoretical model	152.02	65	0.841	0.858	0.898	0.714	0.601	0.919	0.545	0.501
M _{r1} Revised model 1	152.46	67	0.842	0.868	0.903	0.736	0.620	0.925	0.636	0.589
M _{r2} Revised model 2	152.64	68	0.842	0.871	0.903	0.747	0.629	0.927	0.682	0.632
M _{r3} Revised model 3	154.18	69	0.841	0.872	0.903	0.758	0.637	0.926	0.727	0.673
M _{r4} Revised model 4	154.18	69	0.841	0.872	0.903	0.758	0.637	0.926	0.727	0.673
M _{r5} Revised model 5	158.78	71	0.836	0.872	0.900	0.780	0.652	0.921	0.818	0.753
M _{r6} Revised model 6	136.14	69	0.859	0.899	0.923	0.758	0.652	0.959	0.727	0.697
M _{r7} Revised model 7	138.71	70	0.857	0.898	0.922	0.769	0.659	0.956	0.773	0.739
M _m Measurement model	97.59	53	0.899	0.913	0.949	0.582	0.524	1	0	0

N = 122. NFI = normed-fit index; NNFI = non-normed-fit index; CFI = comparative fit index; PR = parsimony ratio; PNFI = parsimonious normed-fit index; RNFI = relative normed-fit index; RPR = relative parsimony ratio; RPFI = relative parsimonious-fit index.

Table 16. Properties of the Modified Alternative Measurement Model (M_{A5})

Construct and Indicators	Standardized Loading	t-value ^a	Reliability	Variance Extracted Estimate
Intuition			.784 ^b	.551
AIS	.843	10.52	.710	
WCS_Agentic	.632	7.22	.400	
WCS_Interpersonal	.738	8.83	.545	
Spiritual Beliefs			.766 ^b	.622
OSBES_Beliefs	.847	10.91	.717	
WCS_Analysis/Interpretation	.726	8.91	.506	
Religiousness			.733 ^b	.579
OSBES_Religious	.808	10.20	.652	
RRFS	.712	8.68	.506	
Contemplative			.760 ^b	.520
AS	.858	11.10		
MS	.679	8.11		
MBTI_Sensing-Intuition	.602	6.95		

a All t-tests were significant at p-value < .001.

b Denotes composite reliability.

Table 17. Discriminant Validity of Factors in the Modified Alternative Measurement Model

Factor 1	Factor 2	Correlation Coefficient	Confidence Interval	Square of Correlation Coefficient	Variance Extracted (F1, F2)
Intuition	Spiritual Beliefs	.686	(.535, .836)	.470	.551, .622
	Religiousness	.115	(-.115, .344)	.013	.551, .579
Spiritual Beliefs	Contemplative	.600	(.437, .764)	.360	.551, .520
	Religiousness	.634	(.460, .808)	.402	.622, .579
	Contemplative	.484	(.295, .673)	.234	.622, .520
Religiousness	Contemplative	-.229	(-.455, -.003)	.053	.579, .520

Table 18. Standardized Path Coefficients for the Modified Alternative Model (M_{A5})

Dependent Variable/ Independent variable	Theoretical Model	Revised Model 1	Revised Model 2	Revised Model 3	Revised Model 4	Revised Model 5	Revised Model 6
Spiritual Experiences							
Intuition	.500***	.470***	.472***	.471***	.471***	.474***	.461***
Contemplative	.178	.198	.194	.195	.195	.195	.209*
Schizotypy	-.057						
Spiritual Beliefs							
Intuition	.112	.122	.122				
Spiritual Experiences	.718***	.715***	.716***	.786***	.786***	.784***	.782***
Religiousness							
Intuition	.124	.119	.127	.135	.135		
Spiritual Experiences	.048	.046					
Spiritual Beliefs	.103	.113	.151	.143	.143		
Contemplative	-.508***	-.511***	-.507***	-.505***	-.505***	-.387***	-.146
Faith	.911***	.912***	.906***	.901***	.901***	1.021***	.927***

Schizotypy	-.009						
Openness ^a							-.222*
Contemplative							
Intuition	.506***	.507***	.508***	.512***	.512***	.483***	.528***
Openness	.706***	.703***	.703***	.705***	.705***	.711***	.746***
Faith							
Spiritual Beliefs	.749***	.750***	.751***	.753***	.753***	.753***	.786***
Openness ^a							-.197**
Openness							
Intuition	.130	.135	.136	.131			
Schizotypy ^a							-.278**
Schizotypy							
Intuition	.237*	.227*	.227*	.239*	.239*	.238*	.249**

*p < .05, **p < .01, ***p < .001

a New path added later.

Table 19. Chi-square Difference Tests for the Modified Alternative Model (M_{A10})

Model	Chi-square	df	Chi-square Difference	df Difference	Critical Value $p < .001$	Significant Difference?
Comparisons to M_m						
M_0 Null model	967.42	91	869.83	38	70.703	Yes
M_u Uncorrelated factors	660.13	75	562.54	22	48.268	Yes
M_t Theoretical model	154.02	65	56.43	12	32.909	Yes
M_{r1} Revised model 1	152.46	67	54.87	14	36.123	Yes
M_{r2} Revised model 2	152.64	68	55.05	15	37.697	Yes
M_{r3} Revised model 3	154.18	69	56.59	16	39.252	Yes
M_{r4} Revised model 4	154.18	69	56.59	16	39.252	Yes
M_{r5} Revised model 5	158.78	71	61.19	18	42.312	Yes
M_{r6} Revised model 6	136.14	69	38.55	16	39.252	No
M_{r7} Revised model 7	138.71	70	41.12	17	40.790	Yes
Comparisons to M_t						
M_{r1} Revised model 1	152.46	67	1.56	2	13.816	No
M_{r2} Revised model 2	152.64	68	1.38	3	16.266	No
M_{r3} Revised model 3	154.18	69	0.16	4	18.467	No
M_{r4} Revised model 4	154.18	69	0.16	4	18.467	No
M_{r5} Revised model 5	158.78	71	4.76	6	22.458	No
M_{r6} Revised model 6	136.14	69	17.88	4	18.467	No
M_{r7} Revised model 7	138.71	70	15.31	5	20.515	No

Table 20. Goodness of Fit and Parsimony Indices for the Revised Model 6 (M_{r6}) with Path Reversals

Model	Combined Model					Structural Model				
	Chi-square	df	NFI	NNFI	CFI	PR	PNFI	RNFI	RPR	RPFI
M_0 Null model	967.42	91	--	--	--	--	--	--	--	--
M_u Uncorrelated factors	660.13	75	0.318	0.190	0.332	0.824	0.262	0	1	0
M_t Theoretical model	152.02	65	0.841	0.858	0.898	0.714	0.601	0.919	0.545	0.501
M_{r6} Revised model 6	136.14	69	0.859	0.899	0.923	0.758	0.652	0.959	0.727	0.697
M_{p1} (Spiritual Experience to Intuition)	132.61	69	0.863	0.904	0.927	0.758	0.654	0.965	0.727	0.702
M_{p2} (M_{p1} and Spiritual Belief to Spiritual Experience)	139.63	69	0.856	0.894	0.919	0.758	0.649	0.952	0.727	0.693
M_{p3} (M_{p2} and Schizotypy to Intuition)	138.63	69	0.857	0.895	0.921	0.758	0.650	0.954	0.727	0.694
M_{p4} (M_{p3} and Contemplative to Intuition)	166.8	69	0.828	0.853	0.888	0.758	0.628	0.903	0.727	0.656
M_m Measurement model	97.59	53	0.899	0.913	0.949	0.582	0.524	1	0	0

N = 122. NFI = normed-fit index; NNFI = non-normed-fit index; CFI = comparative fit index; PR = parsimony ratio; PNFI = parsimonious normed-fit index; RNFI = relative normed-fit index; RPR = relative parsimony ratio; RPFI = relative parsimonious-fit index

CHAPTER IV

DISCUSSION

The Models

The original model proposed and tested in this study was the first of its kind to examine the influence of intuition on spirituality and religiousness. It proved to be a good model, although not done in a generally acceptable way. The idea that intuition leads to spiritual experiences which then lead to spiritual beliefs, then religiousness, and then religious fundamentalism was supported. High levels of intuition predicted low religiousness as proposed in the hypothesis, although it did not do so at a significant level. However, it had a small effect (-.140) which was not trivial. In this type of model anytime there is a standard coefficient over .05 it is indicative of an influence that is not trivial.

The alternative model tested in this study also proved to be a good model. It gave further support to the idea that intuition leads to spiritual experiences which lead to spiritual beliefs, then to faith, and finally to religiousness. In this model, what was defined as faith was more like what was defined as religiousness in the first model, and what was defined as religiousness was more like what was originally defined as religious fundamentalism in the first model. In the original model religiousness was assessed by the OSBES Religious item and the SCSORF, and religious fundamentalism was assessed

by the RRFS. In the alternative model faith was measured by the SCSORF, and religiousness was assessed by the OSBES Religious item and the RRFS.

Interestingly, two new and distinctive constructs emerged in the alternative model, contemplative and openness. The contemplative construct was estimated by the MS, AS, and MBTI Sensing-Intuition items. This factor proved to be distinct from intuition and spirituality though it was inferred by items that were originally thought to be more indicative of intuition or spirituality. Openness was measured with the NEO and was originally used to assess intuition. The correlation between openness and intuition in the alternative model was 0.16. The correlation between openness and contemplative was 0.76, suggesting that the NEO is potentially a better measure of contemplative; however, the alternative model that included the NEO in the contemplative construct (M_{A4}) proved not to fit the data as well as the model in which openness was treated as its own unique variable (M_{A5}).

Comparisons of relationships within the model

Standardized path coefficients (used in Figures 5 and 7) are all on the same unit of measurement (all have a standard deviation of 1) which means that the relative size of each coefficient can be compared to determine which independent variables have the largest effects on the dependent variables (Hatcher, 1994). In the original model, spiritual beliefs had a larger effect (.568, $p < .001$) on religiousness than spiritual experiences had on religiousness (.262, $p < .01$). In the alternative model, there were no direct effects on religiousness by either spiritual experiences or spiritual beliefs, but again, in this model

religiousness was more like religious fundamentalism. Spiritual beliefs had a direct effect on faith (.786, $p < .001$). The model indicates it is beliefs, not experiences, which lead people to become committed to a religious faith. Perhaps these individuals with spiritual beliefs want to be around others who share their beliefs or they may believe that religion can help to clarify these beliefs and put them in a context within the mythology of that particular religion.

Furthermore, as evidenced by the original model, spiritual experience is much more likely to lead to spiritual beliefs (.638, $p < .001$) than to religiousness (.262, $p < .01$). One obvious reason for this finding is that the belief items map perfectly onto the experience items on the OSBES. What is surprising is that it is not a stronger influence. Apparently, not everyone who has a spiritual experience develops a strong spiritual belief from that experience. Experience must be subject to a variety of interpretations, not all of which are spiritual in nature. Perhaps there are instances of individuals interpreting their experiences as not being real. Perhaps they were on drugs, dreaming, or experiencing some other altered state of consciousness when they had one of these experiences and subsequently saw it as being the result of the altered state of consciousness (a manifestation of their mind) and therefore not real (something originating outside of their minds). If it's not real, then no belief develops.

In the alternative model in which spiritual beliefs were not only assessed by the OSBES belief items, but also by the WCS analysis/interpretation items, the effect of spiritual experiences (defined the same way in both models) on spiritual beliefs was

stronger, which is significant given that the WCS_AI items do not directly correspond to the OSBES_E items as the OSBES_B items do. The path coefficient from spiritual experiences to spiritual beliefs in the second model was .782, $p < .001$. The analysis/interpretation items on the WCS measure beliefs based on meaningful coincidences rather than experiences which are expressly more spiritual in nature (e.g., beliefs related to God or angels or prayer). Apparently, experiencing angels, God, the presence of a dead loved one, ESP, and the power of prayer play a role in developing beliefs that meaningful coincidences reveal connections between human minds, that God speaks to us through these occurrences, and that these occurrences are useful for spiritual growth.

According to the original model, spiritual experiences are much less likely to lead to religiousness than to spiritual beliefs. This supports my theory individuals having spiritual experiences do not need a religious authority to tell them about the world of spirit and are therefore not interested in religion. Also, a person may have an experience of the presence of God, but may not necessarily come to believe that this is the God described by one particular religion. Religions have a number of specific beliefs and stories about God, but the actual experience of God may just lead to belief in God, not to specific beliefs about God such as that God is omnipotent or the creator of the universe. The experience itself may just be a vision or a feeling which lacks the level of detail concerning the nature of God that one might find in religious texts. In fact, the majority of people who report having near death experiences (a profound spiritual experience) come away from the experience with less interest in organized religion and an increased

spirituality (Flynn, 1982; Ring, 1984; & Sutherland, 1992). Their experiences lead them to believe that no one set of religious beliefs is able to capture the true complexity of who God really is.

In the alternative model there is no direct effect of spiritual experience on religiousness, instead the path goes first through spiritual beliefs, then through faith, and finally to religiousness. Here it can be seen that spiritual beliefs lead to faith (SCSORF) in which the person is heavily influenced by their beliefs to pray daily, as a source of meaning, as central to who they are as a person, and as an important part of making decisions. Part of their faith includes wanting to be around others of a similar faith, wanting to be active in the faith, and looking to faith for comfort, which is perhaps why those with strong faith are so likely to become religious (.927, $p < .001$). This supports my theory that individuals become religious, in part, out of a desire to be around others of a similar faith. Others may have strong spiritual beliefs, but if these beliefs are not of central importance to the person, then they are much less likely to become religious. It seems that those who are highly committed to their faith are inclined to develop strong beliefs that their faith is the one and only true faith and that it is of the utmost importance to believe in and commit to that faith, which is exactly what I theorized. In this model religiousness is defined by religious fundamentalism items (RRFS), being highly committed to traditional religious beliefs and by saying that one is religious (OSBES_R). So, this faith is, in fact, leading to highly traditional religious beliefs and strong adherence to those beliefs. Part of this belief structure is a lack of openness to other ideas and religions which is probably the reason that openness negatively predicts religiousness

(-.222, $p < .05$) in this model. This model shows that those who are not open to new experience are drawn to traditional beliefs and strongly adhere to those beliefs. This had not been part of my original theory, but was instead a finding revealed through the data analysis.

Openness negatively predicts faith in the alternative model (-.197, $p < .01$). Those low in openness are not likely to have religious beliefs be of central importance to their lives, perhaps because these beliefs are too limiting for them. Adhering to certain religious beliefs may prevent someone from exploring a variety of belief structures, which is what an open person would be most interested in doing, in theory. Openness, in this model, is also a strong predictor of contemplative (.746, $p < .001$), a factor involving a mystical experiences (MS), heightened awareness of external and internal stimuli (AS), and a preference for new and creative ways of doing things and thinking about things (MBTI). Openness is not part of intuition (as initially predicted), but is rather something affected by intuition via schizotypy. However, like intuition, it is a strong predictor of contemplative. Openness as defined by the NEO involves an interest in one's feelings, music, art, imagination, and an interest in new thoughts and experiences. Mystical experiences and absorption both involve a heightened state of awareness and a heightened sensitivity to emotion. Someone who is not very aware of their own emotions may not be likely to experience something as holy or timeless or report feeling pure joy, perfect peace, or awe as described in the MS since this would seem to require a highly attuned emotional system since these are not emotions that everyone reports feeling. Items from the AS are also indicative of heightened sensitivity to emotion such as being

moved by poetry or music. Openness is also contributing to the desire to explore new possibilities (MBTI). In turn this contemplativeness, this tendency to experience things more fully and be more interested in new possibilities, is predictive of spiritual experiences (.209, $p < .05$). Having an interest in trying new things, and a tendency to experience external and internal stimuli more fully leads to spiritual experience in this model.

The central idea behind this dissertation is that the spiritual realm is not easy to detect due its subtle nature. As such, only particularly sensitive individuals are likely to perceive this dimension. This model is supporting this idea by indicating that a heightened sensitivity to emotion, nature, imagination, external stimuli coupled with an openness to new experience and ways of thinking does in fact lead to spiritual experience. This fits with my personal story of spiritual awakening and confirms that it happens this way for others as well. I was born sensitive to emotion, became more aware of nature through shamanic practice and by spending a great deal of time in the outdoors rock climbing, hiking, and backpacking, learned to let my imagination lead at times and not my analytic reasoning, was trained to become a better observer through shamanic rituals in which much is learned by watching very closely, and became open to new experience by trying a variety of different shamanic rituals and meditative practices.

In fact, this model fits my experience very well. I had psychic dreams which are measured by two of the three measures of intuition (the AIS and the WCS_A) and I experienced a number of weird coincidences which are listed in the WCS_A and WCS_I.

I subsequently learned to be more contemplative and then experienced a number of spiritual experiences which then led to spiritual beliefs. I then became more interested and dedicated to shamanism which would be an increase in faith in this model. I never became religious per say since shamanism is not considered a religion. Religion is much more dominant and socially acceptable in this culture than is shamanism which is probably why most people go from faith to religiousness, but I did not. In fact, many people in our culture do not even know what shamanism is let alone have an interest in it. I also became more open to new experiences and ways of thinking as part of my path. With the strong causal pathway from openness to contemplative it is clear that being open is an important step in this process for many people.

There are several other paths on this model which do not fit with my personal experience, but do with others'. Many people go from intuition to spiritual experience without going through contemplative. Perhaps these individuals are born with heightened awareness or develop it through alternative means. I could imagine that a highly skilled athlete or artist could develop a clear, focused mind with heightened attentional abilities, for example. One particularly strong spiritual adept (who frequently has spiritual experiences) I know developed his skills through surfing, skiing, and rock climbing. Whenever he does one of these activities (which he does frequently) he pushes himself to the limits, climbing XXX climbs (very dangerous-indicates a strong potential of rocks breaking while they are being climbed on), climbs barefoot, and skis out of bounds (where it is not permitted to ski) very fast through trees and over precipices. He is forced to be in the moment or risks dying in these situations and this is what he says has led him

to be more spiritually attuned. He also believes he was born with some abilities due to his Native American heritage. He also claims to further enhance these abilities by smoking marijuana which he reports reduces analytic thought and increases sensory perceptions. Drug experiences could be captured by the MS or AS which is part of the contemplative factor meditating between intuition and spiritual experience in our model.

Another path, the opposite path, from spiritual experience to intuition is a possible path (in the second model) that people take. As reported in Table 20, the fit of the model improves slightly when this pathway is reversed. We cannot, however, say that this is a reciprocal relationship as we have not tested that hypothesis. In the second model, psychic experiences and weird coincidences are part of what constitute the construct of intuition. One could imagine that these types of experiences could increase as the result of spiritual experiences which may open people up more to these types of experiences. It's also possible that spiritual experiences are intuitively experienced and as such individuals begin to value their intuition more and as a consequence are more likely to use their intuition when making decisions.

The route to spiritual experience in the alternative model directly from intuition is significant (.461, $p < .001$). In this model intuition is composed of the AIS, WCS_A, and WCS_I. This factor includes intuitive decision making, interpersonal intuition, psychic experience, and weird coincidences. The AIS and WCS_I are likely part of the same factor since they both involve intuitive social skills such as thinking of someone before they call or feeling what another is feeling although that person is at some distance. The

AIS and WCS_A both involve decision making aspects, the AIS with using intuition to guide decisions, and the WCS_A with using meaningful coincidences to guide decision making. Perhaps the individual who turns to intuition to make decisions also turns to meaningful coincidences to make decisions. Perhaps intuitive people notice more details and read people better and in doing so are more likely to see connections (meaningful coincidences) where others would not. Another explanation could be that as a person begins to use their intuition more spirit actually provides more communication since it can now be perceived and does so by way of meaningful coincidences. What links the measures of this factor together seems to be a heightened state of awareness to thoughts and the environment. Intuition in the original model (AIS and RREI_E) had more to do with decision making, while this way of defining intuition has more to do with perception. Both types of intuition are predictive of spiritual experience which leads to spiritual belief, and then to religiousness (with the alternative model going through faith to get to religiousness).

In the alternative model there is no direct path from intuition to spiritual belief, while in the original model there is. However, in the original model intuition much more strongly influences spiritual experiences (.522, $p < .001$) than it does spiritual beliefs (.149). Intuition, in both models, is most likely to lead to spiritual experiences and then to spiritual beliefs. It is not a specific way of thinking, perceiving, or making decisions that leads to beliefs, but rather it is a certain way of being that leads to spiritual experiences. Those who are low in intuition may in fact have dead loved ones visit them or have God speak to them in a dream, but they may not perceive it because they are low in intuition

and lack the capacity or interest in attending to such stimuli. They may just be too busy attending to other stimuli in the environment or in their minds. The whole idea of transliminality is that there are some individuals who are more likely to perceive subtle stimuli than others and as a result are more spiritual, amongst other things. Perhaps this is similarly true of intuition. Perhaps intuitive individuals are also more likely to perceive subtle stimuli.

Transliminality

These results provide support for previous research on transliminality. Specifically, some of the elements that come together to form transliminality correlate with one another in this study. Transliminality is a combination of 1) belief in and experience of the paranormal, 2) creative personality, 3) mystical experience, 4) magical ideation, 5) history of manic-like experiences, 6) absorption, 7) fantasy proneness, 8) hyperaesthesia, 9) attitude towards dream interpretation (Thalbourne & Delin, 1994; Thalbourne, 1998a). This study measures three of the same constructs. Belief in and experience of the paranormal as measured by the OSBES_E and OSBES_B significantly correlate (.716, $p < .01$). Both OSBES_E and OSBES_B correlate significantly with mysticism (.461, $p < .01$ and .359, $p < .01$, respectively). Both OSBES_E and OSBES_B correlate significantly with absorption (.404, $p < .01$ and .307, $p < .01$, respectively). Mysticism and absorption correlated significantly (.601, $p < .01$). Magical ideation is part of schizotypy. The schizotypy measure used in this study (EAPQ) measures different aspects of schizotypy. Using this measure, in this study, no significant correlations

occurred between schizotypy and paranormal belief or experience, absorption, or schizotypy.

Future research should explore the relationship between intuition and transliminality to see if they are associated, and if they are, it should be determined in what way. Does transliminality come first, or intuition, or are they the same thing measured in two different ways? It would also be necessary to test intuitive individuals to see if intuitive individuals are more likely to detect subtle stimuli just as it has been tested for transliminality with hyperaesthesia (Thalbourne & Delin, 1994; Thalbourne et al., 1997), thin boundaries (Houran, Thalbourne, & Hartman, 2003), ESP cards (Crawley, French, & Yesson, 2002), synesthesia (Thalbourne, Houran, Alia, & Brugger, 2001), transmitting emotional states from one person to another (Sanders, Thalbourne, & Delin, 2000), detection of vibration (Houran, Hughes, Thalbourne, & Delin, 2006), and the tendency to remember and interpret dreams (Thalbourne & Delin, 1999).

Schizotypy

The original model indicates that intuition has a small influence on schizotypy (.142). The influence is not significant, yet it is not trivial either. In the alternative model in which intuition is more about perception and less about decision making, the influence is significant (.249, $p < .05$). The relationship is stronger when the focus is more on perception, perhaps because schizophrenia is more a disorder of perceptions than of decision making. There is support for the idea that being more intuitive leads to not just spiritual experiences, but also to other experiences, thoughts, or feelings which result in

schizotypy. It could be that individuals have similar experiences, but some grow from them and call them spiritual, while others are harmed from them and call them a mental disorder. Perhaps it is a person's attentional abilities which determine the outcome. It is clear that at least one form of spiritual practice, i.e. meditation, enhances awareness capabilities while high schizotypy is associated with deficits in the appropriate allocation of attention (Le Pelley, Schmidt-Hansen, Harris, Lunter, & Morris, 2008). Intuitive individuals, in theory, are attending to more stimuli than non-intuitive people by paying more attention to social cues, emotions, their bodies, and as such may have more information to process and make sense of. Someone with strong attentional abilities and emotional capabilities, as seen in long-term meditators, would seem to be more capable of handling this than someone with low attentional abilities.

The WCS-2 Interpersonal factor correlates significantly (.239, $p < .01$) with the EAPQ measure of schizotypy. Those individuals who have weird coincidences involving 1) others (i.e. "I run into a friend in an out-of-the-way place") and 2) thoughts unusually connected to external stimuli (i.e. "I think of an idea and see it on the radio/TV/internet"), are also likely to have schizotypal traits. Loose associations are common in schizophrenia. Perhaps by having loose associations a person is likely to have more associations over all and is able to connect seemingly unconnected things and therefore reports having more weird coincidences, as suggested by Coleman and Beitman (in press).

The alternative model indicates a causal pathway from schizotypy to openness (-.278, $p < .01$). Those with schizophrenia have unusual, yet rigid ways of perceiving the world and as such are more likely to be less open. In this model that relationship is seen not with schizophrenia, but with schizotypy.

The relationship between intuition and schizotypy in both models is relatively small. This could be due to a limited sample or because of the limitations of the measurement used for schizotypy. The validity of the Eysenck Psychoticism measure has been questioned. Howarth (1986) found in his study that Psychoticism was a measure of oral pessimism, rigidity, low social sensitivity, impulsiveness, lack of cooperation, low superego controls, low persistence, absence of anxiety, lack of feelings, and feelings of inferiority. Howarth claims that these nine traits do not constitute psychoticism and that the P scale does not in fact measure psychoticism. Davis (1974) is critical of how the scale was constructed, not according to strict criteria, and he claims that it measures behavior more characteristic of psychopaths than of psychotics. Davis (1974) could not distinguish between psychotic and non-psychotic offenders when using this measure. Torrubia and Muntaner (1987) found that the P Scale did not correlate significantly with the Schizotypal Personality Questionnaire, a well validated, highly regarded measure of schizotypy, evidence that Psychoticism is not measuring schizotypy. Costa and McCrae (1992a) claim that P is a conflation of A (Agreeableness) and C (Conscientiousness). Their follow-up research (Costa & McCrae, 1995) examining factor structure confirm that P should really be broken down into A and C. They claim that P really measures

something more like lack of conventional socialization, than it does psychoticism. It seems likely that our measure of schizotypy was not the best measure of schizotypy.

The transliminality research indicates that the Schizotypal Personality Questionnaire (SPA) measure of schizotypy (Claridge & Broks, 1984) is more strongly correlated with transliminality than is the P scale of the EAPQ (the measure used in this study) (Thalbourne et al., 1997). Transliminality has also been associated with schizotypy as measured by the Oxford-Liverpool Inventory of Feelings and Experiences (Thalbourne, Keogh, & Witt, 2005). Transliminality in that study correlated .78 with unusual experiences, but not significantly with introvertive anhedonia or the lie scale (features of schizotypy captured by the Eysenck measure). Furthermore, the schizophrenics scoring highest on transliminality are those who self-report experiencing hallucinations, hearing voices, and suffering from paranoid ideation (Thalbourne, 1998), none of which are aspects of schizotypy measured by the Eysenck P scale. Since intuition is likely similar to transliminality, the Schizotypal Personality Questionnaire and the Oxford-Liverpool Inventory of Feelings and Experiences are probably better measures of the aspects of schizotypy that are associated with intuition. Also, after a review of a number of schizotypy scales Fonseca-Pedrero, Paino, Lemos-Giraldez, Garcia-Cueto, Campiloo-Alvarez, Villazon-Garcia, and Muniz (2008) determined that the schizotypy scales with the best psychometric properties included the Schizotypal Questionnaire and a number of scales developed by researchers at the University of Wisconsin including the Perceptual Aberration Scale, Magical Ideation Scale, Physical Anhedonia Scale, and the Revised Social Anhedonia Scale. Future research should measure schizotypy with these

scales since they are the best psychometrically and theoretically to determine if schizotypy is influenced even more strongly than our model indicates by intuition.

Adjusting the Model: Meaning and Significance

Some of the measures used in the original model did not hold up and had to be removed from that model. The MBTI and NEO-PI-R did not measure aspects of intuition that were relevant to this model. It was only the RREI and AIS (discussed below) which measured the aspects of intuition central to this model. The OSBES experiential items were retained as good measures of spiritual belief, but the WCS-2 agentic and interpersonal items, the Mysticism Scale, and the Absorption Scale were all found to not measure aspects of spirituality relevant to his model. Many items on both the Absorption Scale and the Mysticism Scale could be experienced by someone while under the influence of hallucinogens, other mind-altering drugs, or in a dream. A person could score high on either measure if he or she gives answers according to what happened to him or her during an altered state of consciousness, rather than during the ordinary waking state of consciousness. This is a limitation for both of these scales and could be the reason that neither was a good predictor in this model. However, these measures along with the MBTI grouped together in the alternative model as contemplative to weakly predict spiritual experience. These factors likely had to be dropped in the original model since they were not grouped together on the right factor. Stepping away from the original model and exploring other models allowed for this discovery.

Furthermore, the type of spiritual experience these scales relate to may not be the type usually found within Christian, Catholic, and Jewish traditions, the traditions that most of the subjects came from in this study. The experience of being highly absorbed or having a mystical experience is more likely to be found in traditions which emphasize the importance of heightened awareness, paying attention to the environment, and paying attention to one's internal thoughts, fantasies, and dreams. Buddhism uses meditation and visualizations to heighten awareness and develop imagination skills. Theoretically speaking, Buddhists would be more likely to score high on absorption and mysticism. Paganism and shamanism are both intimately connected to the environment, the earth, and as such their adherents are more likely to become absorbed in seeing shapes in clouds, noticing various textures, and feeling "inspired by the crackle and flames of a wood fire", items all found on the Absorption Scale. On the other hand, Christian, Catholic, and Judaic traditions are less earth-focused and typically do not involve meditative or visualization practices for lay practitioners. Christianity, Catholicism, and Judaism are much more concerned with transcendent reality, not earthly reality. This transcendent reality is thought to be elsewhere, in the heavens, not on earth. As such, people in these traditions and those who are influenced by them from living in a country where they have infused popular cultural beliefs, may not be inclined to have earth-based or heightened-consciousness based spiritual experiences. This could explain why these scales did not work in this model with this subject set.

The WCS-2 items were not an appropriate measure of spiritual experience in either model. Those with an active imagination may believe they are frequently having

weird coincidences because they are able to imagine all sorts of connections that other people would not. They are seeing connections where there are none. It could also be the case that people underestimate the frequency with which nonprobable occurrences actually happen and see weird coincidences where there are none. These are some of the reasons that weird coincidences may have not proved a good fit as a type of spiritual experience in the original model. When a number of measurement models were tested the one with the best fit grouped the WCS_A and WCS_I together with the AIS to form intuition as discussed earlier. The WCS_AI as part of spiritual belief did not hold up in the original model, but it did in the alternative model.

The OSBES experiential items were the best fit for spiritual experience in both models. These items were the most clearly spiritual in nature with clear links to what is commonly believed to be spiritual in our culture. The experience of God, angels, and prayer to promote health and well-being is commonly believed to be spiritual experience in our culture because these beliefs are all rooted in the predominant religions of our culture. It would be hard to describe feeling the presence of God as anything other than a profound spiritual experience, whereas occurrences described on the other scales such as feeling a void or sensing that all things are conscious on the MS scale are not as decidedly spiritual, but are rather more open to multiple interpretations. The experience of ESP and feeling the presence of a dead loved one is not part of traditional religious belief in America, but is part of popular belief in this culture. ESP and visits from dead loved ones are commonly viewed as a spiritual phenomenon because these experiences

cannot be explained well by science, and seem to be outside the order of nature as it is understood scientifically.

The OSBES belief items were retained in both models as a good measure of spiritual beliefs, while the WCS-2 analysis/interpretation items were not. Once again, the OSBES items were decidedly spiritual given the culture in which we live, whereas the WCS-2 items were more of a mix, with only two of the six items being decidedly spiritual 1)"God speaks to me through meaningful coincidences" and 2) "Meaningful coincidences help me grow spiritually", while other items had more to do with fate or chance as an explanation of weird coincidences.

Which Model is Best?

There are a number of factors to consider when deciding which model is preferable. It is tempting to look at the original model as more parsimonious since it is more simple, however it does not explain the same amount of data as the second (having dropped about half the measures) one does and is therefore no more parsimonious than the second. The original model tested the original theory and was in many ways supported. However, in the alternative model testing approach a number of theories, all grounded in that original theory, were tested. These models allowed for items to load on factors in different ways in the various measurement models and specified more detailed causal pathways in the structural equation models. In other words, it allowed for a more detailed understanding of causation amongst the factors. It also had the benefit of describing almost all of the data collected, not just half of it as in the original model. In

the original model factors were based solely on theory, while in the alternative models theory was used along with exploratory factor analysis to guide the formation of factors.

Another consideration is the R-squared values for the endogenous variables in the original and alternative models. Several factors in the alternative model had higher R² values than the same or similar factors in the original model including faith (.628) and religiousness (.994) in the alternative model compared to religiousness (.509) and religious fundamentalism (.364) in the original model; spiritual experiences in the original model (.272) compared to spiritual experiences in the alternative model (.348); spiritual beliefs in the original model (.528) compared to spiritual beliefs in the alternative model (.612). Thus, spiritual experiences explained more of the variation in spiritual beliefs in the alternative model than spiritual experiences and intuition explained together in the original model. In the alternative model spiritual beliefs was defined by the OSBES_B and WCS_AI, whereas in the original model it was defined by the OSBES_B alone. Furthermore, intuition and contemplative from the alternative model explained a greater percentage of the variation in spiritual experiences than did intuition alone from the original model. Intuition was defined differently in the two models, but the statistically significant path coefficient from contemplative to spiritual experiences shows that this factor influences spiritual experiences. As mentioned previously, what was called religiousness in the original model (OSBES_R and SCSORF) was similar to what was called faith (SCSORF) in the alternative model. Also, what was called religious fundamentalism in the original model (RRFS) was similar to what was called religiousness (OSBES_R and RRFS) in the alternative model. Interestingly, there was a

greater percentage of the variation in faith explained by spiritual experiences and openness in the alternative model as compared to the percentage of the variation in religiousness explained by intuition, spiritual experiences, and spiritual beliefs in the original model. Moreover, 99% of the variation in religiousness (OSBES_R and RRFS) was explained by faith, contemplative and openness in the alternative model, while only 36% of the variation in religious fundamentalism (RRFS) was explained by religiousness (OSBES_R and SCSORF) in the original model.

Overall, the alternative model is preferable since the factors were guided by more than just theory, it accounts for more of the data, has higher R^2 values which explain more of the variance, reveals complexities of the causal pathways that the original model does not, and is done using the alternative model approach which is the strongest approach because one cannot be accused of forcing the data to fit theory in this approach. The data is allowed to speak for itself.

Attig Intuition Scale

The Attig Intuition Scale has demonstrated good reliability and validity in this study, evidence that it is appropriate for use in future research which seeks to measure intuition. It is unique in how it measure intuition. The MBTI measures intuition by assessing creativity, the exploration of alternative and future possibilities that are not readily apparent, and originality. The NEO-PI-R Openness to Experience measures intuition in terms of aesthetic interests, emotion, imagination, and a desire to try new things. The RREI measures intuition as ability (i.e. having good intuition, trusting one's

feelings when meeting a new person) and engagement (i.e. preferring to use intuition to solve problems and make decision). The AIS measures three factors of intuition, 1) premonitions and psychic tendencies, 2) intuition about others, and 3) intuitive decision making. The psychic factor includes items 11, 12, 13, 14, 20, and 22. These items include feeling empathy at a distance, precognitive and telepathic dreams, and knowing a woman is pregnant before the woman tells anyone she is pregnant. The intuition about others factor includes items 6, 17, 18, 19, and 21. These items include being able to read others well including feeling as though the individual already knows someone well they have just met and knows what they are thinking and feeling. The decision making factor includes items 1, 2, 7, 9, 15, and 16. This factor involve the believed accuracy and use of intuition including items such as reliance on first impression, choosing intuition over rationality when making a decision, and having a physical sensation which accompanies the experience of intuition

Of the measures used in this study, the AIS most closely resembles the RREI. Both involve the use of intuition in making decisions and measures of how accurate individuals believe their intuition to be. There are similar items that assess the preference of intuition over rationality. There are two items which are nearly identical. These items are about the accuracy of first impressions when meeting someone new and the desire to make decisions from the heart. The similarity between these two scales is probably the reason that they both were able to stay in the model. The type of intuition that they each measure is predictive of spirituality and religiousness. It is not clear which aspects of each scale had the most predictive value in the model. Future research should examine

how the different factors in each scale relate to the construct of intuition as well as the predictions made in the model. Despite their similarities, the AIS is different in that it uses a broader definition of intuition by also including psychic intuition and more items on social intuition than the RREI. However, the RREI has more items about emotions and their role in intuition. The RREI also has measures of rationality (to measure rationality which is a separate construct), while the AIS does not.

The AIS is unique in its broad definition of intuition. Paranormal experience and belief scales typically only include paranormal and psychic items. This is a limited range of what constitutes intuition. It is at the far end of the spectrum. By including some of these items in the AIS it is possible to identify those who are so intuitive that they may be considered "psychic", but it also measures more common, every day experiences that more people are likely to have, those with a range of intuitive interest and ability, not just those at the extreme end. Bivariate correlations (Table 3) between factors on the AIS indicate that there are significant ($p < .001$) correlations between all three factors ranging from .389 to .445. This supports the notion that different types of intuition overlap and are not entirely separate. Intuitive decision making, intuition about others, and psychic intuition are all significantly related. They are all aspects of intuition.

Limitations of this Study

Obvious limitations in this study were sample size and sample type. Future studies should have larger numbers of subjects so that there are adequate numbers of subjects to look at the effects that gender, ethnicity, and particular religious affiliation

may have. The subjects in this study were mostly young with an average age of 23. It could be that intuition changes as people get older so age is an important consideration. Thalbourne (1999) indicates that transliminality is high in older subjects, so perhaps intuition is likewise higher in older subjects. The sample in this study was predominantly Christian, Catholic, Agnostic, and Jewish. Future research should include populations that are more diverse, including more Buddhists and Earth-based traditions (Paganism and Shamanism) since these traditions place more emphasis on the environment and on heightened awareness which likely corresponds to higher levels of absorption, mystical experience, and perhaps even weird coincidences.

APPENDICES

Appendix A

Demographic Information

Subject # _____

Gender

- Male
 Female

Age

Ethnicity

- White
 Black
 Hispanic
 American Indian/Alaskan Native
 Asian/Pacific Islander

Religious Affiliation

- Christianity
 Catholicism
 Universalist Unitarian
 Mormonism
 Buddhism
 Judaism
 Hinduism
 Confucianism
 Taoism
 Paganism
 Wiccan
 Shamanism
 Native American Church
 Native American Traditional Religion
 Atheism
 Agnosticism
 Other: _____

Appendix B

Scales

The Intuition Scale

Subject# _____

- 1 = Strongly Disagree**
2 = Moderately Disagree
3 = Slightly Disagree
4 = Neutral/Not Sure
5 = Slightly Agree
6 = Moderately Agree
7 = Strongly Agree

- _____ 1. If logic tells me one thing and my intuition tells me another I go with what my intuition tells me.
 _____ 2. My first impressions of people are always accurate.
 _____ 3. I can read other's emotions easily and accurately.
 _____ 4. When I fall in love it's usually an experience of love at first sight.
 _____ 5. I can accurately predict the outcome of my relationships.
 _____ 6. Sometimes when I meet someone for the first time I feel as if I already know them.
 _____ 7. I can always tell when people are not getting along well even if they try to keep it a secret.
 _____ 8. I can get an accurate sense of who someone is just by seeing a photograph of them.
 _____ 9. When I know something in my gut I often have a physical sensation that accompanies this "knowing" such as a chill up my spine or a knot in my stomach.
 _____ 10. I often know who is calling on the phone even before I get to the phone (without looking at caller ID or having a special ring tone)
 _____ 11. Sometimes I have a bad mood for no known reason and later find out that at that same point in time something bad was happening to someone I care about.
 _____ 12. Sometimes I dream about things before they happen.
 _____ 13. Sometimes I dream about things which are actually happening at a distance.
 _____ 14. Sometimes I dream about someone I haven't seen for a long time and then that person ends up contacting me the next day.
 _____ 15. My intuition is always accurate.
 _____ 16. For important decisions in life I lead with my heart, not my head.
 _____ 17. Sometimes I know what someone is thinking even before they speak.
 _____ 18. Sometimes I feel other's emotions as if they were my own.
 _____ 19. Sometimes I feel other's physical pains as if they were my own.
 _____ 20. Sometimes I dream about someone I have never met and then meet them shortly afterwards.

- _____ 21. I can often sense when someone is feeling ill even if there are no obvious symptoms.
- _____ 22. I often know when a woman is pregnant before she tells people that she is pregnant.
- _____ 23. I can always detect when someone is telling a lie.
- _____ 24. I can often tell when someone's spouse or boyfriend/girlfriend is cheating on him or her.
- _____ 25. Sometimes I get a bad feeling about someone I've just met and later learn that this person is in fact dangerous or untrustworthy in some way.

The MBTI

Please circle the answer that comes closest to describing how you usually feel or act.

1. When you go somewhere for the day, would you rather
 - a. plan what you will do and when, or
 - b. just go?
2. If you were a teacher, would you rather teach
 - a. fact courses, or
 - b. courses involving theory?
3. Are you usually
 - a. a “good mixer” or
 - b. rather quiet and reserved?
4. Do you prefer to
 - a. arrange dates, parties, etc., well in advance, or
 - b. be free to do whatever looks like fun when the time comes?
5. Do you usually get along better with
 - a. imaginative people, or
 - b. realistic people?
6. Do you more often let
 - a. your heart rule your head, or
 - b. your head rule your heart?
7. When you are with a group of people, would you usually rather
 - a. join in the talk of the group, or
 - b. talk individually with people you know well?
8. Do you prefer to do many things
 - a. on the spur of the moment, or
 - b. according to your plans?
9. Would you rather be considered
 - a. a practical person, or
 - b. an ingenious person?
10. In a large group do you more often
 - a. introduce others, or
 - b. get introduced?

11. Are you more attracted to
 - a. a person with a quick and brilliant mind, or
 - b. a practical person with a lot of common sense?
12. Does following a schedule
 - a. appeal to you, or
 - b. cramp you?
13. Would you say it generally takes others
 - a. a lot of time to get to know you, or
 - b. a little time to get to know you?
14. Does the idea of making a list of what you should get done over a weekend
 - a. appeal to you, or
 - b. leave you cold?
15. Is it a higher compliment to be called
 - a. a person of real feeling, or
 - b. a consistently reasonable person?
16. Do you tend to spend a lot of time
 - a. by yourself, or
 - b. with others?
17. In your daily work, do you
 - a. rather enjoy an emergency that makes you work against time, or
 - b. usually plan your work so you won't need to work under pressure?
18. Would you rather have as a friend someone who
 - a. is always coming up with new ideas, or
 - b. has both feet on the ground?
19. Can you
 - a. talk easily to almost anyone for as long as you have to, or
 - b. find a lot to say only to certain people or under certain conditions?
20. When you have a special job to do, do you like to
 - a. organize it carefully before you start, or
 - b. find out what is necessary as you go along?
21. Are you inclined to
 - a. value sentiment more than logic, or
 - b. value logic more than sentiment?

22. In reading for pleasure, do you
 a. enjoy odd or original ways of saying things, or
 b. like writers to say exactly what they mean?
23. Can the new people you meet tell what you are interested in
 a. right away, or
 b. only after they really get to know you?
24. In planning a trip would you prefer to
 a. most of the time do whatever you feel like that day, or
 b. know ahead of time what you'll be doing most days?
25. In doing something that many other people do, does it appeal to you more to
 a. do it in the accepted way, or
 b. invent a way of your own?
26. Would most people say you are
 a. a private person, or
 b. a very open person?

Please circle the word in each pair that appeals to you more. Think about what the words mean, not about how they look or how they sound.

27. abstract solid
28. scheduled unplanned
29. gentle firm
30. facts ideas
31. thinking feeling
32. hearty quiet
33. convincing touching
34. statement concept
35. analyze sympathize
36. systematic spontaneous
37. sensitive just

38. reserved	talkative
39. no-nonsense	theoretical
40. compassion	foresight
41. systematic	casual
42. quiet	outgoing
43. benefits	blessings
44. theory	certainty
45. determined	devoted
46. idea	actuality
47. strong-willed	tenderhearted
48. imaginative	matter-of fact
49. objective	passionate
50. make	create
51. warm	objective
52. sensible	fascinating
53. compassionate	logical
54. production	design
55. impulse	decision
56. fair-minded	caring
57. quiet	gregarious
58. analytical	sentimental
59. unconstrained	scheduled

- | | |
|-------------------|-----------------|
| 60. concrete | abstract |
| 61. practical | sentimental |
| 62. open | private |
| 63. build | invent |
| 64. orderly | easygoing |
| 65. imaginative | realistic |
| 66. competent | kindhearted |
| 67. theory | fact |
| 68. few friends | lots of friends |
| 69. possibilities | certainties |
| 70. bighearted | firm-minded |
| 71. novel | already known |
| 72. tenderness | strength |
| 73. practical | innovative |

Please circle the answer which comes closest to describing how you usually feel or act?

74. Do you find being around a lot of people
a. gives you more energy, or
b. is often draining?
75. When making a decision, is it more important to you to
a. weigh the facts, or
b. consider people's feelings and opinions?
76. Do you generally prefer to
a. make your social engagements some distance ahead, or
b. be free to do things on the spur of the moment?

77. At parties, do you
a. sometimes get bored, or
b. always have fun?
78. In most instances, do you prefer to
a. go with the flow, or
b. follow a schedule?
79. Do you usually
a. mingle well with others, or
b. tend to keep more to yourself?
80. Do you prefer to
a. wait and see what happens and then make plans, or
b. plan things far in advance?
81. Are you
a. easy to get to know, or
b. hard to get to know?
82. Do you generally prefer courses that teach
a. concept and principles, or
b. facts and figures?
83. At parties do you
a. do much of the talking, or
b. let others do most of the talking?
84. Do you consider yourself to be
a. more of a spontaneous person, or
b. more of an organized person?
85. Can you keep a conversation going indefinitely
a. only with people who share some interest of yours, or
b. with almost anyone?
86. When you start a big project that is due in a week, do you
a. take time to list the separate things to be done and the order of doing them , or
b. plunge in?
87. Which is a higher compliment, to be called?
a. competent, or
b. compassionate?

88. Do you find going by schedule
- a. necessary at times but generally unfavorable, or
 - b. helpful and favorable most of the time?
89. Would you rather work under a boss (or teacher) who is
- a. good-natured but often inconsistent, or
 - b. sharp-tongued but always logical
90. Overall, when working on a big assignment, do you tend to
- a. figure out what needs to be done as you go along, or
 - b. begin by breaking it down into steps?
91. In social situations do you generally find it
- a. difficult to start and maintain a conversation with some people, or
 - b. easy to talk to most people for long periods of time?
92. Would you rather
- a. support the establishes methods of doing good, or
 - b. analyze what is still wrong and attack unsolved problems?
93. Would you prefer to do most things according to
- a. however you feel that particular day, or
 - b. a set schedule?

NEO-PI-R

Subject # _____

1 = Strongly Disagree**2 = Disagree****3 = Neutral****4 = Agree****5 = Strongly Agree**

- _____ 1. I have a very active imagination.
- _____ 2. Aesthetics and artistic concerns aren't very important to me.
- _____ 3. Poetry has little or no effect on me.
- _____ 4. Without strong emotions, life would be uninteresting to me.
- _____ 5. I'm pretty set in my ways.
- _____ 6. I often enjoy playing with theories or abstract ideas.
- _____ 7. I believe letting students hear controversial speakers can only confuse and mislead them.
- _____ 8. I try to keep all my thoughts directed along realistic lines and avoid flights of fancy.
- _____ 9. I am sometimes completely absorbed in music I am listening to.
- _____ 10. I rarely experience strong emotions.
- _____ 11. I think it's interesting to learn and develop new hobbies.
- _____ 12. I find philosophical arguments boring.
- _____ 13. I believe that laws and social policies should change to reflect the needs of a changing world.
- _____ 14. I have an active fantasy life.
- _____ 15. Watching ballet or modern dance bores me.
- _____ 16. How I feel about things is important to me.
- _____ 17. Once I find the right way to do something, I stick to it.
- _____ 18. I enjoy solving problems or puzzles.
- _____ 19. I believe we should look to our religious authorities for decisions on moral issues.
- _____ 20. I don't like to waste my time daydreaming.
- _____ 21. I am intrigued by the patterns I find in art and nature.
- _____ 22. I seldom pay much attention to my feelings of the moment.
- _____ 23. I often try new and foreign foods.
- _____ 24. I sometimes lose interest when people talk about very abstract, theoretical matters.
- _____ 25. I believe that the different ideas of right and wrong that people in other societies have may be valid for them.
- _____ 26. I enjoy concentrating on a fantasy or daydream and exploring all its possibilities, letting it grow and develop.
- _____ 27. I experience a wide range of emotions or feelings.
- _____ 28. I prefer to spend my time in familiar surroundings.
- _____ 29. I enjoy working on "mind-twister"-type puzzles.

1 = Strongly Disagree

2 = Disagree

3 = Neutral

4 = Agree

5 = Strongly Agree

- _____ 30. I believe that loyalty to one's ideals and principles is more important than "open-mindedness."
- _____ 31. If I feel my mind starting to drift off into daydreams, I usually get busy and start concentrating on some work or activity instead.
- _____ 32. Certain kinds of music have an endless fascination for me.
- _____ 33. I seldom notice the moods or feelings that different environments produce.
- _____ 34. Sometimes I make changes around the house just to try something different.
- _____ 35. I have little interest in speculating on the nature of the universe or the human condition.
- _____ 36. I consider myself broad-minded and tolerant of other people's lifestyles.
- _____ 37. As a child I rarely enjoyed games of make believe.
- _____ 38. Sometimes when I am reading poetry or liking at a work of art, I feel a chill or wave of excitement.
- _____ 39. I find it easy to empathize-to feel myself what others are feeling.
- _____ 40. On a vacation, I prefer going back to a tried and true spot.
- _____ 41. I have a lot of intellectual curiosity.
- _____ 42. I think that if people don't know what they believe in by the time they're 25, there's something wrong with them.
- _____ 43. I would have difficulty just letting my mind wander without control or guidance.
- _____ 44. I enjoy reading poetry that emphasizes feelings and images more than story lines.
- _____ 45. Odd things-like certain scents or the names of distant places-can evoke strong moods in me.
- _____ 46. I follow the same route when I go someplace.
- _____ 47. I have a wide range of intellectual interests.
- _____ 48. I believe that the "new morality" of permissiveness is no morality at all.

The Revised Rational-Experiential Inventory

Subject# _____

1 = Definitely not true of myself

2 = Probably not true of myself

3 = Neutral

4 = Probably true of myself

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 works 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 hard problems that require a lot of 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 ones.
- _____ 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 would not want to depend on anyone who described himself or herself as intuitive.
- _____ 32. I have no problem thinking things through carefully.
- _____ 33. My snap judgments probably aren't as good as most people's.
- _____ 34. Using logic usually works well for me in figuring out problems in my life.

- _____ 35. I tend to use my heart as a guide for my actions.
- _____ 36. Knowing the answer without having to understand the reasoning behind it is good enough for me.
- _____ 37. I can usually feel when a person is right or wrong, even if I can't explain how I know.
- _____ 38. I usually have clear, explainable reasons for my decisions.
- _____ 39. I suspect my hunches are inaccurate as often as they are accurate.
- _____ 40. Learning new ways to think would be very appealing to

Subject# _____

The Absorption Scale

- T F 1. Sometimes I feel and experience things as I did when I was a child.
- T F 2. My feelings can be greatly moved by poetry.
- T F 3. While watching a movie, a T.V. show, or a play, I may become so involved that I forget about myself and my surroundings and experience the story as if it were real and as if I were taking part in it.
- T F 4. If I stare at a picture and then look away from it, I can sometimes “see” an image of the picture almost as if I were still looking at it.
- T F 5. I like to watch cloud shapes change in the sky.
- T F 6. Sometimes I feel as if my mind could envelop the whole world.
- T F 7. If I wish, I can imagine (or daydream) some things so vividly that they hold my attention as a good movie or story does.
- T F 8. I think I really know what some people mean when they talk about mystical experiences.
- T F 9. I sometimes “step outside” my usual self and experience an entirely different state of being.
- T F 10. Textures—such as wool, sand, wood—sometimes remind me of colors or music.
- T F 11. Sometimes I experience things as if they were doubly real.
- T F 12. When I listen to music, I can get so caught up in it that I don’t notice anything else.
- T F 13. If I wish, I can imagine that my body is so heavy that I could not move it if I wanted to.
- T F 14. I can often somehow sense the presence of another person before I actually see or hear her/him.
- T F 15. The crackle and flames of a wood fire stimulate my imagination.

- T F 16. It is sometimes possible for me to be completely immersed in nature or in art and to feel as if my whole state of consciousness has somehow been temporarily changed.
- T F 17. Different colors have distinctive and special meanings for me.
- T F 18. I am able to wander off into my own thoughts while doing a routine task and actually forget that I am doing the task, and then find a few minutes later that I have completed it.
- T F 19. I can sometimes recollect certain past experiences in my life so truly that it is like living them again or almost so.
- T F 20. Things that might seem meaningless to others often make sense to me.
- T F 21. While acting in a play, I think I could really feel the emotions of the character and “become” her/him for the time being, forgetting both myself and the audience.
- T F 22. My thoughts often don’t occur as words but as visual images.
- T F 23. I often take delight in small things (like the five-pointed star shape that appears when you cut an apple across the core or the colors in soap bubbles).
- T F 24. When listening to organ music or other powerful music, I sometimes feel as if I am being lifted into the air.
- T F 25. Sometimes I can change noise into music by the way I listen to it.
- T F 26. Some of my vivid memories are called up by scents and smells.
- T F 27. Some music reminds me of pictures or changing color patterns.
- T F 28. I often know what someone is going to say before he or she says it.
- T F 29. I often have “physical memories”; for example, after I’ve been swimming I may still feel as if I’m in the water.
- T F 30. The sound of a voice can be so fascinating to me that I can just go on listening to it.
- T F 31. At times I somehow feel the presence of someone who is not physically there.

- T F 32. Sometimes thoughts and images come to me without the slightest effort on my part.
- T F 33. I find that different odors have different colors.
- T F 34. I can be deeply moved by a sunset.

The Mysticism Scale

Subject # _____

This questionnaire contains brief descriptions of a number of experiences. Some descriptions refer to phenomenon that you may have experienced while others refer to phenomenon that you may not have experienced. In each case note the description carefully and then place a mark in the left margin according to how much the description applies to your own experience. Write +1, +2, or -1, -2, or ? depending on how you feel in each case.

+2 = This description is definitely true of my own experience or experiences

+1 = This description is probably true of my own experience or experiences.

-1 = This description is probably not true of my own experience or experiences.

-2 = This description is definitely not true of my own experience or experiences.

? = I cannot decide.

- _____ 1. I have had an experience which was both timeless and spaceless.
- _____ 2. I have never had an experience which was incapable of being expressed in words.
- _____ 3. I have had an experience in which something greater than myself seemed to absorb me.
- _____ 4. I have had an experience in which everything seemed to disappear from my mind until I was conscious of only a void.
- _____ 5. I have experienced profound joy.
- _____ 6. I have never had an experience in which I felt myself to be absorbed as one with all things.
- _____ 7. I have never experienced a perfectly peaceful state.
- _____ 8. I have never had an experience in which I felt as if all things were alive.
- _____ 9. I have never had an experience which seemed holy to me.
- _____ 10. I have never had an experience in which all things seemed to be aware.
- _____ 11. I have had an experience in which I had no sense of time or space.
- _____ 12. I have had an experience in which I realized the oneness of myself with all things.
- _____ 13. I have had an experience in which a new view of reality was revealed to me.
- _____ 14. I have never experienced anything to be divine.
- _____ 15. I have never had an experience in which time and space were nonexistent.
- _____ 16. I have never experienced anything that I could call ultimate reality.
- _____ 17. I have never had an experience in which ultimate reality was revealed to me.
- _____ 18. I have had an experience in which I felt that all was perfection at that time.
- _____ 19. I have had an experience in which I felt everything in the world to be part of the same whole.
- _____ 20. I have had an experience which I knew to be sacred.
- _____ 21. I have never had an experience in which I was unable to express adequately Through language.
- _____ 22. I have had an experience which left me with a feeling of awe.
- _____ 23. I have had an experience that is impossible to communicate.

- _____ 24. I have never had an experience in which my own self seemed to merge into something greater.
- _____ 25. I have never had an experience which left me with a feeling of wonder.
- _____ 26. I have never had an experience which deeper aspects of reality were revealed to me.
- _____ 27. I have never had an experience in which time, place, and distance were meaningless.
- _____ 28. I have never had an experience in which I became aware of a unity to all things.
- _____ 29. I have had an experience in which all things seemed to be conscious.
- _____ 30. I have never had an experience in which all things seemed to be unified into a single whole.
- _____ 31. I have had an experience in which I felt nothing is ever really dead.
- _____ 32. I have had an experience that cannot be expressed in words.

Subject# _____

Openness to Spiritual Beliefs and Experiences Scale

- 1 = Definitely No**
2 = Probably No
3 = Possibly No
4 = Maybe
5 = Possibly Yes
6 = Probably Yes
7 = Definitely Yes

- _____ 1. Do you consider yourself to be a “religious” person (e.g. do you follow a particular organized religion)?
 _____ 2. Do you consider yourself to be a “spiritual” person (e.g. do you hold specific values or beliefs)?
 _____ 3. Do you believe in the existence of “God” or a “Higher Power”?
 _____ 4. Do you believe in survival of consciousness after death?
 _____ 5. Do you believe in the existence of “angels” or “guides”?
 _____ 6. Do you believe in “ESP” or “parapsychology”?
 _____ 7. Do you believe that prayer can have an effect on health and well-being?
 _____ 8. Have you ever *experienced* the presence of “God” or a “Higher Power”?
 _____ 9. Have you ever *experienced* the presence of someone who has passed away?
 _____ 10. Have you ever *experienced* the presence of “angels” or “guides”?
 _____ 11. Have you ever *experienced* “ESP” such as connecting with a loved one from a distance or having a predictive dream?
 _____ 12. Have you ever *experienced* prayer help promote health and well-being?

Weird Coincidence Scale

Subject # _____

Please read the following story as an example of meaningful coincidence.

"Kelly is a 28 year old female member of Alcoholics Anonymous. She was struggling with a great deal of anger and resentment focused on her father, an active alcoholic with whom she has been with from the age of 10. She described their relationship as one of emotional turmoil and "dysfunctional."

One day, as she was reading the text, Alcoholics Anonymous, she came across a passage that described alcoholics as sick people and how we would not treat a cancer patient or someone suffering from another serious medical illness with disdain and resentment. She suddenly had this "revelation" about her father and felt the anger and resentment melt into empathy and concern. She realized how he was suffering and ill from his alcoholism just as she had been suffering from the same illness: "I felt like all those feelings that I carried around my dad were gone. I guess I see this now as God removing my resentments." She suddenly "felt a sense of peace." As she pondered these new feelings and perceptions her cell phone rang; it was her father calling. The two had been so alienated that she didn't even think he knew her phone number. Surprisingly, he confessed to her how important she had been in his life, how sorry he was, how he cared about her and would do anything to help her. He wept as he spoke openly about their troubled relationship

Kelly later told the interviewer that the coincidence of her father calling just at the moment when her heart was opening up struck her as "amazing."

Please rate the frequency that you have experienced the following conditions by selecting the appropriate answer.

- 1 = Never**
2 = Seldom
3 = Occasionally
4 = Often
5 = Very Frequently

- _____ 1. When I am in a hurry, I find a parking spot right where I need it.
 _____ 2. I am late to get somewhere and find the way surprisingly open so that I arrive just in time.
 _____ 3. I think of calling someone, only to have that person unexpectedly call me.
 _____ 4. When my phone rings, I know who is calling (without checking the cell phone screen or using personalized ring tones).
 _____ 5. I think about a song and then hear it on the radio.
 _____ 6. I think of a question only to have it answered by external media (i.e., radio, TV, people) before I can ask it.
 _____ 7. I think of an idea and hear or see it on radio, TV, or Internet.
 _____ 8. I think about someone and then that person unexpectedly drops by my house or office or passes me in the hall or street.
 _____ 9. I run into a friend in an out-of-the-way place.

- 1 = Never**
2 = Seldom
3 = Occasionally
4 = Often
5 = Very Frequently

- _____ 10. I need something and the need is met without my having to do anything.
 _____ 11. In a desperate search for information it amazingly shows up.
 _____ 12. The right amount of money shows up from an unexpected source just when I need it.
 _____ 13. A lost object comes back to me in an unexpected way.
 _____ 14. I experience a series of numerically-related coincidences (for example, buying something for \$1.44 before taking flight #144 at 1:44 pm).
 _____ 15. The same name or word has appeared several times in close proximity in different contexts.
 _____ 16. I advance in my work/career/education through being at the “right place-right time.”
 _____ 17. I am introduced to people who unexpectedly further my work/career/education.
 _____ 18. A certain number regularly appears in my life.
 _____ 19. Meaningful coincidence helps determine my educational path
 _____ 20. I discover that I felt pains and/or anguish as someone I loved was dying in another place.
 _____ 21. I experience strong emotions or physical sensations that were simultaneously experienced at a distance by someone I love.
 _____ 22. After a loved one died, I have received some indication that this person was communicating with me.
 _____ 23. I have dreams and later find out that events in my dreams actually happened around the same time that I had dreamt them.
 _____ 24. I have dreams that predict future events.
 _____ 25. I have dreams that supply me with specific information about my personal life, career, or education.
 _____ 26. I have dreams about unknown persons whom I then subsequently met.
 _____ 27. A series of coincidences point me toward taking a particular action in my personal life, career, or education.
 _____ 28. In attempting to reach a goal, obstacle after obstacle prevented me from continuing on a path which I later discovered was better for me.
 _____ 29. Meaningful coincidence validates my course of action.
 _____ 30. Meaningful coincidences change my life.
 _____ 31. I am in the right place at the right time to rescue somebody.
 _____ 32. A meaningful coincidence results in my avoiding an injury or an accident.
 _____ 33. Meaningful coincidences occur to me around *the birth of a child*.
 _____ 34. Meaningful coincidences occur to me around *the death of a loved one*
 _____ 35. Meaningful coincidences occur to me around *a personal crisis*.

_____ 36. After experiencing meaningful coincidence, I analyze the meaning of my experience.

Please rate how strongly you agree or disagree with the following statements.

1 = Strongly Disagree

2 = Somewhat Disagree

3 = Neutral

4 = Somewhat Agree

5 = Strongly Agree

_____ 37. I feel that meaningful coincidences point to a connection between my internal and external worlds.

_____ 38. I believe that human minds are interconnected.

_____ 39. I believe fate works through meaningful coincidences.

_____ 40. I believe God speaks to us through meaningful coincidences

_____ 41. Meaningful coincidences help me grow spiritually.

_____ 42. I believe coincidences can be explained by the laws of probability or chance.

Subject# _____

The Santa Clara Strength of Religious Faith Questionnaire

Please answer the following questions about religious faith using the scale below.
Indicate the level of agreement (or disagreement) for each statement.

1 = Strongly Disagree**2 = Disagree****3 = Agree****4 = Strongly Agree**

- _____ 1. My religious faith is extremely important to me.
- _____ 2. I pray daily.
- _____ 3. I look to my faith as a source of inspiration.
- _____ 4. I look to my faith as providing meaning and purpose in my life.
- _____ 5. I consider myself active in my faith or church.
- _____ 6. My faith is an important part of who I am as a person.
- _____ 7. My relationship with God is extremely important to me.
- _____ 8. I enjoy being around others who share my faith.
- _____ 9. I look to my faith as a source of comfort.
- _____ 10. My faith impacts many of my decisions.

ADULT EYSENCK PERSONALITY QUESTIONNAIRE

Occupation _____

Age _____ Sex _____

Instructions Please answer each question by putting a circle around the YES or the NO following the question. There are no right or wrong answers, and no trick questions. Work quickly and do not think too long about the exact meaning of the questions.

PLEASE REMEMBER TO ANSWER EACH QUESTION

1	Do you have many different hobbies?	YES	NO
2	Do you stop to think things over before doing anything?	YES	NO
3	Does your mood often go up and down?	YES	NO
4	Have you ever taken the praise for something you knew someone else had really done?.	YES	NO
5	Are you a talkative person?	YES	NO
6	Would being in debt worry you?	YES	NO
7	Do you ever feel "just miserable" for no reason?	YES	NO
8	Were you ever greedy by helping yourself to more than your share of anything?	YES	NO
9	Do you lock up your house carefully at night?	YES	NO
10	Are you rather lively?	YES	NO
11	Would it upset you a lot to see a child or an animal suffer?	YES	NO
12	Do you often worry about things you should not have done or said?	YES	NO
13	If you say you will do something, do you always keep your promise no matter how inconvenient it might be?	YES	NO
14	Can you usually let yourself go and enjoy yourself at a lively party?	YES	NO
15	Are you an irritable person?	YES	NO
16	Have you ever blamed someone for doing something you knew was really your fault?	YES	NO
17	Do you enjoy meeting new people?	YES	NO
18	Do you believe insurance schemes are a good idea?	YES	NO
19	Are your feelings easily hurt?	YES	NO
20	Are <i>all</i> your habits good and desirable ones?	YES	NO
21	Do you tend to keep in the background on social occasions?	YES	NO
22	Would you take drugs which may have strange or dangerous effects?	YES	NO
23	Do you often feel "fed up"?	YES	NO
24	Have you ever taken anything (even a pin or a button) that belonged to someone else?	YES	NO
25	Do you like going out a lot?	YES	NO
26	Do you enjoy hurting people you love?	YES	NO
27	Are you often troubled about feelings of guilt?	YES	NO
28	Do you sometimes talk about things you know nothing about?	YES	NO

29	Do you prefer reading to meeting people?	YES	NO
30	Do you have enemies who want to harm you?	YES	NO
31	Would you call yourself a nervous person?	YES	NO
32	Do you have many friends?	YES	NO
33	Do you enjoy practical jokes that come sometimes really hurt people?	YES	NO
34	Are you a worrier?	YES	NO
35	As a child did you do as you were told immediately and without grumbling?	YES	NO
36	Would you call yourself happy-go-lucky?	YES	NO
37	Do good manners and cleanliness matter much to you?	YES	NO
38	Do you worry about awful things that might happen?	YES	NO
39	Have you ever broken or lost something belonging to someone else?	YES	NO
40	Do you usually take the initiative in making new friends?	YES	NO
41	Would you call yourself tense or "highly strung"?	YES	NO
42	Are you mostly quiet when you are with other people?	YES	NO
43	Do you think marriage is old-fashioned and should be done away with?	YES	NO
44	Do you sometimes boast a little?	YES	NO
45	Can you easily get some life into a dull party?	YES	NO
46	Do people who drive carefully annoy you?	YES	NO
47	Do you worry about your health?	YES	NO
48	Have you ever said anything bad or nasty about anyone?	YES	NO
49	Do you like telling jokes and funny stories to your friends?	YES	NO
50	Do most things taste the same to you?	YES	NO
51	As a child were you ever cheeky to your parents?	YES	NO
52	Do you like mixing with people?	YES	NO
53	Does it worry you if you know there are mistakes in your work?	YES	NO
54	Do you suffer from sleeplessness?	YES	NO
55	Do you always wash before a meal?	YES	NO
56	Do you nearly always have a "ready answer" when people talk to you?	YES	NO
57	Do you arrive at appointments in plenty of time?	YES	NO
58	Have you often felt listless and tired for no reason?	YES	NO
59	Have you ever cheated at a game?	YES	NO
60	Do you like doing things in which you have to act quickly?	YES	NO
61	Is (or was) your mother a good woman?	YES	NO
62	Do you often feel life is very dull?	YES	NO
63	Do you ever take advantage of someone?	YES	NO
64	Do you often take on more activities that you have time for?	YES	NO
65	Are there several people who keep trying to avoid you?	YES	NO
66	Do you worry a lot about your looks?	YES	NO
67	Do you think people spend too much time safeguarding their future with savings and insurances?	YES	NO
68	Have you ever wished you were dead?	YES	NO

69	Would you dodge paying taxes if you were sure you could never be found out?	YES	NO
70	Can you get a party going?	YES	NO
71	Do you try not to be rude to people?	YES	NO
72	Do you worry too long after an embarrassing experience?	YES	NO
73	Do you ever insist on having your own way?	YES	NO
74	When you catch a train do you often arrive at the last minute?	YES	NO
75	Do you suffer from “nerves”?	YES	NO
76	Do your friendships break up easily without it being your fault?	YES	NO
77	Do you often feel lonely?	YES	NO
78	Do you always practice what you preach?	YES	NO
79	Do you sometimes like teasing animals?	YES	NO
80	Are you easily hurt when people find fault with you are the work you do?	YES	NO
81	Have you ever been late for an appointment or work?	YES	NO
82	Do you like plenty of bustle and excitement around you?	YES	NO
83	Would you like other people to be afraid of you?	YES	NO
84	Are you sometimes bubbling over with energy and sometimes very sluggish?	YES	NO
85	Do you sometimes put off until tomorrow what you ought to do today?	YES	NO
86	Do other people think of you as being very lively?	YES	NO
87	Do people tell you a lot of lies?	YES	NO
88	Are you touchy about some things?	YES	NO
89	Are you always willing to admit it when you have made a mistake?	YES	NO
90	Would you feel very sorry for an animal caught in a trap?	YES	NO

PLEASE CHECK TO SEE THAT YOU HAVE ANSWERED ALL OF THE
QUESTIONS

Subject# _____

The Revised Religious Fundamentalism Scale

This survey is part of an investigation of general public opinion concerning a variety of social issues. You will probably find that you *agree* with some of the statements and *disagree* with others to varying extents. Please indicate your reaction to each statement by writing next to each statement according to the following scale. If you feel exactly and precisely *neutral* about an item write a “0”.

-4 = Very Strongly Disagree**-3 = Strongly Disagree****-2 = Moderately Disagree****-1 = Slightly Disagree****0 = Neutral****+1 = Slightly Agree****+2 = Moderately Agree****+3 = Strongly Agree****+4 = Very Strongly Agree**

You may find that you sometimes have different reactions to different parts of a statement. For example, you might very strongly disagree (“-4”) with one idea in a statement, but slightly agree (“+1”) with another idea in the same item. When this happens, please combine your reactions, and write down how you feel on balance (a “-3” in this case).

- _____ 1. God has given humanity a complete, unfailing guide to happiness and salvation
Which must be totally followed.
- _____ 2. No single book of religious teachings contains all the intrinsic, fundamental truths about life.
- _____ 3. The basic cause of evil in this world is Satan, who is still constantly and ferociously fighting against God.
- _____ 4. It is more important to be a good person than to believe in God and the right religion.
- _____ 5. There is a particular set of religious teachings in this world that are so true you can’t go any “deeper” because they are the basic bedrock message that God has given humanity.
- _____ 6. When you get right down to it, there are basically only two kinds of people in the world: the Righteous who will be rewarded by God, and the rest, who will not.
- _____ 7. Scriptures may contain general truths, but they should NOT be considered completely, literally true from beginning to end.
- _____ 8. To lead the best, most meaningful life, one must belong to the one, fundamentally true religion.

- _____ 9. “Satan” is just the name people give to their own bad impulses. There really is *no such thing* as a diabolical “Prince of Darkness” who tempts us.
- _____ 10. Whenever science and sacred scripture conflict *science* is probably right.
- _____ 11. The fundamentals of God’s religion should never be tampered with, or compromised with others’ beliefs.
- _____ 12. *All* of the religions in the world have flaws and wrong teachings. There is *no* perfectly true, right religion.

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