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Teachers' Perceptions and Practices of Multiple Intelligences Theory in Middle Schools

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COLLEGE OF EDUCATION

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2016

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MA, Piedmont College, 2000

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Doctoral Study Submitted in Partial Fulfillment

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Abstract

Despite instructional changes and administrative support, students with learning disabilities in a middle school located in Georgia did not meet the state expectations to perform at their grade level in core subjects on the state's standardized test. The purpose of this correlational study was to determine whether a relationship existed between teachers' familiarity with Gardner's multiple intelligences (MI) theory and the MI instructional strategies they used in the classroom setting. Gardner's MI theory was used as the theoretical foundation, which supports the idea that if teachers can identify the intelligences (e.g., interpersonal, intrapersonal, visual/spatial, musical, bodily/kinesthetic, mathematical/logical, verbal/linguistic, and naturalistic) in each child and then teach to those abilities, the child will learn better. The sample included 61 middle school teachers who participated in Gardner's MI familiarity and MI practices online self-report survey. Data were analyzed descriptively and inferentially using correlations and regression. The results revealed that a majority (61%) of teachers were unfamiliar or only somewhat familiar with Gardner's MI theory. A simple linear regression revealed no significant relationship between teacher classroom practices and familiarity with Gardner's theory. Recommendations included conducting additional research on MI with a larger sample; additional research was also recommended on the best classroom practices for teachers to support a wide range of diverse learners. Implications for positive social change include providing the local site with information and recommendations that will further the dialogue related to what schools can do to promote learning and academic success for all students.

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Section 1: Introduction to the Study

Introduction

The purpose of this quantitative correlational study was to determine whether a relationship existed between teachers' familiarity with Gardner's multiple intelligence (MI) theory and the MI instructional strategies they used in the classroom setting. Gardner's MI theory described eight kinds of intelligences that every individual has but in varying degrees; each intelligence can be encouraged and developed as well as change with time (Gardner, 1993). Gardner's eight intelligences are interpersonal, intrapersonal, visual/spatial, musical, bodily/kinesthetic, mathematical/logical, verbal/linguistic, and naturalistic. Some researchers have found that teachers who based their instructional practices on MI theory have more authentic classrooms; that is, students are more genuinely engaged than in classes with teachers who do not practice MI theory (Andronache, Bocoş, Stanciu, & Raluca, 2011).

Al-Wadi (2011) claimed that schools supporting the MI theory reported that 78% of their students tested showed an increased gain on standardized tests. Not only did their test scores increase, but also MI theory had a positive effect on both the students' and the teachers' attitudes toward learning (Al-Wadi, 2011; Andronache et al., 2011). However, studies on teachers' perceptions of MI theory are limited.

Central to the problem of this study were students with learning disabilities, who, despite instructional changes and support from administration, did not meet the state's expectations to perform at their grade levels in core subjects of math or reading for the past 3 years. Consequently, the local school under study fell short by 40.5% of meeting

adequate yearly progress (AYP). AYP is a mandate of the No Child Left Behind (NCLB) Act of 2001 and is defined by each state's education agency (Thompson, Meyers, & Oshima, 2011). To address this problem, I investigated and assessed teachers' perceptions of MI theory and obtained information about the practices they use to create MI inspired instruction and curriculum. The theoretical components of MI theory as proposed by Gardner (1983, 1999, 2004) and their implications for curriculum in the classroom were used to inform this study. Most of the literature reviewed was derived from recent articles in peer-reviewed journals. In addition, data are presented that shed light on the local problem. Search terms or phrases included the following: *students with disabilities, adequate yearly progress, multiple intelligences, learning styles, multisensory,* and *teaching styles.*

Problem of the Study

With ever-evolving legislative changes and public policies in special education, more attention has been placed on accountability through high-stakes testing (Beam, 2009). In prior mandates, accountability was applied only to the test score outcomes of general education students; however, under the current laws, accountability measures have been extended to include those students in special education. That is, scores of students with disabilities (SWD) are considered alongside their peers without disabilities. As a result of the new accountability mandates, educators are now compelled to find effective means to educate SWD who participate in high-stakes testing (Beam, 2009).

Beam (2009) proposed differentiation, an MI approach as a means to educate SWD. Researchers proposed that educators consider Gardner's (1998, 2011) MI theory

when implementing instructions for students requiring differentiation in instruction. The MI theory supports the idea that SWD will be reached academically when teachers incorporate different learning styles and practices into daily plans based on MI. However, it is unknown whether many teachers are familiar with Gardner's theory of MI and various MI practices used to differentiate lessons.

Al-Wadi (2011) suggested that students in schools that adopted MI theory increased their achievement on standardized tests. Researchers also demonstrated that when teachers understand MI theory and the type of relationship between MI and students' academic achievement, they look differently at how they provide student instruction and develop their curriculum (Hassan, Sulaiman, & Baki, 2011; Sulaiman, Hassan, & Yi, 2011). Cortiella (2007) posited that with appropriate services and support, the vast majority of students receiving special education in our nation's schools can achieve proficiency on a state's academic content standards in reading and math.

The focus of this study is a Title I middle school with a student population composed largely of low socioeconomic children who qualified for federal funding. From 2007 to 2011, SWD collectively performed below state expectations. In 2007, 62.5% of the group scored below the expectation in math. In reading, 43.6% of the group scored below the expectation. In 2008, 68.8% of the group scored below the expectation in math. In reading, 45% of the group scored below the expectation. In 2009, in math, 65.6% of the group scored below the expectation. In reading, 51.4% of 100% of the group scored below the expectation (Georgia Department of Education [GaDOE], 2010).

To satisfy the state's criteria for meeting AYP, the school attempted to remediate those students who failed core subjects such as reading and math. The school offered afterschool programs that consisted of tutoring in math and reading. Teachers offered morning tutoring. Also, cotaught classes (specialists and regular classroom teachers working together) were arranged for those who had learning disabilities and needed academic support. The school provided instructional coaches to assist teachers and offered additional math and reading classes during the school day for struggling learners. In addition, the school purchased the Criterion-Referenced Competency Test (CRCT) online computer programs so that students would have access to practice material at school and home.

Finally, the school made available professional development workshops on differentiated instruction, a teaching strategy in which teachers adapt lessons to individual student needs. The adjustment of teachers' instruction included adding study guides, PowerPoint slides or overheads, lecture notes, hands-on activities, and objective setting and feedback. In addition, students were provided a variety of remediation services through tutoring, afterschool programs, and cotaught classes.

Despite these instructional changes and support, SWD in sixth through eighth grades, who participated in the CRCT testing, did not meet the state's expectations to perform at their grade level in core subjects of math or reading (GaDOE, 2010). In 2010, the school reported that 61.8% of the students did not meet or exceed expectations even when all of the initiatives were implemented. The expectation of GaDOE (2010) was that 100% of SWD should score at grade level or higher on the CRCT.

SWD taking part in state and district-wide assessments were not only a local concern. SWD throughout the United States are required to take these assessments (Lai & Berkeley, 2012). Information gathered from peer-reviewed and scholarly journals provide sufficient evidence to label the problem of this study as a nationwide concern (Cho & Kingston, 2012; Sulaiman et al., 2011). Lai and Berkeley asserted that historically, students with known disabilities were excluded from areas of high-stakes testing; however, key stakeholders were concerned that this population of students would not receive equal benefits from the general education systems as their peers without disabilities. Subsequently, the 1997 Amendments to the Individuals with Disabilities Education Act (IDEA) was created, which required that SWD be included in state testing programs (U.S. Department of Education, 2010).

The SWD subgroups did not meet yearly performance criteria. NCLB of 2002 mandated that every student would receive the instruction necessary to succeed. However, students must not only learn specified content, but also do so within a limited time frame; that is, they must achieve AYP at designated grade spans (Grades 3 through 5, 6 through 8, 10 through 12) at a rate and proficiency level consistent with same-age peers (NCLB, 2006). Some educators might think it improbable that SWD can perform at the same levels as the general population; however, many special education educators have argued that the majority of special education students can perform equally to their general education peers (Cortiella, 2007). School administrators are concerned that at the present pace, all schools within the local district will face the “needs improvement category” if actions are not taken to reverse this trend.

Nature of the Study

The problem addressed in this quantitative correlational study was the teachers' level of familiarity with Gardner's MI theory and the MI practices teachers use in the classroom to enhance learning among SWD. The purpose was to determine whether a relationship existed between teachers' familiarity with Gardner's MI theory and teacher practices of Gardner's theory in the middle school classroom. The instrument was a closed-ended modified questionnaire adapted from a study conducted by Al-Wadi (2011). Although portions of this study were in public domain, written permission was sought from the author to distribute the questionnaire for educational purposes. The questionnaire employed in Al-Wadi's study (2011) addressed similar perceptions as in the current study, which precisely focused on teachers' perceptions at an elementary school toward MI theory. The results of the study indicated that teachers were familiar with MI theory but had no formal education about it, either in a teacher education program or through professional development.

The following research questions (RQ) and hypothesis (*H*) statements were addressed in the current study:

RQ1: What are middle school teachers' levels of familiarity with Gardner's MI theory?

$H_0$1*:* The middle school teachers are not familiar with Gardner's MI theory and how to implement it in the classroom.

H_a1: The middle school teachers are familiar with Gardner's MI theory and how to implement it in the classroom.

RQ2: What is the relationship between teachers' level of familiarity with Gardner's MI theory and how they implement Gardner's MI theory in the classroom?

$H_0$2: There is no significant relationship between teachers' level of familiarity with Gardner's MI theory and how they implement the theory in the classroom.

H_a2*:* There is a significant relationship between teachers' level of familiarity with Gardner's MI theory and how they implement the theory in the classroom.

Using the questionnaire design increased the reliability of the information by eliminating researcher biases and concealing participants' characteristics (Johnson & Christensen, 2008; Lichtman, 2006) whereas employing a qualitative design, the researcher issued claims based mostly on constructive perceptions (Creswell, 2009). The quantitative design was shown to be effective in prior research on MI. For example, Sulaiman et al. (2010) used a comparative design approach to determine both the relationship and strength among the eight types of MI and teacher learning styles.

The primary objectives were twofold: (a) to understand on a deeper level how familiar teachers are with the MI theory; and (b) to gain a theoretical and practical understanding of teachers' applications of MI theory in the classroom. The MI approach ensures that students learn and retain information longer than through other available teaching methods (Rettig, 2005). The sample in this study consisted of 61 teachers who taught at one middle school. This number aligned with the computations for the minimum recommended sample size of 59 using G-Power 3.0 calculations (Faul, Erdfelder, Buchner, & Lang, 2009). The key inclusion criteria for participants in this study were (a)

Are the teachers willing to participate voluntarily? and (b) Do they teach middle school classes in inclusive classrooms?

I anticipated that the outcome of this study will greatly contribute to the field of education by introducing teachers' perspectives of Gardner's MI theory used widely in education. The aim was to broaden the implication of MI theory practices in the classrooms and provide valuable information about teachers' familiarity with MI theory. In addition, teachers must be given continued opportunities to deepen and expand their knowledge of MI (Yalmanci & Gözüm, 2013).

Purpose of the Study

The purpose of this quantitative correlational study was to determine whether a relationship existed between teachers' familiarity with Gardner's MI theory and the MI instructional strategies they used in the classroom setting. Gardner and Hatch (1989) suggested that when teaching students with MI, teachers should have knowledge of student intelligences and know how to implement and apply teaching instructions to accommodate the intelligences. Researchers have repeatedly demonstrated that MI theory can be strongly connected to special education, for MI theory fosters the inclusion of a wide range of practices that allow teachers to perceive and help students develop their learning strengths (Fierros, 2004; Hassan et al., 2011; Sulochana & Kumar, 2009).

At the core of Gardner's (2011) theory is the idea that because people think and learn differently, intelligence can be expressed in multiple ways. When teachers use multiple teaching dimensions, they incorporate each of the major intellectual domains in their approach; as such, the student is provided unique opportunities to use his or her

innate intelligence to learn and understand the subject matter presented. The aim is to help students understand their strengths and learn to use their strengths to acquire new information and work on more fully developing their knowledge in areas that are a challenge for them.

According to Yalmanci and Gözüm (2013), when teachers and planners think of activities for each intelligence type, they also enhance their methods and teaching strategies, and they reveal different and original techniques. The key premise is that teachers who are knowledgeable about MI theory are better able to identify the intelligence profile of the students having difficulty in comprehending the subject. The premise is that teachers will be able to prepare the appropriate activities for the individual profiles. For example, when a teacher identifies and recognizes a student's strength in math-logic and problem solving, the teacher will provide activities for the student that includes working with patterns and relationships, classifying, categorizing, and working with abstract. Not only can using MI theory increase students' confidence and enthusiasm for learning, but it may also alter teachers' opinions of their students' learning abilities. MI theory reveals academic strengths and different ways of learning, which can be useful when educating students identified for special education services (Gardner, 1993).

Theoretical Framework

In this study, I used the theoretical concepts of MI proposed by Gardner and Hatch (1989). Gardner's (2011) theory suggested that teachers who used MI teaching methods are able to develop their teaching strategies beyond the standard linguistic and logical methods and develop innovative teaching strategies that reach all students with

learning challenges. The MI theory is widely adapted in all areas of education and is popular because it allows educators to create educational programs that will help students use their innate potentials to grow academically (Hassan et al., 2011).

Using MI, teachers are able to present instructional materials in a flexible manner and, at the same time, provide opportunities that allow students to use their dominant strengths and intelligences. Rettig (2005) claimed the MI approach ensures that students learn and retain information longer than other available teaching approaches. The greatest effect of Gardner's theory in this study will be to demonstrate how the creativity of teachers can be enhanced in developing teaching strategies. Without theoretical knowledge, it is hard for teachers to learn and implement strategies and techniques needed to respond to students' thinking about subject content in ways that facilitate their learning (Gardner, 2011).

Gardner's (1983) theory of MI received positive response from many educators. In addition, it is widely applied by teachers to address the problems of learning in schools nationwide. The theory of MI contributes significantly to education in its encouragement of teachers to improve on a greater variety of teaching strategies (Sulaiman et al., 2011). The MI approach may not only facilitate and compliment teachers' present teaching strategies, but it may be a specific solution to one-sidedness in teaching. In this manner, teachers can focus not only on the strengths and weaknesses of their students, but also on areas that need improvement to heighten classroom achievement (Sulaiman et al., 2011).

Definitions

The key terms discussed in this study were the following:

Adequate yearly progress (AYP): Establishes clear goals for student learning; measures whether students are reaching them; and commits to making improvements in schools that are not raising student achievement (Foley & Nelson, 2011).

Authentic classroom: Classrooms based on instructions within contexts that closely resemble actual situations in which students are genuinely engaged to improve learning (Andronache et al., 2011).

Coteaching: An instructional strategy, which involves a general and special educator working together with the same group of students in a shared teaching space (Bennett & Fisch, 2013).

Criterion-referenced competency test (*CRCT*): A state-mandated test that measures whether students have successfully learned the information and skills specified in the state curriculum (GaDOE, 2005).

Differentiated instruction: A practice of modifying, adapting, or reshaping materials, student projects and products, and educational resources to meet the innate and individual learning needs of students (De Jesus, 2012).

Inclusion: Educational provisions made to assist and include students with various disabilities in reaching their full potential in mainstream educational classrooms (Ball & Green, 2014; De Jesus, 2012; IDEA, 1997, 2004).

Multiple intelligences (MI) theory: An assumption that each individual has varying levels of intelligence and thus has a unique cognitive profile for learning. Gardner's MI theory will support and inform the research process (Gardner, 2011; Gardner & Hatch, 1989).

Students with disabilities (SWD): Children with mental retardation, hearing impairments (including deafness), speech or language impairments, visual impairments (including blindness), serious emotional disturbance, orthopedic impairments, autism, traumatic brain injury, other health impairments or specific learning disabilities (U.S. Department of Education, 2010). For purposes of this study, SWD refers to *students with disabilities, a student with a disability,* or *a student with disabilities*.

Assumptions, Limitations, Scope, and Delimitations

I assumed that all participants were certified teachers who answered the questionnaire items with honesty and careful consideration. I also assumed that participants had some knowledge regarding the concept of MI and some knowledge of other MI theories. As such, I assumed the survey instrument measured the intended construct effectively, a test of validity and reliability (Creswell, 2009).

The data collection method had certain limitations. One limitation was reliance on self-reported data, which was subject to recall biases inherent to questions being asked. Another limitation was how teachers interpreted the meaning of "other theories" on the survey. What they may think is an intelligence theory may not actually be one. The actual level of teacher familiarity with other specific theories is therefore subjective.

In addition, the findings in this survey may not reflect the general population of teachers in other schools with different teaching styles, which limits the ability to generalize the results obtained to the larger population. The scope of the study involved examining the relationship between teachers' levels of familiarity with MI theory and how they implement practices of Gardner's MI in the classroom to improve learning.

Other populations of teachers from different grade levels may not share the same or similar characteristics, thus different outcomes. A delimitation of the study was that I only measured the intelligences and practices of teachers and did not address individual differences.

Significance of the Study

Central to the problem of this study were students with learning disabilities, who, despite instructional changes and support from their teachers, did not meet the state's expectations to perform at their grade level in core subjects of math or reading for the past 3 years. Findings from the study may confirm teachers' level of familiarity with Gardner's (2011) MI theory and their practices. Teachers must be better equipped to widen their pedagogical skills to accommodate the learning needs of students with different intelligence profiles (Mokhtar, Majid, & Foo, 2008).

Teachers must be given continued opportunities to deepen and expand their knowledge of MI (Yalmanci & Gözüm, 2013). The premise is that when teachers are knowledgeable of MI theory, they are better prepared to identify the intelligences of the students having difficulty and able to prepare the appropriate instructions. If teachers believe they lack knowledge or are uniformed, the appropriate MI-based instruction through in-service training can be provided. The overall aim is for all students to become more academically successful (Yalmanci & Gözüm, 2013).

The practice of traditional teaching methods for teaching students with diverse learning styles continues to dominate most classrooms. Sulaiman et al. (2011) described traditional teaching as where learners are classified as if they were an undiversified

group. Teachers tend to teach the same material with the same methods to everyone, regardless of learning styles and with the same or similar instructional methods.

Contemporary teaching methods emphasize individual differences; for example, information can be conveyed through multiple channels (auditory, visual, and kinesthetic) and through intelligences that are more inclusive (Sulaiman et al., 2011). However, in the past few years, teachers were compelled to use an MI framework in their teaching so that more student needs can be met. Educators in the last decade face students unable to meet the assessment criteria of standardized exams where standardized exams focused solely on basic literacy skills such as reading and math; these assessments often overlooking various other intelligences that exist (Sulaiman et al., 2011).

This study has many implications for positive social change. The focus is on ways for teachers to integrate MI into their teaching to adapt to their students' different intelligences (Gardner, 2011). Stemming from Gardner's theory, the implications are that when teachers use a MI approach, they are providing student learning experiences and curricular offerings that can result in positive educational experiences for both students and teachers, which will ultimately enhance the effectiveness of their teaching practices. Positive social change will be realized when the instructional practices of teachers are implemented to enhance the MI that students with learning disabilities possess, improving the likelihood that students will be more successful when they take standardized tests.

Transition Statement

In Section 1, I provided an in-depth overview of the problem that exists in one southern school in Georgia. A large percentage of SWD continue to fail to meet the expectations on the CRCT, although these students received remediation through tutoring, and cotaught classes. The problem was selected to gain an in-depth understanding of how teachers perceive MI theory and related practices used when educating those with learning disabilities. In addition, the problem was selected to gain a theoretical and practical understanding of how using MI approaches can meet the needs of a broader scope of SWD. The ultimate goal is for this population of students to improve on federally and state mandated standardized testing.

In Section 2, I focus on the research literature that provided in-depth information and current research on how teachers integrate MI in teaching in an effort to meet the needs of student with different intelligences. Gardner's (1983, 1989, 2011) work indicated that when teachers use a MI approach, students are provided learning experiences and curricular offerings that can result in positive educational experiences for both students and teachers. Using a MI teaching approach will more likely motivate students to learn, resulting in improved student achievement and test scores as well as enhanced classroom participation. To date, only a few studies have examined the application of MI theory to improve the learning of SWD. In this present study, I provide insights for general education teachers and educators about their intelligences and about integrating MI into the curriculum.

Section 2: Literature Review

Introduction

There are nearly 3 million school-age children in the United States and of that number, 5% are diagnosed with a learning disability and are receiving special education services (Shaywitz, Morris, & Shaywitz, 2010). Central to the problem of this study was how teachers' instructional practices affect students with learning disabilities who have not met the assessment criteria of standardized exams as mandated by NCLB at a Title I middle school in Georgia. NCLB's required focus on high-stakes testing accountability has compelled teachers to search for effective ways to reach students classified with a learning disability or enrolled in special education programs, and the methods are usually included in general education classrooms (NCLB, 2006). Gardner's (1983) theory of MI implies that educators should recognize and teach to a broader range of talents and skills, further suggesting that teachers should structure the presentation of material in a style that engages most or all of the intelligences. As such, the purpose of this quantitative correlational study was to determine whether a relationship existed between teachers' familiarity with Gardner's MI theory and the MI instructional strategies they used in the classroom setting. This literature review includes a search of peer-reviewed journal articles, scholarly books, research documents, and dissertations primarily through Walden University online services. Databases included ProQuest, EBSCOhost, and Sage. Key words for searching the databases included descriptors such as *child-centered learning*, *Howard Gardner*, *learning styles*, *individualized instruction*, *No Child Left Behind*, *multiple intelligences*, and *special education*. This review begins with the discussion of

Gardner's theory, an examination of NCLB, and the effect it has on special education and students with learning disabilities, followed by a discussion of MI and the implications it has for instructional practices.

Theoretical Framework

Gardner's (1983) theory of MI provided the conceptual framework for developing the research questions, organizing the literature review, assessing the teaching practices, and understanding approaches that might better meet the needs of the range of learners in their classrooms. Gardner defined *intelligence* as one's ability to seek out and decipher problems and create valuable products in one's culture. Gardner proposed eight types of intelligences consisting of visual/spatial, verbal/linguistic, musical, logical/mathematics, bodily/kinesthetic, interpersonal, intrapersonal, and naturalistic intelligence. Gardner (1999) alluded to the possibility of a ninth intelligence in his works described as existential intelligence. This intelligence might manifest when a student begins to question about how things exist or created (Roberts, 2010).

Although Gardner (1999) offered a preliminary definition for existential intelligence, that is, "Individuals who exhibit the proclivity to pose and ponder questions about life, death, and ultimate realities" (p. 21), he has not fully confirmed or endorsed this intelligence. The key premise of Gardner's theory is that each type of intelligence is present in each individual but in varying degrees and can be nurtured and developed. Dominant intelligences in individuals are not fixed and could change in time. Intelligence plays a powerful role in the educational system. However, the measurement of

intelligence is only useful if it helps improve instruction argued Bordelon and Banbury (2005).

Gardner (1983) described eight intelligences:

1. Logical/mathematical intelligence is when a person is able to find patterns and think logically and deductively; logical/mathematic is often linked to science and math.
2. Verbal/linguistic abilities allow an individual to use language to its maximal benefits for self-expression and remembering of information.
3. Visual/spatial intelligence is when a person is talented at solving problems that involve manipulating wide spaces mind images.
4. Musical intelligence; individuals can easily recognize rhythm and pitch and are often able to appreciate or compose original musical pieces.
5. Bodily-kinesthetic intelligence. Individuals have well-coordinated body movement starting from a mental level.
6. Interpersonal intelligence. It gives a person the ability to empathize with others' thought and feelings.
7. Intrapersonal intelligence. Individual can understand personal feelings on an in-depth level, which coordinates well with strong interpersonal communication skills.
8. Naturalistic intelligence, which sets an individual with the outside, the natural environment. These people so gifted can identify elements of nature to a heightened degree (Gardner, 1983; Hassan et al., 2011).

In support of Gardner's MI theory, Sulaiman and Sulaiman (2010) claimed that all learners have varied strengths and weaknesses, even though they may differ widely in cognition. Learners vary in how quickly they grasp complex classroom materials. Some learners have difficulty understanding basic concepts and skills, whereas others find them less challenging and easier. By increasing awareness for learners about the different ways in which they learn as well as how they prefer to learn, educators can aid students in metacognitive abilities so that they are motivated to learn. Sulaiman and Sulaiman seemed to suggest that students can become higher achievers when their education settings allow them to use their undiscovered intelligences, subsequently, the students' individuality and learning experience becomes more pleasant (Sulaiman & Sulaiman, 2010). Although Gardner's (1999, 2011) MI theory is widely supported and continues to significantly influence the teaching-learning instructional process, there are critics as indicated in the next section.

Critics of Gardner's Theory

There are critics of Gardner's theory who argued that the MI theory was not grounded in empirical research and cannot provide enough proof to identify and classify all human intellectual faculties (Furnham, 2009; Maftoon & Sarem, 2012). For this reason, some educators were unwilling to accept Gardner's MI theory, citing that there was not enough empirical evidence to support the concept of intelligence. Kaufman (2013) suggested that Gardner's definition of intelligence was too broad, and that his eight, nine, or 10 different intelligences simply represented talents, personality traits, and abilities. Furnham (2009) claimed that one of the most controversial issues is about how

to validate and measure some or all of the MI. The key tenent was that Gardner was less interested in developing tests to validate his popular MI theory. In spite of the critics and controversies, McConnell (2015) believed that teachers are able to put Gardner's MI theory into practice in all classrooms The premise is that when Gardner's MI theory is applied properly, students will respond and become advocates for their education and lifelong success (McConnell, 2015).

Beam (2009) proposed that teachers consider MI, as determined by Gardner (1983), when SWD require differentiation or alternative methods of instruction. The reason is that many of these students have innate intelligences and differentiation is a means to educate all students. The premise is that individual differences play an important role in academic achievement of students and their strengths are promoted. When teachers allow for students' individual differences, they are better able to determine how students with various learning challenges think (Jilardi et al., 2011). The key questions now are how can Gardner's theory of MI be used to differentiate instruction and what are the implications the theory has for teachers. I address these questions in the following sections.

Gardner's Theory and Differentiated Instruction

Some researchers believed that Gardner's (1983) MI theory was not proposed just for the purpose of understanding that students learn differently, but also to support the success of differentiated instruction. The belief is that using MI to differentiate instruction will ultimately assist teachers to accommodate the learning needs of all students and students' individual differences. The premise is that Gardner's theory was

designed to provide a frame for teachers to understand how students learn, process information, Gardner supported the idea that teachers recognize and nurture the various student intelligences; yet as there are critics of Gardner's MI, there are critics of the concept of differentiated instructions as noted in the following section.

Critics of the Concept of Differentiated Instructions

Critics of the concept of differentiated instructions argued that differentiated instruction encourages teachers to categorize students based on popularized notions preferred ways of learning, when in fact, these assessments may be inaccurate in making content more accessible. For example, Pappano (2011) suggested that the notion of differentiating instruction, which refers to altering teaching strategies, assignments, and instructional plans to teach students, is controversial. In spite of the critics, Dixon, Yssel, McConnell, and Hardin (2014) argued that differentiating instruction is an important concept because it offers different paths to understanding and processing information that is appropriate given a child's profile of strengths, interests, and styles.

Most critics of the MI intelligences concept and differentiated instructions agree that both the tasks of each concept are not easy to implement, simply because students require knowledgeable and skillful teachers to plan and implement the concepts at different levels simultaneously. To properly implement the process of differentiating instruction and improve the confidence level of teachers, teachers will require the appropriate professional development (Dixon et al., 2014).

In summary, differentiation instruction requires that teachers modify and adapt teaching materials and content, and assessment to meet the learning needs of students (De

Jesus, 2012). In a differentiated classroom, teachers recognize student differences and realize that they require varied teaching methods to be successful in school. Even though students have different skills, abilities, and talents, the goal in differentiation is for all students to attain mastery over what they need to learn. Student achievement remains a top priority for all stakeholders and educators continue to search for ways to increase performance for SWD (Franzoni & Assar 2009).

The following section provides an in-depth review on relevant literature which helps to explain how schools are held accountable for improving overall student achievement, meeting accountability requirements through NCLB, and improving achievement for special needs students. Additionally, the literature reviewed will help explain how MI manifests itself in the classroom, including MI and learning styles, and the implications for teachers of MI.

Review of Relevant Literature

With evolving changes in recent years on policies and legislature involving special education, more accountability is required through high-stakes testing (Beam, 2009). Historically, accountability efforts only included test scores of general education students; however, test scores of students in special education are required to be reported alongside their non-disabled peers (Beam, 2009). An influential piece of legislation drafted in the field of education was the NCLB Act (2001). Because of NCLB, educators searched for methods to increase student performance and close the achievement gap by setting annual test-score targets for subgroups of students. The NCLB mandate was particularly aimed at SWD based on a goal of 100% proficiency by 2014.

Since NCLB was mandated, students at-risk for failure and SWD were primarily the focus of educators (Quigney, 2008). As a result of NCLB (2001), more attention is given to the education of students living in poverty, with disabilities, and learners of English, who were previously overlooked (Haycock, 2006). It is noteworthy, that unlike the Individuals with Disabilities Education Improvement Act of 2004 (IDEA; 2004), NCLB focuses on the assessment of SWD and the placement of highly qualified special education teachers (Quigney, 2008).

Pursuant to NCLB, every state is required to identify which schools have achieved AYP and achievement goals must be applied to all schools and all students (Wiener & Hall, 2004). Additionally, each state sets increasing achievement goals on each of their standardized assessments, with the ultimate goal that all students will meet the state's standard for *proficient* by 2014.

MI and Learning Styles

Ahanbor and Sadighi (2014) conducted a study to investigate the relationship between learning styles and MI to determine whether a combination of styles and intelligences could improve students' learning or not. The study was based on the MI theory by Gardner (1983) in an effort to explore the types of intelligences held by male and female high school students in one of the local schools. The main objective of this study was to determine if there exists a significant relationship between male and female students' learning styles and their types of MI. The results indicated that there was a statistically significant relationship ($p = .0 < .05$) between learning styles and MI of male

and female students. This significant correlation was observed for both male and female participants.

This study conducted by Ahanbor and Sadighi (2014) was significant to show that teachers should consider using different techniques to develop and strengthen their students' learning styles and intelligences. For example, they can design easier tasks so that students can be more satisfied with their accomplishments. Moreover, teachers can plan and deliver a number of instructional events so that more students with varying learning styles and intelligences can benefit from the instruction they receive. The premise is that when teachers have knowledge of their students learning styles and their different intelligences, they can better help them develop their intelligences and capabilities accordingly.

Trinh and Kolb (2011) defined learning style as an individual's internal basic characteristics or functions for the intake or understanding of new information; a reflection of the underlying causes of learning behavior. Trinh and Kolb argued that teachers should design their teaching methods that include using various combinations of experience, reflection, and experimentation to reach all learning styles. This means introducing a wide variety of teaching elements into the classroom, such as sound, music, visuals, movement, experience, and even talking. Similarly, the learning style of an individual student may be recognized by observing his overt behavior.

Farooq and Regnier (2011) claimed that when learning styles are identified, educators are able to understand students' means of perceiving and processing information. Teachers need to be aware that in their role of helping students to achieve

excellence, students should be taught and encouraged to use a wide range of their skills and intelligences for them to become adaptive in the society in which they live. Bahar and Tangac (2009) advised teachers to identify their own teaching styles to gain an understanding about themselves as well as to modify their teaching to develop successful interactions with their students. However, Dever and Karabenick (2011) cautioned, "one size might not fit all" (p. 135). Teachers must consider factors such as the students' cultural background. For example, authoritarian teaching, in which the teacher takes complete control, may be particularly devastating for Native American and Eskimo students due to their cultural backgrounds.

Beam (2009) suggested that a student's individual learning styles should first be determined to effectively provide differentiated instructions. Once the teacher is able to identify the type of learners that is in the class, lesson plans and activities can be developed that incorporate the differences among the students. The premise is that each learner has a primary learning style and by capitalizing on that style he or she can learn how to study and concentrate. Farooq and Regnier (2011) posited that the style concepts apply to determining the characteristics of learners and teachers because different individuals retain and organize information differently.

Teaching MI and Implications for Teachers

Some researchers believe that every teacher should become knowledgeable of Gardner's theory and become familiar with MI in the context of teaching (Szpringer, Kopik, & Formella, 2014). Modern education is grounded on the premise that a student's strengths and characteristics should be correctly identified and enhanced in the best way

possible (YeŞİl & Korkmaz, 2010). This means that schools are responsible for recognizing students' intelligence characteristics and have a duty to ensure that all students use their intelligences in the best way possible. Students with special learning needs tend do better when teachers use MI when designing curriculum and giving instruction (YeŞİl & Korkmaz, 2010).

When implementing the MI teaching approach in the classroom, teachers will "indirectly decentralize the classroom," thus encouraging students to become proactive in their learning (Sulaiman et al., 2011, p. 430). In addition, the teachers' role transforms from that of a direct instructor to that of one who facilitates the learning process. Hassan et al. (2011) suggested that when teachers find themselves struggling with ways to reach the student's individual learning styles, the solution can be found in Gardner's (1983) MI teaching methods.

Cho and Kingston (2012) looked at individual elementary school SWD and their performance scores who took an alternate assessment-modified achievement (AA-MA) test in reading/math in one mid-western state in 2009. The purpose was to get a better understanding of these students and develop instructional practices. In addition, they wanted to make sure that they were complying with both state and federal laws. Most AA-MAS students in the state fell under two disability categories, learning disability (LD) and intellectual disability (ID). Students with ID performed the lowest across grade level and subject area. Cho and Kingston argued that when teachers fail to provide students' ID with the appropriate instructions, it jeopardizes their chances for academic

success, further suggesting that some teachers' expectations for their SWD are often too low.

Gardner's theory of MI (1983) has direct implications for teachers in terms of classroom instruction (Hassan et al., 2011; Rettig, 2005; Sulaiman & Sulaiman, 2010). Teachers should present material in a manner or style, which encourages the employments of a variety of intelligences. For example, when teaching about a historic event, a teacher can do a show and tell activity, where the teacher shows maps and asks students to play roles based on the event and geographic location. Students can also read historical fiction to learn about events in the past. These types of activities are effective in engaging students in learning, and allow a teacher to introduce and reinforce the same material in a variety of ways (Sulaiman & Sulaiman, 2010).

When students are able to recognize different kinds of intelligence within themselves, they should be able to achieve at higher levels. Ghazi, Shahzada, Gilani, Shabbir, and Rashid (2011) conducted a quantitative study where 714 college students took a 40-item MI test with five questions on each area of MI. The researchers aimed to investigate a possible relationship between how students perceived their own MI and their academic achievement. Significant correlations were found between "self-perceived verbal/linguistic, logical/mathematical, interpersonal, intrapersonal, naturalistic intelligence and students' academic achievement" (Ghazi et al., 2011, p. 619). Still, there were insignificant and very weak relationships between musical intelligence, bodily/kinesthetic intelligence, and academic achievement. Ghazi et al. concluded that an MI based curriculum is superior to any other and through that curriculum, teachers should

plan their lessons based on MI, students should be at the center of their learning, being allowed to make choices about learning tasks. However, Ahanbor and Sadighi (2014) noted that learning style of students will enhance a better and more effective learning environment.

There are many options for teachers when considering the curriculum to teach in their classroom. One positive thing about MI in the classroom is that teachers do not need to set aside what they presently do, but instead can adapt strategies to meet mandated standards. The following section provides a glimpse of several MI related studies with a focus on the methodology employed, teaching strategies, and the outcomes.

Literature Related to Methodologies of MI

MI intelligence strategies are often being used to address the needs of students with various disabilities, including those with social, emotional, or behavioral challenges. Sulaiman et al. (2011) described traditional teaching as where learners are classified as if they were an undiversified group. Sulaiman et al. (2011) conducted an analysis of teaching styles in primary and secondary school teachers based on the theory of MI. The goal of the study was to see what differences, if any, existed among the MI profiles of primary and secondary school teachers as well as their teaching styles.

The findings of the study revealed that the teachers had at least five different MI profiles, which included spatial, naturalistic, logical-mathematics, interpersonal, and musical intelligence. It was determined that both group of teachers practiced the MI in their teaching approaches, which was influenced by the level of subjects they taught. For

example, the teaching styles were more interpersonal because their teaching approach involved activities such as class discussion, group work, or teacher-student interaction. The primary teachers focused more on the musical aspects of the MI theory because musical activities were more prevalent in primary schools. The results indicated that both group of teachers adopted the MI theory in their instructions and organized lesson plans with a focus on the MI theory (Sulaiman et al., 2011). The key tenet is that when teachers understand their individual profiles, they are better able to provide students with the optimal learning environment and help them to achieve their fullest potential in their respective talented areas (Sulaiman et al., 2011).

Mowat (2011) conducted an evaluative case study in Scotland of a group work approach to support secondary students in a low-income area. This mostly qualitative study was based on the experiences of 69 students in an intervention program. The intervention was composed of collaborative activities that encouraged reflection, understanding, and thinking. Thus, the main focus of the study was on the "extent to which [students] developed intrapersonal intelligence" (Mowat, 2011, p. 227). Mowat found that the students had developed, up to 2 years after the intervention, a better understanding of how and why they behaved in particular ways.

Pane and Salmon (2011) conducted an action research study in an author's camp in which music was used to facilitate literacy development for 30 elementary school children from varying socioeconomic and ethnic backgrounds (i.e., low income children, children of parents in a diverse university campus, and others). The conceptual framework of the study not only involved MI but also inquiry-based learning in which the

children developed questions and used what they already knew. The conclusion reached by Pane and Salmon was that teachers were able to understand how literacy can be enhanced through music and how it can be applied in the regular classroom. An important finding of this study is that when teachers employ lessons with a particular intelligence, such as music, the results can be significant because children are encouraged by teachers to deepen their academic knowledge. These assertions are relevant to understanding the problem of the present study which investigates practices teachers use to incorporate different learning styles into daily plans to reach students academically. Incorporating music is an example of how musical intelligence can be encouraged by teachers in the classroom.

Sulochana and Kumar (2009) wanted to test whether empirical relationships existed between variables such as gender, parental income, student's nationality and medium of instruction and the various dimensions of MI, as propounded by Howard Gardner. Using the Likert scale, these items were measured on a 5-point scale, from strongly disagree (1 point) to strongly agree (5 points) after which the mean scores were calculated for each dimension. The key premise of this study was that an individual's MI can nurture learning and can help in developing teaching and curriculum development strategies.

McMahon, Rose, and Parks (2004) contended that since more educators are interested in the MI theory to assess the MI of children and adults alike, the level of interest has increased among researchers to identify and evaluate the appropriate instruments to assess students. Several versions of MI instruments can be found on the

World Wide Web. Sulochana and Kumar (2009) presented a study that examined the prevalence of seven MI dimensions and addressed the meaning and application of MI theory among university students. The seven intelligences included linguistic, mathematical and logical, visual and spatial, musical, interpersonal, intrapersonal and kinesthetic intelligences. The primary data came from 169 participants using a questionnaire of 28 items involving the seven dimensions; each dimension gauged four items.

Sulaiman et al. (2011) validated the Multiple Intelligences Inventory for Teachers (MIIT) instrument and used the MI profile to determine the relationship among the eight types of MI and teaching styles of 310 teachers who were selected randomly from both secondary and primary schools. Sulaiman et al. used the MI questionnaire to investigate the teachers' profile based on Gardner's (1983) eight intelligences. The teaching strategies were connected to a variety of activities based on the eight intelligences and they were investigated on the same questionnaire. Each variable consisted of six items that were measured using 5-point Likert-scale instruments ranging from strongly disagree (1 point) to strongly agree (5 points). The findings indicated that through the implementation of the MI teaching approach in the classroom, both teachers and students learned together and developed their MI through diverse and natural ways of learning (Sulaiman et al, 2011).

The MI teaching approach enabled the teachers to learn the abilities and interests of the students. Learning the individual interest and intelligences of the students enabled the teachers to create an environment where students demonstrated a better learning

connection with content. Additionally, using the MI approach also fostered personal autonomy, responsibility, and empowerment among the students (Sulaiman, et al, 2011).

Much of the literature in MI was related to teaching strategies used by elementary teachers in particular subject areas. Saban and Bal (2012) conducted a descriptive survey study using a questionnaire based on the eight areas of intelligence, in which 215 regular elementary school teachers and elementary school mathematics teachers were asked about the teaching strategies they used in their classrooms. Saban and Bal found that all of the teachers used strategies based on MI even though they did not use it in every class. The regular elementary teachers used MI more often, but Saban and Bal recommended that instead of teachers focusing on what to teach, teachers should focus on how to teach the content. Saban and Bal concluded that teachers must be aware of how students think, rather than focusing solely on how they solve problems. Those skills must also be emphasized in teacher development programs.

Some of the techniques and strategies that Saban and Bal (2012) suggested for teaching MI included teaching via linguistic intelligence such as debates, lectures, and discussions. Logical-mathematical teaching can be done through calculations, solving math problems on the board or using puzzles. Instructions can be delivered through spatial forms of intelligence by using graphs, diagrams, videos, or maps. Bodily-kinesthetic instruction can involve movement and mime, field trips, manipulatives, and other hands-on activities. Teaching through music can be done via rhythmic pieces, rapping, and live music. Delivering instruction through the interpersonal intelligence can include brainstorming in groups, cooperative learning, and peer reviews on essays.

Intrapersonal intelligence may involve journals and instruction at an individual pace. Naturalistic teaching could be composed of field trips outdoors, collecting specimens from ponds and trees, and watching films on the nature theme.

Mokhtar et al. (2008) posited that when teachers use the MI theory approach, they are encouraged to use varied teaching styles within a single instructional design to maximize the learning experiences of all students with different dominant intelligences. When MI is used within the context of classroom, teachers are able to observe a variety of student interests, thus allowing students to be engaged in their learning, leading them to gain a better understanding of the content (Fierros, 2004; Rettig, 2005).

Teachers who integrate MI into their teaching stretch to adapt students' different intelligences in the classroom. By using different strategies, all students can be provided learning experiences and curricular offerings that can result in positive educational experiences for both students and teachers. This teaching approach motivated students to learn, resulting in improved student achievement and test scores as well as enhanced classroom participation (Mokhtar et al., 2008).

Gardner (2011) incorporated MI into all activities and found that students of all levels and abilities are engaged to the point that they are able to summarize and elaborate on all of their lessons. They were able to not only take risks, but also to value their own abilities more than before when observing other students take risks as well. Most important, class participation resulted in the students hearing their own and others' voices so often that they "become agents of their own project based instruction, making the

decision to create something of value … without teacher assistance" (Gardner, 2011, p. 101).

Sulaiman et al. (2010) conducted a quantitative comparative design approach to determine relationships among the eight types of MI and teacher learning styles. Their study applied descriptive analysis using questionnaires to collect the data. The focus of the study was to determine MI teacher profiles and then compare the self-described teaching styles involving the MI of which five different ones were identified between teachers from both primary and secondary schools: spatial, naturalistic, logical mathematic, interpersonal, and musical intelligences. Those who taught at the secondary level were more developed spatially and logically/ mathematically than those who taught at primary schools. The researchers believed this was because the abstract thinking of most of the secondary school teachers was more advanced compared to primary school teachers. Conversely, the primary school teachers were more advanced in musical intelligence, mostly because they used game and music in the primary setting.

Based on the findings of the research by Sulaiman et al. (2010), the conclusion was drawn that both groups of teachers utilized the MI theory in their teaching methods. Nevertheless, the types of intelligences utilized by the teachers differed through their teaching. The teachers realized the effectiveness of adopting the MI theory and organized their lessons based on the theory. By doing so, the teachers were able to help their students to learn new skills better and efficiently (Sulaiman et al., 2010).

In another study using MI theory, Tuan (2011) used a questionnaire survey and participant observations to find how teachers understood the language learning styles in

the classroom as well as teacher student style mismatches in English as a foreign language classrooms in which the students spoke Vietnamese. After matching the student learning styles, the researchers used multi-style teaching strategies to guide students into stretching their learning styles, in addition to guide themselves into teaching styles in which they were less familiar with. Tuan (2011) concluded that the teaching pedagogy used by the teachers could address multiple problems involving student performance.

Similarly, Al-Wadi (2011) investigated teachers' perception of the theory of MI as part of understanding how MI theory affects students' achievement. Al-Wadi used a mixed methods research design that combined both quantitative and qualitative research methods. A cross-sectional survey was used to measure teachers' familiarity with the theory of MI and teachers' practices of different intelligences during class. The findings indicated that teachers on an average tended to be familiar with the MI theory. The results of the study provided Al-Wadi (2011) some idea of what is required for teachers to plan and prepare lessons when practicing MI theory in the classroom.

The present study replicated the cross-sectional survey method used by Al-Wadi (2011) to measure teachers' familiarity with the theory of MI and teachers' practices of different intelligences. The aim was to apply the existing theory to the present situation in order to determine if the study was generalizable with a different group of teachers in a different location. Al-Wadi, unlike the present study, explored a school that had already adopted the MI theory and sought to determine the teachers' perceptions toward using MI theory in the classroom. Additionally, the focus of Al-wadi was all gifted students.

Whereas, in the present study, the focus was general education teachers and special needs students.

Summary and Conclusion

The key tenet of MI theory in education is that it is a specific remedy to only employing one form of pedagogy. It encourages teachers to develop their range of teaching strategies beyond the usual linguistic and logical methods and allows teachers to improve the methods by which they teach (Hassan et al., 2011). The MI theory has motivated educators and academic researchers alike to reassess classroom practices both in general education and in many areas of special education (McConnell, 2015). Presenting instructional material in multiple ways can engage all learners, improve the quality of instruction, and close the achievement gap for SWD. In the research questions of this study, I examined teachers' levels of familiarity with Gardner's MI theory and the relationship between teachers' level of familiarity and teacher practices of Gardner's MI theory in the classroom. The literature review represented an exhaustive review of studies with a focus on Gardner's (1989) theory of MI as a solution to teaching students with learning disabilities. While some researchers provided empirical evidence that many teachers are familiar with Gardner's MI theory, there was no conclusive research found directly linking Gardner's theory with the instructional classroom practices of teachers of students with learning disabilities. More research was needed to fill this gap. The studies and methodologies I reviewed presented sufficient research-based evidence that the problem of this study is worthy of further investigation. It is important to have a variety of pedagogical approaches in the classroom.

Gardner's (1983, 1989. 2011) works indicated that when teachers use a MI approach, students are provided learning experiences and curricular offerings that can result in positive educational experiences for both students and teachers. The premise is that when teachers use a variety of instructions, the more likely students will achieve academically (Gardner, 2011). Gardner and Hatch's (1989) theory of MI indicated that when teachers find ways to reach the diversity of individual learning styles and needs are challenging, they might turn to the MI approach as a solution to teaching students with learning disabilities.

The research literature focused on ways for teachers to integrate MI into their teaching in an effort to adapt to their students' different intelligences (Gardner, 2011). The theory of MI is at this height of greatness when teachers are able to navigate from tradition and expand the strategies by which they teach. When teachers are more knowledgeable of teaching strategies, they can cater to a broader range of learners including SWD (Mokhtar et al., 2008). Using a MI teaching approach will more likely motivate students to learn, resulting in improved student achievement and test scores as well as enhanced classroom participation. Through understanding the MI theory, teachers can take into account personal weaknesses of students as well as their strengths to be able to give their students the maximum learning experience and chances to attain academic excellence (Ahmed, Hussain, Faroq, & Ahmed, 2011; Gardner & Hatch, 1989; Mokhtar et al., 2008; Rinis & Vlachos, 2013).

As indicated from the literature, there are several advantages for using the MI approach for teaching and learning: student individuality is recognized and suitable tasks

are assigned to each student based on his or her own strengths and weaknesses (Rinis & Vlachos, 2013). Gardner (2011) believed that students may be more motivated and confident when using an intelligence they know is one of their strengths. The key disadvantage was that some teachers may find it a challenge and impractical to tailor lessons to students various individual intelligences, especially teachers with large classes and students with multiple disabilities. The lack of preparations of the teachers for the teaching process, their studies in the planning and application of the MI approach may vary widely (Rinis & Vlachos, 2013). Schools must continue to focus on training teachers on how to recognize and build the dominant MI of the students before planning the learning or educational activities (Ahmed et al., 2011).

MI instruction was believed by many leading experts as a proven way to accomplish this as well as provide teachers a consistent approach (Andronache et al., 2011; Beam, 2009; Farooq & Regnier, 2011; Gardner, 2011). Teachers have a limited amount of free reign to work within high stakes (standardized testing) situations, so a system like MI would allow teachers more time to implement instructions that will create good test takers (Gardner, 2011).

The findings from this study may have several implications for social change. I believe that they will serve as a reminder to educators to examine their methods of instruction in an effort to offer a variety of opportunities for students to learn the materials they presented in the classroom. Additionally, the outcome may help educators consider conducting a needs analysis in order to find out the MI profile of their students. Some teachers may not be familiar with their students' learning styles and intelligences.

As such, teachers will need the appropriate teacher education programs and training to increase their awareness of the importance of identifying their students' learning styles and intelligences.

Social change will be realized when teachers have a clear understanding of the student intelligences and can begin to adapt specific strategies for each intelligence to improve student performance when taking standardized tests. When teachers become better equipped with such knowledge, they in turn will become more effective in providing their students with the optimum learning environment through their preferred learning medium. This will help students to achieve their fullest potential in their respective talented and intellectual areas, a major step toward positive social change.

In Section 3, I discuss the research design and description of the study. This included a description of the variables, the instrumentation, and the materials that were used in the study. In addition, the process for collecting data and analysis of the data is discussed.

Section 3: Research Method

Introduction

The purpose of this quantitative correlational study was to determine whether there is a relationship between teachers' familiarity with Gardner's MI theory and the MI instructional strategies they use in the classroom setting. Central to the problem of this study were students with learning disabilities and their failure to meet grade-level performance on state standardized tests. Gardner's MI theory supports the idea that SWD will be reached academically when teachers incorporate different learning styles and practices into daily plans based on MI. However, it is unknown whether many teachers are familiar with Gardner's theory of MI and various MI practices used to differentiate lessons.

The problem of this study stemmed from middle school SWD not meeting grade-level performance on standardized testing in the state of Georgia. To address the problem and purpose of this study, I conducted a survey to examine teacher's level of familiarity with Gardner's (2011) MI theory and the MI applications teachers use in the classroom to enhance learning of SWD. The following research questions and hypotheses statements guided the research:

RQ1: What are middle school teachers' levels of familiarity with Gardner's MI theory?

$H_0$1: The middle school teachers are not familiar with Gardner's MI theory and how to implement it in the classroom.

H_a1: The middle school teachers are familiar with Gardner's MI theory and how to implement it in the classroom.

RQ2: What is the relationship between teachers' level of familiarity with Gardner's MI theory and how they implement Gardner's MI theory in the classroom?

$H_0 2$: There is no significant relationship between teachers' level of familiarity with Gardner's MI theory and how they implement the theory in the classroom.

$H_a 2$: There is a significant relationship between teachers' level of familiarity with Gardner's MI theory and how they implement the theory in the classroom.

The focus of Section 3 is the research design and methodological approach for this study. Included in this section is an in-depth and detailed discussion of the research design, setting and sample, data collection, and data analysis.

Research Design

In this study, I employed a quantitative correlational survey design to test the hypotheses and inform the research questions of this study. The primary research question examined whether there is a significant relationship between teachers' level of familiarity with Gardner's (2011) MI theory and how they implement Gardner's MI theory in the classroom. To address this question, a survey composed of 39 items was administered to the participants. The survey design increased the reliability of the information by eliminating researcher biases and concealing participants' characteristics (Johnson & Christensen, 2008; Lichtman, 2006).

The correlational survey research design was deemed appropriate for the present study because its design would statistically help determine the relationship embedded in

the research question of my study—that is, whether two variables are correlated (Fink, 2013). Restated, this means that correlational survey research attempts to explain the degree a relationship exists and is expressed by a correlation coefficient, a number between .00 and 1.00 (Fink, 2006; Fink, 2013; Trochim, 2008). The aim is to determine whether an increase or decrease in one variable corresponds to an increase or decrease in the other variable. As a result of using this design, I was expecting one of three possible outcomes as indicated by Fink (2013): positive correlation, negative correlation, or no correlation. A positive correlation exists when an increase in one variable leads to an increase in the other and vice versa, whereas a negative correlation demonstrates that an increase in one variable leads to a decrease in another and vice versa. No correlation occurs when a change in the variable does not lead to a change in the other variable (Fink, 2013). These findings were reported in terms of a correlation coefficient, which varied between + 1 and − 1. If the results show a value close to + 1, this indicates a strong positive correlation, whereas a value close to -1 indicates a strong negative correlation. No correlation was indicated by a value near or at 0 (Fink. 2013). It is important to note that correlation does not indicate causation and according to Fink, statistically, causation cannot be proven from a correlational study.

In addition, Al-Wadi (2011) used a quantitative cross-sectional survey design to investigate 22 teachers' perceptions of the theory of MI as part of understanding how MI theory affects students' achievement. The findings indicated that teachers on average tended to be familiar with the MI theory. The results of the study provided Al-Wadi with some idea of what is required for teachers to plan and prepare lessons when practicing MI

in classroom. More specifically, the results of the study showed that teachers were familiar with the theory of MI, but they did not have formal education about it, either in a teacher education program or through professional development for how to use the theory in their classrooms.

Setting and Sample

The setting for this study was a local middle school in Georgia. I used a convenience sample with a purposive sampling method. Fink (2006) described the convenience sample as a group of available and ready individuals who are willing to participate. A purposive sampling method was selected because of the participants' special attributes and experience working with special education youth in the inclusive classroom. The key criteria for participants in this study were (a) voluntary and willing participation and (b) currently teach middle school classes in inclusive classrooms. All of the teachers (n = 125) in the school who met the criteria were invited to participate in the survey. The minimal sample size of 59 was determined by using G-Power 3.0 calculations (Faul, Erdfelder, Buchner, & Lang, 2009). The final sample in this study was 61 middle school teachers, all of whom met the criteria.

Instrumentation and Materials

I replicated a cross-sectional survey developed by Al-Wadi (2011) to measure the middle school teachers' perception toward Gardner's (1999) theory and the teachers' practices of the theory. The survey instrument (see Appendix A) consisted of two sections: In the first section of the survey, participants were asked to demonstrate their

degree of familiarity with Gardner's MI theory by choosing one of five Likert-scale responses from being unfamiliar to being very familiar with the theory.

The second section of the survey instrument consisted of 39 statements designed to explore the teachers' practices of Gardner's (1984) MI theory. The MI teacher's survey has eight constructs. To reiterate, they are:

- Logical/mathematical, in which a person is able to find patterns and think logically.
- Verbal/linguistic abilities, which allow an individual to use language to its maximal benefits for self-expression.
- Visual/spatial intelligence, which involves manipulating wide spaces to create images in the mind.
- Musical intelligent in which individuals recognize rhythm and pitch.
- Bodily-kinesthetic, in which individuals have well-coordinated body movements.
- Interpersonal intelligence, where a person has the ability to empathize with others.
- Intrapersonal intelligence, where an individual can understand personal feelings on an in-depth level.
- Naturalistic intelligence, which an individual is fascinated with the outside, the natural environment. (Hassan et al., 2011)

Validity and Reliability

Validity of a data collection instrument is the extent to which the interpretations of the results of a test are warranted (Kimberlin & Winterstein, 2009). A data collection instrument is said to be reliable when the researcher is able to consistently measure the research constructs over time (Fink, 2006). Therefore, a data collection instrument should not only be valid and reliable but also be able to obtain the needed data over time in different settings (Fink, 2006; Kimberlin & Winterstein, 2009). I used an instrument that has been shown to be valid and reliable in addressing the construct or variables of this study. The questions in the survey were developed based on measures that were validated in previous studies. For example, MacLeod (2002) established validity for the survey instrument through an expert panel review made up of various researchers from the local university and school board. Afterward, a field test was conducted using 12 teachers working in local schools. MacLeod reviewed the feedback from the expert panel from these two schools and field test subjects and made appropriate changes to the survey. Al-Wadi (2011) noted the expert panel and field tests results on question of validity and reliability.

The most efficient alternative for documenting the reliability and validity is to use existing evaluation instruments. In the field studies of the survey instrument, there were no reliability statistics, such as Cronbach's alpha found in MacLeod's evaluation or in other sources citing MacLeod's instrument. Because these cited studies did not provide statistical data documenting reliability, I used Cronbach's alpha, an index to determine the reliability of the summated rating scale, a collection of the related questions and

responses. The rating scale in this study ranges from 1-5. Reliability tests are necessary to insure that variables used in the study for predictive analyses. When the reliability scale shows poor reliability, Trochim (2008) suggested modifying or completely changing the individual items within the scale as needed. The instrument in this study showed high reliability for the items.

Data Collection and Analysis

Upon approval by the Walden Internal Review Board (IRB; IRB Approval No. 02-05-15-0053428), the participants were personally contacted via email or telephone to participate in the online survey. Interested teachers were asked to read the written online consent form (see Appendix B). Completion of the online survey implied consent and is acceptable by the Walden IRB. Reminders were sent to participants until sampling was complete.

Research Question 1 asked: What are middle school teachers' levels of familiarity with Gardner's MI theory?" Part 1 of the instrument addressed this question. Two items in this section of the instrument were assessed using a 5-point Likert-scale ranging from unfamiliar (1) to very familiar (5).The second research question asked: What is the relationship between teachers' level of familiarity with Gardner's MI theory and how they implement Gardner's MI theory in the classroom? I examined teachers' practices of MI theory in the areas of teaching strategies. The teaching strategies were measured through 40 statements in Part 2, in which participants were asked to indicate how often they use certain teaching strategy in the classroom. All items in this part were assessed using a 5-point Likert-scale ranging from never (1) to very frequently (5). Participants

will respond to all the items on the survey by marking their preference on the grid. The data were entered using the scale codes in an Excel™ spreadsheet and then imported to SPSS. The mean of all five items was rounded to obtain the frequency number and percentage number. A simple count and percentages was summarized in the table format.

Data were further analyzed using correlational analysis statistics. I used SPSS data analysis software to perform both functions to determine whether the teacher's familiarity (independent variable) with Gardner's (2011) MI theory is associated with (or predicts) the practices or strategies (dependent variable) of the theory used in the inclusive classroom. That is, to determine the potential relationship between the predictor variable and the outcome variable (Fink, 2006). Regression analysis was used to measure the degree of relationship between the independent variable (familiarity) and the dependent variable (strategies).

I reported the findings descriptively and inferentially. Given the diversity of the possible responses to the MI teacher practice survey, all the teachers did not respond the same to all of the dimensions. Therefore, I ran a factor analysis on the responses using SPSS to enable me to show relatedness. Using SPSS, each response was assigned a value ranging from 1 to 5. The lowest level in the scale was 1, which indicated the unfamiliarity of the participant to the question asked. The value 5 reflected the highest, which indicated that the participant was very familiar with the MI theory. The mean of all five items were rounded to obtain a frequency and percentage number that addressed the question. A simple count and percentages was summarized in table format.

Measures Taken for Protection of Participants' Rights

On approval by Walden's Institutional Review Board (IRB) and before distributing the surveys, I exercised every measure to protect the participants' rights of this study. To assure anonymity of the participants, written signatures were not obtained. Participants' participation was considered as implied consent. Participants were told to download and keep the attached consent forms. Numbers were used instead of names to assure anonymity. All raw data and electronic copies are stored on a password protected computer. All hard copies are stored in locked files. The electronic and hard copies of data will be preserved for a period of 5 years and destroyed thereafter.

Role of the Researcher

My primary role as the researcher was to conduct this study in a professional manner to ensure and maintain good quality research in the data collection, analysis, and dissemination of information. My main objective was to ensure that the interests and rights of anyone affected by this study were properly safeguarded. As with any body of research, there may be ethical concerns. One ethical issue could include doing a study within my own work environment, conflict of interest, or power differentials. It is noteworthy that the focus of this study was my school in general, but did not include my classroom or any of my specific classrooms. Although the participants were invited to participate from my school, none of the participants work directly or indirectly under my supervision.

I selected a survey research design that provided maximum protections to all of the research participants. The content of the survey questions were not of a sensitive

nature or require responses that can be damaging to the participant's professional reputations and employment. There were no direct contact with the participants and all of the surveys collected online will remain anonymous.

Conclusion

The purpose of this quantitative correlational study was to determine whether there is a relationship between teachers' familiarity with Gardner's MI theory and the MI instructional strategies they use in the classroom setting. Research indicated that instructional practices inspired by the MI theory resulted in high levels of authentic instruction and student engagement (Andronacheet et al., 2011). I used a questionnaire to examine the teachers' level of familiarity with MI theory. Correlation analysis was used to determine the strength and direction of the relationship between familiarity with MI theory and instructional practices of MI. In Section 4, I provide the data analysis and report of the findings, whereas in Section 5, I present the findings and recommendations.

Section 4: Results

Introduction

The purpose of this quantitative correlational study was to determine whether a relationship existed between teachers' familiarity with Gardner's MI theory and the MI instructional strategies they used in the classroom setting. I employed a quantitative correlational survey design to test the hypotheses and inform the research questions of this study. To address the research questions and test the associated hypothesis statements, I administered a two-part survey composed of 39 items to the participants. The following research questions and hypotheses statements guided the research:

RQ1: What are middle school teachers' levels of familiarity with Gardner's MI theory?

$H_0$1: The middle school teachers are not familiar with Gardner's MI theory and how to implement it in the classroom.

H_a1: The middle school teachers are familiar with Gardner's MI theory and how to implement it in the classroom.

RQ2: What is the relationship between teachers' level of familiarity with Gardner's MI theory and how they implement Gardner's MI theory in the classroom?

$H_0$2: There is no significant relationship between teachers' level of familiarity with Gardner's MI theory and how they implement the theory in the classroom.

H_a2: There is a significant relationship between teachers' level of familiarity with Gardner's MI theory and how they implement the theory in the classroom.

In Section 4, I present the research design and methodological approach used for this study. Reported in this section is a discussion of the descriptive data collection, data analysis, and summary of results.

Data Collection

The participants were 61 middle school teachers who willingly participated and were currently teaching middle school classes in inclusive, general education, and/or special education classrooms. The teaching experience of participants ranged from 1 to 25 years at their current school. All of the teachers had teacher certification, a requirement imposed by the school district in the state of Georgia.

All data were collected online following the established IRB guidelines. Data were analyzed using the Statistical Package for Social Science (SPSS) version 21.0 for Windows™ using descriptive and inferential statistics. The chosen site for this study was a public middle school with a student enrollment of approximately 1,200 students. The site had approximately 125 full-time teachers and four full-time administrators.

On approval by Walden's IRB, all the teachers (n = 125) were emailed the invitational letter combined with the consent form and survey that explained the purpose of the study, the terms of confidentiality, and protection of privacy in compliance with IRB. After sending three reminders, 61 participants responded. Teachers agreeing to participate were provided the link to SurveyMonkey to proceed. Data collection took place for a period of two months.

Data Analysis

I began the analysis with coding the answers into an Excel™ spreadsheet. The Familiarity and Teacher practice survey was adapted in part from a mixed-methods study conducted by Al-Wadi (2011). The survey consisted of two sections: teachers' familiarity with MI theory and teachers' practices of the theory (see Appendix A).

In the first section, the teachers were asked to specify their level of familiarity by choosing one of five responses on the Likert scale, ranging from *unfamiliar* to *very familiar*. A code of 1 was inserted for the lowest scale answer and 5 for the highest on the scale. I then saved the spreadsheet and imported it into SPSS to begin the analysis. Data were examined for any missing values and incompletions.

The second section of the survey instrument consisted of 39 statements designed to explore the teachers' practices of Gardner's (1984) MI theory. To reiterate, the eight constructs (intelligences) assessed were logical/mathematical, verbal/linguistic abilities, visual/spatial intelligence, musical intelligence, bodily-kinesthetic, interpersonal intelligence, intrapersonal intelligence, and naturalistic intelligence (Hassan et al., 2011).

Reliability of Instrument

I began with using Cronbach's alpha test, an index to determine the reliability of the summated rating scale, a collection of the related questions and responses. The rating scale in this study ranged from 1-5 for Part 1 and Part 2 of the survey. The Cronbach's alpha reliability statistics for the Familiarity and Teacher Survey are shown in Table 1.

Table 1

Survey Reliability Statistics

Survey	Cronbach's alpha	Cronbach's alpha based on standardized items	*n* of items
Familiarity	.721	.729	2
Teacher practices	.927	.929	39

The Cronbach's alpha coefficient (α = .721 and .927, respectively) for the scaled items of both parts of the survey are greater than .7, which suggests that the items have relatively high internal consistency. A reliability coefficient of .70 or higher is considered acceptable in most social science research situations (Fink, 2013).

Descriptive Statistics for Familiarity Survey

Descriptive statistics for Items 1 and 2 related to familiarity with MI theory and other theories in Part 1 of the survey are displayed in Table 2.

Table 2

Descriptive Statistics for Familiarity Survey

	n	*Min*	*Max*	*M*	*SD*
Familiarity with Gardner's MI?	61	1	5	2.49	1.410
Familiarity with other theories	61	1	5	3.03	1.183

As shown in Table 2, the data points were close for both survey items (Item 1, *M* = 2.49, *SD* = 1.41; Item 2, *M* = 3.03, *SD* = 1.18). The frequency report for the first question revealed that 19 (31.1%) teachers responded *unfamiliar*; 18 (29.5%) *somewhat familiar*; seven (11.5%) *familiar*; nine (14.8%) *adequately familiar*; and eight (13.1%) responded *very familiar* (see Table 3).

Table 3

Teachers' Familiarity With Gardner's MI

	Frequency	%
1 = Unfamiliar	19	31.1
2 = Somewhat	18	29.5
3 = Familiar	7	11.5
4 = Adequately familiar	9	14.8
5 = Very familiar	8	13.1
Total	61	100.0

Unlike the first familiarity question, when teachers were asked if they were familiar with other intelligence theories (see Table 4), the total responses indicated only three (4.9%) of the teachers were *unfamiliar;* 22 (36.1%) responded *somewhat familiar;* 16 responded *familiar* (26.2%); 10 (16.4%) responded *adequately familiar;* and 10 (16.4%) responded *very familiar*.

Table 4

Teachers' Familiarity With Other Intelligence Theories

	Frequency	%
1 = Unfamiliar	3	4.9
2 = Somewhat	22	36.1
3 = Familiar	16	26.2
4 = Adequately	10	16.4
5 = Very familiar	10	16.4
Total	61	100.0

Teacher Practice Analysis

In Part 2 of the survey, I examined teachers' practices of Gardner's Theory of MI in the classroom. Teaching practices were first assessed by determining the frequency in which participants applied various teaching strategies. The teaching strategies were measured through 39 statements, in which the teachers were asked to choose one of five responses on a Likert scale ranging from 1 to 5 (*never* to *very frequently*). The lowest level on the scale was 1, which indicated the teacher never applied the teaching strategy. On the other end of the scale, 5 reflected the highest, which indicated the teachers very frequently applied the MI strategy. Descriptive statistics are in Table 5.

Table 5

Descriptive Statistics for Teacher Survey (39 Items)

	n	*Min*	*Max*	*M*	*SD*
Q1L	61	1	5	3.21	.819
Q2L	61	2	5	4.00	.753
Q3L	61	3	5	4.36	.606
Q4L	61	2	5	3.56	.958
Q5L	61	1	5	3.77	.902
Q1Intrap	61	2	5	3.59	.901
Q2Intrap	61	2	5	3.70	.782
Q3Intrap	61	3	5	4.57	.644
Q4.Intrap	61	2	5	3.90	.831
Q5.Intrap	61	3	5	4.23	.716
Q1Interp	61	2	5	3.82	.827
Q2Interp	61	2	5	4.00	.796
Q3Interp	61	2	5	4.10	.724

(Table 5 continues)

	N	*Min*	*Max*	*M*	*SD*
Q4.Interp	61	2	5	4.08	.714
Q5.Interp	61	2	5	4.30	.641
Q1Math	61	1	5	3.70	1.131
Q2Math	61	2	5	4.07	.854
Q3Math	61	1	5	3.62	1.083
Q4Math	61	1	5	3.31	1.218
Q5Math	61	1	5	3.20	1.376
Q1Spatial	61	4	5	4.70	.460
Q2Spatial	61	2	5	4.31	.743
Q3Spatial	61	2	5	4.31	.743
Q4Spatial	61	3	5	4.56	.620
Q5Spatial	61	2	5	4.34	.834
Q1MUSIC	60	1	5	2.90	1.189
Q2MUSIC	61	1	5	2.49	.906
Q3MUSIC	61	1	5	1.72	.951
Q4MUSIC	61	1	5	2.74	1.063
Q5MUSIC	61	1	5	2.26	1.153
Q1BODILY	61	1	5	3.61	1.021
Q2BODILY	60	1	5	3.43	1.064
Q3BODILY	60	1	5	2.22	1.151
Q4BODILY	61	1	5	2.52	1.149
Q1NATURE	61	1	5	2.90	1.165
Q2NATURE	61	1	5	2.84	1.254
Q3NATURE	61	1	5	2.23	1.131
Q4NATURE	61	1	5	2.00	.966
Q5NATURE	61	1	5	2.59	1.160

The average mean score of the 39 items shown in Table 5 was 3.44. The means for each of the items appear to be reasonable as each of the items is measured on a 5-point Likert scale. No values shown were above 5 or below 1. The standard deviations were similar suggesting no outliers for any of the items.

In addition to the mean and standard deviation report, I generated a frequency report for each of the eight intelligences. The percentages represent the highest scale score (1-5) or item practiced most frequently in each of the eight MI categories. In the category of spatial intelligence, a majority (56%) of participants said "I show video, slides, or movies"; for interpersonal, the majority (53%) of participants said "I encourage students to develop socially through their classroom interactions"; for linguistics, 40% said "I encourage students to employ their verbal skills to communicate, solve problems, and express inner feelings." For intrapersonal, 37% said "I encourage my students to make connections between what is being taught in class and what they experience in real life." For bodily/kinesthetic 36% said I provide my students with tactical materials and experience. For mathematics, 32% frequently incorporated mathematical problem solving in teaching. For musical, 32% said sometimes students have the opportunity to express their ideas musically; and for naturalistic, 29% said, "My students classify or sort objects, events, living things, or phenomena into clusters according to their common characteristics." These statements reflect the most frequently practiced item in each category. All other practices were practiced with less frequency.

Factor Analysis

Although the 39 survey questions were replicated from a previous study conducted by Al-Wadi (2011), I conducted a factor analysis in several SPSS generated stages to determine whether the number of variables or items could be further reduced. First, a correlation matrix was generated for the 39 items (independent variables) to determine factorability of the variables. Factorability is the assumption that at least some

correlations amongst the variables are present so that coherent factors can be identified (Tabachnick & Fidell, 2007). It was observed on the correlation matrix that most of the 39 items were correlated suggesting reasonable factorability (see Appendix C). There was no need to consider eliminating any of the questions at this time. The next item from the output was a table of communalities (see Table 6), which showed how much of the variance in the variables had been accounted for by the extracted factors.

Table 6

Commonalties

	Initial	Extraction
Q1L	1.000	.536
Q2L	1.000	.745
Q3L	1.000	.688
Q4L	1.000	.787
Q5L	1.000	.730
Q1Intrap	1.000	.624
Q2Intrap	1.000	.719
Q3Intrap	1.000	.403
Q4.Intrap	1.000	.654
Q5.Intrap	1.000	.509
Q1Interp	1.000	.864
Q2Interp	1.000	.766
Q3Interp	1.000	.764
Q4.Interp	1.000	.738
Q5.Interp	1.000	.727
Q1Math	1.000	.860
Q2Math	1.000	.765
Q3Math	1.000	.726
Q4Math	1.000	.722
Q5Math	1.000	.842
Q1Spatial	1.000	.513
Q2Spatial	1.000	.628
Q3Spatial	1.000	.749
Q4Spatial	1.000	.610
Q5Spatial	1.000	.705
Q1MUSIC	1.000	.532
Q2MUSIC	1.000	.747
Q3MUSIC	1.000	.596
Q4MUSIC	1.000	.769
Q5MUSIC	1.000	.779
Q1BODILY	1.000	.753
Q2BODILY	1.000	.778
Q3BODILY	1.000	.783
Q4BODILY	1.000	.724
Q1NATURE	1.000	.733
Q2NATURE	1.000	.810
Q3NATURE	1.000	.703
Q4NATURE	1.000	.605
Q5NATURE	1.000	.693

Extraction Method: Principal Component Analysis.

As shown in Table 6, over 80% of the variance in Q1 *interpersonal intelligence* was accounted for while 53.5% of the variance in Q1 *linguistics* was accounted for. The communalities were all above .30, further confirming that each item shared some common variance with other items (Tabachnick & Fidell, 2007). Given these overall indicators, factor analysis was deemed to be suitable for all 39 items with a final sample size of 61. All the factors extracted from the analysis along with their eigenvalues, the percent of variance attributable to each factor, and the cumulative variance of the factors are displayed in Table 7.

Table 7

Total Variance Explained

Com-ponent	Initial Eigenvalues			Extraction Sums of Squared Loadings			
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	11.837	30.350	30.350	11.837	30.350	30.350	5.307
2	3.832	9.826	40.176	3.832	9.826	40.176	4.756
3	3.013	7.726	47.902	3.013	7.726	47.902	4.515
4	1.931	4.951	52.853	1.931	4.951	52.853	3.064
5	1.870	4.795	57.648	1.870	4.795	57.648	2.950
6	1.812	4.646	62.294	1.812	4.646	62.294	2.468
7	1.631	4.182	66.476	1.631	4.182	66.476	2.260
8	1.453	3.726	70.201	1.453	3.726	70.201	2.060
9	1.264	3.241	73.442				
10	1.056	2.707	76.149				
11	.985	2.525	78.674				
12	.924	2.370	81.044				
13	.835	2.142	83.186				
14	.691	1.773	84.958				
15	.585	1.500	86.458				
16	.577	1.481	87.939				
17	.510	1.308	89.247				
18	.462	1.184	90.430				
19	.410	1.052	91.482				
20	.371	.952	92.435				
21	*.344*	*.882*	*93.317*				

(*Table 7 continues*)

Com-ponent	Initial Eigenvalues			Extraction Sums of Squared Loadings			Total
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	
22	.320	.821	94.138				
23	.296	.760	94.898				
24	.263	.674	95.572				
25	.224	.575	96.147				
26	.217	.555	96.702				
27	.207	.531	97.233				
28	.181	.464	97.697				
29	.161	.413	98.109				
30	.151	.386	98.496				
31	.128	.329	98.825				
32	.104	.266	99.091				
33	.085	.218	99.308				
34	.074	.189	99.497				
35	.062	.158	99.655				
36	.055	.142	99.797				
37	.041	.104	99.901				
38	.026	.067	99.968				
39	.012	.032	100.000				

Extraction Method: Principal Component Analysis.

As shown in Table 7, the first factor accounted for 30.30% of the variance, the second 9.8%, the third 7.7%, and factors 4-8 were 4.95% to 3.72% in descending order. All the remaining low factors were deemed not significant. Using a principal components factor analysis (PCA) on the 39 items I rotated the factors in order to maximize the relationship between the variables and some of the factors (see Table 8).

Table 8

Rotated Component Matrix

	Component							
	1	2	3	4	5	6	7	8
Q2NATURE	.828	.213	.131	-.029	.096	.202	-.002	.035
Q5Math	.782	-.133	.236	.209	.121	-.183	.178	-.208
Q5NATURE	.740	.315	.016	-.112	.064	.137	.102	.100
Q1NATURE	.738	.285	-.087	.199	.097	.161	.028	.094
Q1Math	.716	-.090	.399	.261	.103	-.096	.241	-.180
Q2Math	.619	-.002	.433	.052	.322	.041	.274	-.161
Q3NATURE	.619	.323	-.192	.077	.178	.308	-.184	.085
Q4NATURE	.589	.371	-.021	.160	-.172	.120	-.250	.000
Q2MUSIC	.158	.780	.147	.032	-.159	.065	.235	.042
Q4MUSIC	.248	.754	.221	-.099	.100	.063	-.012	.231
Q5MUSIC	.131	.742	.214	-.117	.297	.071	-.138	.179
Q3MUSIC	.130	.681	.149	.118	.085	-.004	-.006	-.283
Q4BODILY	.158	.679	-.207	.412	-.006	.039	.127	.075
Q1MUSIC	-.002	.676	.133	.194	.161	.067	-.021	.091
Q1Interp	.014	.220	.878	.173	.039	-.067	.051	.018
Q2Interp	.011	.250	.803	-.006	-.182	.196	.102	.033
Q3Interp	.136	.094	.797	.232	.116	.095	.089	.152
Q5.Interp	.087	.169	.565	.123	.474	.318	.151	-.014
Q4.Interp	.070	.172	.511	-.013	.424	.507	.011	.039
Q4Math	.379	-.101	.468	.204	.256	-.120	.193	-.457
Q3Intrap	.231	-.043	.436	.074	.392	-.012	.013	-.147
Q2Intrap	.156	.234	.142	.735	-.105	.129	.193	-.002
Q4.Intrap	.121	.160	.395	.558	.149	.122	.288	-.011
Q1Intrap	.021	-.014	.205	.542	.191	.367	-.224	.170
Q3BODILY	.129	.450	.001	.453	.353	.210	-.293	-.318
Q3Math	.377	-.119	.316	.433	.183	-.096	.230	-.428
Q5.Intrap	.031	.051	.214	.101	.646	-.144	.077	-.087
Q1Spatial	.146	.146	-.214	-.067	.607	.139	.100	.020
Q3L	.120	.061	.262	.491	.519	-.066	.194	.216
Q4L	.119	.202	.056	.080	.079	.846	-.001	-.079
Q5L	.214	-.036	.131	.191	-.180	.756	.106	.138

(*Table 8 continues*)

	Component							
	1	2	3	4	5	6	7	8
Q1L	.184	.189	-.147	-.007	-.065	.146	-.627	.045
Q2Spatial	.340	.103	.277	.208	.089	.090	.544	.224
Q4Spatial	.223	.363	-.054	.007	.319	.190	.521	.088
Q2BODILY	.382	.420	.006	.350	.082	.271	.503	-.079
Q1BODILY	.361	.462	.139	.309	-.002	.213	.472	-.123
Q3Spatial	.308	.250	.193	.287	.431	.216	.461	.148
Q5Spatial	.003	.053	.075	.067	-.022	.070	.115	.804
Q2L	.138	.190	.172	.392	.410	-.238	-.101	.538

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

As shown in Table 8, 38 items contributed to the factor structure and met the minimum criteria of having a primary factor loading of .4 or above. Only 1 item (shaded in pink) failed to meet a minimum criteria of having a primary factor loading of .4 or above, and had no cross-loading of .3 or above. The item (Q1L) "I read or lecture to my students" did not load above .3 on any factor and was removed.

The final step in this process involved labeling the factors. According to Tabachnick and Fidell (2007), a factor is defined by variables that load on it, therefore, I had to decide on a label to characterize the factors as closely as possible to the variables with the highest factor loadings. Factor 1 is described as *naturalistic and math* because all eight items loaded high, an indication that both factor loadings can be used to describe Factor 1. In other words, Factor 1 has characteristics very similar to what nature and math items can measure. Factor 2 is *musical and bodily*. Factor 3 is *interpersonal*, Factor 4 is *intrapersonal*, Factor 5 is *intrapersonal*, *spatial*, and *math*. Factor 6 is *linguistic*, Factor 7

is *spatial* and *bodily*, and Factor 8 is *spatial* and *linguistic*. The premise is a set of items asking about several teaching practices may have one or many latent variables (MI) underlying it (Tabachnick & Fidell, 2007). To determine if the factor components were related, I ran a simple correlation on the saved component scores in SPSS data set (see Appendix E). Again, there was no relationship found between the eight factor scores and Teacher Familiarity with Gardner's MI theory.

Correlation

With the final count of 38 items, I ran a series of Spearman rank-order bivariate correlations in order to determine if there were any relationships between familiarity with Gardner's MI and teachers' practices in Part 2 of the Teacher's Practice survey. The correlation results indicated no significant relationship (all *p*s > .05) between the variable of familiarity with Gardner's MI and teacher practices in all eight areas of Gardner's MI (see Appendix C). Additionally, based on the 38 items, the Cronbach's Alpha for reliability was .93.

A simple linear regression was calculated to measure the degree of relationship between the independent variable (teacher familiarity) and the dependent variables (teacher strategies). Teacher familiarity with Gardner's MI and all 38 MI teacher strategies were not significantly correlated ($F = 1.30$; all $p > .05$). Because a significant relationship was not found between the teacher familiarity with Gardner's MI and the teacher practices of MI in both bivariate correlation and regression, no other post hoc test were warranted.

Summary of Findings

The presentations in Section 4 provided information on the descriptive and inferential statistics for the study population and the research results. The sample for this study was 61 middle school teachers presently teaching in a middle school in the southern state of Georgia. The initial reliability analysis for Cronbach's alpha coefficient (α = .721 and .927) suggested that the scaled items of both parts of the survey had relatively high internal consistency, as both were greater than .70. A follow up Cronbach's Alpha for reliability based on the final 38 items was .93.

Research Question 1

In the first research question I asked: What are middle school teachers' levels of familiarity with Gardner's MI theory. The concern was addressed primarily with frequency distribution and corresponding percentages for each response. The first survey question asked teachers to rate their responses on a Likert scale of 1-5, "How familiar are you with the concept of Gardner's MI Theory." The majority of participants' responses ranged from "somewhat familiar" to "unfamiliar". However, more than half (n = 41) of the participants were generally familiar with other theories selecting 3 and below. I concluded from the data output of this section of the survey that the teacher's level of familiarity to Gardner's theory was relatively low. Based on these findings, I accepted the null hypothesis that the middle school teachers were mostly unfamiliar with Gardner's MI theory.

Research Question 2

The focus of Research Question 2 was to test if there was a significant relationship between teachers' level of familiarity with Gardner's MI theory and how they implemented Gardner's MI theory in the classroom. Using SPSS-21, I ran three tests to test the null hypothesis and address the research question bivariate correlations, simple linear regression, and factor analysis. The bivariate correlation and regression results revealed no significant relationship between the variable of familiarity with Gardner's MI and teacher practices in all eight areas of Gardner's MI. Using the PCA standard extraction method, eight factors were extracted using Gardner's eight MI constructs to determine the number of factors extracted.

The first factor had maximum variance of 30.35%. The second and all following factors explained smaller and smaller portions of the variance and were not correlated with each other as displayed in Table 7. Following, one item was eliminated and 38 items met the minimum criteria of having a primary factor loading of .4 or above. All correlation tests revealed no significant correlations. Therefore, I accepted the null hypothesis and rejected the alternative. Section 5 concludes the research with a discussion of key findings, conclusions, and recommendations.

Section 5: Discussions, Conclusions, and Recommendations

Introduction

The focus of Section 5 is a detailed discussion of the findings, implications of social change, and the recommendations for practice and future research directly related to the outcome of this study. This study was designed to address whether correlations exist between teachers' level of familiarity with Gardner's MI theory and practices of the theory. Sixty-one teachers were given a two-part survey with a total of 41 items designed to collect data relevant to teacher familiarity with Gardner's theory and how teachers apply the theory in classrooms. Responses from the survey were summarized and analyzed descriptively and inferentially. The findings indicated that 19 (31.1%) teachers responded *unfamiliar*; 18 (29.5%) *somewhat familiar*; seven (11.5%) *familiar*; nine (14.8%) *adequately familiar*; and eight (13.1%) responded *very familiar.* After a series of tests including correlation and exploratory factor analysis, eight factors were extracted and correlated with the variable of teacher familiarity. The results showed no significant differences between teacher practices and the level of familiarity with Gardner's theory.

Interpretation of Findings

Historically, in the United States' systems of education, teachers are the key element upon which the educational process depends. Ideally, teachers should be experienced, knowledgeable, and equipped with the skills to reach diverse groups of students with special learning needs (Gardner, 2006; Mokhtar et al., 2008). The key premise is that when teachers are more knowledgeable of teaching strategies, they can cater to a broader range of learners including SWD.

Research Question 1: Familiarity With Gardner's Intelligences

In terms of middle school teachers' levels of familiarity with Gardner's MI theory, a majority of the participants were unfamiliar (31.1%) with the MI theory or somewhat familiar (29.5%). Only 13% reported they were very familiar. Therefore, it was reasonable to conclude that middle school teachers were mostly unfamiliar with Gardner's MI theory and how to implement it in the classroom. MacLeod (2002) noted that the majority of the participants in his study were at least "somewhat familiar" with Gardner's theory and few participants reported to be "unfamiliar". In contrast, in the current study more than half (62%) of the participants reported to have been "somewhat familiar" and "familiar" with other theories. Only 5% was "unfamiliar" with other theories. The final analysis reflected that the participants were more familiar with other theories of intelligence than with Gardner's theory.

Various reasons might account for teachers being more familiar with other theories than Gardner's MI theory. This may have been a difficult question for many teachers because they may have learned about Gardner's MI theory in previous years but were unable to recall in their memory specific details of the theory. Also, many teachers today may be more focused on the concept of differentiated instruction. Most critics of the MI intelligences concept and differentiated instruction agree that both concepts can be a complex process to implement, in that students are doing different tasks based on a central concept (Dixon et al., 2014). Al-Wadi (2011) believed that teachers are taught to focus more on intelligences that are measured in the state standardized test rather than

those that are not measured, such as musical and naturalistic intelligences. The premise is that most school district assessments do not support using the theory of MI.

Many researchers will agree that intelligence theory is multifaceted and is not new and some have developed different models associated with MI. For example, Sternberg (1996) proposed a triarchic model with three branches of intelligence: analytical intelligence, practical intelligence, and creative intelligence. Al-Wadi (2011) reported that Piaget focused on the adoption and development of knowledge and intelligence through cognitive centers of the human brain. Professional development is needed to improve the confidence level of teachers in the process of understanding the difference in MI intelligence from a theoretical perspective (Dixon et al., 2014).

Research Question 2: Relationship Between Familiarity and Implementation

For Research Question 2, I tested whether a significant relationship existed between teachers' level of familiarity with Gardner's MI theory and how they implement the theory in the classroom. After conducting a factor analysis using the extraction method, teaching practices were assessed via 38 items in which the participants rated the frequency in which they applied the strategies based on the eight intelligences identified in Gardner's (1993, 1999) earlier works. Aforementioned, they were the following: linguistic, mathematical, spatial, bodily, musical, interpersonal, intrapersonal, and naturalist.

To recapitulate, researchers reported that the linguistic learner is word smart, a more verbal learner. The mathematical learner learns through numbers and reasoning and has greater number sense. The spatial learner is more visual and learns through

visualization and pictures. The bodily/kinesthetic learner learns through movement. The musical learner is closely related to the mathematical learners and learns through the sound of music. Interpersonal learners are people oriented and learn through socialization. The intrapersonal learner is often self-taught and thinks deep within themselves. The naturalist learner learns through and from nature (Gardner, 1993, 1999). Most people are believed to have a mixture of the various types but may lean more toward one or two intelligences.

For each of Gardner's (1993, 1999) eight intelligences, the frequency responses on the survey ranged from "never to very frequently." In the current study, the areas that participants reported to practice with more frequency in descending order (very frequently to never) were spatial intelligence (56.0%), followed by interpersonal (53%), linguistics (40%), intrapersonal (37%), bodily/kinesthetic (36.0%), mathematical (32%), musical (31%), and naturalistic (30%).

Of the eight intelligences, Macleod (2002) reported the most frequently used strategies were interpersonal intelligence (98.8%) and verbal (97.7%). The least practiced were naturalistic (53.3%) and musical (42.1%). Al-Wadi's (2011) study showed that 77% of teachers practiced linguistic intelligence frequently followed by spatial intelligence (72.8%). Of the eight teacher practices, musical intelligence (35.3%) and naturalistic intelligence (24.58%) were the least practiced. Al-Wadi believed that because Gardner (2011) added naturalistic intelligence to the other seven intelligences, teachers may not have the available resources to practice naturalistic intelligence.

The results of the current study showed that the middle school teachers do not practice all eight intelligences equally. For instance, spatial practices were practices very frequently (56%) compared to naturalistic at 29%. It is important to note that the teachers were practicing some form of intelligences. However, the basic idea of MI theory is for teachers to apply all intelligences. The key tenet is that "one size does not fit all'' because students' learning abilities are different. All individual have strengths in some areas and weaknesses in other areas. This simply means that teachers should consider multiple educational approaches or practices (Gardner, 2011). Ordinarily, teachers are in better positions to assess and determine how and when to apply Gardner's MI theory. Based on the findings of this study, I recommend that teachers working with SWD encourage the use of all the intelligences. This style if teaching will provide opportunities for all children to use their various intelligences.

Although the teachers in the present study varied widely in terms of how often they implemented the various teaching strategies, the bivariate correlation test and regression analysis indicated there was no linear relationship ($p > .05$) between the teachers' level of familiarity with Gardner's MI and the teacher practices of all eight intelligences ($p > .05$). Therefore, the null hypothesis was accepted and I concluded that teachers' familiarity with Gardner's MI theory was significantly unrelated to the frequency in usage. These findings were similar to MacLeod's (2002) findings in which six areas of his study (e.g., linguistic, interpersonal, naturalistic, intrapersonal, spatial, and bodily) did not reveal any significant relationships between the participants'

perceived skill with a particular intelligence and their teaching strategies within the classroom.

Since MacLeod's (2002) study of over a decade ago, many educational reforms have occurred, which significantly impacted how teachers implement instructional methods to reach the learning needs of all students. These changes may help explain the slight differences in the outcome in the current study compared to MacLeod's (2002). For example, the NCLB Act of 2002 was introduced, which mandates state-level reforms such as new curriculum standards and requirements to raise academic standards. Additionally, NCLB's required focus on testing accountability has compelled teachers to search for effective ways to reach students classified as learning disabled, enrolled in special education programs, and are usually included in general education classrooms (NCLB, 2006).

With the introduction of wireless technology in all schools, more students are learning with mobile and handheld devices, an expansion of ways to learn. Bell (2006) noted that more school districts are moving away the desktop computers to cutting edge technology by providing mobile devices for their teachers and students. The premise is that these classroom resources are available to educators to tap the MI of all students, subsequently, help them to meet state and national standards.

Implications for Special Education

The implications of MI theory for special education were a key focus of this study. The literature reviewed supported the idea that if MI theory is implemented on a large scale in both regular and special education, it is likely to have multiple effects.

Previous researchers support the idea that when the regular curriculum includes the full spectrum of intelligences, referrals to special education classes will decline (Gardner, 1991; 2011). The teachers in the study mainly focused on spatial intelligence, an important intelligence to promote the visual needs of the child. This may be explained because more instruction methods today are geared toward using some form of technology, which offers visual stimulation, such as the IPad, computer, cellphone, and other hand held devices. It is believed that when general education teachers become more sensitive to the needs of diverse learners and began using a variety of teaching approaches, the academic success of all students will be realized.

Implications for Social Change

Social change is at the heart of Walden's mission. The implications for positive social change in this study are clearly rooted in and aligned with making a difference in the lives of both students and teachers by empowering them with the knowledge and skills to become lifelong learners and productive citizens in society. Social change supports the development of more inclusive, equitable, and responsive education systems that meet the needs of all children and youth, including students with special needs Gardner's (2011) theory supports the idea that MI are needed for people in general to productively function in society.

Findings from the study confirmed teachers' level of familiarity with Gardner's (2011) MI theory and their practices. The results indicated that most teachers were only marginally familiar with Gardner's and other MI theories, which is suggestive of a need for teachers to be provided opportunities to deepen and expand their knowledge of MI.

Teachers must be better equipped to widen their pedagogical skills to accommodate the learning needs of students with different intelligence profiles (Mokhtar et al., 2008). The premise is that when teachers are knowledgeable of MI theory, then they are better prepared to identify the intelligences of the students having difficulty and able to prepare the appropriate instructions (Yalmanci & Gözüm, 2013).

All students should be provided learning opportunities that help to nurture and develop their talents and abilities. Positive social change will be realized when teachers began to think of all intelligences as equally important. That is, teachers should recognize and teach to a broader range of talents and skills. Learning opportunities should be available to all students to nurture and develop their cognitive skills and abilities that reflect the multiple nature of intelligence.

Recommendations for Action

Aligned with Gardner's (2011) theory and recommendations, the following recommendations are suggested:

1. Inclusive classroom teachers should apply MI theories in their teaching practices. This means self-development through reading, studying, and learning more about not only Gardner's theory but other theory based practices.
2. Teachers visit classrooms that employ MI focused teaching strategies.
3. Teachers attend professional development conferences and seminars with a focus on understanding MI.

4. Teachers should network with other schools and explore other sources of ideas and practices.

In addition to the stated recommendations, stakeholders and policymakers should seek to expand the standard curriculum to provide diverse learners with a wide range of learning needs an opportunity for academic success. Gardner (2011) argued that many public educational systems today mainly focus on passing state standardized tests. Consequently, teachers inadvertently fail to reach and exclude learners with special learning needs. As such, the results of this study will be disseminated among colleagues and other interested stakeholders with emphasis placed on developing the intelligences, strengths, and abilities of children with disabilities. Faculty seminars and parent awareness may be ways that teachers can begin to build beliefs and practices that are aligned with the spirit of MI.

Recommendations for Future Research

Future research is needed to observe the daily teaching strategies, assessment, and curriculum of teachers in action. The purpose would be to assess qualitatively through observation the actual practices of the teachers. The present study did not address the impact of technology on MI practices. Perhaps this would help to explain the frequent use of Spatial Intelligence. Last, future research may look at a sample of teachers in different geographical regions of the country to explore if the results are similar to the present study.

Conclusion

This study was designed to explore, describe, and capture how familiar teachers were with Gardner's Theory of MI and how their familiarity related to their practices. The participants were 61 middle school teachers. The results of the study were encouraging and the insight gained was valuable. The results revealed that a majority of the teacher participants were at least somewhat familiar with Gardner's theory. Second, it was encouraging to learn that participants were familiar with other theories of intelligence. The results clearly indicated that teachers were practicing the theory of MI in their classrooms frequently. Spatial Intelligence was the most frequently practiced intelligence and Naturalistic Intelligence was the least practiced in the classroom. No significant relationships were found between teaching practices and teacher familiarity with regard to each of the eight intelligences.

This study was significant to increase teachers' awareness of MI practices to improve student learning. Implications for positive social change will be realized when teachers began to integrate MI into their teaching practices with a focus on stretching and expanding the different intelligences of all students. The aim is to foster and provide all students, especially students with learning disabilities, the positive learning experiences that can lead to improved learning and academic success for students and teachers alike.

References

Ahanbor, Z., & Sadighi, F. (2014). The relationship between multiple intelligences, learning styles and gender. *Modern Journal of Language Teaching Methods*, *4*(1), 176–184. Retrieved from http://search.proquest.com/docview/1564107064?accountid=14872

Ahmed, M., Hussain, I., Farooq, R. A., & Ahmed, S. (2011). Regional differentials in students' preferences regarding theory of multiple intelligences at elementary level. *Academic Research International*, *1*(2), 327–331. Retrieved from http://www.savap.org.pk/journals/ARInt./Vol.1(2)/2011(1.2-35).pdf

Al-Wadi, N. (2011). *Teachers' perceptions toward enhancing learning through multiple intelligences theory in elementary school: A mixed methods study* (Doctoral dissertation). Available from ProQuest Dissertations & Theses Full Text database. (UMI No. 277098534)

Andronache, D., Bocoş, M., Stanciu, D., & Raluca, B. (2011). The valences of multiple intelligences theory in optimizing the training process. *Journal of Educational Sciences / Revista De Stiintele Educatiei, 13*(2), 18–26.

Bahar, M., & Tongac, E. (2009). The effect of teaching approaches on the pattern of pupils' cognitive structure: Some evidence from the field. *Asia-Pacific Educational Research, 18,* 21–45.

Ball, K., & Green, R. (2014). An investigation of the attitudes of school leaders toward the inclusion of students with disabilities in the general education setting. *National Forum of Applied Educational Research Journal, 27*(1/2), 57–76.

Bell, A. (2006). Handheld computers are more than personal assistants. *Library Media Connection, 25*(1), 56–59.

Beam, A. P. (2009). Standards-based differentiation: Identifying the concept of multiple intelligence for use with students with disabilities. *Teaching Exceptional Children Plus, 5*(4), 2–13. Retrieved from Education Source database. (Accession No. 39362880)

Bennett, D., & Fisch, A. (2013). Infusing coteaching into the general education field experience. *Interdisciplinary Journal of Teaching & Learning, 3*(1), 18–36.

Bordelon, D. E., & Banbury, M. M. (2005). Pursuing the parameters: Validating "The Multiple Intelligences Inventory for Teachers". *Assessment for Effective Intervention, 30*(3), 33–51. doi:10.1177/073724770503000303

Cho, H-J., & Kingston, M. (2012). The effect of social and classroom ecological factors on promoting self-determination in elementary school. *Preventing School Failure, 56*, 19–28. doi:10.1080/1045988X.2010.548419

Coughlan, M., Cronin, P., & Ryan, F. (2007). Step-by-step guide to critiquing research, Part 1: Quantitative research. *British Journal of Nursing, 16*, 658–663.

Cortiella, C. (2007). *Rewards and roadblocks: How special education students are faring under No Child Left Behind*. New York, NY: National Center for Learning Disabilities.

Creswell, J. W. (2003). *Research design: Qualitative, quantitative, and mixed method approaches* (2nd ed.). Thousand Oaks, CA: Sage.

Creswell, J. W. (2009). *Research design: Qualitative, quantitative and mixed methods approaches* (3rd ed.). Thousand Oaks, CA: Sage.

De Jesus, O. (2012). Differentiated instruction: Can differentiated instruction provide success for all learners? *National Teacher Education Journal, 5*(3), 5–11. doi:10.1080/1045988X.2010.548419

Dever, B. V., & Karabenick, S. A. (2011). Is authoritative teaching beneficial for all students? A multi-level model of the effects of teaching style on interest and achievement. *School Psychology Quarterly, 26*(2), 131–144. doi:10.1037/a0022985

Dixon, F. A., Yssel, N., McConnell, J. M., & Hardin, T. (2014)). Differentiated instruction, professional development, and teacher efficacy. *Journal for the Education of the Gifted, 37*, 111–127. Retrieved from Proquest database. (Accession No. 1534291388)

Farooq, M., & Regnier, J. (2011). Role of learning styles in the quality of learning at different levels. *Informatica Economica, 15*(3), 28–45. Retrieved from Business Source Complete database. (Accession No. 69706009)

Faul, F., Erdfelder, E., Buchner, A., & Lang, A.-G. (2009). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods, 41*, 1149–1160.

Fierros, E. G. (2004). How multiple intelligences theory can guide teachers' practices: Ensuring success for students with disabilities. Retrieved from http://www.urbanschools.org/pdf/onPOINTS.multiple.intelligences.DOCUMENT.style.LETTERSIZE.pdf

Fink, A. (2006). *How to conduct surveys: A step by step guide* (3rd ed.). London, UK. Sage.

Fink, A. (2013). *How to conduct surveys. A step by step guide* (5^{th} ed.). Thousand Oaks, CA: Sage Publications.

Foley, G., & Nelson, S. (2011). The impact of annual yearly progress on middle school principals' job satisfaction. *National Forum of Educational Administration & Supervision Journal*, *28*(2), 27–50. doi:10.1080/1045988X.2010.548419

Franzoni, A. L., & Assar, S. (2009). Student learning styles adaptation method based on teaching strategies and electronic media. *Educational Technology & Society*, *12*, 15–29. doi:10.1109/ICALT.2008.149

Furnham, A. (2009). The validity of a new, self-report measure of multiple intelligence. *Current Psychology, 28*(4), 225–239. doi:10.1007/s12144-009-9064-z

Gardner, H. (1993). *Multiple intelligences: The theory into practice*. New York, NY: Basic Books.

Gardner, H. (1999). *Intelligence reframed: Multiple intelligences for the 21st century*. New York, NY: Basic Books.

Gardner, H. (2011). Promoting learner engagement using multiple intelligences and choice-based instruction. *Adult Basic Education & Literacy Journal, 5*(2), 97–101. Retrieved from Academic Search Complete database. (Accession No. 65148834)

Gardner, H., & Hatch, T. (1989). Educational implications of the theory of multiple intelligences. *Educational Researcher, 18*(8), 4–10. doi:10.3102/0013189X018008004

Gardner, H. (1991). *The Unschooled Mind: How Children Think and How Schools Should Teach.* New York, NY: Basic Books.

Georgia Department of Education. (2010). Georgia performance standards: English/language arts, fourth grade. Retrieved from https://www.georgiastandards.org

Ghazi, S., Shahzada, G., Gilani, U., Shabbir, M., & Rashid, M. (2011). Relationship between students' self-perceived multiple intelligences and their academic achievement. *International Journal of Academic Research*, *3*(2), 619–623. Retrieved from Academic Search Complete database. (Accession No. 67767638)

Hassan, A., Sulaiman, T., & Baki, R. (2011). Philosophical approach in applying multiple intelligence in teaching and learning as viewed by Malaysian school teachers. *International Journal of Business & Social Science*, *2*(16), 205–210. Retrieved from Business Source Complete database. (Accession No. 66328369)

Haycock, K. (2006). No more invisible kids [Electronic version]. *Educational Leadership, 64*(3), 38–42. Retrieved from MasterFILE Premier database. (Accession No. 23054700)

Jilardi Damavandi, A., Mahyuddin, R., Elias, H., Daud, S., & Shabani, J. (2011). Academic achievement of students with different learning styles. *International Journal of Psychological Studies, 3*(2), 186–192. doi:10.5539/ijps.v3n2p186

Johnson, B., & Christensen, L. (2004). *Educational research: Quantitative, qualitative, and mixed approaches* (2nd ed.). Boston, MA: Pearson Education Inc.

Kaufman, S. B. (2013). *Ungifted: Redefining intelligence*. New York: Basic Books.

Kimberlin, C., & Winterstein, A. (2008). Validity and reliability of measurement instruments used in research. *American Journal of Health-Systems Pharmacists, 65*(1), 2227–2284. Retrieved from CINAHL Plus with Full Text database. (Accession No. 2010122099)

Lai, S. A., & Berkeley, S. (2012). High-Stakes Test Accommodations: Research and Practice. *Learning Disability Quarterly, 35*(3), 158–169. doi:10.1080/1045988X.2010.548419

Larsen, R., & Warne, R. T. (2010). Estimating confidence intervals for eigenvalues in exploratory factor analysis. *Behavior Research Methods, 42*, 871–876. doi:10.3758/BRM.42.3.871

Lichtman, M. (2006). *Qualitative research in education: A user's guide*. Thousand Oaks, CA: Sage.

MacLeod, M. (2002). Teachers' perceptions and practices of Howard Gardner's theory of multiple intelligences. Unpublished manuscript, School of Psychology, Mount Saint Vincent University, Canada.

Maftoon, P., & Sarem, S. (2012). The realization of Gardner's multiple intelligences (MI) theory in second language acquisition (SLA). *Journal of Language Teaching & Research*, *3*(6), 1233–1241. doi:10.4304/jltr.3.6.1233-1241

McConnell, M. M. (2015). Reflections of the impact of individualized instruction. *National Teacher Education Journal*, *8*(1), 53–56. Retrieved from EBSCOhost database. (Accession No. 110268129)

McMahon, S., Rose, D., & Parks, M. (2004). Multiple intelligences and reading achievement: An examination of the Teele inventory of multiple intelligences. *Journal of Experimental Education*, *73*(1), 41–52. Retrieved from MasterFile Premier database. (Accession No. 14899344)

Mokhtar, I. A., Majid, S., & Foo, S. (2008). Teaching information literacy through learning styles: The application of Gardner's multiple intelligences. *Journal of Librarianship and Information Science, 40*(2), 93–109. doi:10.1177/0961000608089345

Mowat, J. (2011). The development of intrapersonal intelligence in pupils experiencing social, emotional and behavioural difficulties. *Educational Psychology in Practice, 27*(3), 227–253. doi:10.1080/02667363.2011.603531

No Child Left Behind Act of 2001, 20 U.S.C. § 6301et seq. (2006).

Pane, D., & Salmon, A. (2011). Author's camp: Facilitating literacy learning through music. *Journal of Reading Education*, *36*(2), 36–42. Retrieved from Education Full Text database. (Accession No. 508445533)

Pappano, L. (2011). Differentiated Instruction Reexamined**.** *Harvard Education Letter, 27*(3). Retrieved from: http://hepg.org/hel-home/issues/27_3/helarticle/differentiated-instruction-reexamined_499#home

Quigney, T. A. (2008). The reauthorization of the No Child Left Behind Act: Recommended practices regarding teaching students with disabilities. *Planning and Changing*, *39*(3&4), 146–157. Retrieved from Education Source database. (Accession No. 508034736)

Rettig, M. (2005). Using the multiple intelligences to enhance instruction for young children and young children with disabilities. *Early Childhood Education Journal*, 32(4), 255–259. Retrieved from Academic Search Complete database. (Accession No. 16600348)

Rinis, D., & Vlachos, K. (2013). Exploring electronic storybooks to enhance multiple intelligences. *Research Papers in Language Teaching & Learning*, *4*(1), 81–98. doi:10.1080/1045988X.2010.548419

Roberts, M. (2010). Encounters with existential intelligence: Possibilities for today's effective educator. *International Journal of Interdisciplinary Social Sciences*, *5*(7), 241–253. (Accession No. 66384552)

Saban, A., & Bal, A. P. (2012). An analysis of teaching strategies employed in the elementary school mathematics teaching in terms of multiple intelligence theory. *Journal of Theory & Practice in Education*, *8*(2), 1–23. Retrieved from Education Research Complete database. (Accession No. 84428099)

Searson, R., & Dunn, R. (2001). The learning-style teaching model. Science and Children, 38(5), 22–26. Retrieved from http://search.proquest.com/docview/236888201?accountid=35812

Shaywitz, S. E., Morris, R., & Shaywitz, B. A. (2008). The education of dyslexic children from childhood to adulthood. *Annual Review of Psychology*, *59*, 451–475. Retrieved from http://www.ldaamerica.org/stateline/documents/08mar/annurev.psych.59.103006.pdf

Sternberg, R.J. (1996). *Successful intelligence*. New York, NY: Simon & Schuster.

Szpringer, M., Kopik, A., & Formella, Z. (2014). Multiple Intelligences and minds for the future in a child's education. *Journal Plus Education / Educatia Plus*, *10*, 350–359.

Sulochana, M. M., & Kumar, T. (2009). Multiple intelligence among university students: A study. *International Journal of Business Research*, *9*(5), 149–155. Retrieved from EBSCOhost database. (Accession No. 45462804)

Sulaiman, T. Hassan, A., & Yi, H. Y. (2011). An analysis of teaching styles in primary and secondary school teachers based on the theory of multiple intelligences. *Journal of Social Sciences*, *7*, 428–435. (Accession No. 67068401)

Tabachnick, B.G., & Fidell, L.S. (2007). *Using multivariate statistics*. Boston, MA: Pearson Education Inc.

Thompson, S. M., Meyers, J., & Chris Oshima, T. T. (2011). Student mobility and its implications for schools' adequate yearly progress. *Journal of Negro Education*, *80*(1), 12–21. Retrieved from Education Source database. (Accession No. 508445475)

Trinh, M. P., & Kolb, D. A. (2011). Eastern experiential learning: Eastern Principles for Learning Wholeness. *Career Planning & Adult Development Journal*, *27*(4), 29–43. Retrieved from Education Source database. (Accession No. 76475516)

Trochim, W. M. (2008). Research methods knowledge base: The nature of a relationship. Retrieved from http://www.socialresearchmethods.net/kb/relation.php

Tuan, L. T. (2010). Infusing cooperative learning into an EFL classroom. *English Language Teaching*, *3*(2), 13–25. Retrieved from http://www.academypublisher.com/jltr/vol02/no01/jltr0201.pdf

U.S. Department of Education. (2010). Thirty-five years of progress in educating children with disabilities through IDEA. Retrieved from https://www2.ed.gov/about/offices/list/osers/idea35/history/idea-35-history.pdf

Wiener, R., & Hall, D. (2004). No Child Left Behind: Meeting the challenges. *Principal*, *83*, 1. Retrieved from Education Source database. (Accession No. 507906208)

Yalmanci, S., & Gözüm, A. (2013). The effects of multiple intelligence theory based teaching on students' achievement and retention of knowledge (example of the enzymes subject). *International Journal on New Trends in Education & Their Implications* (IJONTE), *4*(3), 27–36. Retrieved from http://www.ijonte.org/FileUpload/ks63207/File/complete.pdf#page=33

YeŞİl, R., & Korkmaz, Ö. (2010). Reliability and validity analysis of the multiple intelligence perception scale. *Education*, *131*(1), 8–32. Retrieved from Education Source database. (Accession No. 508188935)

Appendix A: Teacher Participation Survey

The following survey was replicated from a study conducted by Al-Wadi (2011).

Part 1

Familiarity Survey

Items	Unfamiliar (1)	Somewhat familiar (2)	Familiar (3)	Adequately familiar (4)	Very familiar (5)
1. How familiar are you with the concept of Gardner's MI Theory?					
1. Are you familiar with any other theories regarding the structure of intelligence (e.g., Sternberg, Binet, Jensen, and Piaget)?					

Part 2

Teacher's Practice Survey

Never (1) Rarely (2) Sometimes (3) Frequently (4) Very Frequently (5)

Linguistic Intelligence

1. I read or lecture to my students.
2. My students have the option to discuss or debate during class.

3. I encourage students to employ their verbal skills to communicate, solve problems, and express inner feelings.
4. I require my students to read during class.
5. I require students to perform writing activities in the class.

Intrapersonal Intelligence

1. My students have the opportunity to set their own personal goals.
2. My students have the opportunity for introspection or deep thinking.
3. I encourage my students to make connections between what is being taught in class and what they experience in real life.
4. I give my students opportunities to make decisions about their learning experiences.
5. I allow my students to express their feelings during the class (e.g., excitement and so on).

Interpersonal Intelligence

1. I encourage my students to perform group brain-storming.
2. Students have the opportunity to work in cooperative groups
3. I encourage students to peer tutor or help each other in class.
4. I encourage students to develop socially thorough their classroom interactions.
5. I encourage students to share with one another.

Mathematical Intelligence

1. I encourage my students to think scientifically about things.
2. I encourage my students to logically organize and sequence concepts.

3. My students perform logical problem solving exercises.
4. I incorporate mathematical problem solving in my teaching.
5. I encourage students to perform scientific demonstration/ experimentation.

Spatial Intelligence

1. I use visual presentations during class (e.g., write on chalkboard, use overhead projector).
2. I encourage my students to visually represent the concepts being taught/ discussed.
3. I encourage my students to visualize what they read or hear during class.
4. I use visual aids in class such as maps, charts, and diagrams.
5. I show video, slides, or movies during class.

Musical Intelligence

1. I play recorded music to my students
2. My students have the opportunity to express their ideas musically.
3. I incorporate the use of musical instruments into my classroom teaching.
4. I use rhythms, chants, raps, or songs in my classroom teaching
5. I make tapping sounds or sing little melodies while teaching

Bodily Intelligence

1. I provide my students with the opportunity to learn by manipulating objects or by making things with their hands.
2. I provide my students with tactical materials and experience.
3. I teach my students physical relaxation exercises.

4. My students have the opportunity to use drama, dance, or physical activity as a part of their learning process.

Naturalistic Intelligence

1. I incorporate nature into curriculum themes.
2. My students classify or sort objects, events, living things, or phenomena into clusters according to their common characteristics
3. My students have the opportunity to study about different plants and animals.
4. I provide field trips for my students to explore the natural environment.
5. Students have the opportunity to work with or study about natural phenomena.

Appendix B: Correlation Matrix

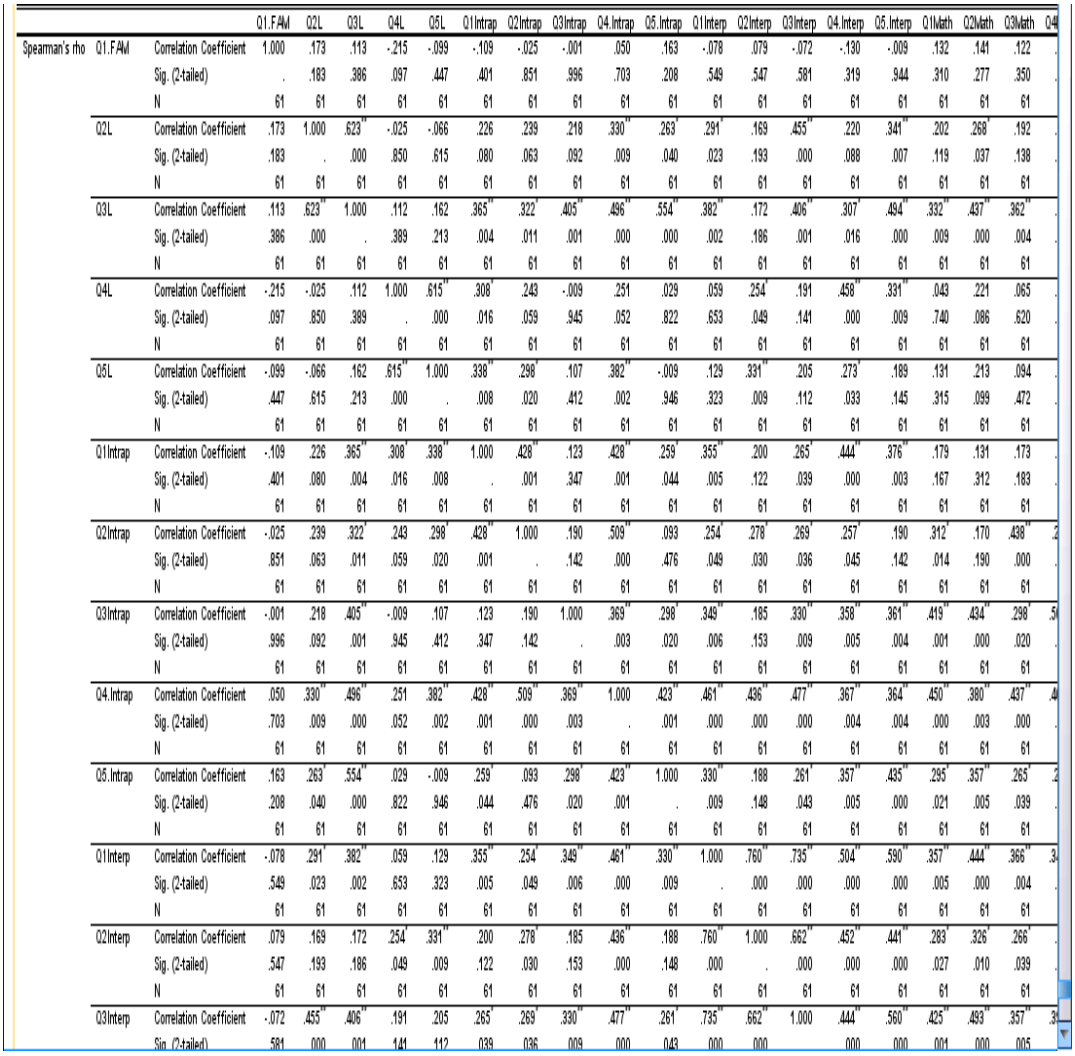
(Note: Resized to accommodate page)

Correlation Matrix

	Q1L	Q2L	Q1Intrap	Q2Intrap	Q1Interp	Q2Interp	Q1Math	Q2Math	Q1Spatial	Q2Spatial	Q1MUSIC	Q2MUSIC	Q1BODILY	Q2BODILY
Q1L	1.000	.162	.070	.005	-.208	-.015	-.088	-.161	.177	-.160	-.043	.109	-.067	
Q2L	.162	1.000	.231	.261	.278	.143	.198	.236	.242	.272	.378	.147	.157	
Q1Intrap	.070	.231	1.000	.439	.292	.177	.196	.123	.117	.258	.112	.017	.139	
Q2Intrap	.005	.261	.439	1.000	.296	.264	.369	.180	.105	.403	.257	.340	.434	
Q1Interp	-.208	.278	.292	.296	1.000	.744	.389	.412	-.136	.250	.312	.282	.302	
Q2Interp	-.015	.143	.177	.264	.744	1.000	.315	.308	-.029	.311	.290	.310	.286	
Q1Math	-.088	.198	.196	.369	.389	.315	1.000	.723	.105	.499	.061	.116	.478	
Q2Math	-.161	.236	.123	.180	.412	.308	.723	1.000	.212	.489	.107	.210	.446	
Q1Spatial	.177	.242	.117	.105	-.136	-.029	.105	.212	1.000	.259	.152	.022	.076	
Q2Spatial	-.160	.272	.258	.403	.250	.311	.499	.489	.259	1.000	.156	.276	.450	
Q1MUSIC	-.043	.378	.112	.257	.312	.290	.061	.107	.152	.156	1.000	.384	.374	
Q2MUSIC	.109	.147	.017	.340	.282	.310	.116	.210	.022	.276	.384	1.000	.512	
Q1BODILY	-.067	.157	.139	.434	.302	.286	.478	.446	.076	.450	.374	.512	1.000	
Q2BODILY	-.025	.193	.112	.459	.167	.267	.414	.434	.223	.508	.370	.440	.857	
Q1NATURE	.098	.287	.297	.373	.099	.089	.526	.433	.248	.355	.359	.261	.480	
Q2NATURE	.154	.196	.139	.271	.194	.236	.581	.548	.136	.314	.180	.256	.463	
Q1L		.110	.300	.485	.057	.456	.254	.112	.090	.113	.374	.205	.306	
Q2L	.110		.039	.023	.017	.140	.066	.036	.032	.018	.002	.133	.118	
Q1Intrap	.300	.039		.000	.012	.090	.069	.177	.189	.024	.199	.448	.147	
Q2Intrap	.485	.023	.000		.011	.022	.002	.086	.213	.001	.025	.004	.000	
Q1Interp	.057	.017	.012	.011		.000	.001	.001	.153	.028	.008	.015	.010	
Q2Interp	.456	.140	.090	.022	.000		.007	.009	.414	.008	.013	.009	.014	
Q1Math	.254	.066	.069	.002	.001	.007		.000	.215	.000	.324	.190	.000	
Q2Math	.112	.036	.177	.086	.001	.009	.000		.053	.000	.210	.056	.000	

Q1Spatial	.090	.032	.189	.213	.153	.414	.215	.053		.024	.126	.434	.283
Q2Spatial	.113	.018	.024	.001	.028	.008	.000	.000	.024		.119	.017	.000
Q1MUSIC	.374	.002	.199	.025	.008	.013	.324	.210	.126	.119		.001	.002
Q2MUSIC	.205	.133	.448	.004	.015	.009	.190	.056	.434	.017	.001		.000
Q1BODILY	.306	.118	.147	.000	.010	.014	.000	.000	.283	.000	.002	.000	
Q2BODILY	.424	.072	.200	.000	.102	.021	.001	.000	.045	.000	.002	.000	.000
Q1NATURE	.231	.014	.011	.002	.229	.252	.000	.000	.029	.003	.003	.023	.000
Q2NATURE	.122	.069	.147	.019	.070	.036	.000	.000	.152	.008	.087	.025	.000

Appendix C: Screen Shot of Correlation Matrix



			Q1.FAM	Q2L	Q3L	Q4L	Q5L	Q1Intrap	Q2Intrap	Q3Intrap	Q4.Intrap	Q5.Intrap	Q1Interp	Q2Interp	Q3Interp	Q4.Interp	Q5.Interp	Q1Math	Q2Math	Q3Math	Q4
Spearman's rho	Q1.FAM	Correlation Coefficient	1.000	.173	.113	-.215	-.099	-.109	-.025	-.001	.050	.163	-.078	.079	-.072	-.130	-.009	.132	.141	.122	
		Sig. (2-tailed)	.	.183	.386	.097	.447	.401	.851	.996	.703	.208	.549	.547	.581	.319	.944	.310	.277	.350	
		N	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	
	Q2L	Correlation Coefficient	.173	1.000	.623**	-.025	-.066	.226	.239	.218	.330**	.263*	.291*	.169	.455**	.220	.341**	.202	.268*	.192	
		Sig. (2-tailed)	.183	.	.000	.850	.615	.080	.063	.092	.009	.040	.023	.193	.000	.088	.007	.119	.037	.138	
		N	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	
	Q3L	Correlation Coefficient	.113	.623**	1.000	.112	.162	.365**	.322*	.405**	.496**	.554**	.382**	.172	.406**	.307*	.494**	.332**	.437**	.362**	
		Sig. (2-tailed)	.386	.000	.	.389	.213	.004	.011	.001	.000	.000	.002	.186	.001	.016	.000	.009	.000	.004	
		N	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	
	Q4L	Correlation Coefficient	-.215	-.025	.112	1.000	.615**	.308*	.243	-.009	.251	.029	.059	.254*	.191	.458**	.331**	.043	.221	.065	
		Sig. (2-tailed)	.097	.850	.389	.	.000	.016	.059	.945	.052	.822	.653	.049	.141	.000	.009	.740	.086	.620	
		N	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	
	Q5L	Correlation Coefficient	-.099	-.066	.162	.615**	1.000	.338**	.298*	.107	.382**	-.009	.129	.331**	.205	.273*	.189	.131	.213	.094	
		Sig. (2-tailed)	.447	.615	.213	.000	.	.008	.020	.412	.002	.946	.323	.009	.112	.033	.145	.315	.099	.472	
		N	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	
	Q1Intrap	Correlation Coefficient	-.109	.226	.365**	.308*	.338**	1.000	.428**	.123	.428**	.259*	.355**	.200	.265*	.444**	.376**	.179	.131	.173	
		Sig. (2-tailed)	.401	.080	.004	.016	.008	.	.001	.347	.001	.044	.005	.122	.039	.000	.003	.167	.312	.183	
		N	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	
	Q2Intrap	Correlation Coefficient	-.025	.239	.322*	.243	.298*	.428**	1.000	.190	.509**	.093	.254*	.278*	.269*	.257*	.190	.312*	.170	.438**	.2
		Sig. (2-tailed)	.851	.063	.011	.059	.020	.001	.	.142	.000	.476	.049	.030	.036	.045	.142	.014	.190	.000	
		N	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	
	Q3Intrap	Correlation Coefficient	-.001	.218	.405**	-.009	.107	.123	.190	1.000	.369**	.298*	.349**	.185	.330**	.358**	.361**	.419**	.434**	.298*	.5
		Sig. (2-tailed)	.996	.092	.001	.945	.412	.347	.142	.	.003	.020	.006	.153	.009	.005	.004	.001	.000	.020	
		N	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	
	Q4.Intrap	Correlation Coefficient	.050	.330**	.496**	.251	.382**	.428**	.509**	.369**	1.000	.423**	.461**	.436**	.477**	.367**	.364**	.450**	.380**	.437**	.4
		Sig. (2-tailed)	.703	.009	.000	.052	.002	.001	.000	.003	.	.001	.000	.000	.000	.004	.004	.000	.003	.000	
		N	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	
	Q5.Intrap	Correlation Coefficient	.163	.263*	.554**	.029	-.009	.259*	.093	.298*	.423**	1.000	.330**	.188	.261*	.357**	.435**	.295*	.357**	.265*	.2
		Sig. (2-tailed)	.208	.040	.000	.822	.946	.044	.476	.020	.001	.	.009	.148	.043	.005	.000	.021	.005	.039	
		N	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	
	Q1Interp	Correlation Coefficient	-.078	.291*	.382**	.059	.129	.355**	.254*	.349**	.461**	.330**	1.000	.760**	.735**	.504**	.590**	.357**	.444**	.366**	.3
		Sig. (2-tailed)	.549	.023	.002	.653	.323	.005	.049	.006	.000	.009	.	.000	.000	.000	.000	.005	.000	.004	
		N	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	
	Q2Interp	Correlation Coefficient	.079	.169	.172	.254*	.331**	.200	.278*	.185	.436**	.188	.760**	1.000	.662**	.452**	.441**	.283*	.326*	.266*	
		Sig. (2-tailed)	.547	.193	.186	.049	.009	.122	.030	.153	.000	.148	.000	.	.000	.000	.000	.027	.010	.039	
		N	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	
	Q3Interp	Correlation Coefficient	-.072	.455**	.406**	.191	.205	.265*	.269*	.330**	.477**	.261*	.735**	.662**	1.000	.444**	.560**	.425**	.493**	.357**	.3
		Sig. (2-tailed)	.581	.000	.001	.141	.112	.039	.036	.009	.000	.043	.000	.000		.000	.000	.001	.000	.005	

Appendix D: Correlation Matrix for Factor Scores

(Modified for size

		Q1.FAM	REGR factor score 1 for analysis 1	REGR factor score 2 for analysis 1	REGR factor score 3 for analysis 1	REGR factor score 4 for analysis 1
Q1.FAM	Correlation Coefficient	**1.000**	**.208**	**.186**	**-.129**	
	Sig. (2-tailed)	**.**	**.117**	**.163**	**.334**	
	N	**61**	**58**	**58**	**58**	
REGR factor score 1 for analysis 1	Correlation Coefficient	**.208**	**1.000**	**.042**	**.019**	
	Sig. (2-tailed)	**.117**	**.**	**.753**	**.888**	
	N	**58**	**58**	**58**	**58**	
REGR factor score 2 for analysis 1	Correlation Coefficient	**.186**	**.042**	**1.000**	**-.016**	
	Sig. (2-tailed)	**.163**	**.753**	**.**	**.906**	
	N	**58**	**58**	**58**	**58**	
REGR factor score 3 for analysis 1	Correlation Coefficient	**-.129**	**.019**	**-.016**	**1.000**	
	Sig. (2-tailed)	**.334**	**.888**	**.906**	**.**	
	N	**58**	**58**	**58**	**58**	
REGR factor score 4 for analysis 1	Correlation Coefficient	**-.076**	**.015**	**-.089**	**.068**	
	Sig. (2-tailed)	**.572**	**.911**	**.505**	**.612**	
	N	**58**	**58**	**58**	**58**	
REGR factor score 5 for analysis 1	Correlation Coefficient	**.130**	**.043**	**-.006**	**.131**	
	Sig. (2-tailed)	**.329**	**.750**	**.966**	**.328**	
	N	**58**	**58**	**58**	**58**	
REGR factor score 6 for analysis 1	Correlation Coefficient	**-.250**	**.033**	**.035**	**.021**	
	Sig. (2-tailed)	**.059**	**.806**	**.796**	**.878**	
	N	**58**	**58**	**58**	**58**	
REGR factor score 7 for analysis 1	Correlation Coefficient	**.087**	**.001**	**.065**	**.026**	
	Sig. (2-tailed)	**.517**	**.997**	**.626**	**.847**	
	N	**58**	**58**	**58**	**58**	
REGR factor score 8 for analysis 1	Correlation Coefficient	**-.091**	**-.073**	**.052**	**.018**	
	Sig. (2-tailed)	**.498**	**.585**	**.699**	**.891**	
	N	**58**	**58**	**58**	**58**	