Determining multiple intelligences in the preschool aged child

Jill Elizabeth Capie
Rowan University

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DETERMINING MULTIPLE INTELLIGENCES
IN THE PRESCHOOL AGED CHILD

by
Jill Elizabeth Capie

A Thesis
Submitted in partial fulfillment of the requirements of the
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The objective of this research study was to explore whether valid Multiple Intelligence profiles could be created for preschool children. This study was conducted over a three month period and included 16 preschool-aged participants. Research strategies included surveys (teacher, paraprofessional, and parent), naturalistic observations, and participant interviews. There were four key findings in this study. First, the teacher, the paraprofessional, and the parents had differing perceptions about which intelligences were dominant for each participant. Second, participants appear to have multiple, equally dominant intelligences. Third, participant’s views related to their own dominant intelligences frequently differed from those reported by the teacher, paraprofessional, or parent. Fourth, participants appeared to have limited self-awareness related to dominant intelligences. Based on that information, it appears that observations and perceptions about dominance should be considered when creating classroom activities, but should not be expected to create a cohesive Multiple Intelligence profile.
Table of Contents

CHAPTER I: INTRODUCTION ................................................
Overview of the Study ..................................................... 1
Guiding Research Questions .............................................. 2
Methodology ........................................................................ 2
Terminology Used .................................................... 3
Overview of the Paper ..................................................... 3

CHAPTER II: REVIEW OF THE LITERATURE ......................... 4
History ............................................................................... 4
Gardner’s Theory ........................................................ 5
Intelligence Selection ..................................................... 6
Application of Gardner’s Theory ...................................... 7
The Eight Intelligences .................................................... 8
School Impact ................................................................. 13
Philosophy ......................................................................... 13
Classroom Practices ....................................................... 14
Home Impact ................................................................. 16
Early Childhood Education ............................................ 17
Montessori Connections ................................................ 17
The Use of Multiple Intelligences in An Early Childhood Classroom ......................................................... 18
Research Studies ................................................. 20
Project Spectrum ................................................. 20
An Application of Multiple Intelligences in a Lebanese Kindergarten ........................................ 24
DISCOVER Assessment Study ..................................... 25
Learner-Centered Instruction and the theory of MI with Second Language Learners ................................................. 26
Summary .................................................................. 27

CHAPTER III: METHODOLOGY ................................... 29
Guiding Research Questions ........................................ 29
Selected School ......................................................... 29
Selected Sample ....................................................... 30
Research Strategies ................................................. 31
Data Collection and Analysis ...................................... 33
Reliability and Validity .............................................. 34

CHAPTER IV: ANALYSIS AND INTERPRETATION OF DATA .... 35
Participant Profiles ..................................................... 35
Guiding Research Questions ....................................... 38
Summary of Findings ............................................... 42

CHAPTER V: SUMMARY, FINDINGS, AND CONCLUSIONS ....... 43
Relationship to Previous Research ............................... 43
Personal Thoughts ..................................................... 46
Recommendations ............................................................. 46
Limitations ............................................................................. 47
References ............................................................................. 48
Appendices
A. Gardner’s Selection Criteria ............................................. 50
B. Gardner’s Eight Intelligences .......................................... 51
C. Activities to Strengthen Intelligences ............................... 52
D. Activities For Parents ...................................................... 55
E. Preschool Behaviors and Activities ................................. 60
F. Project Spectrum Activities ............................................. 62
G. Intelligences used in Classroom Centers ......................... 64
H. Books List That Support Each Intelligence ..................... 66
I. Parent Survey ................................................................. 68
J. Questions used for Student Interviews ......................... 74
K. Intelligence Profile Graphs ............................................. 76
CHAPTER I: INTRODUCTION

This study was designed to explore the relevance of Gardner's theory of Multiple Intelligences within an early childhood program. Gardner defines Multiple Intelligences as "a biological and psychological potential; that potential is capable of being realized to a greater or lesser extent as a consequence of the experiential, cultural, and motivational factors that affect a person" (Gardner, 1995, Myths of Multiple Intelligences, ¶8).

Gardner identified eight intelligences, interpersonal, intrapersonal, bodily kinesthetic, linguistic, logical mathematical, musical, naturalist, and spatial. It has documented that certain behaviors and interests are typically associated with each of the intelligences at the various age levels and that there are ways to strengthen the intelligences (Rettig, 2005).

There has been extensive research validating the use of Gardner's theory in the elementary grades, but there is little known about its use in the early childhood classroom. The ideas behind Gardner's theory are incorporated into the curriculum and instructional strategies that are used by prominent educators such as Maria Montessori, but little is know about the viability of identifying intelligence preferences in young children. Thus, this study has the potential to advance the existing literature base.

Overview of the Study

The purpose of this research study was twofold. First, this study aimed to explore whether it is realistic for classroom teachers to identify children's intelligence preferences. Second, this study was completed to determine to what degree the theory of
Multiple Intelligences can be used to structure an early childhood program and activities. Research findings suggest that there are behaviors, actions, and interests that are typically demonstrated by children who exhibit strengths in a particular intelligence (Rettig, 2005). Based on those findings, this study compared observational data to known facts about young children in relation to Gardner’s Theory of Multiple Intelligences. This study was specifically designed to advance our understanding of whether intelligence preferences could be identified and utilized in an early childhood classroom.

**Guiding Research Questions**

Specifically, four research questions guided the collection and analysis of data.

1. Do parents and school professionals perceptions about a child’s Multiple Intelligence profile match?

2. How consistently evident are dominant Multiple Intelligences in a preschool classroom?

3. Are parents and school professional’s observations consistent with a child’s self-selections in the classroom?

4. Are preschool children aware of their Multiple Intelligences?

**Methodology**

This study was completed with 16 participants, ranging in age from 4.3 years to 5.3 years. All participants were in the same full day preschool program in an Abbott district in New Jersey.

Data was collected from 5 sources: teacher observations, paraprofessional observations, parental observations, student interviews, and literature selections initiated by the students. The data gathered was then graphed to conclude whether it is possible
to create a useful Multiple Intelligence Profile for preschool aged children, without the
use of specialized tools.

Terminology Used

Multiple Intelligences. The collective term used to refer to all eight intelligence
categories: interpersonal, intrapersonal, bodily/kinesthetic, linguistic,
logical/mathematical, musical, spatial, and naturalistic (Checkley, 1997).

Preschool aged child. Children who are four or five years old. (New Jersey State
Department of Education, 2006).

Overview of the Paper

In Chapter Two, Gardner’s theory of Multiple Intelligences is presented.
Specifically, this includes a description of how this theory was developed and integrated
into educational settings. Next, a review of current research regarding the use and
impact of Multiple Intelligences in the classroom is provided. This includes descriptions
of Project Spectrum, DISCOVER, and the use of multiple intelligences with English
language learners. In Chapter Three, the research questions for this study are presented
and the methodology is described. In Chapter Four, the data gathered during the study is
presented and summarized. In Chapter Five, implications of this study are discussed,
recommendations are offered, and limitations of the study are reviewed.
CHAPTER II: REVIEW OF THE LITERATURE

The purpose of this research study was twofold. First, this study aimed to explore whether it is realistic for classroom teachers to identify children’s intelligence preferences. Second, this study was completed to determine to what degree the theory of Multiple Intelligences can be used to structure an early childhood program and activities. To set the context for this exploration, a review of the literature was conducted. First, the history of Multiple Intelligences will be outlined and the changes that Gardner has made to his theory over time will be discussed. Next, the impact that Gardner’s theory has made on education and curriculum development is discussed. Finally, the importance of Multiple Intelligences and the impact they have on interactions between the preschool child and his or her caregivers will be reviewed.

Resources used for this review were accessed using multiple strategies. The first source of information was locating works written by Gardner himself. Next, journal articles were also located using the ERIC database using the descriptors: Gardner, Multiple Intelligences, Early Childhood Education, and Project Spectrum. The reference lists from the articles obtained through the ERIC database were also used to gather more sources of information. A few of the academic journals searched for relevant articles include, Early Childhood Education Journal, Phi Delta Kappan, Teachers College Record, and Exceptional Children.

History

In the early 1980’s intelligence was defined by Gardner as “the human ability to solve problems or to make something that is valued in one or more cultures” (Checkley,
1997, p. 8). Although it was Gardner who originated the term “Multiple Intelligences” and brought this theory to the forefront of educational discussions through his book *Frames of Mind* (1983), the ideas he incorporated can be observed in the theories and practices of early educators in the 1800’s, such as Edouard Sequin, Maria Montessori, Froebel, and Loris Malaguzzi. These early theories focused on the concept of the “whole child”. For example, Froebel who is considered the “father” of Kindergarten, stressed the importance of language, sense, and nature (Rettig, 2005). A detailed explanation of the early childhood practices of Maria Montessori will be presented in the early childhood section of this paper.

Before Gardner wrote about Multiple Intelligences, the prevailing view was that intelligence was a singular construct based on those ideas that were important to the success in the school setting (Gardner & Hatch, 1989). Intelligence was also seen as something that could easily be tested, measured, and compared in order to determine the relationship between individuals according to their intelligence level. Consequently, assessment of intelligence reflected this view and although specific tests were modified slightly over time, they still measured essentially the same construct (Gardner & Hatch, 1989).

**Gardner’s Theory**

Gardner’s theory of Multiple Intelligences represents a very different view than this traditional, singular, construct. His theory is rooted in his beliefs that there is no test to concretely measure a person’s level of intelligence and that intelligence is not a valid predictor of an individual’s capabilities or potential. Gardner believes that the
intelligence tests currently being used only measure school-based skills and largely ignore a person's full range of abilities. For example, "it doesn't look at other virtues like creativity or civic mindedness, or whether a person is moral or ethical" (Checkley, 1997, p. 10).

In 1983, Gardner first proposed the theory of Multiple Intelligences in *Frames of the Mind*. Subsequently, he has redefined and expanded his theory in *Multiple Intelligences: The Theory In Practice* (1993), *Intelligences Reframed* (1999), and *Project Zero Frameworks for Early Childhood Education* (1998). Gardner currently believes "an intelligence is a biological and psychological potential; that potential is capable of being realized to a greater or lesser extent as a consequence of the experiential, cultural, and motivational factors that affect a person" (Gardner, 1995, p. 2).

**Intelligence Selection**

Gardner originally identified seven intelligences based on the repeated patterns of behavior he and his colleagues observed during a study of human cognition. Specifically, they used a selection process that was based on eight criteria (Chen, 2004, p. 18). A list of these criteria can be found in Appendix A. The eight "signs" (as Gardner referred to them) were designed only to be used as a focus of consideration. An intelligence was not necessarily included or excluded based on the frequency of criteria matched, rather the criteria was used to highlight the key elements of each. The seven intelligences that emerged through the use of this process were linguistic, musical, logical-mathematical, spatial, bodily-kinesthetic, intrapersonal, and interpersonal. However, Gardner (1993) stated that his initial theory would be revised as subsequent studies and data expanded their knowledge base.
In 1997, Gardner expanded his theory to include an eighth intelligence, naturalist. He also recognized the possibility of other intelligences being included in the future. Specifically he stated that the “evidence that [was] secured after 1983 continues to be hospitable to the [original] theory” (Gardner, 2004, p. 214) and the “theory is constantly being reconceptualized in terms of new findings from the laboratory and from the field” (Gardner, 1995, Myths of Multiple Intelligences, ¶19).

Unlike the techniques that are used to assess intelligence in the traditional sense, Gardner believes that understanding multiple intelligences is only possible by using a variety of measures to examine the performance and capability of an individual in various ongoing contexts. Further, since the theory of Multiple Intelligences was not created to compare individuals, but rather to identify and build each person’s unique blend of intelligences, new assessment strategies needed to be designed (Chen, 2004). As Gardner (1995) points out, a typical paper and pencil test would not be an accurate way to understand an individual’s range of strengths and weakness in all eight intelligences.

Although it has been advised by Gardner and Chen that a means of assessing the Multiple Intelligences needs to be developed, there is no standard means to do so. Gardner has been involved in projects such as Spectrum, Arts PROPEL, and Practical Intelligence for School. These programs were attempts at using “intelligence-fair measures” to “assess individual’s intelligences in a comfortable setting with materials that are familiar to the individual” (Gardner, 1995, Myths of Multiple Intelligences, ¶3).

**Application of Gardner’s Theory**

Gardner’s Theory of Multiple Intelligences is now viewed by many as being relevant to educational settings (Gardner, 1995). Although Gardner did not originally
seek to develop an educational philosophy, he now acknowledges the benefits since “education works most effectively for most individuals if these differences in mentation and strengths are taken into account rather then denied or ignored” (Gardner, 1995, Messages About MI in the Classroom, ¶9). Specifically, the theory of multiple intelligences has been infused into lesson plans, room arrangements, classroom management, and scheduling across all grade levels (Gardner, 1995). However, even Gardner cautions that despite the popularity of using the multiple intelligence theory “there is no ‘right way’ to conduct a multiple intelligences education” (Gardner, 1995, Messages About MI in the Classroom, ¶4).

Although the theory of Multiple Intelligences influences many aspects of education, the most significant impact might be how it shapes a teacher’s educational philosophy to reflect that “we are not all the same; we do not all have the same kinds of minds” (Gardner, 1995, Messages About MI in the Classroom, ¶9). The theory of Multiple Intelligences stresses that every individual posses all eight multiple intelligences, but not to the same degree. Consequently, teachers who follow Gardner’s theory, model their lessons to allow for the inclusion of all learning styles.

**The Eight Intelligences**

Gardner’s current theory includes eight intelligences: linguistic, logical-mathematical, spatial, bodily kinesthetic, musical, interpersonal, intrapersonal, and naturalist (Checkley, 1997). In this section, a summary of each intelligence will be provided. Specifically this includes a description of the common characteristics associated with each intelligence and a discussion about Gardner’s justification for
including the intelligence in his theory. Appendix B provides a summary of the eight intelligences.

_Linguistic intelligence._ Individuals who show strengths related to the linguistic intelligence have good language skills and are able to manipulate language easily. Language is at the root of human development and it is one of the first intelligences that babies exhibit by making babbling noises that soon progress to sounds, words, and eventually phrases or sentences (Calvin-Campbell, 1998). With this progression of language, one of Gardner’s criteria is being met. Language also has and identifiable core operation through sound/letter connections. Languages, although different across the world, still encompass the same purpose and stages of development. The use and manipulation of language is an important intelligence trait to possess when pursuing a writing career as a poet, journalist, speaker, or even a lawyer. People who exhibit a strength in this intelligence will tend to enjoy listening for the sounds of words, have a fondness for books and jokes, and often have the ability to spell words easily.

_Logical/mathematical intelligence._ Individuals who show strengths related to the logical/mathematical intelligence are “logic smart” (Rettig, 2005, p. 256). They also tend to excel in situations where there is a need for critical thinking and problem solving. The mathematical intelligence meets Gardner’s fourth and fifth criteria by having a set of stages with strong ties to various cultures. The mathematical sense is incorporated into the daily lives of people in various ways according to their culture and Gardner recognized that even primitive lifestyles incorporated the mathematical intelligence into their daily living activities. Another connection to Gardner’s list of criteria is that a person moves through stages in their development of logical/mathematical skills.
Scientists and mathematicians usually depend on a strong logical/mathematical intelligence to be successful at their jobs.

Musical intelligence. Individuals who show strengths related to the musical intelligence are able to manipulate music and discriminate the different patterns and sounds used in musical compositions. “People who have a strong musical intelligence don’t just remember music easily – they can’t get it out of their minds, it’s so omnipresent” (Checkly, 1997, p. 12). Although some philosophers might argue that the musical intelligence is more accurately classified as a talent, Gardner has included the musical intelligence because it involves an undeniable set of operations. Music has its own language and set of symbols that convey meaning. It is also possible for those with omnipresent musical intelligence to be at different levels of involvement with music. Both composers and musicians are seen as having a strong musical intelligence. Thus aside from the linguistic intelligence, the musical intelligence is the first intelligence to emerge and develop. It has been hypothesized that “A child’s first exposure to music is in the womb, hearing the repeated rhythm of the mother’s heartbeat. As children grow and develop, their musical involvement widens through opportunities for moving, listening, creating, and singing” (Hill-Clark, & Robinson, 2004, p. 92). Gardner adds support for the inclusion of the musical intelligence by referencing how some patients who have suffered brain injuries loose their ability to use language, but maintain their musical ability.

Bodily-kinesthetic intelligence. Individuals who show strengths related to the bodily-kinesthetic intelligence rely on their gross and fine motor abilities to succeed. The importance of the bodily-kinesthetic intelligence can be traced back to the Greeks during
the classical era where “they sought to develop a body that was perfectly proportioned and graceful in movement, balance, and tone” (Gardner, 1983, p. 207). In all cultures, the importance of the body is expressed in that the need for body movement for daily existence is imperative. At the most primitive levels, body movement is needed for hunting and sustaining life. On the other extreme the movement of the body could be worshiped and looked highly upon as a form of art. As with the other intelligences, people also progress from stage to stage in acquiring and strengthening their bodily-kinesthetic intelligence. The ability of being able to move the body in the absence other brain functions also supports Gardner’s decision to include bodily-kinesthetic as an intelligence. Commonly, these individuals are involved with professions such as athletics, dancing, carpentry, or other building trades.

Spatial intelligence. Individuals who show strengths related to the spatial intelligence are considered to have “picture smarts” (Rettig, 2005, p. 256). People that have strong spatial intelligences typically enjoy and excell at drawing, painting, building and/or constructing items. Spatial intelligence has been show to exist over time and throughout a wide array of cultures. Spatial intelligence is used in games, arts, and lifestyles in different parts of the world. This intelligence has also been demonstrated by those who are considered idiot savants and individuals who are blind such as the gentleman that despite a very low IQ can create pictures that are in high demand.

Personal intelligences (interpersonal/intrapersonal). The interpersonal and intrapersonal intelligences are collectively referred to as the personal intelligences. The personal intelligences, unlike the spatial or bodily-kinesthetic intelligences, are not easily comparable across cultures. Although they exist in these cultures, the interpersonal
intelligence is very distinct to a particular culture and is developed and cultivated depending on what is considered normal to that culture. For that reason “what might be pathological in one setting can be deemed normal in another” (Gardner, 1983, p. 240).

Individuals who show strengths related to the interpersonal intelligence have the ability to understand other people. These individuals are usually able to identify the feelings of those around them and are able to communicate and relate to these individuals. “We see highly developed forms of interpersonal intelligence in political and religious leaders, in skilled parents and teachers, and in individuals enrolled in the helping professions, be they therapists, counselors, or shamans” (Gardner, 1983, p. 239).

In contrast, individuals who show strengths related to the intrapersonal intelligence “have an understanding of yourself, of knowing who you are, what you can do, what you want to do, how you react to things, which things to avoid, and which things to gravitate toward” (Checkly, 1997, p. 12). People who have this awareness are typically self confident and goal oriented.

**Naturalist intelligence.** The eighth intelligence, which was added after Gardner proposed his original theory, is the naturalist intelligence. This intelligence was added because it represents an ability we need to survive as human beings, although it is not restricted to human beings. It also follows a progress of learning and there are certain parts of the brain that are particular dedicated to the recognition and the naming of what are called natural things (Checkly, 1997). Individuals who show strengths related to the naturalist intelligence enjoy and excel at discriminating among living things and they possess a sensitivity to other features of the natural world.
School Impact

Gardner did not originally propose his theory of Multiple Intelligences as an educational theory. However, over time its influence and use within educational settings has expanded. Although it is not a curriculum per say, the principles have been incorporated into many current school philosophies and classroom practices that exist today.

Philosophy

Educational mission and vision statements outline a school’s overarching philosophy and it’s goals for achievement. Many of these statements incorporate ideas that are aligned with Gardner’s theory of multiple intelligences. For example, the mission of the Bridgeton Public Schools, in Bridgeton New Jersey states: “all pupils graduate from high school as lifelong learners who will make positive contributions to the community, act with the highest moral and ethical standards, promote equal opportunity, and participate in the advancement of our democratic society” (Bridgeton Public Schools, 2006). Similarly, Bridgeton’s Early Childhood Program recently created the following mission statement that states: “to establish a foundation in which all students become active participants in a rich environment where developmentally appropriate practices are exemplified” (Bridgeton Public Schools, 2006). Finally, Rowan University claims to:

provide a collaborative, learning-centered environment in which highly qualified and diverse faculty, staff, and students integrate teaching, research, scholarship, creative activity, and community service. Through intellectual, social and cultural
contributions, the University enriches the lives of those in the campus community and surrounding region. (Rowan University, 2006)

Collectively, these mission statements illustrate how the theory of Multiple Intelligences has been incorporated into a variety of educational settings. These institutions, as well as many others, are committed to holistic student growth.

Classroom Practices

Instruction. Gardner’s theory of Multiple Intelligences has significantly impacted how many teachers structure their classroom. Historically, a uniformed strategy was used because it was assumed that all students learned the same way (Gardner & Hatch, 1989). However, Gardner’s theory has facilitated the use of multiple teaching strategies, which are strategically designed to match students’ unique strengths and needs (Hatch, 1997). This approach allows more students to feel included in instructional activities and it promotes achievement. Clearly it is not realistic for teachers to design and implement eight different versions of every lesson. Rather, if a particular student is struggling a teacher should be comfortable and should be encouraged to approach the lesson from a different perspective in order to reach that child (Gardner, 1995).

Gardner emphasized that educators should take “a deep interest in children and how their minds are different from one another, and to help them use their minds well” (Checkly, 1997, p. 111). In order to do this, teachers and caregivers need to be familiar with children’s unique strengths and weaknesses so they can tailor education expectations appropriately. Understanding a child’s strengths allows you to enhance those abilities, but also to develop areas that are weaker.
The goal of identifying a child’s strengths and weaknesses is not to label him or her, rather it is to assist the child in personal growth. Furthermore, it is important that all adults who interact with a child understand his or her unique intelligence profile and the developmental growth that has been made (Hatch, 1997). For example, a first grade teacher would want to identify the strengths and weaknesses of a child and share their findings with the child’s second grade teacher. Time can be saved and more productive learning can take place if information regarding a child’s multiple intelligences are recorded and passed on with the child. This enables future teachers to understand the child’s past and keep the child’s educational profile up to date with his or her current abilities (Checkley, 1997).

Assessment. Just as the theory of Multiple Intelligences has influenced instructional practices, it has also led to change in assessment practices. For example, some states have utilized annual performance-based assessments as a way to document students’ performance with authentic tasks. Two examples of this are the Maryland School Assessment and the New Jersey Assessment of Skills and Knowledge. These performance-based measures are being used to gain a more holistic and practical understanding of student’s abilities (New Jersey State Department of Education, 2006).

Gardner’s theory has influenced assessment practices at the preschool level as well. Whereas performance used to be measured and recorded on progress reports based on individual tasks such as color, shape, or color recognition, it is increasingly common for schools to use narrative progress reports. These narratives allow teachers to describe students’ performance across a variety of authentic tasks. For example, the Bridgeton
school district has revised their preschool progress reports to now include data and narratives that represent the development of the whole child.

Summary. In *Intelligence Reframed* (1999), Gardner reflected on his work with the theory of Multiple Intelligences and the outcomes that have occurred since in *Frames of Mind* (1993) was originally published. He challenged schools to recognize the differences that children have in obtaining and representing knowledge and create an environment where every individual is successful. However, he also outlined some concerns with the use of Multiple Intelligences in the classroom and some of the misconceptions that occurred with the use of his theory. Specifically, he expressed concern that his theory was being used to track or label children because these practice went against the core principles of his beliefs. “We are not all the same; we do not all have the same kinds of minds; and education works most effectively if these differences are taken into account rather than denied or ignored” (Gardner, 1999, p. 91).

Consequently, after identifying an individual’s strengths and weaknesses related to each of the eight intelligences, educators should strategically create instructional activities that allow students to become well rounded. This includes capitalizing and enhancing areas of strength as well as seeking to develop areas of weakness. Appendix C contains sample activities that help achieve this goal.

Home Impact

In addition to being integrated into educational practices, the theory of Multiple Intelligences can be utilized in home environments. If parents are able to identify their children’s interests, they can better provide activities that will promote growth. Appendix
D provides a list of behaviors that help identify children’s strengths and activities that encourage growth in each of the eight intelligences.

**Early Childhood Education**

In the beginning of this chapter, the basic principles and applications of Gardner’s theory of Multiple Intelligences were presented. In this section, a discussion of how this theory relates to early childhood education will be presented.

**Montessori Connections**

Many early childhood programs incorporate the theories and practices researched by Gardner and Montessori. Although the theorists worked independently, overlap exists in their thoughts of intelligence and educating the “whole child,” thus a discussion of Montessori’s ideas is relevant (Calvin, Campbell, 1998, p. 27).

Maria Montessori believed that the role of the teacher is to support a child’s endeavors and that learning should take place in “an environment which will enable children to develop freely” (Calvin-Campbell, 1998, p. 9). Within that context, Montessori believed a teacher’s primary purpose should be to support childrens’ explorations by allowing them to choose among a variety of hands on activities that encourage movement. Grounded in the belief that “the child with all the tools she needs for creating the adult she will become” (Calvin-Campbell, 1998, p. 13), the Montessori curriculum reflects this goal of self-discovery and development of the whole child.

Although Gardner’s theory of Multiple Intelligences was not specifically developed to reform educational practices, it naturally supports Montessori’s practices because both emphasize the development of the “whole child” and the use of activities
that encourage children to explore and develop skills in a variety of areas (Calvin-Campbell, 1998, p. 27).

The Use of Multiple Intelligences in an Early Childhood Classroom

As an early childhood educator, I am committed to creating environments where children can prosper because a child’s first school experiences must be positive. An early childhood educator’s job is two fold: she or he has to set the foundation for a productive school career and has to begin eliminating any obstacles that will prevent future educational success. I believe when students’ exhibit strengths, it is vital to recognize how to help them develop them. As they show weaknesses, their needs should be immediately addressed by using methods to help them grow. Because preschool aged children are in critical stages of development and are only beginning to realize their unique potential, it is vital to provide an enriching environment in which it would be possible to encourage development of the “whole child” (Calvin-Campbell, 1998). This philosophy directly reflects the underlying principles of Gardner’s theory of Multiple Intelligences (Berger, Pollman, 1996). As Gardner noted, “In early childhood education, instruction should emphasize on opportunity. It is during these years that children can discover something of their own peculiar interests and abilities” (Berger, Pollman, 1996, p. 243).

Irrespective of their own intelligence profile, teachers should strive to create instructional activities that relate to all eight intelligences and utilize learning centers that encourage children to explore areas where they feel most confident in working (Carlisle, 2001). The absence of mandated standardized tests at the preschool level further supports the application of Gardner’s theory because teachers have the freedom to design activities
based on their perceptions about students' strengths and needs, not in response to feeling the need to prepare students for the test. In Appendix E, a list of age-appropriate characteristics and activities associated with each intelligence is provided.

In many cases, Gardner’s theory can be easily included into the existing structures of a preschool class because activities that target each intelligence can be incorporated into existing learning centers. For example, within a block center, the verbal linguistic intelligence is incorporated when a child listens and speaks to others and writes signs. The logical-mathematical intelligence is used when a child counts, measures, and problem solves. The visual-spatial intelligence is used when a child imagines play scenarios and creates three-dimensional maps or structures from blocks. The bodily-kinesthetic intelligence is used when a child uses fine and gross motor skills to move within the area and to pick up blocks and put them together. The naturalist intelligence is used when a child forms relationships by matching, sorting, and classifying blocks and props such as animals, cars, and people. Interpersonal intelligence is used when a child uses social skills to work with peers toward a common building goal. The intrapersonal intelligence is used when a child gains a sense of self, abilities, and mastery in completing block structures. The musical intelligence is used when a child sings during cleanup (Carlisle, 2001).

In addition to incorporating the eight intelligences into pre-designed lessons, teachers should also use spontaneous teachable moments to extend their students' interest and skills in all areas. For example, if students found a ladybug in the classroom, the teacher should encourage all of the students to look at it but then allow each to decide
what related activity they wanted to pursue, (e.g. draw the ladybug, create a temporary home, write a song, search for more ladybugs, count the spots).

Research Studies

Because Gardner suggested that intelligences can be enhanced or diminished in response to opportunities in the environment, it is logical to question if strengths and weaknesses can be determined in young children. One program, Project Spectrum, was developed to explore this possibility. Project Spectrum found that “it is indeed possible to use alternative methods to assess strengths in children as young as four years old” (Chen, Krechevsky, Viens, Isberg, 1998, p. 3). Research suggests that incorporating the theory of Multiple Intelligences into school curriculums is practical. In this section, four specific studies will be discussed: A Pluralistic View of Early Assessment: The Project Spectrum Approach (Wexler-Sherman, 1988), an Application of Multiple Intelligences in a Lebanese Kindergarten (El Hassan, 1999), Discovering Multiple Intelligences through a performance based assessment consistency with independent ratings (Sarouphim, 1999), Learner-centered instruction and the theory of Multiple Intelligences with second language learners (Haley, 2004).

Project Spectrum

The findings of Project Spectrum have been documented in publications from the Project Spectrum group as a whole and also from the individuals who have contributed to the project. Most of the results that were reported were positive, although there were some negative concerns raised.

Project Spectrum was a ten year long experimental project that explored early childhood curriculum and assessment strategies created to reflect Gardner’s theory of
Multiple Intelligences. The program is built on the belief that “children exhibit a distinctive profile of different abilities, or multiple intelligences; moreover, rather than being fixed, these intelligences can be enhanced by an educational environment rich in stimulating materials and activities” (Chen et al., 1998, p. xiii). During the first four years, Project Spectrum focused solely on preschool aged children. During the fifth year, the program expanded to include children at the kindergarten and first grade levels.

The initial goal of Project Spectrum was to develop an assessment process which enabled students to demonstrate their “own distinct competencies across a broad range of content areas” (Wexler-Sherman, 1988, p. 79). Their model involved teachers observing students’ choices of center activities in order to develop a profile of strengths and weaknesses. The activities were categorized under seven broad titles (music, language, numbers, visual arts, movement, science, social) that focused on 15 sub-skills (Krechevsky, 1991). A sample list of activities that support each broad category is provided in Appendix F. Based on their observation of student behavior, an assessment and instruction program designed for public school settings was created.

Gardner & Hatch (1989) described the project spectrum research and the subsequent classroom tests that were completed. Field testing to determine reliability of assessment procedures was completed on Project Spectrum during the 1987-1988 school year with twenty preschool children from primarily white upper middle-income backgrounds. The children were assessed with the Stanford-Binet Intelligence Scale and through observations completed during spectrum activities (i.e., story telling, drawing, singing, music perception, creative movement, social analysis, hypothesis testing, assembly, calculation and counting, and number and notational logic). In order for a
comparison to be made between the activities, standard deviations were calculated for each. In determining strengths and weaknesses one standard deviation above or below, respectfully, was used. The data suggested that students’ performance was not the same across activities. “Distinct intellectual profiles” were found in nineteen of the twenty children (Gardner & Hatch, 1989, p. 8). Fifteen students showed a strength in at least one activity and twelve students showed areas of weakness.

Because this investigation of preschool involved a small sample of children, conclusions regarding the reliability and validity of the Spectrum assessment system should be made with caution. Additionally, the authors did not describe who completed the observations, which raises concern over the reliability of the data.

A second project Spectrum study was completed during the 1988-1989 school year with fifteen children in a combined kindergarten-first grade classroom in a low-to-middle-income public school district (Gardner & Hatch, 1989). Specifically, the sample included eight kindergartners (four boys and four girls) and seven first graders (five girls and two boys). These children were assessed using seven activities from the Modified Spectrum Field Inventory (MSPFI). This inventory encompasses activities dealing with language, numbers and logic, mechanics, art, music, social analysis, and movement and originated from the ideas used on the preschool level. For this study, two observers were used to develop student profile observations and the author reported an inter-rater reliability ranged from .88 -.97. As with the preschool study, strengths and weakness were determined using a metric of one standard deviation (Gardner & Hatch, 1989).

Many of the children’s profiles did not display a definitive area of weakness or strength. Some had no strengths or weaknesses and others had multiple areas of strength.
The authors explained that when they looked at the data for each individual child, they could not determine which intelligences were strengths or weaknesses. However, when they ordinally ranked all the participants, they could see patterns of strengths and weaknesses in comparison to the student’s peers. For example, one child’s individual scores may have suggested strengths in art and music. However, when the scores were compared to their peers, the art score remained strong, but the music score was no longer so distinct.

As in the first Project Spectrum study (Gardner & Hatch, 1989), the level of independence between activities was also examined. The authors reported that with this sample of older children, there were more correlations. Specifically, the kindergartners had a significant correlation between the art and social analysis activities. The activity dependence increased at the first grade level where the study showed there to correlations between the language and assembly activities, language and numbers activity, movement and social analysis activity, and the assembly and numbers activity.

Collectively, the results of this study suggest that it might be possible to use the Spectrum assessment tool, but only under certain conditions. However, findings from this study are potentially limited by a small sample size and the participants’ age range. It is also difficult to compare these results with the results from the first study because this project did not use the Stanford Binet as an assessment. Finally, the researchers noted that the students became familiar with tasks over time, so the data may have been influenced by that effect.
The reliability and validity of the Project Spectrum assessment tool was further explored in a study conducted by El Hassen (1999). This study used a pretest-posttest experimental group design with the pretest being the teachers’ overall achievement ratings of the children, based on the previous year’s performance and the posttest being the end of the experimental year ratings. The sample included 228 Lebanese kindergartners between the ages of 3.10 years and 5.6 years. All of the sample participants were classified as falling between “middle to high socioeconomic levels as decided by the school fees” (El Hassen, 1999, p 15). The experimental group (150 students: 84 male and 60 female) were educated in a private school in Beirut. The control group (78 students) was educated in a branch of this same school that was located in the suburbs. Both groups followed the school curriculum, but the experimental group also completed Project Spectrum activities as well.

Pretest and posttest data were collected at the beginning and end of the school year, respectfully. A profile of each child’s strengths and weaknesses, and the percentage of students showing distinct profiles was determined. A correlation matrix was also used to show the relationship between the different intelligences and a t test was used to evaluate the differences between the control and experimental groups’ preferences.

Results of this study suggested that the Lebanese kindergartners were able to have distinct profiles created with the Project Spectrum assessment tool and that the different intelligence are not highly related with one another. The author concluded that “the implementation of the Spectrum gave the teachers a rich picture of each child’s intelligence and they were able to recognize and address all of the students’ intelligences”
However, he did not find that the use of Project Spectrum activities resulted in higher achievement according to the end-of-the-year teacher ratings.

**DISCOVER Assessment Study**

Researchers sought to determine whether DISCOVER (Discovering Intellectual Strengths and Capabilities through Observation while allowing for Varied Ethnic Responses) could reliably assess a child’s Multiple Intelligences. During a two-phase study in the fall of 1995 and in the spring of 1996 the results of the DISCOVER assessment were compared to the observational data gathered by an independent observer, teacher, and teacher aide (Sarouphim, 1999).

DISCOVER assessment is a performance-based tool that was developed by University of Arizona to help identify giftedness among culturally diverse students. This assessment was based on the framework that Gardner outlined in his theory of Multiple Intelligences. DISCOVER is “designed for aggregated grade levels (k-2, 3-5, 6-8, 9-12)” and requires the students to complete problem solving tasks within the context of five activities (Sarouphim, 1999, Abstract, ¶ 7). These include the pablo(R) for the spatial intelligence; math for the logical-mathematical intelligence; tangrams for the spatial and logical-mathematical intelligences; storytelling and story drawing for the linguistic intelligence. Limited information about the sample was provided. The two students selected for this study were selected from the 24 students enrolled in a kindergarten class in a school that has a “large Hispanic population of lower socioeconomic status, as determined by the students place or residence and their participation in the free lunch program” (Sarouphim, 1999, Setting, ¶ 1). The two children were selected according to the results from a pretest that identified the children as extremely “gifted” cases. Anna, a
five year old Hispanic female, and Rita, a five and half year old Hispanic female, were observed twice, for approximately two and a half hours, each time. Interviews were conducted with the classroom teacher and aide who were aware of the DISCOVER assessment results. The results of this study suggested that information about the two girls’ multiple intelligences could be similarly classified through observation and the Discover assessment. The only inconsistencies were related to the personal and kinesthetic intelligences for Anna and only the personal intelligence for Rita.

One significant concern related to this research is the extremely small sample size. Another limit is the potential bias involved with observes who are familiar with the selection process of the two subjects. However, this study does offer tentative support that Multiple Intelligences could be correctly identified by teachers and other adults through observation and performance based tests.

*Learner-Centered Instruction and the theory of MI with Second Language Learners*

Haley conducted a study “to determine the impact of implementing the theory of multiple intelligences in daily classroom activities” (Haley, 2004, p. 164). It involved 23 foreign language and English as a Second Language teachers and their 650 students in grades K-12 who lived in Virginia, New York, Florida, Texas, Georgia, California, South Carolina, Kentucky, Australia and Germany. At the beginning of the study, an informal Multiple Intelligences survey was completed as a way to create an initial profile that would help increase the student’s and teacher’s awareness to the multiple intelligences.

The participants in this study were divided into two groups the quasi-experimental group and the quasi-control group. The quasi-experimental group incorporated the Multiple Intelligence theory into their instruction by creating learner-centered classrooms...
and having students engage in a wide variety of instructional activities. The quasi-control group relied heavily on rote drill and memorization.

Data was collected from daily logs, entrance surveys, weekly logs, and electronic communications via e-mail and websites. After the nine week study was completed, the students and teachers in both groups completed exit papers where they were asked to provide their personal reactions to the Multiple Intelligence activities and assessments. Teachers were also asked to write descriptive narratives that further described their feelings regarding the project and they provided grade reports to supplement the data on academic progress.

The results of this study suggests that student in the quasi-experimental group benefited from the use of the Multiple Intelligence theory because they had higher achievement, more enthusiasm, and exhibited fewer behavioral problems. However, these findings should be interpreted cautiously because the data for this study was collected with an extremely heterogeneous sample, the target content and activities differed in the classes, and the grading policies also differed from school to school. This study, though limited in nature, provides further evidence that the use of the Multiple Intelligence theory in the classroom “has the potential to make a positive impact on both teachers and students” (Haley, 2004, p. 172).

Summary

In summary, findings from the studies reviewed in this paper suggest that it might be beneficial to create a unique intelligence profile for each student in a classroom. This information could then be used to help teachers design learner centered environments that capitalize on strengths and addressing on areas of weakness. “[Project Spectrum] also
suggests that the development of different intelligences can be fostered from as early as the preschool years, through a learning environment that is child-centered.” (El Hassen, 1999, p. 19) However, many questions still remain about how teachers can identify intelligence strengths and weaknesses within the context of a regular early childhood classroom. This study was designed to explore whether collecting and analyzing multiple sources of data to create Multiple Intelligence profiles for students is a viable option.
CHAPTER III: METHODOLOGY

In this chapter, the research methodology will be discussed. First, the guiding research questions are presented. Next, the research strategies and data analysis procedures are discussed. Then, a description of the selected site and participants is offered. Finally, potential researcher biases and considerations related to reliability and validity will be presented.

Guiding Research Questions

Data collection and analysis for this study were initiated and guided by my interest in determining the degree to which a preschooler’s Multiple Intelligences can be identified by parents and educators. Specifically, the guiding research questions and sub-questions for this study included: Do parents and school professionals perceptions about a child’s Multiple Intelligence profile match?; How consistently evident are dominant Multiple Intelligences in a preschool classroom?; Are parents and school professionals observations consistent with the child’s self selections in the classroom?; and Are preschool children aware of their multiple intelligence tendencies?

Selected School

This study was conducted in a preschool classroom that is located in a public early childhood center in Southern New Jersey (given the pseudo name, Stonebrooke). Stonebrooke is part of an “Abbot” district. This means that the state has identified this district as being a “poorer urban district” based on a large percentage of enrolled families meeting the federal eligibility guidelines to participate in the
reduced/free meal program and the “municipal overburden” in regards to taxes. Overall, the students in this school are from lower economic households (New Jersey State Department of Education, 2006).

This school was selected for convenience purposes because it is the researcher’s place of employment. However, it provided an ideal site to study Multiple Intelligences among young children because of the diversity of the students and the use of a curriculum which provided children vast opportunities for free choice and exploration.

Selected Sample

The sample for this study included eight male and eight female children between the ages of 4.3 years and 5.3 years who were all enrolled in a full day program. Two of the students were Caucasian, six were African American, and eight were Hispanic. All eight Hispanic children come from Spanish speaking homes. Three of the children are extremely limited in their use of English in the classroom. The other five children range in their use of English, but all have at least a basic command of the language. All children in the sample were members of the same class which was lead by the researcher, a certified early childhood teacher. A highly qualified paraprofessional also assisted in the classroom.

Within the classroom, the early childhood curriculum, Tools of the Mind, was used. Daily lesson plans were created to support this curriculum and the New Jersey Early Childhood Education Program Expectations: Standards of Quality. Students were assessed using a variety of techniques. This included evaluating play plans and the productivity of play according the curriculum guidelines, completing a matrix based on
the New Jersey standards, and completing the state required Early Learning Assessment System (ELAS). These forms of assessment rely on teacher observation and portfolio collections to show growth and development during three grading periods in the 10 month school year.

As part of daily instruction, students had the opportunity to engage in free-choice activities for approximately two hours. Specifically, students were able to choose from six centers which included: Art, Block, Dramatic Play, Literacy, Science, and Table Toys. Each center included a variety of activities, materials, and toys from which students could choose. Appendix G includes a list of sample center activities related to each of the Multiple Intelligences. The primary goal of these activities was to promote mature play.

Research Strategies

Multiple research strategies were utilized for this study. These included observations of student choice during centers, informal discussions with students about literature choices, and surveys that were completed by the each participant, the teacher, the paraprofessional, and each participant’s parent.

Observations. For a period of three months, the teacher and paraprofessional documented students’ choice of centers and play scenarios. All six centers were available during all free-choice time periods. Students were also able to interact in a grocery store, mall, post office, and automobile repair shop during the time frame in which observations were recorded.
Informal discussions with students about literature choices. Once a week throughout the duration of the study, the teacher read a selection of books, representing each of the eight intelligences. This was done with the entire class in a whole group setting. These books were specifically selected to represent each of the eight Multiple Intelligences. Appendix H provides a list of the books used. Books selected to represent the logical/mathematical intelligence were counting books with simple texts. Those chosen for the linguistic intelligence used a variety of languages in the text. In selecting books for the musical intelligence those with alliterative text or those put to music were chosen. Books chosen for the intrapersonal intelligence focused on moral issues while the books chosen for the interpersonal intelligence with feelings and social interactions. Those books chosen for the spatial intelligence had a “hands on” theme. Movement books were chosen for the bodily-kinesthetic intelligence. Books describing nature and animals were chosen for the naturalist intelligence. After the readings, students were individually asked which of the books he or she wanted to reread.

Surveys. The parent(s) of each participant were asked to complete a survey regarding the behaviors and attitudes they observed at home. Parents were given a list of activities that reflected all eight intelligences and were asked to consider if their child typically demonstrated that behavior. Parents’ responses reflected their perspectives of how their child functioned within the context of his or her native languages and cultural expectations.

The teacher and paraprofessional who work with the students completed the same survey based on their perspectives of students’ behavior and interactions in the
classroom. Appendix I shows the survey completed by the parent, teacher, and paraprofessional.

Students also completed a survey that was designed to help them describe their interests in a developmentally appropriate manner. Specifically, each student indicated how they felt about certain activities during four individual interviews. The interview was split into four sessions to maximize the attention span of the child. During the interviews the teacher described each activity to the child. The child indicated his feelings regarding the activity through a verbal response and by coloring in the appropriate face i.e., (happy, neutral, sad). Appendix J shows the questions used during the student survey. All survey results were analyzed to determine which intelligences were considered to be dominant by the surveyor.

Data Collection and Analysis

Data related to each student was initially recorded on four separate graphs. The first graph displayed students' literature choices. The second graph displayed data gathered from both the parental and teacher completed surveys. The third graph displayed data collected from participants' surveys. The fourth graph displays the participants' self-selections, survey results and literature. Collectively, these four graphs, collectively, created a profile of patterns related to each of the eight intelligences.

To help with data analysis, a fifth graph was created to highlight the specific areas of intelligence that were noted to be dominant for the participants. This intelligence profile summarized the data from four sources: teacher, paraprofessional, parent, and the participants' self-selections. For the adult elements i.e., (teacher, paraprofessional,
parent) an intelligence was considered dominant if it received a ranking of a six or
greater. For the participant element an intelligence was considered dominant if it
received a ranking of four or greater. Appendix K contains these intelligence profile
graphs identified as Tables 1-16

After compiling the data regarding strengths, the graphs were analyzed to
determine if patterns related to each of the Multiple Intelligences emerged. The survey
data were also compared to see if patterns exhibited in the classroom were consistent with
those reported by parents about behavior at home. Specifically, the survey results were
analyzed to determine the level of dominance for each of the eight intelligences.

Reliability and Validity

Numerous strategies were used to increase the reliability and validity of this
study. Specifically, this included using data from the teacher, the paraprofessional, the
parents, and study participants themselves to create an intelligence profile. Students’
activities were monitored in a structured environment by a teacher and paraprofessional
that they had known for five months prior to data collection. The longevity of this study
was also an asset because it allowed students’ behaviors to be observed for three months.
Finally, although the researcher’s familiarity with the setting had the potential to impact
this study, the use of multiple data sources helped reduce this risk.
CHAPTER IV: ANALYSIS AND INTERPRETATION OF DATA

This chapter will present the data that were gathered during the research study. First, unique findings related to each participant’s intelligence profile are offered. Next, the findings related to the four research questions are presented. Finally, a summary of key points is offered.

Participant Profiles

The following section is an overview of the unique aspects that emerged from each participant’s profile (found in Appendix K).

Adam. A unique aspect of Adam’s profile is the high number of dominant intelligences identified by the parents. All eight intelligences were considered to be dominant according to the parent. In contrast, the paraprofessional identified only four intelligences as dominant, and the teacher and participant only found three.

Aiesha. A unique aspect of Aiesha’s profile is the contrasting opinions regarding dominant intelligences that the participant and the parent held. Specifically, the one intelligence Aiesha’s parents reported to be non-dominant is the intelligence that Aiesha indicated as most dominant.

Alba. A unique aspect of Alba’s profile is the consistency in identifying non-dominant intelligences. Specifically, the teacher, paraprofessional, parent, and Alba all indicated that the musical intelligence is non-dominant. The teacher, paraprofessional, and Alba also agreed that the mathematical intelligence was non-dominant.

Curtis. A unique aspect of Curtis’ profile is that he identified only two intelligences as dominant, whereas the adults indicated many intelligences as being
dominant. Specifically, Curtis only indicated the musical and spatial intelligences as being dominant. The teacher and paraprofessional identified both of these as well as five other intelligences as being dominant. The parent indicated that all eight intelligences were dominant.

_Danae._ A unique aspect of Danae’s profile is the high number of dominant intelligences that were reported by all four sources. Specifically, the teacher, paraprofessional, and parent identified all eight intelligences as being dominant. Danae self-identified six intelligences as being dominant.

_Dion._ A unique aspect of Dion’s profile is that the teacher and paraprofessional identified only two intelligences as dominant. They agreed that the bodily/kinesthetic intelligence was dominant, along with one other. The parent and participant did not report the bodily/kinesthetic intelligence to be dominant, but indicated that at least four others were dominant.

_Jennifer._ A unique aspect of Jennifer’s profile is the discrepancy between the dominant intelligences that were identified by Jennifer and the adult sources. Jennifer identified that three intelligences were dominant, whereas each adult reported at least six intelligences as being dominant.

_Jesus._ A unique aspect of Jesus’ profile is the different number of intelligences found to be dominant by Jesus and the adult sources. Jesus identified three intelligences to be dominant but the teacher, paraprofessional, and parent each indicated at least seven dominant intelligences, although they were not the same.
Juan. A unique aspect of Juan’s profile is the number of intelligences considered to be dominant by the parent as compared with the other three sources. The teacher, paraprofessional and the participant each reported that two intelligences were dominant, although they were not all identical. In contrast, Juan’s parent identified six dominant intelligences.

Julio. A unique aspect of Julio’s profile is that all four sources reported many intelligences were dominant. Specifically, the teacher and paraprofessional found all eight intelligences to be dominant and the parent and the participant reported seven.

Ketara. A unique aspect of Ketara’s profile is that her parent, the teacher, and the paraprofessional all identified at least seven intelligences as being dominant, whereas she only reported two.

Lamont. A unique aspect of Lamont’s profile is related to the specific level of dominance that he reported. Specifically, Lamont identified six intelligences as being dominant, but one (interpersonal) was much more dominant that the others.

Latisha. A unique aspect of Latisha’s profile is the contrast that emerged between her scores and those of the teacher. Specifically, the teacher identified five dominant intelligences and the participant identified two completely different intelligences as being dominant.

Luis. A unique aspect of Luis’ profile is the various levels of dominance reported for the naturalist intelligence. The participant and paraprofessional did not consider this intelligence to be dominant. The teacher reported that it was dominant, but not as dominant as other intelligences. In contrast, Luis identified it as being most dominant.
Sonya. A unique aspect of Sonya’s profile is the contrast between her scores and those of the teacher and paraprofessional. Specifically, Sonya only identified the musical and naturalist intelligences as being dominant, but neither of the adults reported the musical intelligence to be dominant.

Taneesha. A unique aspect of Taneesha’s profile is that the only dominant intelligence identified by the paraprofessional was the spatial intelligence, but neither the teacher nor Taneesha agreed. This profile is also unique because it consists of only three data sources because Taneesha’s parents did not complete the parent survey.

**Guiding Research Questions**

*Do parents and school professional’s perceptions about a child’s Multiple Intelligence profile match?*

The results of this study show parents and school professionals do not consistently identify the same intelligences as being dominant. Specifically, differences were noticed in both the number of intelligences that were reported to be dominant and which intelligences were identified as being dominant. Regarding the number of intelligences identified, parents indicated more dominant intelligences than the school professionals. On average, parents identified seven dominant intelligences for their child. In contrast, the teacher identified an average of five for each participant and the paraprofessional identified an average of six. More specifically, six parents identified all eight intelligences as being dominant. In contrast, the teacher only identified three participants as being dominant in all eight and the paraprofessional only identified four.
Regarding the actual intelligences that were identified as being dominant, it was found that the two school professionals and the parents never created the same profile pattern. However, there were examples where some agreements were found. An example of differing perceptions is evident in Dion’s profile. Both the teacher and paraprofessional identified the bodily/kinesthetic intelligence as dominant, but then they each identified a second dominant intelligence, spatial and intrapersonal, respectfully. The teacher and the parent did not identify any of the same dominant intelligences, and the paraprofessional and the parent agreed on one, the intrapersonal intelligence.

A similar scenario emerged with Adam’s profile. Adam’s parent identified all eight intelligences as dominant, the teacher indicated that the linguistic, musical, and naturalist intelligences were dominant and the paraprofessional identified the intrapersonal, bodily/kinesthetic, mathematical, and spatial intelligences as dominant.

*How consistently evident are dominant Multiple Intelligences in a preschool classroom?*

Observational data were collected by both the teacher and the paraprofessional. These are the first two elements of the individual profile graphs. This data suggests that the participants did not display a single dominant intelligence in the classroom. Individually, the teacher and the paraprofessional each identified more than one dominant intelligence for all but one participant, Taneesha. In her profile the paraprofessional only found the spatial intelligence to be dominant. But when observing the data collectively it is seen that together the teacher and paraprofessional found that each participant had at least three dominant intelligences. Specifically, the teacher and paraprofessional
collectively identified that half of the participants were dominant in all eight intelligences. Three other participants were identified as being dominant in seven of the intelligences. One participant each was identified as being dominant in four, five, and six of the intelligences. Finally, the teacher and paraprofessional identified two participants to be dominant in three intelligences.

The data for individual intelligence levels in this study were close in range. Due to the proximity of data it does not appear as though dominant multiple intelligences were consistently evident in this study.

Are parents and school professional’s observations consistent with the child’s self-selections in the classroom?

Comparisons between the adult surveys and the students’ self-selections proved difficult because of the significant differences in the perceptions of dominance reported by the teacher, paraprofessional, and parents. To simplify the analysis, participants’ perceptions were compared to each adult separately. Using that technique, it was found that six of the participants matched the teacher, nine matched the paraprofessional, and eight matched the parents in reporting the same intelligences as being dominant. For example, Jesus identified the interpersonal, bodily/kinesthetic, and naturalist intelligence to be dominant. He agreed with the paraprofessional and parent, but did not agree with the teacher. He was in agreement with the paraprofessional and parent since all three intelligences, the interpersonal, bodily/kinesthetic, and naturalist intelligence were all identified by both people. Jesus was not in agreement with the teacher since she did not find the naturalist intelligence to be dominant.
It is important to note that there were four instances (Curtis, Danae, Jennifer, and Ketara) where the participants' beliefs about dominance matched all three adults. However, even though there was some consistency between the child and the adults, the three adults had additional intelligences identified. For example, in Jennifer’s profile the dominant intelligences that the adults agreed with Jennifer on were the intrapersonal, linguistic, and spatial intelligences. In addition to those three the teacher found an additional four intelligences to be dominant, the paraprofessional found an additional three, and the parent and additional five.

*Are preschool children aware of their multiple intelligences?*

The results of this study suggest that participants had limited awareness of their dominant intelligences. Specifically, participants answered in a neutral or positive fashion to 79% of all the questions about activities they like to do. Many of the participants answered yes to at least some of the questions related to each intelligence. Only Ketara, Taneesha, and Adam answered no to all the questions pertaining to a particular intelligence. This suggested that these three students had an acute awareness to areas that they disliked.

Fifty percent of the children demonstrated a partial dislike towards at least one of the intelligences by answering no to 75% of the questions related to a specific intelligence. For example Luis’ answers, suggested that he was dominant in seven of the intelligences. This conclusion was drawn because he answered yes to all questions posed regarding the interpersonal, bodily/kinesthetic, mathematical, and spatial intelligences. He also answered yes 75% of the time for linguistic, musical, and
naturalistic intelligences. The only intelligence that was not considered to be dominant was the intrapersonal intelligence because he only answered yes to 25% of the questions pertaining to this intelligence.

Although students had difficulty consistently describing their preferences for certain activities during the interview, daily observations showed that some demonstrated preferences. Specifically, ten of the participants continually chose similar activities. In contrast, only six students did not select activities which suggested a preference for a particular intelligence. For example, Aiesha did not show preferences to particular activities in the classroom and would interact with materials that represented different intelligences while playing in centers. On the other hand, Curtis’ self selections during free play tended to focus on drawing activities.

Summary of Findings

Based on the findings from this study, a number of conclusions can be drawn regarding Multiple Intelligences in the participating preschool aged children. First, it appears that the teacher, the paraprofessional, and the parents had differing perceptions about which intelligences were dominant for each participant. Specifically, there was little consistency with the number of dominant intelligences reported and in the specific intelligences that were perceived to be dominant. Second, participants appear to display more than one dominant intelligence in the classroom. Third, participant’s views related to their own dominant intelligences frequently differed from those reported by the teacher, paraprofessional, or parent. Fourth, participants appeared to have limited self-awareness related to dominant intelligences.
CHAPTER V: SUMMARY, FINDINGS, AND CONCLUSIONS

In this chapter, connections between previous research and the findings from this study are discussed. Then, personal reflections and recommendations are offered. Finally, limitations of the study are identified.

Relationship to Previous Research

Howard Gardner did not originally propose his theory of Multiple Intelligences to be applied in the educational setting. However, over time its influence and use within educational settings has expanded, because “education works most effectively for most individuals if these differences in mentation and strengths are taken into account rather then denied or ignored” (Gardner, 1995, Messages About MI in the Classroom, ¶ 8). This is especially true in the preschool setting (Rettig, 2005).

Previous research investigated whether Gardner’s theory could be used to understand students’ strengths and needs. For example findings from the Project Spectrum study suggest that “children exhibit a distinctive profile of different abilities, or multiple intelligences” and the assessment tool could be used to create distinct intelligence profiles that identified dominant strengths and weaknesses for each student (Chen et al., 1998, p.xiii). Similarly, El Hassen (1999), found that by using the Project Spectrum Assessment tool in a Lebanese Kindergarten “teachers [had] a rich picture of each child’s intelligence and they were able to recognize and address all of the students’ intelligences” (p. 16). Sarouphim (1999) also found that observational data supported the intelligence profiles created through the use of specialized tools.
The data from this study offers some support for the findings that multiple intelligence profiles can be created for preschool children. However, it was not found that using multiple data sources would help clarify areas of dominance. In fact, just the opposite was found because there was little consistency in the perceptions of the teacher, paraprofessional, parent, and child.

Unlike the findings of Chen (1998), El Hassen (1999), and Sarouphim (1999), the multiple intelligence profiles created in this study did not highlight one area of dominance for each student. Rather, multiple dominant intelligences emerged. This finding supports Gardner's ideas that everyone possess a combination of the eight intelligences, and the respective levels of dominance are always changing. As he stated, "an intelligence is a biological and psychological potential; that potential is capable of being realized to a greater or lesser extent as a consequence of the experiential, cultural, and motivational factors that affect a person" (Gardner, 1995, p.2).

Due to differences in backgrounds and levels of education, I expected that similar opinions regarding intelligence profiles would not be reported by the teacher, paraprofessional, and parent. However, I was surprised with the extremely different perspectives that emerged. Perhaps the differences between the school professionals occurred because of the individual relationships that the teacher and paraprofessional have fostered with each participant during the ten months of school. Although both school professionals functioned in similar ways throughout the day, certain roles were established by each for certain children. For example, for students who had a behavior problem either the teacher or the paraprofessional was in charge of supporting that
student. Those who came in after the year started and who had a language delay primarily worked with the teacher and special bonds would have been formed separate with those that formed with the paraprofessional. These special bonds provided the teacher with a more in-depth understanding of the child’s preferences then the paraprofessional who did not develop as strong of a relationship with the child.

The lack of consistency among the adult observers in creating intelligence profiles is abundantly clear when reviewing the parent’s perceptions. Specifically, parents answered “yes” to the vast majority of questions that described activities. There are three possible explanations for this situation. First, parents may have answered yes to most questions to give a positive impression that their child was “well rounded”. Second, the overwhelming positive responses may be the result of parent’s misinterpreting the question or situation posed in the question. This theory is supported by the fact that during conferences held to discuss progress reports, some parents need verbal clarifications to support the written activities. Third, the parents may have answered yes to situations that they had not actually observed.

Finally, the results of the students’ self-selections suggested that they had limited awareness of their Multiple Intelligences, but the teacher’s observations suggest that their behavior did reveal patterns. This finding is unique to this study since El Hassen (1999) and Sarouphim (1999) did not observe the demonstration of self-awareness in any manner.
Personal Thoughts

This study proved to be extremely beneficial for my own professional growth as a preschool teacher. I had always thought that it was important to consider children's interests when designing lesson plans and activities. However, after expanding my knowledge of Gardner's theory of Multiple Intelligences, I now have a much better understanding of my students and can more effectively design activities to suit their unique intelligence profiles. Using that approach allows me to truly nurture the whole child.

Recommendations

The findings from this study suggest that consistent Multiple Intelligence profiles did not emerge from the multiple data sources that were selected. The teacher, paraprofessional, parents, and participants had differing perceptions about dominance. It was also found that participants appeared to have multiple areas of dominance, although the measures used with this study were not sensitive enough to measure the dominant strength with in each profile. However, observational data did provide evidence that the preschool aged children in this study did show preferences towards activities in the classroom.

Based on those conclusions, I believe that Gardner's theory of Multiple Intelligences is relevant to the preschool classroom. Because participants demonstrated multiple areas of dominance, it seems very appropriate for teachers to create activities that reflect all eight intelligences. Since students show preferences towards certain
intelligences, these preferences can be used to increase and strengthen areas of dominance and also enhance those which are less dominant.

I plan to continue to use Gardner’s theory in future years while developing lessons and activities. However, since the findings from this study suggested that the use of multiple data sources did not create a unified profile, I plan to only utilize classroom observations to develop intelligence profiles. This knowledge will assist me in teaching my students and will also be beneficial to share with parents.

The use of intelligence profiles could also prove to be beneficial in the social aspect of the preschool classroom. I am interested in utilizing the profiles to help children who have socialization delays to interact with children who have similar interests. This initial pairing of children could increase their self-esteem and allow them to be more comfortable in exploring the classroom environment.

Limitations

As with all research, this study had some inherent limitations. First, the sample only reflects students who were members of one classroom. This could limit the study since two of the three observers were the same for all sixteen children. Second the survey instruments used with this study were developed by the researcher. Thus, there is not any reliability or validity data available for them. Finally, although the use of observations provided additional information about student preferences, there is always the risk that personal bias influenced this data.
References


### Appendix A

**Gardner’s Selection Criteria**

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potential isolation by brain damage</td>
<td>The extent that a particular faculty can be destroyed, or spared in isolation, as a result of brain damage, its relative autonomy from other human faculties seems likely</td>
</tr>
<tr>
<td>Exceptional individuals</td>
<td>Individuals who exhibit highly uneven profiles of abilities and deficits such as idiot savants and prodigies</td>
</tr>
<tr>
<td>An identifiable core operation or set of operations</td>
<td>An existence of one or more basic information-processing operation or mechanisms, which can deal with specific kinds of input</td>
</tr>
<tr>
<td>A distinctive developmental history, along with a definable set of expert “end state” performances</td>
<td>An intelligence should have stages in which individuals pass with a definite end state performance</td>
</tr>
<tr>
<td>An evolutionary history and evolutionary plausibility</td>
<td>An intelligence should have prior roots and evidence to supports it existence over time</td>
</tr>
<tr>
<td>Support from experimental psychological tasks</td>
<td>This is used to support that an intelligence is capable of independently operating from the other intelligences</td>
</tr>
<tr>
<td>Support from psychometric findings</td>
<td>There should be low correlations between intelligences</td>
</tr>
<tr>
<td>Susceptibility to encoding in a symbol system</td>
<td>A primary characteristic of human intelligence is it’s “natural” gravitation toward embodiment in a symbolic system</td>
</tr>
</tbody>
</table>

Note: from Gardner, (1993), p.63
### Gardner's Eight Intelligences

<table>
<thead>
<tr>
<th>Intelligence</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bodily-kinesthetic</td>
<td>The potential of using one's whole body or parts of the body to solve problems or fashion products</td>
</tr>
<tr>
<td>Interpersonal</td>
<td>Denotes a person's capacity to understand the intentions, motivations, and desires of other people and, consequently, to work effectively with others</td>
</tr>
<tr>
<td>Intrapersonal</td>
<td>The capacity to understand oneself, to have an effective working model of oneself— including one's own desires, fears, and capacities – and to use such information effectively in regulating one's own life</td>
</tr>
<tr>
<td>Linguistic</td>
<td>Sensitivity to spoken and written language, the ability to learn languages, and the capacity to use language to accomplish certain goals</td>
</tr>
<tr>
<td>Logical-mathematical</td>
<td>The capacity to analyze problems logically, carry out mathematical operations, and investigate issues scientifically</td>
</tr>
<tr>
<td>Musical</td>
<td>Skill in the performance, composition, and appreciation of musical patterns</td>
</tr>
<tr>
<td>Naturalist</td>
<td>The ability to recognize and classify plants, minerals, and animals, including rocks and grass and all variety of flora and fauna</td>
</tr>
<tr>
<td>Spatial</td>
<td>The potential to recognize and manipulate the patterns of wide space as well as the patterns of more confined areas</td>
</tr>
</tbody>
</table>

Note: from Gardner, (1999), p. 41
### Appendix C

#### Activities to Strengthen Intelligences

<table>
<thead>
<tr>
<th>Weakness</th>
<th>Strength</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interpersonal</td>
<td>Intrapersonal</td>
<td>Trust and Team Building activities</td>
</tr>
<tr>
<td>Bodily-Kinesthetic</td>
<td>Role playing or creative dramatics</td>
<td></td>
</tr>
<tr>
<td>Linguistic</td>
<td>Person of the Week interviews</td>
<td></td>
</tr>
<tr>
<td>Logical-Mathematical</td>
<td>Sort students by favorite activities or personality attributes</td>
<td></td>
</tr>
<tr>
<td>Musical</td>
<td>Singing or playing with a group; Matching music to moods</td>
<td></td>
</tr>
<tr>
<td>Spatial</td>
<td>Make partner drawings; design a group mural</td>
<td></td>
</tr>
<tr>
<td>Intrapersonal</td>
<td>Interpersonal</td>
<td>Describe yourself; have a classmate describe you, then compare</td>
</tr>
<tr>
<td>Bodily-Kinesthetic</td>
<td>Listen to a made-up situation; use body movement to react</td>
<td></td>
</tr>
<tr>
<td>Linguistic</td>
<td>Write in journals or create diary entries as a character in a story</td>
<td></td>
</tr>
<tr>
<td>Logical-Mathematical</td>
<td>Create charts and graphs of interests; construct a feelings mind map</td>
<td></td>
</tr>
<tr>
<td>Musical</td>
<td>Listen to a song and describe how it makes you feel</td>
<td></td>
</tr>
<tr>
<td>Spatial</td>
<td>Create a collage, painting, mobile to describe or represent who you are</td>
<td></td>
</tr>
<tr>
<td>Bodily-Kinesthetic</td>
<td>Interpersonal</td>
<td>Role Playing; drama, mime, and charades</td>
</tr>
<tr>
<td>Intrapersonal</td>
<td>Individual sports; Mediation; Yoga</td>
<td></td>
</tr>
<tr>
<td>Linguistic</td>
<td>Sign Language; write or make letters using the whole body</td>
<td></td>
</tr>
<tr>
<td>Logical-Mathematical</td>
<td>Use body math to reinforce patterning, estimating, shapes and counting; solve problems using manipulatives</td>
<td></td>
</tr>
<tr>
<td>Musical</td>
<td>Dancing; Playing a musical instrument</td>
<td></td>
</tr>
</tbody>
</table>

52
<table>
<thead>
<tr>
<th>Spatial</th>
<th>Creating Play dough and clay sculptures; building</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linguistic</td>
<td>Collaborative writing; panel discussions or debates</td>
</tr>
<tr>
<td>Interpersonal</td>
<td>Personal narratives, journal writing or experience charts; Show and Tell activities and Person of the Week Interviews</td>
</tr>
<tr>
<td>Intrapersonal</td>
<td>Finger Plays and Puppet shows; Dramatic Play</td>
</tr>
<tr>
<td>Bodily-Kinesthetic</td>
<td>Story Mapping; Crossword Puzzles</td>
</tr>
<tr>
<td>Logical-Mathematical</td>
<td>Writing lyrics to songs; creating poetry</td>
</tr>
<tr>
<td>Musical</td>
<td>Book Making; alphabetizing</td>
</tr>
<tr>
<td>Spatial</td>
<td>Board games; cooperative skill building</td>
</tr>
<tr>
<td>Logical</td>
<td>write in Math journals; Create own story problems from your life experiences</td>
</tr>
<tr>
<td>Mathematical</td>
<td>Determine probability by shooting basketballs or rolling dice</td>
</tr>
<tr>
<td>Intrapersonal</td>
<td>Time Lines; Statistical analysis to create a story.</td>
</tr>
<tr>
<td>Bodily-Kinesthetic</td>
<td>Put number problems to music; clap patterns or rhythms</td>
</tr>
<tr>
<td>Musical</td>
<td>Manipulatives like unifix cubes, Cuisenaire rods, pattern blocks, geo-solids, and geo-boards</td>
</tr>
<tr>
<td>Spatial</td>
<td>Play circle games; Learn musical games from other countries</td>
</tr>
<tr>
<td>Musical</td>
<td>Listen to music and think about how it affects you; Compare yourself to a musical instrument or piece of music</td>
</tr>
<tr>
<td>Bodily-Kinesthetic</td>
<td>Use your body to make music; make up a dance with instrumental accompaniment</td>
</tr>
</tbody>
</table>

53
<table>
<thead>
<tr>
<th>Domain</th>
<th>Activity Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linguistic</td>
<td>Compose a song, rap, jingle or melody; Find music to accompany parts of a story or poem which demonstrate the mood</td>
</tr>
<tr>
<td>Logical-Mathematical</td>
<td>Assign sounds to pattern elements and play the pattern; sort and classify music by style, genre, or instrumentation</td>
</tr>
<tr>
<td>Spatial</td>
<td>Listen to a musical work and draw the visual image you get</td>
</tr>
<tr>
<td>Spatial</td>
<td>Murals, collages, and finger puppets</td>
</tr>
<tr>
<td>Interpersonal</td>
<td>Make dioramas, design costumes</td>
</tr>
<tr>
<td>Intrapersonal</td>
<td>Building with geometric solids, blocks or manipulatives; painting with different tools</td>
</tr>
<tr>
<td>Bodily-Kinesthetic</td>
<td>Flannel boards; poster and display boards</td>
</tr>
<tr>
<td>Linguistic</td>
<td>Puzzles and mazes; Scale models</td>
</tr>
<tr>
<td>Logical-Mathematical</td>
<td>Create a floor plan of the symphony; Set up an orchestra using paper models of instruments.</td>
</tr>
</tbody>
</table>

Note: from New City Schools, 1994.
## Appendix D

### Intelligence

#### Linguistic Activities
- Talking with them
- Lots of books
- Supplies for writing,
- Family storytellings,
- Trips to places where words are important

### Activities For Parents

<table>
<thead>
<tr>
<th>Intelligence</th>
<th>Behavior</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linguistic</td>
<td>- Likes to write creatively at home</td>
<td>- Talking with them</td>
</tr>
<tr>
<td></td>
<td>- Spins tall tales or tell jokes and stories</td>
<td>- Lots of books</td>
</tr>
<tr>
<td></td>
<td>- Has a good memory for names, places, dates, or trivia</td>
<td>- Supplies for writing,</td>
</tr>
<tr>
<td></td>
<td>- Enjoys reading books for pleasure</td>
<td>- Family storytellings,</td>
</tr>
<tr>
<td></td>
<td>- Spells words accurately and easily</td>
<td>- Trips to places where words are important</td>
</tr>
<tr>
<td></td>
<td>- Appreciates nonsense rhymes and tongue twisters</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Likes doing crossword puzzles or playing games such as scrabble or anagrams</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Enjoys listening to the spoken word</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Has a good vocabulary for his or her age</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Excels at subjects in school that involve reading and/or writing</td>
<td></td>
</tr>
<tr>
<td>Logical/</td>
<td>- Computes arithmetic problems quickly in his or her head</td>
<td>- Concrete materials to explore</td>
</tr>
<tr>
<td>Mathematical</td>
<td>- Enjoys using computer languages or logical software programs</td>
<td>- Be patient with their questions</td>
</tr>
<tr>
<td></td>
<td>- Asks question like “Where does the universe end?” or “Why is the sky blue?”</td>
<td>- Logic based games</td>
</tr>
<tr>
<td></td>
<td>- Plays chess, checkers, or other strategy games with skill</td>
<td>- Provide opportunities for collections</td>
</tr>
<tr>
<td></td>
<td>- Reasons out problems logically</td>
<td>- Go places that encourage scientific thinking</td>
</tr>
<tr>
<td></td>
<td>- Devises experiments to test out things that aren’t understood at first</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Spends lots of time working on logic puzzles or games</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Enjoys putting things in categories or</td>
<td></td>
</tr>
</tbody>
</table>
hierarchies
- Has a good sense of cause and effect
- Enjoys math or science classes at school
  and does well in them

<table>
<thead>
<tr>
<th>Spatial</th>
<th>- Excels in art class at school</th>
<th>- Provide opportunities to create with paint and other materials</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- Reports clear visual images when thinking about something</td>
<td>- explorations with cameras, telescopes</td>
</tr>
<tr>
<td></td>
<td>- Easily reads maps, charts, and diagrams</td>
<td>- three-dimensional building supplies</td>
</tr>
<tr>
<td></td>
<td>- Draws accurate representations of people or things</td>
<td>- visit architectural landmarks, planetariums, and art museums.</td>
</tr>
<tr>
<td></td>
<td>- Likes it when you show movies, slides, or photographs</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Enjoys doing jigsaw puzzles, mazes, or other visual activities</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Daydreams a lot</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Builds interesting three-dimensional constructions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Doodles on stray scraps of paper or on school work</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Gets more out of pictures than words while reading</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bodily-Kinesthetic</th>
<th>- Does well in competitive sports at school or in the community</th>
<th>- Allot time for activities that allow for role-play, creative movements or physical activities</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- Moves, twitches, taps or fidgets while sitting in a chair</td>
<td>- Access to playgrounds and locations for gross motor exploration.</td>
</tr>
<tr>
<td></td>
<td>- Engages in physical activities such as swimming, biking, hiking, or skateboarding</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Needs to touch things in order to learn more about them</td>
<td>- Opportunities for hands on explorations such as fixing or creating</td>
</tr>
<tr>
<td></td>
<td>- Enjoys jumping, running, wrestling, or similar activities</td>
<td></td>
</tr>
</tbody>
</table>
- Demonstrates skill in a craft like woodworking, sewing, carving, or sculpture
- Cleverly mimics other people’s gestures, mannerisms, or behaviors
- Gets “gut feelings” when working on problems at home or school
- Enjoys working with clay, fingerpainting, or other “messy” activities
- Loves to take things apart and put them back together again

### Musical
- Plays a musical instrument at home or in a school orchestra or band
- Remembers melodies of songs
- Does very well in music class at school
- Studies better when background music is playing
- Collects CDs or tapes
- Sings to herself or to others
- Keeps time rhythmically to music
- Has a good singing voice
- Is sensitive to environmental noises
- Responds strongly to different kinds of music

### Interpersonal
- Has a lot of friends
- Socializes a great deal at school or around the neighborhood
- Appears to be “street smart”
- Gets involved in after-school group activities
- Serves as the “family mediator” when disputes arise

- Provide experiences with music either through instruments or computer programs
- Supply a variety of musical experiences at home
- Visit places such as operas or musicals.
- Provide many opportunities to interact with others, so child can take on a teaching or supportive role with others
- Join activities or social groups where there is
- Enjoys playing group games
- Has a lot of empathy for the feelings of others
- Is sought out as an “adviser” or “problem-solver” by peers
- Enjoys teaching others
- Seems to be a natural leader

**Intrapersonal**
- Displays a sense of independence or a strong will
- Has a realistic sense of her strengths and weaknesses
- Reacts with strong opinions when controversial topics are being discussed
- Works or studies well alone
- Has a sense of self-confidence
- Marches to the beat of a different drummer
- Learns from past mistakes
- Accurately expresses inner feelings
- Is goal-directed
- Engages in self-directed hobbies or projects

**Naturalist**
- Relates well to pets
- Enjoys walks in nature or to the zoo or a natural history museum
- Shows sensitivity to natural formations
- Loves to garden or be around gardens
- Spends time near aquariums, terrariums, or other natural living systems
- Displays an ecological awareness
- Believes that animals have their own rights
- Keeps records of animals, plants, or other cooperation among the members.

- Allow child to pursue hobbies and interests independently in a quiet undisturbed location
- Support their desire to be individualistic.

- Provide access to the outdoors or with living things so the child can observe and research using tools such as binoculars, telescope, or a magnifying glass
- Go on nature walks or visit museums and zoos together
natural phenomena
- Brings home bugs, flowers, leaves, or other
natural things to share with family members
- Does well in topics at school that involve
living systems

Note: from Armstrong, 2000
### Appendix E

#### Preschool Behaviors and Activities

<table>
<thead>
<tr>
<th>Intelligence</th>
<th>Behavior</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Logical-Mathematical</strong></td>
<td>- Likes to categorize things</td>
<td>- Provide these students with books that have simple text, clear plot, and that include counting experiences</td>
</tr>
<tr>
<td></td>
<td>- Enjoys creating patterns and matching objects</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Enjoys number and counting activities</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Excels at sorting and 1-1 correspondence activities</td>
<td></td>
</tr>
<tr>
<td><strong>Linguistic</strong></td>
<td>- Talk a lot</td>
<td>- Encourage these children to create books where they are writing about their experiences.</td>
</tr>
<tr>
<td></td>
<td>- Memorize rhymes/fingerplays</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Enjoy sharing experiences</td>
<td>- Expose these students with books that have other languages in them</td>
</tr>
<tr>
<td></td>
<td>- Strong oral language</td>
<td></td>
</tr>
<tr>
<td><strong>Musical</strong></td>
<td>- Love to sing both individually and in groups</td>
<td>- For these students you should incorporate music with books. Sing books instead of reading them. Use books with alliterative text. Make a tape of the children singing through the book.</td>
</tr>
<tr>
<td></td>
<td>- Enjoys the listening and instrument center</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Able to discriminate sounds easily</td>
<td></td>
</tr>
<tr>
<td><strong>Intrapersonal</strong></td>
<td>- Wise beyond years</td>
<td>- For these children you should create a class student made book and choose books that have characters with moral issues.</td>
</tr>
<tr>
<td></td>
<td>- Philosophers</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Ask “why?”</td>
<td></td>
</tr>
<tr>
<td><strong>Interpersonal</strong></td>
<td>- Empathy for others</td>
<td>- For these children you should create a class student made book and choose books that deal with family, pets, friendship, love, or socializing themes.</td>
</tr>
<tr>
<td></td>
<td>- Wants peace – is a mediator</td>
<td></td>
</tr>
<tr>
<td>Spatial</td>
<td>Kinesthetic</td>
<td>Naturalist</td>
</tr>
<tr>
<td>------------------</td>
<td>------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>- Good fine motor skills</td>
<td>- Gross motor traits – have to move</td>
<td>- Love plants/animals</td>
</tr>
<tr>
<td>- Unique and creative</td>
<td></td>
<td>- Enjoys learning about insects and dinosaurs</td>
</tr>
<tr>
<td>- Enjoys making collage, building with blocks or legos</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Usually not very verbal</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- For these students you should include “hands-on” themes and stories that have minimal text.
- For these students you should include movement type books.
- For these students you should read traditional science books (factual works) Have national geographic type magazines available.

Note: from Mielenz, 2002
## Appendix F

### Project Spectrum Activities

<table>
<thead>
<tr>
<th>Category</th>
<th>Activity</th>
<th>What it Assesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Numbers</td>
<td>Dinosaur Game</td>
<td>Number concepts, counting skills, ability to adhere to rules and use of strategy.</td>
</tr>
<tr>
<td></td>
<td>Bus Game</td>
<td>Ability to create a useful notation system, use mental calculations, and organize number information for one or more variables.</td>
</tr>
<tr>
<td>Science</td>
<td>Assembly Activity</td>
<td>Mechanical ability with the use of visual-spatial, observational, and problem solving</td>
</tr>
<tr>
<td></td>
<td>Treasure Hunt Game</td>
<td>Ability to make logical inferences</td>
</tr>
<tr>
<td></td>
<td>Water Activity</td>
<td>Ability to generate hypotheses based on observations and to conduct simple experiments</td>
</tr>
<tr>
<td></td>
<td>Discovery Area</td>
<td>Observations, appreciation, and understanding of natural phenomena</td>
</tr>
<tr>
<td>Music</td>
<td>Music Production Activity</td>
<td>Ability to maintain accurate pitch and rhythm while singing and to recall a song’s musical properties</td>
</tr>
<tr>
<td></td>
<td>Music Perception Activity</td>
<td>Ability to discriminate pitch, song recognition, error recognition, and pitch</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------------------</td>
<td>-----------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td><strong>Language</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storyboard Activity</td>
<td>Complexity of vocabulary and sentence structure, use of</td>
<td></td>
</tr>
<tr>
<td></td>
<td>use of connectors, use of descriptive language and dialogue, and ability to pursue a storyline</td>
<td></td>
</tr>
<tr>
<td>Reporting Activity</td>
<td>Ability to describe an event he or she has experienced with regard to the following criteria: ability to report content accurately, level of detail, sentence structure, and vocabulary.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Visual Arts</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Art Portfolios</td>
<td>Use of lines and shapes, color, space, detail, and representation and design.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Movement</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Creative Movements</td>
<td>Sensitivity to rhythm, expressiveness, body control, generation of movement ideas, and responsiveness to music</td>
<td></td>
</tr>
<tr>
<td>Athletic Movement</td>
<td>Coordination, timing, balance, and power</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Social</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Classroom Model Activity</td>
<td>Ability to observe and analyze social events and experiences in his or her classroom</td>
<td></td>
</tr>
</tbody>
</table>

*Note: from Krechevsky, 1991*
Appendix G

Intelligences used in Classroom Centers

<table>
<thead>
<tr>
<th>Intelligence</th>
<th>Center</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intrapersonal</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blocks</td>
<td>Individual Block play</td>
<td>Individual Block play</td>
</tr>
<tr>
<td>Art</td>
<td>Individual creations</td>
<td>Individual creations</td>
</tr>
<tr>
<td>Dramatic Play</td>
<td>Role Playing</td>
<td>Role Playing</td>
</tr>
<tr>
<td>Literacy</td>
<td>Dolls are available to read to</td>
<td>Dolls are available to read to</td>
</tr>
<tr>
<td>Table Toys</td>
<td>Individual Play with thematic materials</td>
<td>Individual Play with thematic materials</td>
</tr>
<tr>
<td>Science</td>
<td>Mirrors</td>
<td>Mirrors</td>
</tr>
<tr>
<td><strong>Interpersonal</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blocks</td>
<td>Blocks</td>
<td>Blocks</td>
</tr>
<tr>
<td>Art</td>
<td>Art materials available</td>
<td>Art materials available</td>
</tr>
<tr>
<td>Dramatic Play</td>
<td>Toy Telephones</td>
<td>Toy Telephones</td>
</tr>
<tr>
<td>Literacy</td>
<td>Group interactions</td>
<td>Group interactions</td>
</tr>
<tr>
<td>Table Toys</td>
<td>Games</td>
<td>Games</td>
</tr>
<tr>
<td>Science</td>
<td>Group interactions</td>
<td>Group interactions</td>
</tr>
<tr>
<td><strong>Linguistic</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blocks</td>
<td>Group Interactions</td>
<td>Group Interactions</td>
</tr>
<tr>
<td>Art</td>
<td>Letter shapes, pencils, paper</td>
<td>Letter shapes, pencils, paper</td>
</tr>
<tr>
<td>Dramatic Play</td>
<td>telephones, various props</td>
<td>telephones, various props</td>
</tr>
<tr>
<td>Literacy</td>
<td>books, book making supplies, flannel board, tape recorders</td>
<td>books, book making supplies, flannel board, tape recorders</td>
</tr>
<tr>
<td>Table Toys</td>
<td>Games</td>
<td>Games</td>
</tr>
<tr>
<td>Science</td>
<td>science journals</td>
<td>science journals</td>
</tr>
<tr>
<td><strong>Logical/Mathematical</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blocks</td>
<td>Stacking Toys, Blocks</td>
<td>Stacking Toys, Blocks</td>
</tr>
<tr>
<td>Art</td>
<td>Paper, Crayons</td>
<td>Paper, Crayons</td>
</tr>
<tr>
<td>Dramatic Play</td>
<td>Paper, Pencils</td>
<td>Paper, Pencils</td>
</tr>
<tr>
<td>Literacy</td>
<td>Games, Lotto Games, Pencil, Paper, Books</td>
<td>Games, Lotto Games, Pencil, Paper, Books</td>
</tr>
<tr>
<td>Table Toys</td>
<td>Games, Lotto Games, Stacking &amp; Nesting toys</td>
<td>Games, Lotto Games, Stacking &amp; Nesting toys</td>
</tr>
<tr>
<td>Science</td>
<td>Items to sort, categorize, and sequence</td>
<td>Items to sort, categorize, and sequence</td>
</tr>
<tr>
<td><strong>Spatial</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blocks</td>
<td>Variety of building materials</td>
<td>Variety of building materials</td>
</tr>
<tr>
<td>Art</td>
<td>Play Dough, Paint</td>
<td>Play Dough, Paint</td>
</tr>
<tr>
<td>Dramatic Play</td>
<td>Manipulatives to create props for thematic play</td>
<td>Manipulatives to create props for thematic play</td>
</tr>
<tr>
<td>Literacy</td>
<td>drawing materials, easels, chalkboards</td>
<td>drawing materials, easels, chalkboards</td>
</tr>
<tr>
<td>Table Toys</td>
<td>Puzzles, Doll House</td>
<td>Puzzles, Doll House</td>
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<tr>
<td>Science</td>
<td>Sand</td>
<td>Sand</td>
</tr>
<tr>
<td>Bodily/Kinesthetic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------------------------------------</td>
<td></td>
<td></td>
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<tr>
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<td></td>
<td></td>
</tr>
<tr>
<td>Art</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dramatic Play</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Literacy</td>
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</tr>
<tr>
<td>Table Toys</td>
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<td></td>
</tr>
<tr>
<td>Science</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blocks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Play-dough</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dress Up clothes – to role play</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feely Letters</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Music and movement games</td>
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<td></td>
</tr>
<tr>
<td>Sand, Water, Items to touch and explore</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Musical</th>
</tr>
</thead>
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<td>Art</td>
</tr>
<tr>
<td>Literacy</td>
</tr>
<tr>
<td>Table Toys</td>
</tr>
<tr>
<td>Create Home made instruments</td>
</tr>
<tr>
<td>Computer, Listening Center</td>
</tr>
<tr>
<td>Musical Instruments</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Naturalist</th>
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<tbody>
<tr>
<td>Blocks</td>
</tr>
<tr>
<td>Art</td>
</tr>
<tr>
<td>Literacy</td>
</tr>
<tr>
<td>Science</td>
</tr>
<tr>
<td>Blocks, Farm toys</td>
</tr>
<tr>
<td>play-dough, hammers</td>
</tr>
<tr>
<td>Nature books</td>
</tr>
<tr>
<td>Toy animals, sand, rocks, leaves, water</td>
</tr>
</tbody>
</table>
### Books List That Support Each Intelligence

<table>
<thead>
<tr>
<th>Intelligence</th>
<th>Book</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logical/Mathematical</td>
<td>Big Fat Hen by Keith Baker</td>
</tr>
<tr>
<td></td>
<td>A String of Beads by Margaret S. Reid</td>
</tr>
<tr>
<td></td>
<td>Feast for 10 by Cathryn Falwell</td>
</tr>
<tr>
<td></td>
<td>One Little Mouse by Dori Chaconas</td>
</tr>
<tr>
<td></td>
<td>My Little Sister Ate One Hare by Bill Grossman</td>
</tr>
<tr>
<td></td>
<td>100&lt;sup&gt;th&lt;/sup&gt; Day Worries by Margery Cuyler</td>
</tr>
<tr>
<td>Linguistic</td>
<td>In the Snow by Huy Voun Lee</td>
</tr>
<tr>
<td></td>
<td>The Iguana Brothers by Tony Johnston</td>
</tr>
<tr>
<td></td>
<td>The Little French Whistle by Carole Lexa Schaefer</td>
</tr>
<tr>
<td></td>
<td>Rainy Day Slug by Mary Palenick Colborn</td>
</tr>
<tr>
<td>Musical</td>
<td>The Seals on the Bus by Lenny Hort</td>
</tr>
<tr>
<td></td>
<td>Howdi Doby Woody Guthrie</td>
</tr>
<tr>
<td></td>
<td>Twinkle, Twinkle Little Star by Iza Trampani</td>
</tr>
<tr>
<td></td>
<td>Zin! Zin! Zin! A Violin by Lloyd Moss</td>
</tr>
<tr>
<td>Intrapersonal</td>
<td>Diary of a Wombat by Jackie French</td>
</tr>
<tr>
<td></td>
<td>I'm Not Going to Chase the Cat Today! by Jessica Harper</td>
</tr>
<tr>
<td></td>
<td>It's Okay to Be Different by Todd Parr</td>
</tr>
<tr>
<td></td>
<td>Verdi by Janell Cannon</td>
</tr>
<tr>
<td>Interpersonal</td>
<td>Adventure on Klickitat Island by Hilary Horder Hippely</td>
</tr>
<tr>
<td></td>
<td>Don’t Need Friends by Carolyn Crimi</td>
</tr>
<tr>
<td></td>
<td>Click, Clack, Moo: Cows that Type by Doreen Cronin</td>
</tr>
<tr>
<td>Spatial</td>
<td>Hands by Lois Ehlert</td>
</tr>
<tr>
<td>------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td></td>
<td>Old McDonald Had a Woodshop by Lisa Shulman</td>
</tr>
<tr>
<td></td>
<td>Snowballs by Lois Ehlert</td>
</tr>
<tr>
<td></td>
<td>Workshop by Andrew Clements</td>
</tr>
<tr>
<td>Kinesthetic</td>
<td>Finklehopper Frog by Irene Livingston</td>
</tr>
<tr>
<td></td>
<td>The Big Bug Ball by Dee Lillegard</td>
</tr>
<tr>
<td></td>
<td>The Snail’s Spell by Joanne Ryder</td>
</tr>
<tr>
<td></td>
<td>The Wing Shop by Elvira Woodruff</td>
</tr>
<tr>
<td></td>
<td>Once There Were Giants by Martin Waddell</td>
</tr>
<tr>
<td></td>
<td>Mud by Mary Lyn Ray</td>
</tr>
<tr>
<td>Naturalist</td>
<td>House for Hermit Crab by Eric Carle</td>
</tr>
<tr>
<td></td>
<td>Is This A House for Hermit Crab by Megan McDonald</td>
</tr>
<tr>
<td></td>
<td>Little Beaver and the Echo by Amy McDonald</td>
</tr>
<tr>
<td></td>
<td>Scurry’s Treasure by Anne Carter</td>
</tr>
<tr>
<td></td>
<td>The Salamander Room by Anne Mazer</td>
</tr>
</tbody>
</table>

Note: from Mielenz, 2002
Appendix I
Parent Survey

Dear Parents,

As part of the study that you signed consent for your child to partake in I have a few quick questions and a simple survey that I would like for you to answer regarding your child’s behaviors.

1) Please provide the name and author of your child’s favorite book that you read to them. ________________________________________________________________

2) Please describe the activity that your child most often chooses when they are at home. ________________________________________________________________
____________________________________________________________________
____________________________________________________________________

3) After completing the survey please fill in any other information that you feel is relevant regarding your child’s actions and choices while at home.
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________

Please complete the following survey by checking yes if the statement describes your child or no if does not describe your child.

Child’s Name: __________________________________________________________

Parent’s Name: _________________________________________________________

Thank you so much for your time and for helping me out in this project.

Miss Capie
<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eager participant in group activities.</td>
<td></td>
</tr>
<tr>
<td>Enjoys informally teaching others or volunteers help when others need it.</td>
<td></td>
</tr>
<tr>
<td>Others seek out his or her company.</td>
<td></td>
</tr>
<tr>
<td>Likes to play games with other children.</td>
<td></td>
</tr>
<tr>
<td>Helps to solve conflicts.</td>
<td></td>
</tr>
<tr>
<td>Can identify and label emotions and feelings of other people.</td>
<td></td>
</tr>
<tr>
<td>Verbally communicates needs.</td>
<td></td>
</tr>
<tr>
<td>Is able to compromise and negotiate.</td>
<td></td>
</tr>
<tr>
<td>Solves social problems independent of assistance.</td>
<td></td>
</tr>
<tr>
<td>Expresses how he or she is feeling.</td>
<td></td>
</tr>
<tr>
<td>Persistent in self-selected activity.</td>
<td></td>
</tr>
<tr>
<td>Concentrates on topics or tasks.</td>
<td></td>
</tr>
<tr>
<td>Adds unique qualities to a task (creative).</td>
<td></td>
</tr>
<tr>
<td>Self motivated</td>
<td></td>
</tr>
<tr>
<td>Independent</td>
<td></td>
</tr>
<tr>
<td>Self-confident</td>
<td></td>
</tr>
<tr>
<td>Is willing to try something and not become frustrated at lack of success.</td>
<td></td>
</tr>
<tr>
<td>Values and enjoys time to oneself.</td>
<td></td>
</tr>
<tr>
<td>Knows when to ask for help and when not to ask.</td>
<td></td>
</tr>
<tr>
<td>Enjoys role playing or has a dramatic way of expressing self.</td>
<td></td>
</tr>
<tr>
<td>Enjoys taking things apart and putting them back together.</td>
<td></td>
</tr>
<tr>
<td>Prefers to touch and explore the shape of objects in order to learn about them.</td>
<td></td>
</tr>
<tr>
<td>Is interested in writing</td>
<td></td>
</tr>
<tr>
<td>Enthusiastically uses playground equipment or enjoys movement activities.</td>
<td></td>
</tr>
<tr>
<td>Shows good fine motor coordination.</td>
<td></td>
</tr>
<tr>
<td>Shows good gross motor coordination</td>
<td></td>
</tr>
<tr>
<td>Enjoys tactile experiences like, clay and water</td>
<td></td>
</tr>
<tr>
<td>Voluntarily moves body, does work standing up, prefers movement to sitting still.</td>
<td></td>
</tr>
<tr>
<td>Participates or enjoys puppet shows, dancing activities, sports</td>
<td></td>
</tr>
<tr>
<td>Starts conversations or discussion on his/her own</td>
<td></td>
</tr>
<tr>
<td>Describes an object or idea in several ways</td>
<td></td>
</tr>
<tr>
<td>Readily verbalizes background knowledge and factual information</td>
<td></td>
</tr>
<tr>
<td>Asks many questions</td>
<td></td>
</tr>
<tr>
<td>Shows verbal ability in English, considering another language is used in the home.</td>
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</tr>
<tr>
<td>Enjoys reading books.</td>
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</tr>
<tr>
<td>Uses advanced vocabulary.</td>
<td></td>
</tr>
<tr>
<td>Memorizes easily</td>
<td></td>
</tr>
<tr>
<td>Enjoys listening to stories, poems, plays</td>
<td></td>
</tr>
<tr>
<td>Asks “What does this say?” making the connection between meaning and the written word.</td>
<td></td>
</tr>
<tr>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>------</td>
<td>----</td>
</tr>
<tr>
<td>Is able to plan or describe steps or events in order</td>
<td></td>
</tr>
<tr>
<td>Sorts and classifies objects or pictures.</td>
<td></td>
</tr>
<tr>
<td>Assembles puzzles with skill and enjoyment</td>
<td></td>
</tr>
<tr>
<td>Asks questions about how things work</td>
<td></td>
</tr>
<tr>
<td>Creates rhythm patterns</td>
<td></td>
</tr>
<tr>
<td>Shows curiosity about numbers, shapes, relationships, and patterns</td>
<td></td>
</tr>
<tr>
<td>Enjoys math stories.</td>
<td></td>
</tr>
<tr>
<td>Notices numbers in the environment and in books.</td>
<td></td>
</tr>
<tr>
<td>Sees patterns and relationships in the environment</td>
<td></td>
</tr>
<tr>
<td>Counts objects in the environment.</td>
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</tr>
<tr>
<td>Reproduces newly heard melody or rhythm</td>
<td></td>
</tr>
<tr>
<td>Composes rhythm, patterns, or melodies</td>
<td></td>
</tr>
<tr>
<td>Creates own words to fit familiar tunes</td>
<td></td>
</tr>
<tr>
<td>Keeps a beat with musical instruments</td>
<td></td>
</tr>
<tr>
<td>Sings or hums melodically during independent activities.</td>
<td></td>
</tr>
<tr>
<td>Experiments with objects to create different sounds</td>
<td></td>
</tr>
<tr>
<td>Uses body to make musical sounds</td>
<td></td>
</tr>
<tr>
<td>Recognizes many tunes</td>
<td></td>
</tr>
<tr>
<td>Asks to hear music</td>
<td></td>
</tr>
<tr>
<td>Moves body when music is playing</td>
<td></td>
</tr>
<tr>
<td>Puts things together imaginatively to form construction</td>
<td></td>
</tr>
<tr>
<td>Takes things apart and can put them back together</td>
<td></td>
</tr>
<tr>
<td>Can organize and group objects</td>
<td></td>
</tr>
<tr>
<td>Carefully plans use of space</td>
<td></td>
</tr>
<tr>
<td>Includes relevant details in artwork</td>
<td></td>
</tr>
<tr>
<td>Enjoys puzzles and mazes</td>
<td></td>
</tr>
<tr>
<td>Shows interest in working with art materials</td>
<td></td>
</tr>
<tr>
<td>Shows interest in shapes, colors, patterns, and textures</td>
<td></td>
</tr>
<tr>
<td>Enjoys looking at pictures and talking about others’ art work</td>
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</tr>
<tr>
<td>Describes and discusses personal artwork.</td>
<td></td>
</tr>
<tr>
<td>Relates well to pets</td>
<td></td>
</tr>
<tr>
<td>Enjoys walks in nature</td>
<td></td>
</tr>
<tr>
<td>Loves to garden or take care of plants</td>
<td></td>
</tr>
<tr>
<td>Brings home bugs, flowers, leaves or other pieces of nature</td>
<td></td>
</tr>
<tr>
<td>Creates collections of above items or likes to draw their finds</td>
<td></td>
</tr>
<tr>
<td>Enjoys books about nature and animals</td>
<td></td>
</tr>
<tr>
<td>Spends time near aquariums or terraiums</td>
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</tr>
<tr>
<td>Enjoys going to the zoo</td>
<td></td>
</tr>
<tr>
<td>Asks questions or comments on the weather</td>
<td></td>
</tr>
<tr>
<td>Discusses or shows interest in clouds, trees, water, or mountain formations</td>
<td></td>
</tr>
</tbody>
</table>
Querido Padres:

Como parte del estudio que usted firmó como consentimiento de que su niño podía participar yo les tengo unas preguntas rápidas y una simple encuesta que yo quisiera que me contestaran en respecto a los comportamientos de su niño.

1) Favor de proveer el nombre y el autor del libro más favorito de su niño que usted le haya leído. __________________________________________
   __________________________________________
   __________________________________________
   __________________________________________

2) Favor de describir la actividad que su niño más elige cuando está en la casa.
   __________________________________________
   __________________________________________
   __________________________________________
   __________________________________________

3) Después de completar la encuesta favor de llenar cualquier otra información que usted siente sea pertinente en respecto a las acciones y las selecciones mientras está en la casa. __________________________________________
   __________________________________________
   __________________________________________
   __________________________________________
   __________________________________________

Favor de completar la siguiente encuesta poniéndole una marca ✓ así marque que si, la oración sí describe a su niño ó no la oración no describe a su niño.

Nombre del niño(a): __________________________________________

Nombre de los padres: __________________________________________

Muchas gracias por su tiempo y por haberme ayudado con este proyecto.

Srta. Capie
<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Es un ansioso participante en actividades de grupos.</td>
<td></td>
</tr>
<tr>
<td>Disfruta enseñando informalmente a otros ó voluntarios que ayudan cuando otros lo necesitan.</td>
<td></td>
</tr>
<tr>
<td>Otros buscan en el ó ella su compañía.</td>
<td></td>
</tr>
<tr>
<td>Le gusta jugar juegos con otros niños.</td>
<td></td>
</tr>
<tr>
<td>Ayuda resolver conflictos.</td>
<td></td>
</tr>
<tr>
<td>Puede identificar y calificar emociones y sus sentimientos con otras personas.</td>
<td></td>
</tr>
<tr>
<td>Verbalmente comunica sus necesidades.</td>
<td></td>
</tr>
<tr>
<td>Esta dispuesto a comprometerse ó negociar.</td>
<td></td>
</tr>
<tr>
<td>Resuelve problemas sociales independentemente sin asistencia.</td>
<td></td>
</tr>
<tr>
<td>Expresa como el ó ella se siente.</td>
<td></td>
</tr>
<tr>
<td>Es persistente en escojer solo su actividad.</td>
<td></td>
</tr>
<tr>
<td>Se concentra en tópicos y trabajos.</td>
<td></td>
</tr>
<tr>
<td>Le anade una calidad unica a sus trabajos creativo.</td>
<td></td>
</tr>
<tr>
<td>Se motiva.</td>
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</tr>
<tr>
<td>Independiente.</td>
<td></td>
</tr>
<tr>
<td>Seguro de sí mismo.</td>
<td></td>
</tr>
<tr>
<td>Esta dispuesto a tartar algo y no ponerse frustrado al no ganar éxito.</td>
<td></td>
</tr>
<tr>
<td>Valora y disfruta si tiempo solo.</td>
<td></td>
</tr>
<tr>
<td>Sabe cuando pedir ayuda y cuando no.</td>
<td></td>
</tr>
<tr>
<td>Disfruta jugando diferentes temas ó tiene una manera dramatica de expresarse.</td>
<td></td>
</tr>
<tr>
<td>Disfruta quitando cosas así afuera y poniendo las para atraz.</td>
<td></td>
</tr>
<tr>
<td>Prefiere tocar y explorar las figuras de los objetos en orden para aprender sobre ellos.</td>
<td></td>
</tr>
<tr>
<td>Esta interesado en escribir.</td>
<td></td>
</tr>
<tr>
<td>Con entusiasmo utiliza el equipo de recreo ó disfruta actividades de movimientos.</td>
<td></td>
</tr>
<tr>
<td>Demuestra muy bien su coordinación de mano.</td>
<td></td>
</tr>
<tr>
<td>Demuestra muy bien su coordinación de cuerpo.</td>
<td></td>
</tr>
<tr>
<td>Disfruta experencias con táctiles como barro y agua.</td>
<td></td>
</tr>
<tr>
<td>Voluntariamente mueve su cuerpo, hace trabajolevantado, prefiere movimiento sentado quieto.</td>
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</tr>
<tr>
<td>Participa ó disfruta de programas de marioneta actividades bailables, deportes.</td>
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<tr>
<td>Comienza conversaciones ó discussions por si mismo.</td>
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</tr>
<tr>
<td>Describe un objeto ó idea en muchas maneras.</td>
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</tr>
<tr>
<td>Rapidamente verbalize conocimientos y información factual.</td>
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<tr>
<td>Hace muchas preguntas.</td>
<td></td>
</tr>
<tr>
<td>Demuestra abilidad verbal en ingles, considerando que hay otra idioma en el hogar.</td>
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<tr>
<td>Disfruta leer libros.</td>
<td></td>
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<tr>
<td>Usa vocabulario avanzado.</td>
<td></td>
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<tr>
<td>Memoriza fácilmente.</td>
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</tr>
<tr>
<td>Disfruta escuchar cuentos, poemas, y actuar.</td>
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<tr>
<td>YES</td>
<td>NO</td>
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<td>-----</td>
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<tr>
<td>Pregunta ¿Qué dice esto? haciendo.</td>
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<tr>
<td>Tiene la capacidad de describe paso por paso de eventos en orden.</td>
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<tr>
<td>Divide en grupos y clasifica objetos o fotos.</td>
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<tr>
<td>Junta rompe cabezas con destrezas y entretenimiento.</td>
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<tr>
<td>Hace preguntas de como las cosas trabajan.</td>
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</tr>
<tr>
<td>Crea ritmo de patrones.</td>
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</tr>
<tr>
<td>Demuestra curiosidad por los números, figures geométricas, relaciones y patrones.</td>
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</tr>
<tr>
<td>Disfruta cuentos de matemáticas.</td>
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<tr>
<td>Se da cuenta de números en el ambiente y en libros.</td>
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<tr>
<td>Vea patrones y relaciones en el ambiente.</td>
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</tr>
<tr>
<td>Cuenta objetos en el ambiente.</td>
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<tr>
<td>Reproduce melodías o ritmos escuchado recientemente.</td>
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<tr>
<td>Compone ritmo, patrones, o melodías.</td>
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<tr>
<td>Crea sus palabras para tonados familiares.</td>
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<tr>
<td>Mantiene un ritmo con los instrumentos musicales.</td>
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<tr>
<td>Canta o murmura melodías durante actividades independientes.</td>
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<tr>
<td>Experimenta con objetos para crear diferentes sonidos.</td>
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<tr>
<td>Usa el cuerpo para hacer sonidos musicales.</td>
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<tr>
<td>Reconoce muchas tonadas.</td>
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<tr>
<td>Pregunta por oír música.</td>
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</tr>
<tr>
<td>Mueve su cuerpo cuando la música está tocando.</td>
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</tr>
<tr>
<td>Pone cosas juntas usando su imaginación para formar construcción.</td>
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<tr>
<td>Deshace cosas y las puede poner para atrás.</td>
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<tr>
<td>Puede organizar y poner objetos en grupos.</td>
<td></td>
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<tr>
<td>Cuidadosamente hace planes saber su espacio.</td>
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<tr>
<td>Incluye detalles relevantes en su trabajo de arte.</td>
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</tr>
<tr>
<td>Disfruta de rompe cabezas y laberintos.</td>
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</tr>
<tr>
<td>Demuestra interés en trabajar con materiales artísticos.</td>
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</tr>
<tr>
<td>Disfruta mirar fotos y hablando sobre el trabajo artístico de otros.</td>
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<tr>
<td>Describe y discute trabajo artístico personal.</td>
<td></td>
</tr>
<tr>
<td>Se relaciona bien con los animales.</td>
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</tr>
<tr>
<td>Disfruta caminatas en la naturaleza.</td>
<td></td>
</tr>
<tr>
<td>Ama el jardín o cuidar de plantas.</td>
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</tr>
<tr>
<td>Trae a la casa insectos, flores, hojas o otras piezas de la naturaleza.</td>
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</tr>
<tr>
<td>Crea colecciones de los artículos mencionados le gusta dibujar sobre ellos.</td>
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</tr>
<tr>
<td>Disfruta libros de la naturaleza o de animales.</td>
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</tr>
<tr>
<td>Pasa tiempo cerca de el acuario o terrario.</td>
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</tr>
<tr>
<td>Disfruta ir al zoológico.</td>
<td></td>
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<tr>
<td>Hace preguntas o comentarios sobre el tiempo.</td>
<td></td>
</tr>
<tr>
<td>Discute o demuestra interés en las nubes, arboles, agua, o formaciones de las montañas.</td>
<td></td>
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</table>
Appendix J

Questions used for Student Interviews

Logical/Mathematical
1. Do you enjoy playing pattern movement?
2. Do you enjoy doing the timeline?
3. Do you enjoy playing math collections?
4. Do you enjoy completing the weather chart?

Linguistic
1. Do you enjoy story expressions?
2. Do you enjoy saying Nursery Rhymes?
3. Do you enjoy fingerplays?
4. Do you enjoy doing Share the News?

Musical
1. Do you enjoy singing songs?
2. Do you enjoy playing instruments?
3. Do you enjoy using the Sound Map?
4. Do you enjoy listening to books on tape?

Bodily/Kinesthetic
1. Do you enjoy the Freeze Game?
2. Do you enjoy the popcorn song?
3. Do you enjoy playing on the playground?
4. Do you enjoy Graphic Practice?

Intrapersonal
1. Do you like to play by yourself?
2. Do you like doing play planning?
3. Do you like reading by yourself?
4. Do you like doing a puzzle on your own?

Interpersonal
1. Do you like playing with friends?
2. Do you like Sharing the news?
3. Do you like playing with toys at the table(group time)?
4. Do you like buddy reading?
Spatial

1. Do you like building with blocks?
2. Do you like making things in art?
3. Do you like playing with the links?
4. Do you like playing with the cubes?

Naturalist

1. Do you like playing at the sand table?
2. Do you like playing in the water bucket?
3. Do you like playing with the rice?
4. Do you like looking at the fish/rocks?
Appendix K

Intelligence Profile Graphs
Table 1

Intelligence Profile - Adam

<table>
<thead>
<tr>
<th>Elements</th>
<th>Teacher</th>
<th>Paraprofessional</th>
<th>Parent</th>
<th>Participant</th>
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Table 2

Intelligence Profile - Aiesha

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Table 3

Intelligence Profile - Alba

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Table 4

Intelligence Profile - Curtis

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Table 5

Intelligence Profile - Danae

Table 6

Intelligence Profile - Dion
Table 7

Intelligence Profile - Jennifer

Table 8

Intelligence Profile - Jesus
Table 11

Intelligence Profile - Ketara

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Table 12

Intelligence Profile - Lamont

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Table 13
Intelligence Profile - Latisha

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Table 14
Intelligence Profile - Luis

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Table 15

Intelligence Profile - Sonya

Table 16

Intelligence Profile - Taneesha