

COGNITIVE DEFICITS AND SPIRITUAL DEVELOPMENT
THE RELATIONSHIPS BETWEEN COGNITIVE DEFICITS AND SPIRITUAL
DEVELOPMENT

By

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TABLE OF CONTENTS

CHAPTER ONE: INTRODUCTION

Statement of the Problem.....	1
Purpose of the Study.....	2
Statement of Hypothesis.....	3
Limitations/Delimitations.....	3
Definitions.....	5
Importance of Study.....	8

CHAPTER TWO: LITERATURE REVIEW

Cognitive Development.....	10
Cognitive Deficits and Specific Learning Disability.....	15
Spiritual Development.....	25
Spiritual and Cognitive Development.....	39
Synopsis.....	41

CHAPTER THREE: METHODOLOGY

Research Design.....	43
Selection of Subjects.....	43
Instrumentation.....	45
Assumptions.....	55
Procedures.....	56
Data Processing and Analysis.....	57
Summary.....	61

CHAPTER FOUR: ANALYSIS AND FINDINGS

Introduction.....	62
Data Analysis Relating to Hypothesis.....	62
Null Hypothesis One.....	63
Null Hypothesis Two.....	68
Summary.....	71

CHAPTER FIVE: CONCLUSIONS

Specific Findings.....	73
Implications for Theory.....	76
Limitations of the Study.....	79
Recommendations for Future Research.....	80
Summary.....	80

REFERENCES.....	83
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APPENDICES.....	104
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Appendix A: Spiritual Assessment Inventory.....	104
Appendix B: Spiritual Assessment Inventory Score Guide.....	106
Appendix C: Informed Consent.....	109
Appendix D: Institutional Permission Letter.....	110
Appendix E : Cover Letter.....	111

Abstract

An individual's spirituality is shaped and supported by his or her cognitive capacities. The purpose of this study was to investigate the relationship between various cognitive deficits and the spiritual development in individuals who qualified for special education under the category of Specific Learning Disability. Participants were randomly selected through systematic sampling of students and former students of Kellyville Public School who met the criteria. The cognitive deficits were measured by the Woodcock-Johnson III Tests of Cognitive Abilities (2001) or the Woodcock-Johnson Psycho-Educational Battery- R (1989), and spiritual development was measured by the Spiritual Assessment Inventory (2002). The results of this study indicate that there is a marginal correlation between Long-Term Retrieval and Awareness of God.

CHAPTER ONE

The Relationships Between Cognitive Deficits and Spiritual Development

Introduction

Statement of the Problem

Since the foundational work on cognitive development by Piaget (Santrock, 2005), researchers have been studying the organization and adaptation processes of cognitive development as one learns to adjust to the environment. Each person is born with an inherited potential to grow intellectually (Kalat, 2007). Wong, Eaton, Winkelstein, Wilson, Ahmann & DiVito-Thomas (1999, p. 134) discuss this potential by saying "With cognitive development, children acquire the ability to reason abstractly, to think in a logical manner, and to organize intellectual functions or performances into higher order structures. Language, morals, and spiritual development emerge as cognitive abilities advance". Cognitive development is a common element in human development. The degree by which one develops cognitively affects traditional educational issues and spiritual development.

In the public school population about 10% of the students qualify for special services due to some form of cognitive deficit (Shaywitz & Shaywitz, 2005). This is a significant amount of the population whose development is hampered in educational areas such as reading, math or written expression. Schools provide services for those individuals who qualify in a *Least Restrictive Environment* under the direction of a document developed to guide their education entitled an *Individual Education Program*. States, like Oklahoma, provide a policy and procedures manual for use in public

education which directs districts on the application of state and federal law regarding students with disabilities (Garrett, 2003).

Those who teach in special education classrooms are provided research based education at the college level to prepare them to meet the challenges of this special population. The study of spiritual development is now an emerging emphasis with approximately 125 known and accepted measures of religiosity and spirituality (Hill & Hood, 1999). Other studies have addressed the relationship between general cognitive development and spiritual development. However, there is a paucity of research on how specific cognitive deficits may influence spiritual development.

The question addressed in this study was the description of relationships between cognitive deficits and spiritual development in individuals who qualified for special education under the category of Specific Learning Disability.

Purpose of the Study

The purpose of this study was to investigate the relationships between cognitive deficits and spiritual development. The information gained will provide insight into these relationships and identify which of the studied deficits (Long-Term Retrieval, Auditory Processing, Visual-Spatial Processing, Processing Speed and Short-Term Memory) has the greatest influence on an individual's spiritual development.

Special consideration was given to the role of Processing Speed and its relationship to spiritual development. The primary rationale for its selection over other processing areas was due to its prevalence as an inclusion factor for placement in special education as observed by the researcher. Research also indicates that within the adult

lifespan Processing Speed increases its impact on general intelligence whereas other processing areas remain fairly stable.

Statement of the Hypothesis

The null hypothesis was that there would be no correlation between cognitive deficits and spiritual development among individuals who qualified for special education under the category of Specific Learning Disability. The alternative hypothesis for this study was that a correlation exists between various cognitive deficits and spiritual development among individuals who qualified for special education under the category of Specific Learning Disability.

A second null hypothesis for this study was that individuals who qualified for special education under the category of Specific Learning Disability with a deficit in Processing Speed will not score lower on a scale used to measure spiritual development than those individuals who qualified for special education under the category of Specific Learning Disability who qualified under Long-Term Retrieval, Auditory Processing, Visual-Spatial Processing or Short-Term Memory. The alternative hypothesis was that individuals who qualified for special education under the category of Specific Learning Disability with a deficit in Processing Speed will score lower on a scale used to measure spiritual development compared to those individuals who qualified for special education under the category of Specific Learning Disability who qualified under Long-Term Retrieval, Auditory Processing, Visual-Spatial Processing or Short-Term Memory.

Limitations/Delimitations

Limitations

The Woodcock-Johnson (WJ) tests for cognitive development is based on a theory which espouses that overall intelligence is comprised of seven cognitive processes including, comprehensive knowledge, long-term memory, auditory processing, visual processing, fluid reasoning, processing speed and short-term memory. This study may be limited by the use of the WJ since not all testing instruments share this theory base. Further, the Spiritual Assessment Inventory (SAI) has a limited research history and provide only two dimensions of spiritual development (Awareness of God and Quality of Relationship with God). This implies that the study may be limited in its scope of understanding spirituality.

An additional limitation to the study may relate to the reading level of the participants. Although the SAI is rated on a third grade reading level, there was a concern for this researcher that it may be too difficult for some of the participants. The type and severity of the deficit and what academic area that deficit effected could prevent instrument completion. However, no issues were reported and scoring patterns seemed to indicate that the SAI was both read and comprehended.

The use of a self report instrument could be the source of limiting the study since individuals may respond with what they assume to be socially desirable responses. Further by using the SAI a limitation may occur as participants may not discriminate between different aspects of their life.

The selection of participants also contributed to the study limitations. Since all participants had qualified under the category of Specific Learning Disability, this study did not address other categories such as Other Health Impaired, Mental Retardation,

Autism or Multiple Handicapped and how these disabilities effected spiritual development.

A fundamental assumption regarding this study was that the cognitive deficit(s) which placed a student into a special education program continued to be a deficit for them in later life and that the WJ has correctly identified that deficit.

Delimitations

This study was limited by the number of participants. A larger sample size from a more diverse population could add to its external validity and the capacity to generalize data to additional populations. The ability to access protected groups for research purposes oftentimes limited the number of study participants.

Definitions

The following definitions are provided so that the reader may be able to more clearly understand each term and its relationship to the study. The definitions fall under the headings of cognitive deficits, cognitive development, Specific Learning Disability, and spiritual development.

The Cattell-Horn-Carroll theory (CHC)(Woodcock & McGrew, 2001) provided a conceptual framework for the operational definition and terms for cognitive development. Hall and Edwards (2002) provided the conceptual framework for the operational definition and terms for spiritual development.

Cognitive deficits

The CHC constructs are measured in the WJ (Woodcock & McGrew, 2001). Fluid Reasoning and Comprehensive-Knowledge are also measured in the WJ but will not be discussed since they are not included in this study.

A deficit in cognitive ability is defined as a score of 78 or below on a standardized measure. Scores can be obtained from the WJ as it is used to assess the following cognitive areas

- a. Long-Term Retrieval: The ability to store information and fluently retrieve it later in the thinking process. It is not a measure of stored information but rather a measure of processing efficiency through which information is initially stored and then recalled later.
- b. Short-Term Memory: The ability to pick up and hold information in immediate awareness and then be able to use that information within a few seconds.
- c. Processing Speed: The ability to perform simple and relatively automatic visual-motor tasks and to maintain attention under a timed condition.
- d. Visual-Spatial Thinking: Ability to perceive, analyze, synthesize and think with visual patterns by recognition, rotation and reversals of figures, including the ability to store and recall the visual representation.
- e. Auditory Processing: The ability to analyze, synthesize and discriminate auditory stimuli.

Cognitive development

Cognitive development means the improvement of the cognitive elements defined by the WJ as Long-Term Retrieval, Short-Term Memory, Visual-Spatial Thinking, Auditory Processing, and Processing Speed.

Specific learning disability

A Specific Learning Disability is a disorder that involves one or more of the basic psychological processes that is involved in understanding or using language. It may be expressed as a flawed ability to listen, think, speak, write, spell or perform math. Specific Learning Disability is a broad term that includes such disorders as perceptual abilities, brain injury, minimal brain dysfunction, dyslexia and aphasia. Key eligibility indicators include:

1. A disorder in basic psychological processing abilities
2. Achievement that is not corresponding to age and ability levels after having been provided those appropriate learning experiences
3. A severe discrepancy between achievement and intellectual abilities (Garrett, 2003).

Spiritual development

Miller (2000) suggests that spirituality is a multidimensional construct that includes one's practices, beliefs and experience. Hall and Edwards (2002) operationalized experiential spiritual development with an instrument called the Spiritual Assessment Inventory (SAI). The SAI is a 36-item self report which is theoretically based on Objection Relations. The SAI has two dimensions. The Quality of Relationship which is composed of the Realistic Acceptance scale, Disappointment scale, Grandiosity scale and the Instability scale. These are designed to assess the developmental quality of an individual's relationship with God and the Awareness dimension is a scale designed to assess the individual's awareness of God's responsiveness, guidance and presence.

- a. Quality of Relationship: Developmental levels of relationship with God

- Realistic Acceptance: Able to experience and tolerate mixed feelings about their relationship with God.
- Disappointment: The ability to accept disappointment with God and keep in fellowship with God.
- Grandiosity: Preoccupied with self and the need to present their self as better than they are.
- Instability: Have difficulty trusting God and seeing God as one who is loving.

b. Awareness of God: The awareness of God's communication and presence.

Importance of Study

Implications

The results of this study contribute data to the body of knowledge regarding the relationship between cognitive development and spiritual development. This study also provides insight into the role of cognitive deficits and their effect on spiritual development. The data may contribute to discussions regarding any correlation between various cognitive deficits and one's experience of faith. Also, this study supports the understanding of spiritual development through the same processes first organized by Piaget in that formal operational thinking allows for the introduction of faith concepts (Santrock, 2005). Results indicate that as one develops spiritually that the ability to provide a mental framework or representation for the concepts of God also develops.

Scripture reminds us that we are wonderfully made (Psalms 139:14). We are called to be transformed beings by the renewing of our minds (Romans 12:2). Yet the development of the brain can be affected by prenatal care, genetic inheritance, health of

the mother, and the reaction of fetal development to ingestants such as drugs, alcohol and smoke from tobacco (Kalat, 2007). Since a Specific Learning Disability is related to brain development and in turn to cognitive development, the information from this study could lead to further research on these educational and theological issues.

Applications

The information gained from this study would be beneficial to individuals and publishing houses which provide educational resources to students who have a Specific Learning Disability. Individuals with a learning disability could benefit from information that could enlighten their understanding of their particular journey of faith. Those involved in evangelism or outreach on behalf of a religious organization could use this information to address those with specific learning disabilities in new and innovative ways. Importantly, churches could use this information to assess their youth programming to better benefit those who have been categorized with a learning disability.

CHAPTER TWO

Literature Review

The following sections will discuss the topics of cognitive development, cognitive development and Specific Learning Disability, spiritual development and spiritual and cognitive development. Each section is divided into historical reviews, definitions, brain development, and measurement.

Cognitive Development

Historical review

Most texts on child development address the area of cognitive development (Jaffe, 1998; Santrock, 2005; & Dusek, 1996). The most well known theory and perhaps the most influential in education is that of Jean Piaget, a French psychologist whose observations of his own children led him to envision that children's knowledge is composed of schemas which are basic units of knowledge that are used to organize a past experience. Schemas are used to understand a new experience. "...he demonstrated that there was a developmental aspect to the cognition of people beginning at the earliest years of infancy and continuing through clearly defined stages into adulthood" (Fortosis & Garland, 1990, p. 632). For Piaget, this process is modified by other processes called assimilation and accommodation. To assimilate is to take in new information and incorporate into the present schema and to accommodate is to change the schema to adjust to the new knowledge. If these two processes are balanced equilibration occurs (Santrock, 2005 & Dusek, 1996).

At the center of Piaget's theory (as cited in Santrock, 2005) is a series of four distinct, universal, stages which are characterized by an increasingly more sophisticated

and abstract level of thought. They are the sensorimotor stage (birth to 24 months), the preoperational stage (2-6 years), the concrete operational stage (6-11 years), and the stage of formal operational thought (11 or 12 into adulthood). Also, Jaffe (1998) points out that “almost all adolescents show dramatic improvement in their ability to think rationally and to reason systematically” (p. 112). This would seem to be supportive of Piaget’s view.

Santrock (2005) delineates three approaches to cognitive development. They include Piaget under a cognitive developmental view, Vygotsky with sociocultural cognitive theory and information processing theory. Piaget’s theory has already been described. The sociocultural approach sees knowledge as collaborative in nature and in essence ties together conceptually the impact of both genetics and environmental influences.

Gauvin (2003) supports an information-processing view. Cognitive processes are required to interpret and organize perception. As development continues, an individual is able to process mental representations even when there is an absence of a subject to be perceived (Bremner & Fogel, 2001). Interestingly Gauvain (2003) suggests that by describing children’s cognitive development in terms of what they do or think at a given age there is a failure to account for the effects of the physical, social, and emotional aspects that may influence how learning occurs. Gauvain maintains that there are four key cognitive domains which are affected by context. These are the domains of attention, memory, problem-solving, and planning. These domains would also be the cognitive processes necessary to provide the mental representation of a concept like God and how one understands the relationship one has to that perception.

Thus one could measure cognitive development with a psychometric instrument to understand what intelligence is and how it develops. More will be said of this in the section on measurement (See Measurement on page 20).

The last approach to cognitive development is one of social cognition (Elkind & Selman, 2005, 2005). This approach relies on studies of how adolescents move from an egocentric world view to an ever improving perspective. As they develop, they are increasingly able to anticipate the reactions of others and the ability to imagine another person's point of view. This approach, however, is an outgrowth of basic cognitive development as addressed by Piaget. It relies on formal operational thinking to move from one perspective (egocentric) to another (perspective taking).

Definition

Cognitive development refers to "...how a person perceives, thinks, and gains an understanding of his or her world through the interaction and influence of genetic and learned factors" (Plotnik, 1999). Cognitive processes involved in this development may include such diverse elements as remembering, problem solving and decision making. Information processing, intelligence, reasoning, language development and memory should develop along a similar time table (Santrock, 2005). Language, moral and spiritual development should also advance with one's cognitive abilities (Wong, et.al. 1999).

Siegler (1991) proposed that cognitive abilities involve perception, logical thinking and reasoning. Bremner & Fogel (2001) suggest that cognitive processes are required to interpret and organize what is perceived. They would also argue that the ability to provide a mental representation for something which lacks any perceptual input, such as the perception of God, requires cognitive ability.

Brain development

Kalat (2007) describes the development of the human nervous system as beginning to form when the embryo is about two weeks old. Further, through the process of cell proliferation the new cells migrate from the brain stem area forward. As they proceed, the cells differentiate into axons and dendrites with a specific shape. Many axons are myelinated which provides insulation which speeds transmission. This process lasts a lifetime. Synaptogenesis is the final process in which various synapse are formed. The cerebral cortex envelopes areas known as the hind brain, midbrain and forebrain areas.

The cerebral cortex is divided into two hemispheres and four lobes (the occipital, the parietal, the temporal and the frontal (Kalat, 2007). As this discussion unfolds, specific brain parts will be discussed in light of cognitive and spiritual development. This is an important issue as Durston and Casey (2005) note that “developmental neuroimaging studies of cognitive control, as well as other functions, suggest that cognitive development is supported by changes in patterns of brain activation, including enhancement of activation in critical areas, attention to others, and changes in the extent of activation as well as shifts in lateralization” (p.2151). Teske (2006) adds that as individuals respond to narratives there is neural change in memory, attention, emotional marking and temporal sequencing. Gauvin (2005) notes that now there are more studies concerning the biological underpinnings of how cognition works and notes that it is presently studied through developmental cognitive neuroscience, behavioral genetics, comparative and ethological approaches and through evolutionary developmental psychology.

Measurement

How does one measure cognitive development? For some, the question is whether or not a child follows the progressive stages of Piaget's theory. Even here, one would need to review the effect of a learning disability on the constructs of assimilation and accommodation. Although Fortoris and Garland (1990) suggest that the result of disequilibrium is invariably a movement to a higher cognitive development, because it requires the assimilation or accommodation processes to function. It begs the question of what is actually occurring in the brain and how it is affected by a Specific Learning Disability.

Most responses to the question of measuring cognitive development have centered around some form of measurement of intelligence. Instruments normally used include the Stanford-Binet , the Wechsler Scales or the Woodcock-Johnson III or Woodcock-Johnson Psycho-Educational Battery-R.

Summary

Cognitive development involves elements of memory, problem solving and decision making which follow distinctive patterns of brain development and is supported by changes in patterns of brain activation. Cognitive development, although influenced by environment, follows a basic developmental pattern for most individuals made up of distinct components such as perception, logical thinking and reasoning. The mental framework for the concept of God is defined to some degree by the level of cognitive development (Cartwright, 2001, Faber, 2004, & Hall, 2002).

Cognitive Deficits and Specific Learning Disability

Historical review

Special education services provides assistance to numerous categories of disabilities such as Autism, Multiple Handicapped, Intellectually Disabled as well as those categorized as Learning Disabled. Torgesen (2004, p. 3) notes that “More children are currently being served in LD programs than in any other area of special education”. Also, LD represents the fastest growing category of service. While the International Dyslexia Association (2004) suggests that between 15-20% of the population has a reading disability, the reality is that over 50% of all students who are served will be in the category of Specific Learning Disability (LD).

The following is a brief history of the development of learning disabilities, including key individuals, books, measurements and the legal status of the field. Other sources for historical development are available through the following writers: Coles (1987), Doris (1986), Hallahan & Cruickshank (1973), Hallahan & Mercer (2002), Kavale & Forness (1985), Myers & Hammill (1990) and Wiederholt (1974).

Historically, LD has been a disorder that has been difficult to define or even name. Terms such as “specific learning disabilities”, “developmental disabilities”, “learning disabilities”, “developmental disorders” and “minimal brain dysfunction” have been used (Fletcher, Morris & Lyon, 2003, & Ardila, 1996).

Torgesen (2004) reports that the question of possible causes for differences between individuals has a history that goes back to the time of the Greeks (approximately 350 B.C.). In the early nineteenth century Joseph Gall (in Torgesen, 2004) described a soldier who could not express in spoken language his feelings or ideas. The work of

individuals like Broca and Wernecke (in Torgesen, 2004) who studied speech and language disorders added to the information in the field. Clinical studies by James Hinshelwood in 1917 discussed the loss of the ability to read following brain trauma in adults. Hinshelwood also reported on children who, although they were quite normal in intellectual skills, had extreme difficulties learning to read.(Torgesen, 2004). The problem was described as “congenital word blindness.” Its cause was presumed to be some sort of damage to the part of the brain that stores visual memories of words and letters (in Torgesen, 2004).

Samuel Orton (in Torgesen, 2004), a child neurologist in 1937 proposed that reading difficulties were not the result of one localized area of the brain not functioning but rather a delay or a failure in the left hemisphere of the brain. Orton used the term “strephosymbolia” or twisted symbols to refer to the practice of disabled children to reverse letters or words. These reversals were thought to be due to confusion between the visual image and the two renderings of two different hemispheres.

The work that seems to lead directly to the establishment of an organized field of learning disability was attributed to Werner and Strauss (in Torgesen, 2004) who sought to describe the processes that affected learning rather than explaining a failure in a specific academic task. Distractibility, hyperactivity, visual perception and perceptual/motor problems were considered processes that would negatively affect learning. Publications were generated providing extensive recommendations for remediation to strengthen those processes or using teaching methods that did not stress the weak processing areas.

During the 1940's, 1950's and early into the 1960's, there was no field of learning disabilities. Rather there were differing persons from different fields studying common phenomenon. Coined in 1963 (Torgesen, 2004), the term "learning disability" (LD) served as a catalyst for the formation of the Association for Children with Learning Disabilities. The first major legislation related to this field was passed in 1969 with the Children with Learning Disabilities Act which authorized the U.S. Office of Education to establish programs for LD students. Since that time Public Law 94-142, Education of All Handicapped Children Act, was passed. The Individuals with Disabilities Act has just recently been reauthorized with modifications (2004).

Within the field of education there have been struggles with definition and measurement. Early models (Hallahan & Cruickshank, 1973) stressed processes that caused learning difficulty and developed measurements that looked for processing issues. The services provided were based on developing the weak process area. Further research (Mann, 1979) seemed to indicate that process training did not generalize into improvements in learning academic skills (in Torgesen, 2004). Yet, by definition, LD results from deficiencies in basic psychological processes and is diagnosed in terms of discrepancy between a general measure of intelligence and a general measure of achievement.

Definition

Cognitive deficit is an inclusive term that is used to describe weaknesses in intellectual functioning in global disorders like mental retardation or specific deficits in certain cognitive abilities such as in learning disabilities. Definitions for LD have had

historically differing terminology. The National Joint Committee on Learning Disability provides the following definition for learning disability:

Learning disabilities is a general term that refers to the heterogeneous group of disorders manifested by significant difficulties in acquisition and use of listening, speaking, reading, writing, reasoning, or mathematical abilities. These disorders are intrinsic to the individual, presumed to be due to central nervous system dysfunction, and may occur across the life span. Problems in self-regulatory behaviors, social perception, and social interaction may exist with learning disability. Although learning disabilities may occur concomitantly with other handicapping conditions (for example sensory impairment, mental retardation, serious emotional disturbance) or with extrinsic influences (such as cultural differences, insufficient or inappropriate instruction), they are not the result of those conditions or influences (NJCLD memorandum, 1998, p. 1) (in Torgesen, 1998,p. 23).

In connection with this definition, the State of Oklahoma follows federal standards and provides the following definition.

A Specific Learning Disability is a disorder that involves one or more of the basic psychological processes that is involved in understanding or using language. It may be expressed in a flawed ability to listen, think, speak, write, spell or do math. Specific Learning Disability is a broad term that includes such disorders as perceptual abilities, brain injury, minimal brain dysfunction, dyslexia and aphasia. Key eligibility indicators include a disorder in basic psychological processing abilities, achievement that is not corresponding to age and ability levels after

having been provided those appropriate learning experiences and a severe discrepancy between achievement and intellectual abilities. (Garrett, 2003, p. 46).

The Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR-2000) provides yet another definition learning disorder. A learning disability is diagnosed “when the individual’s achievement on individually administered, standardized tests in reading, mathematics, or written expression is substantially below the expected for age, schooling and level of intelligence” (p. 49).

Ardila (1996) adds a definition for a subtype of LD that he termed dyslexia. Dyslexia as defined by Ardila is a disorder that manifests itself in problems with reading despite conventional instruction, adequate intelligence, and sociocultural opportunity. Further “if learning disabilities were interpreted as a result of certain brain dysmaturation or dysfunction, it could be easily assumed that, theoretically, as many developmental learning disabilities as basic cognitive abilities must exist” (p. 196). The net result is that there is more to be said in the future regarding the specific definition and thus as Torgesen (2004) implies that present broad definitions allows differing results in research.

Brain issues in learning disabilities

There are two main issues that surface in a study of the relationship of the brain to LD. The first issue is that 50% or more of phonological processes (the ability listen to and understand speech) that cause a learning disability are genetically based (Olson, 1997; Wadsworth, Olson, Pennington and DeFries 2000; Torgesen, 2004; Shaywitz & Shaywitz, 2005; Scarborough, 1996, Williams, & O’Donovan, 2006, Plomin & Kovas, 2005) with a risk factor eight times greater for developing a reading disability with

children whose parents were reading disabled. The second issue is the consistent finding that LD is related to the left hemisphere of the brain (Shaywitz, 2000; Torgesen, 2004; Aloyzy, 2001; McCrory, Eamon, Mechelli, Frith & Price, 2005; Sousa, 2001; Zeffiro & Edens, 2000, & Dowker, 2006).

Dowker (2006) noted weakness in the insula, (which functions to connect visual and language areas), as well as reduced activation in the angular gyrus (which serves as a link between visual input from the occipital lobe and a linguistic representation in the temporal lobe). Apparently the degree of reduced activation in the angular gyrus corresponds to the severity of LD (Rumsey, Horwitz, Donohue, Nace, Maisog, & Anderson, 1999). McCrory, et. al. (2005) pinpointed reduced activation in the left occipitotemporal area which is also the same area as the angular gyrus. Also, Logan (1997) notes that word analysis is localized within the parietotemporal region and that the occipitotemporal area functions as the visual format. Thus the ability to read and gain knowledge from reading is effected negatively

Sousa (2001) provides a linear view of reading but states “it is really bidirectional and parallel, with many phonemes being processed at the same time” (p.89). The linear view of reading is a four step process which allows for a person to (1) see the word through the visual cortex and then have it (2) decoded into its phonological elements in the angular gyrus (occipitotemporal area). This then is followed by (3) having the word identified in Broca’s area of the left temporal lobe. Finally (4), through vocabulary, reasoning and concept formation give the word meaning in Wernecke’s area of the left temporal lobe also referred to as the parieto-temporal area (Sousa, 2005). Thus, as Sousa

explains, to read requires the coordination of three systems: the visual processing to see the word, auditory processing to hear it and semantic processing to understand it.

Measuring deficits

In essence, the process of developing a definition for LD has led to measuring deficits along three different criteria. These three areas are discussed here.

The State of Oklahoma's guidelines for determining if a student should be served under special education with the category of Specific Learning Disability seeks to cover all three criteria. Measurements need to establish three differing criteria to be placed. The first criterion is a disorder in psychological processing. The second criteria is achievement that is not corresponding to age and ability levels after having been provided those appropriate learning experiences. The third criteria is a severe discrepancy between achievement and intellectual abilities. Thus a study like the one done in India by Karande, Sawant, Kulkarni, Kanchan and Sholapuwala (2005) in which LD was determined by achievement scores being two years below an actual grade level would not meet federal standards in the United States or the State of Oklahoma.

The WJ consists of two separate batteries, the cognitive (COG) and the achievement (ACH) batteries which were co-normed on the same population. The WJ III COG is designed to measure General Intellectual Ability and specific cognitive functions such as Long-Term Retrieval, Short-Term Memory, Auditory Processing, Visual-Spatial Processing, and Processing Speed. The WJ III ACH is designed to measure achievement in reading, math, written expression and oral language. When the tests are administered together, the batteries allow the tester to investigate over/underachievement and to view patterns of intraindividual discrepancies among cognitive or achievement areas.

McGrew and Woodcock (2001) state that “the tests, clusters, factors, and scales of the WJ III provide more precise measures and a wider breadth of coverage of human cognitive abilities that are found in any other system of psychological and educational assessment” (p. 2). Gregory Cizek (2003), a reviewer for the Mental Measurement Yearbook, agrees that the WJ III provides accurate measures of cognitive abilities. Sandoval (2003) adds, “The WJ III must be considered the premier battery for measuring both the cognitive abilities and school achievement of school-aged children and young adults” (p. 1027).

Raymond B. Cattell hypothesized in 1941 that there are two types of intelligence, fluid intelligence (Gf) and crystallized intelligence (Gc). For Cattell, the construct of fluid intelligence was seen as related to factors of physiology and thus would be influenced by genetics and was seen as stable over the life span. Fluid intelligence would be a non-verbal and cultural free mental ability. Education would not affect fluid intelligence. Crystallized intelligence on the other hand would be formed through education, training, life experiences and thus be highly susceptible to environmental factors (Vance, 1998).

J.L. Horn (in McGrew & Woodcock, 2001) refined the GF-Gc theory in 1965 and finally in 1991 included nine broad factors which fall under the 69 general categories brought forward by Cattell. J. B. Carroll (in McGrew & Woodcock, 2001) then published a meta-analysis of all the previous work and developed a three stratum theory upon which the present WJ III operates. Carroll’s stratum are: Stratum I- narrow cognitive abilities which lists 69 specific abilities; Stratum II- eight broad abilities which include fluid intelligence, crystallized intelligence, general memory and learning, broad

auditory perception, broad retrieval ability, broad cognitive speediness and processing speed; Stratum III- general intelligence.

Support for the Cattell-Horn-Carroll (CHC) theory is well documented (Ferrer & McArdle, 2004; Kaufman & Kaufman, 2001; Schrank, McGrew & Woodcock, 2003; Floyd, 2003; Rizza, McIntosh & McCunn, 2001; Woodcock, McGrew & Mather, 2001; Cizek, 2003; & Sandoval, 2003). Evans, Floyd, McGrew and Leforgee (2001) comment that “The Cattell-Horn-Carroll theory of cognitive abilities is considered to be one of the most well-validated models of cognitive abilities” (p. 247).

The cognitive ability area of Processing Speed was deemed by the researcher to have a greater relationship on spiritual development than the other processing areas (Long-Term Retrieval, Short-Term Memory, Auditory Processing, and Visual-Spatial Processing). The choice of Processing Speed was supported by clinical observation, definition of Processing Speed and statistical information regarding the weighted scoring method used to provide the best estimate of general intelligence.

The researcher, a state certified School Psychologist, has observed through evaluating hundreds of students that a higher number meet qualifications for services in special education due to deficit in Processing Speed than other processing areas. As Mark Kelly (2004) notes, “Much can be determined if we simply observe students during testing” (p. 43). Gay (1987) points out that observation is similar to a case study conducted to determine characteristics of children with problems. He also adds that “observer reliability generally requires that at least two observers independently make observations” (p. 217). In essence the two observers for this study included the researcher and the testing results.

Mather and Woodcock (2001) define Processing Speed as “an aspect of cognitive efficiency” (p. 20) which is the capacity for one to process information automatically. Schrank and Flanagan (2003) refer to it as “the fluency and speed with which one can ‘cycle’ or integrate all types of information” (p. 66). They also note that Processing Speed is strongly related to the academic achievement of both children and adults which makes it important across all domains for the ease of learning. Specifically, they report that Processing Speed is “significantly related to...basic reading...across the life span” (p. 134).

Mather and Schrank (2001) discussed scoring the Woodcock-Johnson Tests of Cognitive Abilities and the use of weighted scores for each of the General Intellectual Ability (GIA) factors (Long-Term Retrieval, Short-Term Memory, Auditory Processing, Visual-Spatial Processing and Processing Speed). “Each GIA score is a weighed combination of cognitive tests that account for the largest portion of variance in the component tests” (p. 7). In essence “Each test included in the GIA score is weighted to provide the best estimate of *g* [General Intellectual Ability]” (p. 7).

Among college age students Long-Term Retrieval was weighted highest (.16) with the other factors weighted between .11 and .13. However, in terms of life span development Processing Speed weighted factor rose to .15 while Visual-Spatial Thinking dropped to .10, Auditory Processing dropped to .11. Short-Term Memory averaged about a .14 weighted factor. Long-Term Retrieval remained fairly constant at about a .16-.17 weighted range (Mather and Schrank, 2001).

Summary

Specific Learning Disability (LD), as a category, has developed over time with differing definitions and concepts regarding etiology. This disorder includes criteria of basic psychological processing abilities, achievement that is not corresponding to age and ability levels (after having been provided those appropriate learning experiences), and a severe discrepancy between achievement and intellectual abilities. LD is a left hemispheric brain issue predominately in the temporal and occipital lobes and is designated as such after criteria for the three areas of the definition are met. The WJ measures all three areas of the definition of LD.

Spiritual Development

Historical review

Spirituality is now being referred to as the 5th force in counseling and psychology (Sandhu & Painter, 2000). Research on spirituality tends to fall into three broad categories. “There are researchers who view spirituality as an integral part of religiosity; those who view spirituality as separate from religiosity; and those who view spirituality as synonymous with religiosity” (Roehlkepartain, Benson, King, and Wagener, 2006, p.424). This researcher takes the view that spirituality is an integral part of religiosity. In effect, spirituality is a formative part of human existence no matter how it is approached or studied. Issues do arise, however, due to the nature of definition and etiology. Further, “the vast majority of published scholarship in well established journals presumes a North American context with a primary focus on the majority population (Caucasian and Judeo-Christian).” (Roehlkepartain, Benson, King & Wagener, 2006, p.9). Yet, as Boyatzis (2003) notes, studies on Christianity and development represented less than a quarter of one percent of the total articles on growth and development. Studies of children and

religion represented two-thirds of 1% of reported research on children. Benson, Roehlkepartain and Rude (2003) simply add the obvious, that spiritual development in children and adolescence is understudied.

References available in religious studies indicate a consistent pattern of positive influence. Religiosity has been shown to be positively associated with prosocial values and behaviors such as wisdom (Furrow & Wagener, 2000), premature sexual involvement (Langille & Curtis, 2002; Hardy & Raffaelli, 2003; Rostosky, Regnerus, & Wright, 2003; Steinman & Zimmerman, 2004; Lefkowitz, Gillen, Shearer & Boone, 2004; healthy living choices and fewer risk behaviors (Kass & Lennox, 2005; Schulz, 2004; Smith, 2003; Regnerus & Elder, 2003; Caputo, 2004; Ebstyne & Furrow, 2004; Steinman & Zimmerman, 2004; Perkins & Jones, 2004; C'de Baca & Wilbourne, 2004; Furrow, King, 2004; & Hardy & Carlo, 2005) as well as improved relationships with others (Lefkowitz, 2005 & McCullough, Enders, Brion, & Jain, 2005).

Historically, early leaders in psychology such as William James (in Paloutzian, 1996) and G. Stanley Hall (1996) considered spirituality and religion to be associated, if not fundamental, to their area of study. As psychology developed there became tension between religion and science. Vandenberg and O'Conner (2005) spell out how a scientific world view is radically different from a theological one in terms of identity (organic vs. divine), nature (biological vs. biblical), and development (higher vs. fallen).

Perhaps the initial separation came through the works of Freud (in Paloutzian, 1996). As the father of modern psychology, Freud referred to religion as some kind of universal obsessional fixation which was based on mere illusions derived from infantile wishes (Paloutzian, 1996). Carl Jung (1996) also saw religion as a delusion but, unlike

Freud, asserted that religion had value in providing assurance and strength. Therefore humanity was allowed to move past instincts alone and onto higher moral ground. From an object-relations viewpoint, Maria Rizzuto (in Hall, 1997) stated that God representations are essentially universal and are based on a child's relationship with parents and other caretakers. Object Relations Theory affirms a relationship between a number of areas:

- Faber (2004) provided evidence for the relationship between how the mind-brain works and how parent-child relationships are internalized.
- The formation of a cognitive-affective schemata (Deeley, 2004)
- Attachment and spiritual development in adolescence and children (Granqvist & Dickie, 2006)
- How the mind uses ordinary representations system to represent religious acts (Slone, 2005)
- How faith is related to attachment (Clore, 1997)
- How spirituality is relationally based and mediated through neurobiology and emotional information processing (Hall, 2002).

Erik Erickson (in Santrock, 2005) offered a stage theory of development which provided a venue for studying religious and spiritual development. As an example, the first stage of trust verses mistrust can become the foundation for hope which can be transformed into faith. James Fowler (1995) made use of Erickson's model to develop a stage theory for faith development. How one develops cognitively as suggested by Piaget seems to "fit" the stage theories of Erickson and Fowler. Johnson (2000) adds that developmentally children go through a stage which includes magical thinking. Johnson

would assert that this is a part of the process of how a person develops faith. Tisdell (1999), on the other hand, suggests that a view of faith development in adults must take into account not only the relationships and experiences by which one gains meaning but recognize that adults are informed by their lives and relationships. Thus Tisdell challenges a true stage theory and supports a developmental systems theory. The third phase historically, is systems theory which seeks to locate development in the ongoing transactions between an individual and the multiple layers of his or her family context. Thus writers like Benson, Roehlkepartain, and Rude (2003) argue that spiritual development is multifaceted, developmental, shaped by the person's cognitive capacities and environmental influences.

Paloutzian (1996) summarizes by saying, "...the finding that these obtained stages of religious development all closely parallel the general stages of cognitive development..." (p.102). Further, religious development "can be accounted for by stages of general psychological development, plus our understanding of the limits of childhood experience, and family and social modeling influences with their associated selective exposure to religious ideas, teaching, and practices" (p. 103).

A review of literature in the area of disabilities and spirituality provided a small number of studies. Schultz (2005) explored the relationship between the age of onset of a physical disability and how a person experiences spirituality. His study suggested that those who had a childhood onset of a disability were able to experience spirituality more favorably. A number of studies (Tepper, Rogers, Coleman, & Maloney, 2001; Phillips, Larkin & Pargament, 2002; Sullivan, 1993 & Hodge, 2004) established that those who suffered with a mental illness found spirituality to be a positive influence on their lives.

Literature dealing directly with the relationship between cognitive deficits and spirituality was almost nonexistent in this writer's research.

Turner, Hatton, Shah, Stansfield and Rahim (2004) published a qualitative study of 29 individuals with intellectual disabilities from differing religious backgrounds such as Christian, Islam and Hindu. The results of that study suggested that these individuals had strong religious identities and found prayer to be the most favored religious expression. The study participants seemed to believe that the religious institutions failed to recognize them and support their efforts to be faithful. Lindenthal, Pepper and Stern (1970) reported a negative correlation between level of cognitive impairment and participation in organized faith systems in that the more one was cognitively impaired the less one would participate in organized religion.

The author located a resource for church ministries to the cognitively impaired: Friendship Ministries (Grand Rapids, MI) The target population for Friendship Ministries was those under the category of mentally retardation. No direct services seemed available for those who are labeled with a Specific Learning Disability.

Definition

Two prominent issues need mentioning prior to providing a definition for the term spiritual development. The first issue involves integration. As noted in the history section, the world of classic psychology and that of faith do not always share a common journey or understanding. Integration will be the first issue discussed. The second issue is that there are really two definitions. Separate definitions need to be given for spiritual and spiritual development.

Frankl (1997) was quite clear on his view of merging psychology and spirituality, “Any fusion of the respective goals of religion and psychotherapy must result in confusion” (p.80). This was said based on the belief that the intentions of the two were different. “...psychotherapy by its very nature is not and can never be religiously oriented” (p.81). Sorenson (2004) at the other end of the spectrum assumes that the therapist is a spiritual being which in turn influences how work is done clinically. Also affirmed is that a therapist exerts more spiritual influence upon a patient than does “the patient’s parents in the family of origin, or the patient’s religious authorities...” (p.31). Writers from a distinctively Christian view point such as McMinn (1996), pinpoint the center of Christian spirituality as the healing of one’s relationship with God. The goal of spirituality is “the alleviation of mental, emotional, and spiritual distress” (Miller, 2000, p. 20) whereas the goal of psychotherapy is the “alleviation of mental and emotional distress that may have biological referents” (p.20). McMinn and Hall (2000) pinpointed the problem with definition as the result of conflicting world views “Psychology, deeply rooted in scientific epistemology, places great value in systematic and measurable observation. Christian theology is bounded by central doctrines, forged over centuries of dialog and based on the authority of a sacred text” (p.251).

Definitions of spirituality are as multiple as the writers of articles and books. What can be observed in the definitions from both psychology and theology is a common core concept of searching for the sacred. As Pargament (1999) shares, “It has to do with however people think, feel, act, or interrelate in the efforts to find, conserve, and if necessary, transform the sacred in their lives” (p.12). This view is reiterated by Hill, Pargament, Hood, McCullough, Swyers, Larson, & Zinnbauer (2000); Miller and West,

(2003); Jones, (1995); Argyle, (2002) and Houskamp, Fisher, & Stuber, (2004). Thus psychology and theology share the perspective that spirituality is fundamentally relational. As Hall (2002) proposes, “we are hard-wired to seek attachment relationships with people, and relationships are fundamental to the creation of meaning” (p.6). Thus Hall would agree that we are hard-wired to seek a relationship with God or the sacred.

Spiritual development, to some, potentially involves risks and uses classic methodologies such as contemplation, meditation and prayer (Reich, 2001). The writings of such luminaries as Thomas A’Kempis (1981), Chafer (1967), Watchman Nee (1968), Dallas Willard (1998) or Robert Foster (1988) have for the Christian community been a source of direction and practical insight. Benson, Roehlkepartain and Rude (2003) may provide for us a starting point by which to define spiritual development, realizing that spirituality can be experienced, observed and described but not captured in its totality.

Spiritual development is the process of growing the intrinsic human capacity for self-transcendence, in which the self is embedded in something greater than the self, including the sacred. It is the developmental “engine” that propels the search for connectedness, meaning, purpose and contribution. It is shaped both within and outside of religious traditions, beliefs and practices (p. 205-206).

Benson, et.al. (2003) continue by pointing out that “spiritual development may well be the least understood of human capacities” (p.206). Miller (2000) agrees and adds that in defining spiritual development the multiple dimensions of practice, belief and experience are incorporated with experience. As in this study, the search for the sacred is fundamental to defining the nature of the meaning of spirituality. In fact, the term spiritual development raises the focus to spiritual change, transformation, growth or

maturation, where each person is an active agent in his or her own growth process. If this is true, then the question of this study is of great importance. It will assist in the understanding of deficits in cognitive development and the work of spiritual development.

Brain and spiritual development

Just prior to this writing a new avenue for investigating religious experience has developed called neurotheology, whose aim is to define how brain functions correlate with a person's relationship to God. Azari, Missimer, & Seitz (2005) sought in their study to find specific neocortical networks that mediate a religious experience. In so doing they affirmed that religious experiences are cognitively mediated. Boyer's (2003) article on religious thought and behavior promotes the idea that religious concepts activate distinct mental systems.

The connection between how the brain operates and spiritual development has also gained attention in the public sphere. Exposés in newspapers and magazines such as the *Newsweek* with an article by Sharon Begley on May 7, 2001 entitled "Religion and the Brain" and *The Times-Picayune* (New Orleans, January 4, 2003) article by Amy Nutt called "Brain is wired for God" reveal a growing interest in this research.

The literature seems to support four major systems involved in spiritual or religious experience. Seybold (2005) notes that "While there is some localization of functions in the human brain, the brain operates as a result of complex (i.e., adaptive and self-organized) interconnections among these models" (p.125). So even though four areas will be discussed, it is understood that it is not simply the parts but the whole that is being considered.

The limbic system which includes the amygdala, hippocampus and hypothalamus collectively is involved in learning, motivation, memory and emotion has been cited for studies into spiritual experiences (Pesinger, 1987; Joseph, 2001; Saver & Rabin, 1997; & Faber, 2004). Since the limbic system is common to all people, it may suggest why there is an apparent universality of religious beliefs. Cozolino (2002) points out that the amygdala is a key component in the neural networks that invoke attachment, fear, emotional experience and early affective memories. If so, then attachment theory makes clear developmental sense since early emotional memories would be stored in the amygdala. The resulting attachment would vary depending on the memory involved.

Further, the hippocampus organizes explicit memory or information that actually occurred and works with the cerebral cortex to narrate the memory. The thalamus processes all sensory information with the exception of the olfactory bulb. Whereas the amygdala holds implicit memory or memory in which previous experiences aid in the performance of a task without a person's awareness, the hippocampus holds the explicit memory. The thalamus provides the sensory information that acts as a trigger for response patterns. The hypothalamus, which is regulatory in nature, provides direction to the body for such diverse functions as circadian cycles, body temperature, hunger, thirst, control of emotions and sexual activity (Kalat, 2007).

The second area of focus in studies is the temporal lobe (Devinsky, 2003 and Persinger, 1987). Auditory information is first processed there and thus is essential for understanding language. Further, it contributes to perception of movement and recognition of faces (Kalat, 2007). Two observations are then necessary at this point. There should be a clear relationship between language, reading and spiritual

development. Second, as Persinger (1987) argues, auditory input can trigger activity in the temporal lobe which connects to areas of the limbic system leading to emotional responses.

The third system noted in studies was the parietal lobe (VanHeertum & Tikofsky, 1995; Joseph, 1996, & Newberg & d'Aquili, 2001). This portion of the brain helps us to have a sense of our body in space (Cozolino, 2002) and assists us in interpreting visual and auditory information (Kalat, 2007). In essence, it helps integrate our experiences. Therefore, if there is blocking to the parietal lobe, the distinction between self and other occurs. Other may be a person or thing. This may lead to a sense of being a part of other (Newberg & Newberg, 2006).

Newberg and d'Aquila (2001) noted that during a peak spiritual experience participants showed a decreased activity in the parietal lobe. This infers that the orientation between self and others is less distinct. When participants meditated or prayed there was an increased activity in the frontal lobe and limbic system implying increased concentration, memory and emotional input.

The last area of the brain that was indicated in studies of this nature was the frontal lobe (Newberg & d'Aquili, 2001; McNamara, 2001; Lazar, Bush, Gollub, Fricchione, Khalsa & Benson, 2000 and Anderson, 2001). The frontal lobe is involved in motor behavior, expressive language, executive functioning, abstract reasoning and directed attention. As such, it operates in spiritual experiences by intensifying awareness and alertness (Cozolino, 2002).

Two results may be gleaned from these studies as well. First, there may be a sensitive period when the brain is ready to learn about God (Barrett & Richert, 2003).

Secondly, since the brain has plasticity, images of God can and do change (Miller & West, 2000).

Measuring spiritual development

Measuring spirituality may appear to be an absurd task. However, Scripture often speaks of growing up in Christ and maturing (Ephesians 4:15, I Peter 2:2, II Peter 3:18, Hebrews 6:1, Psalms 92:12). These are spiritual developmental expressions. Conceptually then, measuring spiritual development is not a foreign construct to Scripture or the life of the church.

Normally, as Pargament (2003) notes, spirituality is measured by global indices such as frequency of church attendance or self-rating scales. Critiques of quantifying spirituality have been raised such as the potential to leave out important information not covered in a questionnaire, the inability of a client to fully express his or her journey, spirituality is such a subjective reality that it is difficult to quantify in any manner (Hodge, 2001). Slater, Hall and Edwards (2001) add that issues such as the precision of definition and social desirability also affect quantitative measures of spirituality. From a more pragmatic perspective, Standard, Sandhu and Painter (2000) see quantitative measures of spirituality useful for the counselor in terms of diagnosis and treatment planning. “From the client’s viewpoint, assessment results are useful in self-exploration, self-understanding, and a perspective shift necessary for decision making and action planning” (p.205).

Although there are at least 115 measures of religiosity (Hill & Hood, 1999), research oriented spiritual assessment forms are less numerous. Among the best known are *The Spiritual Well-being Scale* (Paloutzain & Ellison, 1982) which has two subscales

that measure spiritual and existential well being; *INSPIRIT* (VandeCreek & Ayres & Bassham, 1995) reports on spiritual experiences rather than beliefs or practices.

Other measures include *The Spiritual Experience Index* (Genia, 1997) which is a 23 item scale used to measure spiritual support and openness; *The Spiritual Involvement and Beliefs Scale* (Hatch, Burg, Naberhaus & Hellmich, 1998) which assesses with a 26 item questionnaire beliefs and actions in a way that avoids cultural or religious bias.

Further measures include *The Spiritual History Scale in Four Dimensions (SHS-4)* (Hays, Meador, Branch & George, 2001) which with its 23 items measures lifetime spiritual experiences and whose four dimensions include: God helped, family history of religiousness, lifetime religious social support and the cost of religiousness.

Measures that are more subjective in nature include *The Spirituality Index of Well-being* (Daaleman, Frey & Wallace, 2002) which reports to measure the effect of spirituality on subjective well-being. *The Spiritual Transcendence Index* (Seidlitz, Abernathy, Duberstein, Evinger, Chang & Lewis, 2002) is an eight item measure used to assess perceived experiences of the sacred that affects self-perception, feelings, goals and ability.

The Spiritual Assessment Inventory (SAI) (Hall & Edwards, 2002) is a questionnaire to measure spiritual maturity from a Judeo-Christian perspective which “blends concepts from object relations theory with the contemplative Christian spirituality literature” (Hill & Pargament, 2003, p. 71). The author chose to use this instrument for his study.

The SAI has been used in numerous dissertations since its inception. Included in those dissertations are those by Donofrio (2005) in a study of the correlation between the

NEO-PR-I and the SAI; Smith (2004) in a study of object relations and spirituality; Small (2003) in a pilot study of Christian-oriented computer-assisted cognitive therapy; and Plass (2003) concerning a theological assessment of narcissism.

Zequeira-Russell (2003) reviewed concepts of wilderness (experiencing living in undeveloped regions) and spirituality. Evans (2003) explored the impact of Christ's image on religious coping specifically in African American Christians. Thelander (2003) researched perfectionism and spiritual functioning. Bergaas (2003) used the SAI in a study of missionary burnout in Norwegian missionaries. Bryant (2003) completed a study of parenting styles and spiritual maturity.

In other studies, Murray (2002) researched the illusion of maturity among seminary students by using the SAI as an indicator. Dyer (2001) studied the relationship between spirituality and caregivers of those afflicted with Alzheimer's. Seatter (2001) performed a study investigating relationships between the SAI and the Rorschach. Kim (2000) researched Korean American adolescent behavior including running away and delinquency utilizing the SAI. Horton (1999) sought to find relationships between spiritual maturity and extrinsic or intrinsic religiosity.

Fee and Ingram (2004) correlated three scales including the SAI, Holy Spirit Questionnaire and the Spiritual Well-Being Scale, Warren (1998) studied spiritual maturity and attachment, and Tisdale (1998) compared levels of object relations development between Jewish, Muslim and protestant faith groups.

An apparent thread that ran through most of the studies was that the SAI was used as a means to understand spiritual maturity. Support and the use of the SAI comes from many sources. Hall, Brokaw, Edwards and Pike (1998) indicted a strong correlation

between the SAI and the Bell Object Relations Inventory (BORI). Barnett, Duvall, Edwards, & Hall (2005) found construct validity for the SAI as they correlated it with “the Spiritual Well-Being Scale, the Intrinsic/Extrinsic-Revised, the BORI, the Narcissistic Personality Inventory, and the Defensive Style Questionnaire” (p.31). Fee and Ingram (2004) stated “The Spiritual Assessment Inventory (SAI) is considered to be a valid indicator of one’s awareness of God (“spiritual maturity”) and the nature of that relationship (“psychological maturity”)” (p.105) as based on their correlational study between the SAI, the Spiritual Well-Being Scale and the Holy Spirit Questionnaire. Standard, Sandhu and Painter (2000), in their summary of the SAI, stated that it would be useful as a research instrument. Their only critique was its Judeo-Christian bias.

Other support for the use of the SAI to measure spirituality can be found in Lewin (2001); McDonald, Kuentzel and Friedman (1999); Hall and Edwards (1996); Hall et al (1998). A description of the SAI will be provided in the section on instrumentation.

Summary

Spirituality is an integral part of religiosity. The spiritual development of children and adolescents is understudied. Religiosity is positively correlated with prosocial values and behavior. Although spirituality was part of early psychological studies, it only recently has been reintroduced into the mainstream as an area of study. Few articles have been published regarding the study of spiritual development and cognitive deficits.

Spirituality, for this paper, is defined as the search for the sacred which includes how one thinks, feels, acts and interrelates. Spiritual development is defined as the process of growing through change, transformation and maturation in the search for the sacred and our relation to others. Measuring this development will be accomplished in

this study by the use of the Spiritual Assessment Inventory (SAI) which measures two dimensions of spiritual development, the Awareness of God and the Quality of Relationship with God.

Neurotheology seeks to define how the brain functions as it relates to a persons relationship with God. At this juncture the literature seems to indicate four main areas involved in spirituality. They include the limbic system (learning, motivation, memory and emotion); the temporal lobe (language, movement and face recognition); the parietal lobe (self in space and the interpretation of visual and auditory information), and the frontal lobe (executive functioning, abstract reasoning and direct attention).

Spiritual and Cognitive Development

“Theories of spiritual development have existed in the margins of student development theory for about 20 years” (Love, 2002, p.357). A study of the two areas in direct relation to each other has been significantly overlooked. There seems to be a common sense understanding or what one may refer to as a face valid approach to their relationship, in which it is thought that the two areas parallel each other in development. Love (2002) states , “One’s level of cognitive development need not be similar to one’s spiritual development, though because they both relate to the development of meaning-making, it is hard to imagine a situation where they would be significantly divergent in an individual” (p.369). This concept is further supported by Mulqueen and Elias (2000) who suggest that to understand how adults learn implies an understanding of their spirituality. Strize (2002) is more direct in stating that spirituality is related to cognitive processes. Without the use of cognitive processes, any of the numerous dimensions of religious belief lack the ability to be declared. However, regardless of the deficit within cognitive

functioning, spirituality is still a developmental process. Obviously, spiritual development is a complex and multifaceted concept. Yet this development is both shaped and supported by environment and the individual's cognitive capacities (Benson, Roehlkepartain, & Rude, 2003).

What Love (2002) did not consider in his statements was the possible differences based on cognitive deficits. It is true, as Helminiak (1987) notes, that spiritual development is not guaranteed. Can cognitive development affect spiritual development? James and Wells (2003) seem to suggest a positive response to that question saying, "Religious beliefs and particularly religious behaviors may affect ongoing cognitive processes..." (p. 369). Vaughn (2002) goes as far as to say that there is a radical difference between intelligence which Vaughn defined as "the ability to manage cognitive complexity" (p.17) and spiritual intelligence as it "is more than individual mental ability. Spiritual intelligence appears to connect the personal to the transpersonal and the self to the spirit" (p.19). Strizenec (2002) defines spiritual intelligence as involving "ideas, goals and convictions concerning the most essential principles termed "ultimate concerns"" (p. 136).

From a Piagetian point of view, when one reaches formal operation thinking, there is the ability to reason logically about abstract notions which would include ideas about God and one's relationship to that being. Yet it is obvious that there is a wide variability of levels of cognitive functioning and spiritual development even among adults. Cognitive development is what mediates the understanding of the relationship between mortals and the Eternal, even though environment plays a role (Cartwright,

2001). Cartwright adds, “it is suggested that an individual’s level of cognitive development constrains their understanding of this relation” (p.213).

Intellectual development seems to be age-related but not necessarily age-determined (Mulqueen & Elias, 2000). This aspect of intellectual development may provide for variation in the development of both cognitive and spiritual development, and potentially hamper an individual's understanding of his or her concept of God (Cartwright, 2001). If spirituality is primarily understood as experience related or seeking for the sacred, then it can be understood on an intellectual level. This is illustrated when an individual has reached a stage of development in which he or she was reflective and analytically self aware. Also, this may imply that spiritual development could involve the whole person so that the emotional, social, and cognitive domains provide meaning to how God is understood and how one understands that relationship (Love, 2002). Piaget demonstrated that there was a developmental aspect of the cognition of people beginning from the earliest years of infancy into adulthood. Formal operational thinking, according to Piaget, included the concepts of assimilation and accommodation in response to an individual meeting a sense of disequilibrium (Fortosis & Garland, 1990). With disequilibrium the individual moves toward higher cognitive development. This may be suggestive of issues faced by individuals with lower cognitive functions in dealing with spiritual development.

Synopsis

The proposed purpose of this study was to discover what correlations exist between an individual with a cognitive deficit(s) who was categorized with a Specific

Learning Disability and scores on a measure of spiritual development. A number of conclusions can now be offered following the review of literature.

1. Both cognitive and spiritual development are a universal phenomenon.
2. Cognitive deficits negatively effect cognitive development.
3. Both cognitive development and spiritual development share common neurological paths.
4. Both cognitive development and spiritual development are measurable.
5. There is a recognized category termed Specific Learning Disability whose etiology is at least in part related to cognitive processing and thus cognitive development.
6. There appears to be limited agreement that cognitive development and spiritual development are related.
7. There does not appear to be a study on the specific subject of the relationship between cognitive deficits and spiritual development.
8. This study can be an important addition to the field of spiritual development and subsequent services provided.

CHAPTER THREE

Methodology

“The purpose of correlational research is to describe the nature of existing relationships among variables” (Portney & Watkins, 2000, p. 278). Therefore, the purpose of this study was to investigate the relationships between various cognitive deficits and an individual’s spiritual development.

Research Design

The correlational design of this study focused on two variables of interest. One variable comprised scores obtained from the Woodcock-Johnson Tests of Cognitive Abilities (WJ) in the areas of Long-Term Retrieval, Short-Term Memory, Auditory Processing, Visual-Spatial Processing, and Processing Speed. The other variable comprised the obtained scores from the Spiritual Assessment Inventory along two broad categories: Awareness of God, and Quality of Relationship. These two areas are more narrowly measured under the headings of Awareness, Realistic Acceptance, Disappointment, Grandiosity, and Instability.

Subjects

The population for this study was derived through a search of special education files of students and former students at Kellyville Public Schools who qualified for special services under the category of Specific Learning Disability and who were between the ages of eighteen and twenty-eight years of age. This led to a population available for the study of sixty-five students or former students.

State law allows an individual to attend public education through the age of twenty-one. Thus, the maximum age for an individual in this study would be twenty-eight

years of age. The minimum age was set at eighteen to mirror the college age norm group used to develop the Spiritual Assessment Inventory.

In order to obtain a representative sample from the population every third name from a random ordered list (sampling frame) was selected providing a list of 50 students who were contacted for participation in the study. The initial mailing was sent on February 10, 2007. Twenty-five individuals did not respond. A second mailing was sent however further efforts to contact them were hampered due to changes in addresses and phone numbers. Nine of the mailings were returned for lack of a forward address. Sixteen individuals returned a completed Spiritual Assessment Inventory.

Upon review of the sixteen in the sample, it was discovered that three individuals did not score in the deficit range on their last evaluation but rather had been kept within the special education services as a safety net by the multidisciplinary team who determines placement. They were dropped from the study for not meeting the criteria of having a deficit in a processing area. Thus the sample size available for study was lowered to thirteen. Inquiry was made to a near school district seeking to enhance the sample size. However, permission was not granted to allow their students to participate.

The study participants ranged between eighteen and twenty-eight years old and represented a variation of gender, social, economic, and cultural backgrounds. The sample included three females and ten males. The median age of the both genders was twenty-one. The sample identified themselves as ethnically 77% Caucasian, and 23% as American Indian. All the participants lived within a twenty-five mile radius of Kellyville, Oklahoma.

Fundamentally the larger the sample size, the more probable that a given coefficient represents a relationship that more closely approximates the population. Gay (1987) suggests that a sample size of 30 is generally considered an acceptable sample size for a correlational study. In the study, due to the low sample size in this study (13), broad distinctions in relationships between cognitive deficits and spiritual development were difficult to discern. Thus the statistical power of correlation coefficient lacks any significant ability to be generalized to the population of the study.

Instruments

Woodcock-Johnson

Description.

Two assessment instruments comprise the Woodcock-Johnson III (WJ). They are the Woodcock-Johnson III Tests of Cognitive Abilities and the Woodcock-Johnson III Tests of Achievement. These two instruments provide a comprehensive set of individually administered test that are normed off the same sample (co-normed). They are used to measure intellectual abilities and academic achievement. Together the WJ provides a system for measuring general intellectual ability, specific cognitive abilities, oral language and academic achievement (McGrew & Woodcock, 2001). This instrument is designed for ages two to ninety plus years of age.

For this study, the Woodcock-Johnson III Tests of Cognitive Abilities was used. The cognitive abilities tests of the WJ has ten tests in the standard battery, although in most testing situations only the first seven are given. There are ten tests in the extended battery which are available to the examiner as parallel tests of the same constructs measured in the standard battery. The tests are contained in two easels for ease in

presenting the material. Scores provided are standard scores with the mean as 100 and a standard deviation of 15. Other scores reported include percentile rank, age- and grade-equivalents, and a Relative Proficiency Index that functions as a score to predict “the quality of performance on tasks similar to the ones tested” (Mather & Woodcock, 2001, p. 70).

The Tests of Cognitive Abilities is used to measure seven different cognitive functions as based on the Cattell-Horn-Carroll (1993) theory of cognitive abilities. Cattell and Horn developed the theory of fluid reasoning and crystallized knowledge referred to as Gf-Gc theory. Carroll's addition was with a three stratum theory with Stratum III representing general intelligence (g); Stratum II included the Cattell-Horns approach of eight broad abilities which include fluid intelligence, crystallized intelligence, general memory and learning, broad auditory perception, broad retrieval ability, broad cognitive speediness and processing speed and Stratum I included the 69 narrow abilities (Mather & Woodcock, 2001). The broad abilities in this study are Long-Term Retrieval, Visual-Spatial Thinking, Auditory Processing, Processing Speed and Short-Term Memory. Research evidence suggests that the Woodcock-Johnson Tests of Cognitive Ability can provide insight into various cognitive ability deficits (Schrack & Flanagan, 2003).

Reliability.

Reliability in testing refers to “the extent to which a measurement is consistent and free from error. Reliability can be conceptualized as reproducibility or dependability” (Portney & Watkins, 2000, p. 61). A reliability coefficient expresses the level of reliability. A perfectly reliable instrument would score 1.00. Portney and Watkins (2001)

suggest that a reliability coefficient of .50 to .75 is considered moderately reliable and a score above .75 indicates good reliability.

In review of the reliability of the Woodcock-Johnson Tests of Cognitive Abilities, Woodcock and McGrew (2001) report that "The reliability characteristics of the WJ III meet or exceed basic standards for both individual placement and programming decisions" (p. 48). Sattler (2001) reports that the Woodcock-Johnson III Tests of Cognitive Abilities "has excellent internal consistency reliability" (p. 573). Within the Technical Manual for the Woodcock III, McGrew and Woodcock (2001) summarize tests reliability reports with "most are .80 or higher and several are .90 or higher (p. 48). Sattler (2001) adds,

Median internal consistency reliability coefficients for the GIA-Standard and GIA-Extended are .97 and .98, respectively. Median internal consistency reliability coefficients for the seven clusters associated with the Cattell, Horn, and Carroll model range from .81 to .95. Finally, median internal consistency reliability coefficients for the 20 WJ III COG tests range from .76 to .97...(p.573).

Validity.

Validity is defined as the degree to which a test measures what it is intended to measure (Portney & Watkins, 2000; Gay, 1987 and Isaac & Michael, 1971). There are three major forms of validity. They are content validity (the degree to which a test measures an intended content area), construct validity (the degree to which a test measures a hypothetical construct) and concurrent validity (the degree to which scores on a test are related to the scores on another well established test) (Gay, 1987).

For the Woodcock-Johnson Tests of Cognitive Abilities content validity is directly tied to construct validity, that is, the content of the test item is based upon the desire to measure the assumed construct. This was an area of early debate regarding the validity of the Test of Cognitive Abilities. In question was the construct validity of the cluster scores used by the test. Sattler (1992), in his book *Assessment of Children*, 3rd edition, argued that “Factor analytic studies do not support the use of various cluster scores” (p. 338). He concluded:

Construct validity is not satisfactory for the Cognitive Ability cluster scores, however. The concerns raised above indicate that the Cognitive Ability Full Scale score should not be used as a replacement for other standardized measures of intelligence such as scores on the Wechsler Scales or the Stanford-Binet Intelligence Scale: Fourth Edition (p.338).

Thus Sattler argued that the Tests of Cognitive Abilities could be used for screening purposes but not for decision making in regards to educational placement and planning. In brief, the scores from the standard battery of seven tests used to measure various cognitive functions and the general intellectual ability score did not have construct validity.

McGrew and Woodcock (2001) explain the content validity based on the CHC theory. “Each test in the WJ III is intended to be a single measure of one of the narrow abilities” (p. 50). The clusters were formed to include two or more qualitatively different narrow abilities and thus improve the content validity of the measure.

Mather and Woodcock (2001) in the examiner’s manual for Test of Cognitive Abilities states that,

Clusters of tests provide the primary basis for test interpretation. Cluster interpretation minimizes the danger of generalizing from the score for a single, narrow ability to a broad, multifaceted ability. Cluster interpretation results in higher validity because more than one component of a broad ability comprises the score that serves as the basis for interpretation (p.11).

By the time the fourth edition of *Assessment of Children* came out in 2001 Sattler provided a different opinion regarding the Woodcock-Johnson Tests of Cognitive Abilities. He states,

Evidence for construct validity of the WJ III COG comes from several sources. First several factor analyses support the Cattell, Horn, and Carroll model. Second, correlations between related clusters are higher than correlations between unrelated clusters. Third, developmental growth curves and content validity analysis support the WJ III COG factors (p.573).

Also, Sattler adds that concurrent validity is acceptable thus weaving together a picture of a content, construct and concurrent valid instrument. In so doing the earlier concerns about the use of cluster scores from the WJ were removed. However, the place of the CHC theory in psychological testing is also changing. In an article entitled Higher Order, Multisample, Confirmatory Factor Analysis of the Wechsler Intelligence Scale for Children- Fourth Edition: What Does It Measure? Keith, Fine, Taub, Reynolds and Kranzler (2006) note that the Wechsler scales have progressed from a two factor to a three factor and now four factor instrument. They also note that the two factor interpretation (Verbal IQ and Performance IQ) has been abandoned. The Wechsler Intelligence Scale for Children- Fourth Edition (WISC-IV) now has four factors (index)

called Verbal Comprehension, Processing Speed, Working Memory and Perceptual Reasoning.

Two points are worthy of attention in relation to this discussion. First is that “Long criticized as atheoretical, the current version of the WISC draws on CHC theory in its organization and structure” (Keith, et.al., 2006, p. 118). Secondly, in conclusion the authors note,

Despite what may be unsettling changes for those accustomed to the WISC-R and the WISC-III, this latest version of the test comes closer to mirroring contemporary research and theory in the field of intelligence, ... to gain the maximum utility from the scale, we recommend that users interpret tests according to CHC theory, as supported by this research, as an alternative to the organizational structure outlined in the WISC-IV manual and scoring program (p. 125).

Appropriateness.

The primary reasons for using the Woodcock-Johnson Tests of Cognitive Abilities scores were they were scores available from existing student files. The school district records for special education include information regarding placement and services. The testing scores, which, for the Kellyville district, are scores from the Woodcock-Johnson Psycho-Educational Battery-Revised or Woodcock-Johnson III.

Currently, the WJ has been shown to be an excellent tool in the determination of the possibility of a learning disability. Dr. Tansey of Arizona State University referred to the WJ as “cutting edge” in measuring intelligence. (personal communication, October 24, 2007). Sattler (2001) notes that, “The WJ III COG is useful for assessing the

cognitive ability of children and adults (p. 573). Mather and Woodcock (2001) add that it can be used to “determine and describe the present status of an individual’s strengths and weaknesses, to determine the nature or extent of an impairment, and to provide information to aid in classification and diagnosis” (p. 5).

Thus the three key elements for qualification for Specific Learning Disability as outlined by the State of Oklahoma (Garrett, 2003) are addressed in the Woodcock-Johnson III scoring report:

- A disorder in basic psychological processing abilities is addressed through scores on the Cognitive Tests of Abilities.
- Achievement that is not corresponding to age and ability levels after having been provided those appropriate learning experiences is addressed through the Relative Proficiency Index which is criterion related score.
- A severe discrepancy between achievement and intellectual ability is addressed through the Aptitude/Achievement Discrepancy Percentile score

Spiritual Assessment Inventory

Description.

The Spiritual Assessment Inventory (SAI) was developed to address the psychometric and theoretical limitations that seemed to exist in other instruments (MacDonald, Kuentzel & Freidman, 1999). Hall and Edwards (1996) sought to develop and instrument to measure spiritual maturity that could be used by “pastoral counselors and clinicians working with religiously-oriented clients” (p. 234).

The theoretical bases for the SAI is derived from the idea that “spiritual maturity from both biblical and psychological perspectives involves, at its core, relationship with

others. Object relations theory provides a cogent framework within which to articulate this aspect of spirituality” (Hall& Edwards, 1996, p. 236). The psychometric measure of the instrument has been addressed through factor analytic studies (Hall & Edwards, 1996, 2002).

Tisdale’s (1999) review of the SAI indicated that the inventory was constructed on the idea that spiritual maturity is composed of two specific dimensions: the degree of awareness by an individual of God in his or her life and the quality of that relationship. Hall and Edwards (1996) note that these dimensions should be related, but distinct. They add,

a person can be quite developed in being aware of God’s voice without relating to Him in a mature way. Likewise, an individual can be mature in the way he or she relates to God, without having a very developed capacity to be aware of God’s voice (p. 238).

There are five scales used in the SAI. They include:

- Awareness: a measure of the extent to which a person is aware of God in his or her life. A high score indicate the presence of this trait.
- Realistic Acceptance: a measure of the level of a person’s ability to experience and tolerate mixed feelings regarding ones relationship to God. A high score would indicate the ability to have negative experiences and still maintain confidence in God’s care of them. People tend to reach this stage in late adolescence or early adult years.
- Grandiosity: A measure of relating with an inflated sense of self importance and uniqueness. High scores would indicate the presence of

this trait. People tend to reach this stage of spiritual maturity in the middle years of childhood.

- **Instability:** A measure of relating in an expression of an all-good or all-bad views of self and others. A high score on this scale would indicate the presence of that trait. People tend to reach this stage of spiritual maturity as a young child.
- **Disappointment:** A scale that functions similar to a Lie Scale. A low score on this measure suggests that the test taker is being defensive regarding his or her actual spiritual life and thus would raise the validity of the other responses.

The test itself can be taken in about fifteen minutes. It uses a 5-point Likert format with 1 indicating no endorsement and 5 indicating endorsement of the statement. The instrument is for use with college adults.

Reliability.

Reliability in testing refers to “the extent to which a measurement is consistent and free from error. Reliability can be conceptualized as reproducibility or dependability” (Portney & Watkins, 2000, p. 61). A reliability coefficient expresses the level of reliability. A perfectly reliable instrument would score 1.00. Portney and Watkins (2001) suggest that a reliability coefficient of .50 to .75 is considered moderately reliable and a score above .75 indicates good reliability.

The Spiritual Assessment Inventory's (SAI) reliability for the five factors using Cronback's coefficient alpha measure of internal consistency reported .88 for Instability, .91 for Defensiveness; .90 for Awareness; .76 for Acceptance and .52 for Grandiosity.

MacDonald, Kuentzel and Freidman (1999) stated that the, “Examination of the psychometric properties of the SAI factors generated largely supportive results” (p. 169).

Validity.

Validity is defined as the degree to which a test measures what it is intended to measure (Portney & Watkins, 2000; Gay, 1987 and Isaac & Michael, 1971). MacDonald, Kuentzel and Freidman (1999) state that “evidence of validity has been shown through the production of expected factor intercorrelations as well as through observed correlations with measures of theoretical similar and dissimilar constructs” (p. 169).

The Construct validity is based on results of factor analysis completed by Hall and Edwards (1996, 2002) and Hall, Brokaw, Edwards and Pike (1998). There is limited research history since it is a relatively new scale. Results indicated a positive outlook with the exception of the Grandiosity scale which is undergoing further investigation (Tisdale, 1999).

Appropriateness.

The Spiritual Assessment Inventory has utility for this study as follows:

- When reviewing the population that would be filling out a survey it was necessary that the instrument be fairly easy to read (no big words), have a simple format (scale of 1-5), and be personal (“I” statements).
- The SAI is a strongly theory driven measure. Hall and Edwards (2002) note:

The SAI draws on the theoretical insights of object relations theory, which is very congruent with attachment theory and consistent with a sizable literature on God image/representation, indicating that one's

relational/emotional development is mirrored in one's relationship with the Divine, however that is perceived by the individual (p. 341).

- As MacDonald, Kuentzel and Freidman (1999) note, “the SAI appears to be based in a Judeo-Christian view of spiritual maturity” (p. 170). These scales were developed for use by pastors as well as clinicians who may be working with religious clients and seems to be a better fit into the working definition of spiritual development used in this research which is spiritual development is defined as the process of growing through change, transformation and maturation in the search for the sacred and our relation to others.

Assumptions or Limitations

This study was limited by its lack of control over maturation. Since scores used for special education placement were based on the student's last evaluation or the last evaluation prior to exiting high school, there is a fundamental assumption that cognitive deficits remain fairly stable over time. This assumption is supported by longitudinal research. For instance Hoekstra, Bartels and Boomsma (2007) conducted a study over a 13 year period beginning at age five and retesting at ages seven, ten, twelve and eighteen that indicated a stable IQ score. Ingesson (2006) retested 65 dyslexic students after six and half years and found that verbal IQ decreased while performance IQ increased. This was interpreted as the result of less experience with reading over the time span with the increase in performance scores suggesting a coping mechanism at play.

The inability to control for history resulted in another limitation. Scores on the Spiritual Assessment Inventory (SAI) were consistently near the average range. No

information was available regarding what extent these students may have been influenced by a Christian environment nor of their present relationship with a church fellowship or other house of worship. Such demographics played no role in the sample selection.

Procedures

Kellyville Public Schools approved the study on August 14, 2006. Liberty University provided Internal Review Board approval February 8, 2007. Files from students who had graduated from or left Kellyville Schools were reviewed for information. Students who were 18 years of age and still in attendance were also included in the record search.

Woodcock-Johnson scores from each participant's last evaluation were recorded along with pertinent information such as the last test date, date of birth, last known address and phone number. A total of 65 records were reviewed as meeting the inclusion criteria of having a Specific Learning Disability. The 65 names were assigned numbers that were placed in a table of random numbers. Every third number from that list was chosen till the list size of 50 was reached.

The sample was contacted either by mail, phone or direct contact by the researcher. They were provided a cover letter (see Appendix E), a copy of the informed consent (see Appendix C), a colored copy of the SAI and a stamped return envelope. Nine of the mailings returned undeliverable due to changes in addresses. Efforts were made to contact them by phone or through a family member. This allowed for a second mailing. The result of these efforts was a sample size of sixteen participants rather than the 30 desired for the study. The final sample size used in data analysis was thirteen.

Three participants were dropped from the sample of sixteen due to not meeting all the criteria and thus becoming outliers in the statistical field. They did not meet the criteria because none of their scores were considered deficit. Participant number two scored lowest in Short-Term Memory with an 85. Even with a standard error of measure of ± 4 the range score would not have been in the deficient range. Participant number 4 scored lowest in Processing Speed with a 95. Participant number sixteen scored lowest in Processing Speed with a 98. Inclusion of these scores would have skewed the results.

Contact was also made with another area school for the purpose of increasing the size of the sample. However, since this would require access to confidential records, the school officials declined the request.

Data Processing and Analysis

The null hypothesis is that no correlation exists between cognitive deficits and spiritual development among individuals who qualified for special education under the category of Specific Learning Disability. The alternative hypothesis is that a correlation exists between various cognitive deficits and spiritual development among individuals who qualified for special education under the category of Specific Learning Disability.

A second null hypothesis for this study is that individuals who qualified for special education under the category of Specific Learning Disability with a deficit in Processing Speed will not score lower on a scale used to measure spiritual development than those individuals who qualified for special education based on weaknesses in Long-Term Retrieval, Auditory Processing, Visual-Spatial Processing or Short-Term Memory.

The alternative hypothesis is that individuals who qualified for special education under the category of Specific Learning Disability with a deficit in Processing Speed will

score lower on a scale used to measure spiritual development than those individuals who qualified for special education based on weaknesses in Long-Term Retrieval, Auditory Processing, Visual-Spatial Processing or Short-Term Memory.

The hypothesis that a correlation exists between cognitive deficits and spiritual development will be tested using the Pearson product-moment correlation coefficient. The hypothesis that those whose deficit is in processing speed will score approximately the same on a scale of spiritual maturity than other processing deficits will be tested by a comparison of means.

Portney and Watkins (2000) in their discussion of data analysis note that the Pearson r is commonly used for interval and ratio data. This study, however, is one of combined data. The Woodcock-Johnson provides interval data and the Spiritual Assessment Inventory (a Likert scale) provides ordinal data.

Thus it is important that the statistical method used in this study be shown to be an acceptable approach. Three sources of support are provided. The first level of support is from published text books. The second source of support will be a historical review of the use of combined data in research and thirdly, two online resources will be referenced.

Gay (1987), in the discussion of data analysis in his book *Educational Research*, Third Edition, provided an example of mixed data and states that “the Person r is more precise, with a smaller number of subjects (less than 30) “(p. 237) when compared to using the Spearman ρ . Toothaker and Miller (1996), in the book *Introductory Statistics for the Behavioral Sciences*, Second Edition, provided an example of a correlation study using combined data. In that study age (interval) was correlated with a score on a dental

anxiety score- a Likert scale (ordinal). The statistical test used in the example was the Pearson r.

The use of mixed data in research has been a practice for a number of years as is evidenced by comments from the following articles. Lawerence Mayer, in 1971, wrote an article entitled “A Note on Treating Ordinal Data as Interval Data” in which he pointed out that social scientist often treat ordinal scales as interval scales. In 1976, David Gerether also argued for the use of ordinal data as interval data in an article entitled “On the use of Ordinal Data in Correlation Analysis”. In 1984, Charles Hofaker, in an article entitled, “Categorical Judgment Scaling with Ordinal Assumptions” spoke about a common practice among psychologists and other researchers of developing a Likert scale and then analyzing them as interval data.

In reviewing Likert scales on the web two interesting sources were found which relate directly to the question at hand. First, Wikepedia (retrieved July 10, 2007), an online encyclopedia, notes that “when responses to several Likert items are summed, they may be treated as interval data” (http://en.wikipedia.org/wiki/Likert_scale). Secondly, Dr. G. David Garson from North Carolina State University (retrieved July 10, 2007) posted lecture notes for his classes online. He stated “use of ordinal variables such as 5-point Likert scales with interval techniques is the norm in contemporary social science”. Further he adds, “Likert scales... are very commonly used with interval procedures, provided the scale item has at least 5 and preferably 7 categories” (<http://www2.chass.ncsu.edu/garson/pa765/datalel.htm>).

Historically, the issue has been discussed and the concept of treating ordinal data as interval data in analysis has been affirmed since at least 1971.

Lastly, current information from web sources confirm that the practice of using mixed data (ordinal and interval) is a common practice. One special note of consideration should be mentioned here. Dr. Garson (2007) specified that the Likert scale needs to have at least five categories in order to be treated as interval data. The Spiritual Assessment Inventory has five categories.

Analysis of the information will be provided in table and text format. The study was designed to investigate the relationship between processing deficits as measured by the Woodcock-Johnson Tests of Cognitive Abilities with scores from the Spiritual Assessment Inventory. As such, the analysis of the information requires that each of the five processing areas (Long-Term Retrieval, Auditory Processing, Visual-Spatial Processing, Processing Speed and Short-Term Memory) be used as separate groups.

Since placement into a special education setting required the presence of a deficit score (a standard score of 78 or below for this study) only those scores were used. Further, due to the nature of the sample size this scoring system defined each group's size; the Long-Term Retrieval group's size was six, and the Visual Processing group was two. Only one person in the sample qualified under the Auditory Processing deficit. The largest group was comprised of nine members who shared in a Processing Speed deficit score. The Short-Term memory group was comprised of four members. A table containing information regarding each group and the Pearson r correlation coefficient will be provided for each group followed by a discussion of significance.

The second hypothesis was that individuals who qualified for special services under the category of Specific Learning Disability whose scores reflected a deficit in Processing Speed would score lower on a scale of spiritual maturity. The hypothesis was

analyzed by comparing the mean scores on the SAI with the means of various deficit areas.

Summary

The correlational research design was used in this study. The sample participants consisted of students and former students who had qualified for special services under the category of Specific Learning Disability from Kellyville Public Schools ages 18-28 Kellyville, Oklahoma.

The instruments used in this study to collect data included the Woodcock-Johnson-Revised (1989), the Woodcock-Johnson-III (2001) and the Spiritual Assessment Inventory (SAI) (2002). Each participant received a copy of the SAI and scores were then compared to their Woodcock-Johnson scores from the last evaluation report.

Confidentiality was upheld. Permission for this study was gained from Kellyville Public Schools and the Institutional Review Board of Liberty University. The study participants (LD students) voluntarily read the informed consent and filled out the SAI and returned the forms.

The quantitative data was analyzed using SPSS (2004) that produced a Pearson product-moment correlation using scores provided and a comparison of mean scores. The current study investigated the relationship between various cognitive deficits and spiritual development. The analysis and findings are reported in chapter four.

CHAPTER FOUR

Findings and Analysis

Introduction

The contents of Chapter Four provide the results of the analysis for this study that explored the relationship between cognitive deficits and spiritual development. This chapter will describe the sample, introduce each research null hypothesis and alternative hypothesis, present the findings in table format, include a brief discussion of significance of the findings, and conclude with a summary.

Description of Sample

The final sample that met the inclusion criteria yielded thirteen participants. There were ten males and three females. Ages of participants ranged between eighteen and twenty-eight with the mean age of twenty-one. Mean age of the females was 21.3. Mean age of the males was 20.6. Ethnically, the group was 23% American Indian and 77% Caucasian.

Data Analysis Related to Research Questions

The following sections will provide the findings of the data analysis for research null hypotheses one and two. Each null hypothesis and alternative hypothesis will be restated to provide the reader with a review, and insights into justification of the rationale that determined the selection of the statistical analysis.

In order to assist the reader, a brief definition and discussion of the symbols and terms used in the tables below is offered. The mean (M) is an arithmetic average of the scores. The standard deviation (SD) is a descriptive statistic which reflects the dispersion of scores around a mean. The number (N) of individuals is the total number members in a

sample. Power or probability is represented by the symbol (p). That is the ability of the statistical test to find significant differences that really do exist. For this study p was set at .05, thus a score at or less than .05 would be considered significant. The Pearson product-moment correlation coefficient (r) is the statistical number suggesting the tendency for variations in one variable (scores from the SAI) to be related to variations in a second variable (processing deficit scores). The Pearson product-moment correlation squared (r^2) provides the coefficient of determination which represents the amount variance in one variable (SAI scores) that can be accounted for by a second variable (processing deficit scores) (Portney and Watkins, 2000, Gay, 1987).

Null Hypothesis One and Alternative Hypothesis One

The null hypothesis was that there would be no correlation between cognitive deficits and spiritual development among individuals who qualified for special education under the category of Specific Learning Disability. The alternative hypothesis for this study is that a correlation exists between various cognitive deficits and spiritual development among individuals who qualified for special education under the category of Specific Learning Disability (See Table 1).

Table 1

Inferential Analysis of Scores of Long-Term Retrieval (Woodcock-Johnson) and the Spiritual Assessment Inventory

Variable	r	Sig.	M	SD	N
Aware	-.868	.056	3.12	.79	5

Table 1 (continued).

Inferential Analysis of Scores of Long-Term Retrieval (Woodcock-Johnson) and the Spiritual Assessment Inventory

Variable	r	Sig.	M	SD	N
Real/Accept	-.165	.791	3.48	.49	5
Disappoint	.611	.274	1.66	.70	5
Grandiosity	.255	.679	2.60	1.10	5
Instability	-.848	.070	2.33	.31	5

Correlation is significant at the 0.05 level (2-tailed)

There is strong negative relationship between LTR and Awareness and Instability. The r^2 (coefficient of determination) was .753. Therefore 75% of the variance in Awareness can be accounted for by knowing the variance in LTR. The coefficient of significance between Awareness and Long-Term Retrieval was marginal at .056. Since $p = .05$, the significance coefficient reported fails to reject the null hypothesis in the area of Long-Term Retrieval and all variables measured by the Spiritual Assessment Inventory. Rejection of the null hypothesis would be to commit a Type I error which is rejecting a null hypothesis that is true (Portney and Watkins, 2000, Gay, 1987, Newton and Rudestam, 1999). The null hypothesis is accepted therefore the alternative hypothesis is rejected.

Table 2

*Inferential Analysis of Scores of Visual-Spatial Processing (Woodcock-Johnson)
and the Spiritual Assessment Inventory**

Variable	r	Sig.	M	SD	N
Aware	--	--	4.26	.08	2
Real/Accept	--	--	4.36	.71	2
Disappoint	--	--	1.79	.11	2
Grandiosity	--	--	2.21	.71	2
Instability	--	--	1.22	.16	2

Correlation is significant at the 0.05 level (2-tailed)

* In a test like the Pearson r the test of significance is based on a statistical concept called degrees of freedom which indicate the number of values within a distribution which are allowed to vary. This amount for the Pearson r is N-2. Thus with just two scores in this group inferential statistics are unable to be calculated. However, reported means and standard deviations are helpful in gaining insight into the overall group of scores.

There was no data available to determine a correlation coefficient. The lack of data fails to reject the null hypothesis in the area of Visual-Spatial Processing and all variables measured by the Spiritual Assessment Inventory. The alternative hypothesis is rejected.

Table 3

*Inferential Analysis of Scores of Auditory Processing (Woodcock-Johnson) and the Spiritual Assessment Inventory**

Variable	r	Sig.	M	SD	N
Aware	--	--	3.38	--	1
Real/Accept	--	--	3.00	--	1
Disappoint	--	--	2.57	--	1
Grandiosity	--	--	3.29	--	1
Instability	--	--	2.56	--	1

Correlation is significant at the 0.05 level (2-tailed)

* In a test like the Pearson r the test of significance is based on a statistical concept called degrees of freedom which indicate the number of values within a distribution which are allowed to vary. This amount for the Pearson r is N-2. Thus with just one score in this group inferential statistics are unable to be calculated. However, reported means are helpful in gaining insight into the overall group of scores although it is the mean of one score.

There was no data available to determine a correlation coefficient. The lack of data fails to reject the null hypothesis in the area of Auditory Processing and all variables measured by the Spiritual Assessment Inventory. The alternative hypothesis is rejected.

Table 4

Inferential Analysis of Scores of Processing Speed (Woodcock-Johnson) and the Spiritual Assessment Inventory

Variable	r	Sig.	M	SD	N
Aware	-.056	.886	3.61	1.02	9
Real/Accept	-.453	.221	3.91	.88	9
Disappoint	-.039	.921	1.94	.68	9
Grandiosity	-.056	.886	2.32	.70	9
Instability	.036	.926	1.88	.56	9

Correlation is significant at the 0.05 level (2-tailed)

Very weak relationships were reported by the Pearson correlation coefficient in all subject areas in the Spiritual Assessment Inventory. The r^2 (coefficient of determination) was .205 for Realistic Acceptance. Therefore 21% of the variance in Realistic Acceptance can be accounted for by knowing the variance in Processing Speed. Since $p = .05$, the significance coefficients reported fails to reject the null hypothesis in the area of Processing Speed and all variables measured by the Spiritual Assessment Inventory. The alternative hypothesis is rejected.

Table 5

Inferential Analysis of Scores of Short-Term Memory (Woodcock-Johnson) and the Spiritual Assessment Inventory

Variable	r	Sig.	M	SD	N
Aware	.862	.138	3.41	.51	4
Real/Accept	-.756	.224	3.32	.68	4
Disappoint	-.104	.896	1.71	.65	4
Grandiosity	-.932	.068	3.00	.82	4
Instability	.584	.416	2.34	.33	4

Correlation is significant at the 0.05 level (2-tailed)

The Pearson r correlation coefficients reflected strong negative relationships in the areas of Awareness, Realistic Acceptance and Grandiosity. The r^2 (coefficient of determination) was .743 for Awareness, .571 for Realistic Acceptance and .868 for Grandiosity. Therefore 74% of the variance in Awareness, 57% of the variance in Realistic Acceptance and 87% of the variance in Grandiosity can be accounted for by knowing the variance in STM. Since $p = .05$, the significance coefficients reported fails to reject the null hypothesis in the area of Short-Term Memory and all variables measured by the Spiritual Assessment Inventory. The alternative hypothesis is rejected.

Null Hypothesis and Alternative Hypothesis Two

The null hypothesis was that individuals who qualified for special education under the category of Specific Learning Disability with a deficit in Processing Speed will not score lower on a scale used to measure spiritual development than those individuals who qualified for special education under the category of Specific Learning Disability who qualified under Long-Term Retrieval, Auditory Processing, Visual-Spatial Processing or Short-Term Memory. The alternative hypothesis for this study was that individuals who qualified for special education under the category of Specific Learning Disability with a deficit in Processing Speed will score lower on a scale used to measure spiritual development compared to those individuals who qualified for special education under the category of Specific Learning Disability who qualified under Long-Term Retrieval, Auditory Processing, Visual-Spatial Processing or Short-Term Memory.

A comparison of mean scores on the Spiritual Assessment Inventory as based on the processing areas evaluated by the Woodcock-Johnson is provided (See Table 6).

Table 6

Comparison of Means of SAI and Cognitive Processing Area

Variable	LTR (n=6)	V (n=2)	A (n=1)	Sp (n=9)	STM (n=4)
Aware	3.11	4.26	3.38	3.61	3.41
Real/Accept	3.50	4.36	3.00	3.91	3.32
Disappoint	1.86	1.79	2.57	1.92	1.71
Grand	2.36	2.21	2.67	2.32	3.00
Instability	2.43	1.22	3.00	1.88	2.33

The mean score for all processing areas in the category of Awareness was 3.55. The Processing Speed mean was 3.61. The actual lowest mean (3.11) was in Long-Term Retrieval with both Auditory (3.38) and Short-Term Retrieval (3.41) scoring lower than Processing Speed. This may indicate that those with a Visual Processing deficit tend to score higher on a scale designed to measure ones awareness of God.

The mean score for all processing areas in the category of Realistic Acceptance was 3.62. The Processing Speed mean was 3.91 which is higher than the mean of the group. All other processing scores were lower than Processing Speed with the exception of Visual Processing (4.36). This suggests that those with a Visual Processing deficit tend to score higher on a scale designed to measure ones Realistic Acceptance of God.

The mean score for all processing areas in the category of Disappointment was 1.97. The Processing Speed mean score was 1.92. All other processing areas scored lower (meaning less disappointed with God and a higher quality of relationship) with the exception of the score in Auditory Processing (2.57). This may indicate that those with a processing deficit in Short-Term Memory tend to be less disappointed with God than those with other cognitive processing deficits.

The mean score for all processing areas in the category of Grandiosity was 2.51. The Processing Speed mean score was 2.32. Those who displayed a processing deficit in Visual Processing scored a mean of 2.21. This suggests that those with Visual Processing deficits score lower on a scale designed to measure a sense of ones self importance with God than those with other processing deficits.

The mean score for all processing areas in the category of Instability was 2.17. The mean score for those with a Processing speed deficit was 1.88. Those who were

recorded as having a processing deficit in Visual Processing had a mean score of 1.22. This indicates that those with a Visual Processing deficit score lower (high score denotes the presence of that trait) on a measure designed to measure how stable one is in his or her relationship with God.

Mean scores reported fails to reject the null hypothesis that individuals who qualified for special education under the category of Specific Learning Disability with a deficit in Processing Speed will score the same on a scale used to measure spiritual development than those individuals who qualified for special education under the category of Specific Learning Disability who qualified under Long-Term Retrieval, Auditory Processing, Visual-Spatial Processing or Short-Term Memory. The alternative hypothesis is rejected.

A One-Way Analysis of Variance (ANOVA) was considered to analyze the mean scores of the Spiritual Assessment Inventory subject areas in order to “determine if the observed differences among a set of means are greater than would be expected by chance” (Portney & Watkins, 2000, p. 427). Due to sample size the ANOVA would not have statistical power.

Summary

The contents of chapter four provided outcomes of the analysis for this study which explored the relationships between cognitive deficits and spiritual development among students, 18-28 years of age, who qualified for special services under the category of Specific Learning Disability (LD).

The Pearson r was the statistical approach used to provide a response to the null hypothesis that there would be no correlation between cognitive deficits and spiritual

development among individuals who qualified for special education under the category of Specific Learning Disability. Due to lack of subjects, data was not available for Visual-Spatial Processing and Auditory Processing to provide a correlation coefficient. In the three correlations that were provided (Long-Term Retrieval, Processing Speed and Short-Term Memory) the reported significance scores failed to reject the null hypothesis.

A comparison of means was provided to respond to the second null hypothesis. The null hypothesis is that individuals who qualified for special education under the category of Specific Learning Disability with a deficit in Processing Speed will score the same on a scale used to measure spiritual development than those individuals who qualified for special education under the category of Specific Learning Disability who qualified under Long-Term Retrieval, Auditory Processing, Visual-Spatial Processing or Short-Term Memory.

The comparison of means suggested that Visual Processing did not score the same as Processing Speed but lower on a measure of spiritual development. The reported comparison failed to reject the null hypothesis. The alternative hypothesis is rejected.

Chapter five will review the significant findings of the study. Implications for theory as based on this study will be suggested. Limitations of the study that affects the generalizability of the results will be addressed and some recommendations for further research will be presented.

CHAPTER FIVE

Conclusions

The following discussion responds to the findings reported in chapter four which address this question. If the awareness that "...spiritual development emerges as cognitive abilities advance" (Wong, Eaton, Winkelstein, Wilson, Ahmann & DiVito-Thomas, 1999, p. 134) what, then, occurs in the spiritual development of an individual whose cognitive abilities are not as well developed as others? Paloutzian (1996) suggests that spiritual development is roughly parallel to the general stages of cognitive development. This would imply that one with a cognitive deficit would also be less developed in their spiritual development.

Significant Findings

Correlational research is used "to determine whether and to what degree, a relationship exists between two or more quantifiable variables" (Gay, 1987, p. 354). The statistical evidence generated in this study failed to reject the null hypothesis and was unable to provide data in support of the relationship between cognitive deficits and a measure of spiritual maturity.

However, the study provides insight which forwards knowledge in the field of cognitive development and spiritual development. As noted in the review of literature, limited studies are available on the specific questions surrounding the relationship between individuals who have a cognitive deficit and their level of spiritual maturity.

Still, Strizenec (2002), James and Wells (2003), Love (2002), Paloutzian (1996), and Vaughn (2002) emphasize that spirituality is related to cognitive processes. In this study that relationship was marginally indicated.

First, there needs to be an understanding of how data is reported in order to gain a proper perspective. Common practice in reporting a level of significance is to round the reported statistics to two places. Thus a .056 score from SPSS is usually rounded to .06 for data reporting purposes.

This researcher chose to report the data using three places in order to demonstrate the marginal strength of the .056 significance level between Long-Term Retrieval and Awareness. Rudestam and Newton (2001) argue that “significance levels (e.g., .05, .01) are somewhat arbitrary...” (p. 170). However, since the significance level was set at .05 for this study, the discussion regarding the relationship between Long-Term Retrieval (LTR) and Awareness can be presented as marginally suggestive at best.

The data indicates that as LTR increases the awareness of the presence of God decreases. Why? Is there something about this sample which creates this relationship? How does LTR impacts that level of awareness?

First, LTR standard scores ranged from 64 to 77. Thus even though there was a reported increase of LTR in relation to a decrease in Awareness, the total series remained within the deficit range of scores. The data is unable to suggest an inverse relationship for those who may score within the normal range in LTR.

Secondly, the sample was comprised of thirteen individuals who, due to their disability, may not have a clear understanding of their own journey of faith. This issue would confound any definitive relationship. Cartwright (2001). Faber (2004), and Hall (2003) stress that the mental framework for the concept of God is defined to some degree by the level of cognitive development. Paloutzain (1996) also agrees in by stating that a persons stage of religious development closely parallels the cognitive development of a

person. If so, then scoring on a scale designed to measure spiritual development would provide an underdeveloped view of Awareness and Relationship from a population who is learning disabled. As will be discussed later, the scores on the Disappointment scale raise the question of the validity of the overall scoring patterns.

Thirdly, by comparing Hall and Edwards' (1996) definition of Awareness and what Long-Term Retrieval measures may help in developing one conclusion as to the inverse relationship. "The awareness dimension of spiritual maturity involves developing an awareness of God conjointly communicating to us and through us, as well as communicating to us through our own thoughts and feelings and through others" (Hall & Edwards, 1996, p. 237). For Hall and Edwards (1996) this is God speaking through someone (auditory) and the still small voice (self-awareness). The test for Long-Term Retrieval measures the "ability to store information and fluently retrieve it later in the process of thinking" (Mather & Woodcock, 2001, p. 19).

The data indicates that as one gains in the ability to store and retrieve information the less one hears God speak to them either through another person or within their self. This is reminiscent of the writer of Ecclesiastes (8:17) who speaks of wise men saying they know but not being able to discover the truth. So, perhaps, the scores on LTR and Awareness are indicative of human nature to walk in the garden (to make one wise) and not hear the footsteps of God. As Todd and Hall (1996) note:

a person can be quite developed in being aware of God's voice without relating to Him in a mature way. Likewise, an individual can be mature in the way he or she relates to God, without having a very developed capacity to be aware of God's voice (p. 238).

Special consideration was given to the role of Processing Speed and its relationship to spiritual development. The primary rationale for its selection over other processing areas was due to its prevalence as an inclusion factor for placement in special education as observed by the researcher. This held true for the sample in this study as well with nine of the thirteen scoring in the deficit range in the area of Processing Speed. However, those within that group did not produce the lowest scores on any area of the Spiritual Assessment Inventory. Low scores were spread across a number of domains with no area seemingly providing significant patterns.

Although Mather and Schrank (2001) noted that Long-Term Retrieval was weighted highest for college age individuals and provided the lowest score for Awareness, that score was in the average range (3.11). If, as Mather and Schrank (2001) suggest, Processing Speed is important across all domains of learning (including spiritual) and is experienced across the life span with significant increased weighting to a level approximating the impact of Long-Term Retrieval, then deficits in Processing Speed could correlate with lower scores on a measure of spiritual assessment than are presently reported.

Implications for Theory

According to Object Relations Theory (Hall, 1994), a person develops a sense of God based on visual input early in life. That “object” is given a sense of quality of relationship. The SAI seeks to tap into those constructs by use of a questionnaire.

The responses from this study fell into the developmental categories by Hall and Edwards (1996) that suggests high scores in Instability would typically appear for

children. High scores in Grandiosity would most likely be evident for those in adolescence, and high scores in Realistic Acceptance would usually appear in late adolescence and early adulthood. With a mean age of 21 and Realistic Acceptance scores with a mean of 3.62, the scoring patterns mirrors what the Hall and Edwards (1996) predicted and supports the use of the Spiritual Assessment Inventory.

Consideration needs to be given to the development of a construct called “spiritual coping”. In essence, the SAI scoring is premised on normal cognitive development. However not everyone will meet that standard. If “...spiritual development emerges as cognitive abilities advance” (Wong, Eaton, Winkelstein, Wilson, Ahmann & DiVito-Thomas, 1999, p. 134) or as Paloutzian (1996) suggests that spiritual development is roughly parallel to the general stages of cognitive development then how do students with Specific Learning Disabilities cope with their disability and is that a model for spiritual development?

The Woodcock-Johnson (WJ) as based on the Cattell-Horn-Carroll theory (Woodcock, R. & McGrew, K. (2001) suggests that one’s cognitive abilities falls into seven broad areas of cognitive functioning including the five major processing forms in this study. The WJ seeks to provide insight into those areas through its tests.

The reported scores for those in the sample exemplified common patterns of scoring for those who become eligible for special services. A weakness in one of the processing areas and relative stable to strong scores in other areas is ordinarily what is observed. The WJ Cognitive Battery is used in Oklahoma as a part of the process in determining service needs for students to establish if there is a “flawed ability to listen, think, speak, write, spell, or do math” (Garrett, 2003, p.46).

The implication that cognitive processes are important for an understanding of God and thus a relationship with Him is evidenced through such scripture as Isaiah 1:18 where the invitation is given by the Lord to Isaiah to reason together with Him. Further, scripture supports the use of cognitive abilities whether it be Jesus “let him who has ears to hear let him hear” (Matthew 11:15) or Moses who reads the law to the people (Deuteronomy 5:1ff) or “faith comes by hearing” (Romans 10:17) (auditory processing). There is an appeal to visual processing with the serpent raised in the desert (Numbers 21:9)) or Christ raised on the cross (John 12:32). Scripture appeals to LTR with “Remember Jesus Christ” (2 Timothy 2:8) or “Remember the former things” (Isaiah 46:9). Jesus appeals to STM when he asks who is my neighbor (Luke 10:36) or the practice of having the children repeat the Deut 6:4-9 (Shema). Processing Speed was evident in the paralytic who immediately got up (Mark 2:12) and the action of the disciples who left their nets to follow Christ (Mark 1:17).

Evidently, since God created us with these processes, He would appeal to His creation through these cognitive functions. Further, developmental characteristics are implied in such stories as creation (Genesis 4:19-22) and the Apostle Paul’s comments regarding being babies (I Corinthians 3:1) and the call to maturity (Ephesians 4:15). Thus it would appear that an Object Relations perspective helps to describe a developmental understanding of the brain created by God. As Gauvain (2003) maintained, there are four key cognitive domains which are affected by context. These are the domains of attention, memory, problem-solving, and planning. Teske (2006) pointed out there are neural changes that occur in memory, attention, emotional marking and temporal sequencing as a response to narrative. Thus by theory LTR can be affected by narrative, such as

preaching, reading scripture, and personal testimony. These domains would also represent cognitive processes necessary to provide the mental representation of a concept like God and how one understands the relationship one has to that perception.

Limitations of the Study

The fundamental issue which affects this study in terms of its generalizability is the sample size. Gay notes that "...30 subjects are generally considered to be a minimally acceptable sample size (1987, p. 231). Portney and Watkins (2000) add that "correlation coefficients are very sensitive to sample size..." (p. 496). For a small sample size, as in this study, not only was a level of significance requires ($p=.05$) but also a strong correlation coefficient (.80 or better) (Newton and Rudestam, 1999).

Another area which may have affected scores and thus results was the Hawthorne effect. The scoring may have been altered "by their knowledge of participation in a study" (Gay, 1987, p. 275.). The Hawthorne effect also seems plausible as based on the scoring patterns found within the Spiritual Assessment Inventory (SAI). As noted earlier, the SAI has a scale entitled "Disappointment". Hall and Edwards (1996) remarks:

Since these items tap assumed normal, human difficulties experienced in a relationship with God, we hypothesized that an individual who acknowledges very few or none of these difficulties may be exhibiting a degree of defensiveness that would raise questions about the validity of his or her profile (p. 242).

Since the SAI uses a Likert scale from one to five, a score of one would signify a high degree of defensiveness regarding their response. The mean score on the Disappointment scale was 1.98 with no scores at or above a three. This seems to indicate that the profiles presented on this instrument may lack validity.

Recommendations for Further Research

Current research focused on the relationship between cognitive deficits and spiritual development is meager. In essence, there is an educational and societal need for current research in this area. This study, due to the sample size, lacks the strength to be discussed beyond this study group. Although efforts were made to obtain at least 30 participants only thirteen were actually available for data analysis.

The Spiritual Assessment Inventory can provide information that could be used further research. Hall and Edwards (2002) suggest the SAI should become a “clinical tool for pastors, pastoral counselors, chaplains, and psychotherapists to formally assess parishioners’ and clients’ spiritual development” (p. 353).

One issue that will be faced by future researches is obtaining access to records. Some populations are considered vulnerable if there are justifiable concerns about their ability to understand information presented to them and make sound choices. These populations include people with psychiatric, cognitive, or developmental disorders and substance abusers. Educators may believe that access to special education files or sending questionnaires to special needs students of any category is placing those students in a vulnerable state. Further, the files for those in special education are usually destroyed within seven years following graduation thus creating a void of accessible information if a researcher waits too long to initiate their study.

Summary

The data provided for this study failed to reject the null hypothesis that there would be no correlation between cognitive deficits and spiritual development among individuals who qualified for special education under the category of Specific Learning

Disability. The alternative hypothesis for this study that a correlation exists between various cognitive deficits and spiritual development among individuals who qualified for special education under the category of Specific Learning Disability was not accepted.

The data also failed to reject the null hypothesis that that individuals who qualified for special education under the category of Specific Learning Disability with a deficit in Processing Speed will not score lower on a scale used to measure spiritual development than those individuals who qualified for special education under the category of Specific Learning Disability who qualified under Long-Term Retrieval, Auditory Processing, Visual-Spatial Processing or Short-Term Memory. The alternative hypothesis for this study that individuals who qualified for special education under the category of Specific Learning Disability with a deficit in Processing Speed will score lower on a scale used to measure spiritual development compared to those individuals who qualified for special education under the category of Specific Learning Disability who qualified under Long-Term Retrieval, Auditory Processing, Visual-Spatial Processing or Short-Term Memory was also rejected.

There was a marginal relationship between Long-Term Retrieval and Awareness. However, the validity of the scoring patterns is questionable based on scores reported on the Disappointment scale.

Scores for the Spiritual Assessment Inventory fell into age ranges expected by Hall and Edwards (1996). The Woodcock-Johnson Tests of Cognitive Abilities remains a sound test of intelligence. The implication that cognitive processes are important for an understanding of God and thus a relationship with Him is evidenced throughout Scripture

and if there is an inverse relationship between Long-Term Retrieval and Awareness then a persons understanding of narrative (in any form) can be affected.

The study was limited by the sample size. The data lacks the ability to be generalized beyond this sample. Future researchers will need to gain a larger sample to address the strength of the research and will need to do so prior to destruction of special education records.

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Appendices

Appendix A:

Spiritual Assessment Inventory

Todd W. Hall, Ph.D.

Keith J. Edwards, Ph.D.

Instructions:

1. Please respond to each statement below by writing the number that best represents your experience in the empty box to the right of the statement.
2. It is best to answer according to what really reflects your experience rather than what you think your experience should be.
3. Give the answer that comes to mind first. Don't spend too much time thinking about an item.
4. Give the best possible response to each statement even if it does not provide all the information you would like.
5. Try your best to respond to all statements. Your answers will be completely confidential.
6. Some of the statements consist of two parts as shown here:

2.1	There are times when I feel disappointed with God.	
2.2	When this happens, I still want our relationship to continue.	

Your response to the second statement (2.2) tells how true this second statement (2.2) is for you when you have the experience (e.g. feeling disappointed with God) described in the first statement (2.1).

	1 Not At All True	2 Slightly True	3 Moderately True	4 Substantially True	5 Very True
1	I have a sense of how God is working in my life.				
2.1	There are times when I feel disappointed with God.				
2.2	When this happens, I still want our relationship to continue.				
3	God's presence feels very real to me.				
4	I am afraid that God will give up on me.				
5	I seem to have a unique ability to influence God through my prayers.				
6	Listening to God is an essential part of my life.				
7	I am always in a worshipful mood when I go to church.				
13	God recognizes that I am more spiritual than most people.				
14	I always seek God's guidance for every decision I make.				
15	I am aware of God's presence in my interactions with other people.				
16	There are times when I feel that God is punishing me.				
17	I am aware of God responding to me in a variety of ways.				
18.1	There are times when I feel angry at God.				
18.2	When this happens, I still have the sense that God will always be with me.				
19	I am aware of God attending to me in times of need.				

8.1	There are times when I feel frustrated with God.	
8.2	When I feel this way, I still desire to put effort into our relationship.	
9	I am aware of God prompting me to do things.	
10	My emotional connection with God is unstable.	
11	My experiences of God's responses to me impact me greatly.	
12.1	There are times when I feel irritated at God.	
12.2	When I feel this way, I am able to come to some sense of resolution in our relationship.	

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20	God understands that my needs are more important than most people's.	
21	I am aware of God telling me to do something.	
22	I worry that I will be left out of God's plans.	
23	My experiences of God's presence impact me greatly.	
24	I am always as kind at home as I am at church.	
25	I have a sense of the direction in which God is guiding me.	
26	My relationship with God is an extraordinary one that most people would not understand.	

		1 Not At All True	2 Slightly True	3 Moderately True	4 Substantially True	5 Very True
27.1	There are times when I feel betrayed by God.					
27.2	When I feel this way, I put effort into restoring our relationship.					
28	I am aware of God communicating to me in a variety of ways.					
29	Manipulating God seems to be the best way to get what I want.					
30	I am aware of God's presence in times of need.					
31	From day to day, I sense God being with me.					
32	I pray for all my friends and relatives every day.					
33.1	There are times when I feel frustrated by God for not responding to my prayers.					
33.2	When I feel this way, I am able to talk it through with God.					
34	I have a sense of God communicating guidance to me.					
35	When I sin, I tend to withdraw from God.					
36	I experience an awareness of God speaking to me personally.					
37	I find my prayers to God are more effective than other people's.					
38	I am always in the mood to pray.					
39	I feel I have to please God or he might reject me.					
40	I have a strong impression of God's presence.					
41	There are times when I feel that God is angry at me.					
42	I am aware of God being very near to me.					
43	When I sin, I am afraid of what God will do to me.					
44	When I consult God about decisions in my life, I am aware of His direction and help.					
45	I seem to be more gifted than most people in discerning God's will.					
46	When I feel God is not protecting me, I tend to feel worthless.					
47.1	There are times when I feel like God has let me down.					
47.2	When this happens, my trust in God is not completely broken.					

Appendix B:

SPIRITUAL ASSESSMENT INVENTORY**Instructions**

1. Please respond to each statement below by writing the number that best represents your experience in the box to the right of the statement.
2. It is best to answer according to what really reflects your experience rather than what you think your experience should be.
3. Give the answer that comes to mind first. Don't spend too much time thinking about an item.
4. Give the best possible response to each statement even if it does not provide all the information you would like.
5. Try your best to respond to all statements. Your answers will be completely confidential.
6. Some of the statements consist of two parts as shown here:

2.1 There are times when I feel disappointed with God.

2.2 When this happens, I still want our relationship to continue.

Your response to 2.2 tells how true statement 2.2 is for you when you have the experience of feeling disappointed with God described in statement 2.1.

		1 Not At All True	2 Slightly True	3 Moderately True	4 Substantially True	5 Very True
1	I have a sense of how God is working in my life			A		
2.1	There are times when I feel disappointed with God			D		
2.2	When this happens, I still want our relationship to continue			RA		
3	God's presence feels very real to me			A		
4	I am afraid that God will give up on me			I		
5	I seem to have a unique ability to influence God through my prayers			G		
6	Listening to God is an essential part of my life			A		
7	I am always in a worshipful mood when I go to church.			IM		
8.1	There are times when I feel frustrated with God			D		
8.2	When I feel this way, I still desire to put effort into our relationship			RA		
9	I am aware of God prompting me to do things			A		
10	My emotional connection with God is unstable			I		
11	My experiences of God's responses to me impact me greatly			A		
13	God recognizes that I am more spiritual than most people					G
14	I always seek God's guidance for every decision I make.					IM
15	I am aware of God's presence in my interactions with other people					A
16	There are times when I feel that God is punishing me					I
17	I am aware of God responding to me in a variety of ways					A
18.1	There are times when I feel angry at God					D
18.2	When this happens, I still have the sense that God will always be with me					RA
19	I am aware of God attending to me in times of need					A
20	God understands that my needs are more important than most people's					G
21	I am aware of God telling me to do something					A
22	I worry that I will be left out of God's plans					I
23	My experiences of God's presence impacts me greatly					A
24	I am always as kind at home as I am at church.					IM

12.1	There are times when I feel irritated at God	D
12.2	When I feel this way, I am able to come to some sense of resolution in our relationship	RA

25	I have a sense of the direction in which God is guiding me	A
26	My relationship with God is an extraordinary one that most people would not understand.	G

1 Not At All True	2 Slightly True	3 Moderately True	4 Substantially True	5 Very True
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27.1	There are times when I feel betrayed by God	D
27.2	When I feel this way, I put effort into restoring our relationship	RA
28	I am aware of God communicating to me in a variety of ways	A
29	Manipulating God seems to be the best way to get what I want	G
30	I am aware of God's presence in times of need	A
31	From day to day, I sense God being with me	A
32	I pray for all my friends and relatives every day.	IM
33.1	There are times when I feel frustrated by God for not responding to my prayers	D
33.2	When I feel this way, I am able to talk it through with God	RA
34	I have a sense of God communicating guidance to me	A
35	When I sin, I tend to withdraw from God	I
36	I experience an awareness of God speaking to me personally	A

37	I find my prayers to God are more effective than other people's	G
38	I am always in the mood to pray.	IM
39	I feel I have to please God or he might reject me	I
40	I have a strong impression of God's presence	A
41	There are times when I feel that God is angry at me	I
42	I am aware of God being very near to me	A
43	When I sin, I am afraid of what God will do to me	I
44	When I consult God about decisions in my life, I am aware of His direction and help	A
45	I seem to be more gifted than most people in discerning God's will	G
46	When I feel God is not protecting me, I tend to feel worthless	I
47.1	There are times when I feel like God has let me down	D
47.2	When this happens, my trust in God is not completely broken	RA

Scales:

A	=	Awareness	
RA	=	Realistic Acceptance	(Formerly = Healthy Ambivalence)
D	=	Disappointment	(Formerly = Defensiveness)
G	=	Grandiosity	(Formerly = Narcissism)
I	=	Instability	(Formerly = Splitting)
IM	=	Impression Management	(New Scale, experimental)

Scoring Instructions: The score for each scale is the average of answered items. If the respondent omits more than half the items for a given scale, the scale cannot be scored.

Scoring of the RA scale items (designated by xx.2 item numbers) depends on the respondent's answer to the corresponding disappointment item (designated by xx.1 item numbers). If the respondent answers "not at all true" (1) on the xx.1 item, then the corresponding xx.2 item is NOT included in the RA scale average score. For example, if he/she rates item 2.1 as a "1", then item 2.2 is not included in calculating the RA scale score average.

Appendix C:

INFORMED CONSENT

Informed Consent Form for research being conducted under the auspices of Liberty
University
Lynchburg, Virginia

INTRODUCTION:

This survey, “Spiritual Assessment Inventory”, is part of my dissertation research to meet the requirements set forth by Liberty University, Lynchburg, Virginia on the topic of “The Relationships Between Cognitive Deficits and Spiritual Development”. The study has been approved by Kellyville Schools, Kellyville, Oklahoma for Nolan Thomas, ABD, who is under the direction of Dr. Gene Mastin, to proceed. By completing and turning in this survey you are giving consent for the researcher to include your responses in his analysis. Your participation in this research is strictly voluntary, and you may choose not to participate without fear of penalty or negative consequences. Individual responses will be treated confidentially. No names are to be on the surveys. Each survey will be coded with a number. No individual identifiable information will be disclosed or published, and all results will be presented as group summary data or information. If you wish, you may request a copy of the results of this research by writing to Nolan Thomas, P.O. Box 138, Kellyville, OK 74039.

DESCRIPTION OF THE STUDY:

Every person develops both in their thinking ability and in their understanding of God and how they relate to God. There seems to be a clear understanding of how an individual who qualified for services under the category of Specific Learning Disability is affected in his or her educational performance. What is not known is how an individual’s learning disability will affect his or her spiritual development. The purpose of this study is to investigate the relationship between thinking and spiritual development. If you participate in this research you will be asked to fill out a brief survey. Completion of the scales will take about 15 minutes. Scores from the Spiritual Assessment Inventory will be compared to scores from your last testing for Specific Learning Disabilities. Only those on the research team will review the scores and your name will not appear on the information collected or in published material. You must be 18 years of age to participate.

POTENTIAL RISKS AND BENEFITS OF PARTICIPATION:

There are no foreseeable risks or discomforts to the study participants as a result of participating in this study beyond normal everyday life. A potential benefit to the participant, by answering the survey, is personal insight into how they see themselves in relationship to God as they understand God to be. However, the results of the research may contribute to our understanding of spiritual development and assist schools, churches and other agencies in assisting people on their journey of faith.

Further questions about this study and your rights may be addressed by contacting Nolan Thomas at 918-247-5049 or Gene Mastin, PhD at 434-592-4042.

Appendix D:

Institutional Permission Letter

Kellyville Public Schools

P.O. Box 99

Kellyville, OK 74039

Administration 247-6133

Middle/High School 247-6333

Elementary School 247-6300

Liberty University
1971 University Blvd.
Lynchburg, Virginia

August 14, 2006

Dr. Gene Mastin
Committee Chair,

Please be advised that this document comprises the institutional permission letter on behalf of Kellyville Public Schools for the study entitled "The Relationships Between Cognitive Deficits and Spiritual Development" with Nolan Thomas as the primary researcher.

The purpose and procedures of this study has been explained and found acceptable within the policy guidelines of the district and the State of Oklahoma.

On behalf of Kellyville Public Schools

Joe Pierce
Assistant Superintendent

Appendix E:

Cover Letter

Nolan Thomas
P.O. Box 138
Kellyville, OK
74039

Hi,

This is Nolan Thomas, one of the counselors from Kellyville Schools, asking you to help me on a project I am doing. This will only take about 15-20 minutes of your time to do and would help me out greatly. Plus, I will send you a \$15 Wal-Mart gift card for taking the time to fill out a short questionnaire and mailing it back to me.

With this notice you will find some other forms. One is an official looking paper with the words “Informed Consent” at the top of the page. This page tells you what I am doing and why I want to do it and why I need you. It further informs you that all information is kept confidential. It also tells you that by filling out the questionnaire and mailing it back is your way of saying “Yes, You can use my information”. This way no signatures are involved. I will know who sends the forms back based on a number on the questionnaire. Second, you will find a copy of the “Spiritual Assessment Inventory” on colored paper. Just read each sentence and mark it with a number based on your experience. This is a two sided sheet so be sure and fill out both sides.

Once done, simply mail back the colored “Spiritual Assessment Inventory” in the envelope I have provided. It has a stamp already, too. Once I receive your answers I will mail you the \$15 gift card. Print your correct return address on the envelope before you mail it. If you have any questions please call me using the number on the Informed Consent form.

I hope to hear from you soon

Nolan Thomas

Thank you for your consideration

