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Multiple intelligences of young adolescents

Abstract

This study investigated how multiple intelligences related specifically to young adolescents. Self-perceptions of seventh and eighth graders, attending a large middle school and a moderately sized junior high in Iowa, were compared. Intelligence categories rated by students included intrapersonal, interpersonal, body/kinesthetic, mathematical/logical, verbal/linguistic, visual/spatial, and music/rhythmic.

Implications for this research include utilizing activity based instruction, promoting risk free learning opportunities for girls, implementing developmentally responsive practices at the middle level, providing educational support for low socio-economic students who may lack other resources often needed for success, and using visual, kinesthetic and musical approaches to learning for learning disabled students.

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MULTIPLE INTELLIGENCES OF YOUNG ADOLESCENTS

A Graduate Project

Submitted to the

Division of Middle Level Education

Department of Curriculum and Instruction

Dr. Donna Schumacher-Douglas

In Partial Fulfillment

Of the Requirements for the

Master of Arts in Education

UNIVERSITY OF NORTHERN IOWA

by

Kelly A. Schloss

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ABSTRACT

This study investigated how multiple intelligences related specifically to young adolescents. Self-perceptions of seventh and eighth graders, attending a large middle school and a moderately sized junior high in Iowa, were compared. Intelligence categories rated by students included intrapersonal, interpersonal, body/kinesthetic, mathematical/logical, verbal/linguistic, visual/spatial, and music/rhythmic. Students also self-reported their average grade earned in school and demographic data. Data was disaggregated and compared for the following student subgroups: 7th and 8th graders, middle school and junior high, right- and left-handed, gender, socio-economics, learning disabled, race, and English as a Second Language (ESL).

Significant differences occurred in several areas. The middle school students' self-perceptions were higher than the junior high students' in all categories and showed a significant difference in intrapersonal skills. Girls rated themselves significantly higher than boys in verbal/linguistic and music/rhythmic skills, while boys reported higher scores in mathematical/logical and body/kinesthetic intelligences. Low socio-economic and learning-disabled children's self-perceived intelligences were similar to peers', however, they reported significantly lower average grades than classmates. No significant differences were found for handedness, race, and ESL.

Implications for this research include utilizing activity based instruction, promoting risk free learning opportunities for girls, implementing developmentally responsive practices at the middle level, providing educational support for low socio-

economic students who may lack other resources often needed for success, and using visual, kinesthetic and musical approaches to learning for learning disabled students.

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INTRODUCTION

Each fall my eighth grade mathematics students complete multiple intelligence surveys. The surveys help me get to know them and their unique learning styles. Over a period of five years, the young adolescents' self-perceptions on the surveys seemed to present trends. During that time, I taught in a middle school setting for four years and then moved to a junior high setting. Over-all responses from the eighth graders seemed similar in both the middle school and junior high school. I noticed that the eighth grade students rated themselves high in both Interpersonal and Music/Rhythmic skills, and low in Intrapersonal skills. During the fifth year, I also taught seventh graders. The seventh graders responded similarly to the eighth graders, although their self-perceptions didn't seem to be as high in the Interpersonal intelligence. I started to wonder if my sample was large enough to generalize that seventh graders' Interpersonal self-perceptions changed as they became more acclimated to the new school setting, gained friendships and became active in school and community activities. I decided to analyze the results of self-profiles from seventh and eighth graders attending a middle school and a junior high school. The lowest grade level in both schools was seventh, so seventh graders would be going through similar transitions. I also decided to disaggregate the data according to demographic breakdowns noted in the No Child Left Behind [NCLB] Act of 2001.

> *All* public schools and districts will be held accountable for the achievement of individual subgroups, including students in major racial/ethnic groups, economically disadvantaged students, limited English

> proficient students and students with disabilities. Accountability decisions must be based on the achievement of each subgroup, as well as on overall achievement. (Paige, 2002, para. 2)

This study compared self-perceptions of multiple intelligences held by young adolescents and attempted to determine if those self-perceptions significantly change as they age. Seventh and eighth grade students attending a large middle school and a mid-sized junior high participated in the study. All students completed a multiple intelligence survey in October and May. The survey asked students to respond to questions regarding their self-perceived strengths in the areas of intrapersonal understanding, interpersonal relationships, body/kinesthetic skills, verbal/linguistic abilities, mathematical/logical abilities, visual/spatial behaviors, and music/rhythmic awareness.

Students reported one average grade that summarized their total performance in school. Comparing the survey responses helped determine if significant intelligence differences existed in responses of students who earn lower grades than their peers.

Students reported demographic information during the spring survey. Data gathered included chronological age of the student, the child's current grade level in school, right- or left-handedness, gender, race, learning or other disability, if the student received free or reduced price lunches and if the child spoke English as a second language. This information was then used to compare self-perceptions of subgroups of participants.

Significance of the Study

This research analyzed self-perceptions of intelligence held by young adolescents in the seventh and eighth grades. A need exists for this study because extensive research

specifically relating young adolescents and multiple intelligence self-perceptions is limited. Morris and LeBlanc (1996) supported the conclusion that little specific research data tying early adolescence and multiple intelligences exists. This was noteworthy since Gardner (1980) presented the concept of multiple intelligences sixteen years earlier.

Changes or stability in self-perceptions provides insight to learning style trends of young adolescents. Educators can use this information to improve instruction. This information can be used to facilitate learning by utilizing students' strengths. Survey results also provided information regarding perceived weaknesses of young adolescents. Educators can focus on and promote development of those perceived weak areas by incorporating them in review situations or by promoting them with risk free learning experiences. For example, educators can help students strengthen intrapersonal skills through journaling. By studying the specific subgroups (middle school/junior high school, female/male, full-pay lunch students/free or reduced-pay lunch students, regular education/learning disabled students, non-white/white students, and English as a second language/English as a first language) learning styles or learning needs for specific groups may be defined. Educators can use this information to specialize instruction to better meet the needs of specific learners.

Research Questions

The following research questions guided the study:

1) Do result patterns of high mean scores in the Interpersonal and Music/Rhythmic categories and low mean scores in the Intrapersonal category continue with a formal survey of the self-perceptions of young adolescents from a larger sample population?

2) How do the resulting patterns of responses on the formal survey relate to the following:

a) emotional development of young adolescents?

b) cognitive development of young adolescents?

c) physical development of young adolescents?

3) Do statistical differences occur in young adolescents' self-perceptions when comparing:

a) seventh and eighth grade students; indicating that self-perceptions have changed with one year's development?

b) middle school and junior high school students; indicating school structure may affect young adolescent self-perceptions?

c) female and male students; indicating that they have different learning styles or learning needs?

d) low socio-economic status students and moderate to high socio-economic status students; indicating they have different perceptions of their multiple intelligences?

e) learning disabled and non-learning disabled students; indicating that they have different perceptions of their multiple intelligences?

f) students with disabilities other than learning disabilities and non-disabled students; indicating that they have different perceptions of their multiple intelligences?

g) students of varied races; indicating that they have different perceptions of their multiple intelligences?

h) ESL and English as a first language students; indicating that they have different perceptions of their multiple intelligences?

4) Do trends exist that will give educators, parents and students better understanding of how young adolescents, as a group, perceive their intelligences?

Limitations

Possible limitations of this study included:

- Low numbers of non-white students participating in the study. Both schools were predominantly white.
- Low numbers of learning disabled students choosing to participate.
- Unreliable responses by students about receiving free or reduced price meals, due to embarrassment or lack of awareness about their free or reduced meal status.
- Attention Deficit Disorder/Attention Deficit with Hyperactivity Disorder students not realizing they fall under the "other disabilities" category.
- Low participant numbers of any subgroup impedes finding statistically significant differences or similarities in student self-perceptions.

External Validity

Findings will not pertain to younger children, older children, or adults. As people grow and gain experiences, perceptions change. Piaget contended "that cognitive development is the combined result of environmental influences and the maturation of the brain and nervous system" (Rice, 1996, p. 38). This means that young adolescents' self-perceptions should change as their life experiences and physical development continue. For this reason, they will perceive their environment and introspect differently than

younger children, older children and adults. Findings from this study may only be generalized to other young adolescents.

Definition of Terminology

For the purpose of this study, the following intelligence definitions from Shearer (2003) were used:

Intrapersonal – To think and understand one's self. To be aware of one's strengths and weaknesses and to plan effectively to achieve personal goals. It involves reflecting on and monitoring one's thoughts and feelings and regulating them effectively. The ability to monitor one's self in interpersonal relationships and to act with personal efficacy. Subscales of this category include knowing yourself, goal awareness, managing feelings, and managing behavior.

Interpersonal – To think about and understand another person. To have empathy and recognize distinctions among people and to appreciate their perspectives with a sensitivity to their motives, moods, and intentions. It involves interacting effectively with one or more persons in family, friend or working relationships. Subscales of this category include understanding people, getting along with others, and leadership.

Bodily/Kinesthetic – To think in movements and to use the body in skilled and complicated ways for expressive as well as goal-directed activities. It involves a sense of timing and coordination for whole body movement and the use of hands for manipulating objects. Subscales of this category include physical skill, dancing/acting, and working with one's hands.

Verbal/Linguistic – To think in words and to use language to express and understand

complex meanings. Sensitivity to the meaning of words as well as the order [of] words, ... their sounds, rhythms, and inflections. To reflect on the use of language in everyday life. Subscales of this category include linguistic sensitivity, reading, writing, and speaking.

Mathematical/Logical – To think of cause and effect connections and to understand relationships among actions, objects, or ideas. To be able to calculate, quantify, consider propositions, and perform complex mathematical or logical operations. It involves inductive and deductive reasoning skills as well as critical and creative problem solving. Subscales of this category include problem solving and calculations.

Visual/Spatial – To think in pictures and to perceive the visual world accurately. To be able to think in three-dimensions and to transform one's perceptions and re-create aspects of one's visual experience via imagination. To work with objects. Subscales of this category include imagery, artistic design, and construction.

Musical/Rhythmic – To think in sounds, rhythms, melodies, and rhymes. To be sensitive to pitch, timbre, and tone. To be able to recognize, create, and reproduce music by using an instrument or the voice. It involves active listening and there is a strong connection between music and emotions. Subscales of this category include instrumental, vocal, and appreciation.

For the purpose of this study, the following sample population subgroup definitions were used:

Learning disability – The University of Maryland (2003) and Smith et. al. (1995) defined

a learning disability as a developmental disorder that may cause a discrepancy between the child's achievement and certain skills, or the level of achievement expected based on the child's age and intelligence. There are different types of learning disabilities. Developmental speech and language disorders are usually the first indication that a learning disability is present. Children may also have an academic skills disorder such as a developmental reading disorder, a developmental writing disorder, or a developmental arithmetic disorder.

Other disability – The University of Maryland (2003), the South Carolina Division on Career Development (2002), and Smith et. al. (1995) list several conditions that are considered other disabilities under the Individuals with Disabilities Education Act. These that cause physical or mental impairment, sometimes called other health impaired, which could substantially limit one or more major life activities. Physical disabilities include but are not limited to any physiological disorder or condition, cosmetic disfigurement (muscular-skeletal, respiratory, digestive, skin, or neurological), spinal cord injury, blindness, deafness, asthma, stuttering, pregnancy, incontinence, allergies, ulcers, and special diets. Mental or psychological disorders can include mental retardation, emotional or mental illness, Attention Deficit Disorder or Attention Deficit with Hyperactivity Disorder (South Carolina Division on Career Development and Transition, 2002, (University of Maryland Medicine, 2003; Smith et al., 1995).

Free or reduced meal participants – Students that receive free or reduced price school meals based on household income. For example, a family of four would have an annual income of less than $34,000 to qualify. The U.S. Department of

Agriculture and individual states fund the program (Iowa Department of Education, 2003a).

English as a Second Language (ESL) – An English language learner. A student from a non-English speaking country who has limited-English-proficiency (U.S. Department of Education, 2003; Donoghue, 1990).

Closing

Understanding young adolescents' self-perceived intelligences may aid educators in selecting effective instructional practices. Little research specifically connecting multiple intelligences and young adolescents currently exists. Research regarding human growth and development showed that self-perceptions change as people age, therefore findings from this study may only be generalized to other groups of young adolescents.

LITERATURE REVIEW

Introduction

This study analyzed young adolescents' self-perceptions regarding their intelligences. This literature review addresses adolescent growth and development, school structures implemented to educate young adolescents, gender differences in learning styles and needs, socio-economic status and its effect on learning, research illuminating needs of learning disabled students, race as it relates to learning, English Language Learners and their specific educational needs, and the role music plays in education and development. The study compared student responses by grade level, school structure, gender, socio-economic status, disability, language, and race to determine if variances in student self-perceptions exist for individual subgroups. A special section relating music, emotions, and adolescence is included in this literature review due to past informal observations by the researcher showing that adolescents regard their musical intelligence as higher than other intelligence categories.

Adolescent Growth and Development

Informal multiple intelligence surveys administered by the researcher in the past showed that young adolescents viewed themselves as strong in Interpersonal and Music/Rhythmic skills and low in Intrapersonal skills. In order to connect this to cognitive, emotional, and physical development of the young adolescent, research to understand adolescent growth and development was needed. Connecting adolescent

growth and development to the self-perceptions that the group holds may provide a lens educators can use to enhance instructional practices.

"Thornburg (1982) asserted that diversity is the hallmark characteristic of young adolescents" (Manning, 1998, para. 1). However, research indicates that adults mistrust adolescents more than any other age group and view adolescents as all being alike – delinquent, disturbed, or addicted (Rice, 1996). Adult perceptions conflict with actual evidence revealing adolescent behavior. "These middle schoolers differ enormously in their personalities, talents, growth patterns, and coping skills. ... Early adolescents show as much variability in their backgrounds, life experiences, values, and aspirations as do adults" (George & Alexander, 1993, p. 4).

Cognitive Abilities

Various views of adolescent cognitive development exist. Rice (1996, p. 38) defines cognition as "the act or process of knowing. The emphasis is not on the process by which information is acquired but on the mental activity or thinking involved in understanding." Piaget viewed cognition as the "combined result of environmental influences and the maturation of the brain and nervous system" (Rice, 1996, p. 38). During Piaget's concrete operational stage (7-11 years of age) children show some capacity for logical thinking, although it relates only to things already experienced. Children then enter formal operations (11-12 years to adulthood) where more logical and abstract thinking occurs. Piaget contends that by age 12, most children "are able to engage in introspection, to think about their thoughts" (Rice, 1996, p. 38). This supports the idea that ten to fifteen year-olds have well developed intrapersonal skills.

Conversely, some research suggests most young adolescents (10-15 years old) remain in the concrete operational stage. "Other research studies ... indicate that great numbers of students remain in the stage of concrete operations throughout their tenure in the middle school" (George & Alexander, 1993, p.7). "Students may appear to be operating in one stage of reasoning, then revert to a lower stage. Confusion may result when students seem to understand complicated concepts, but cannot extend those concepts to other situations" (George & Alexander, 1993, p. 8). This research indicates that adolescents' meta-cognitive strategies, the ability to think about one's thinking, still needs development. If these findings are true, young adolescents may report lower self-perceptions of intrapersonal intelligence.

Developmental changes that occur during formal operations aid intrapersonal growth (the ability to know one's self). According to Rice (1996), Erikson defined adolescence as the process of achieving identity versus identity diffusion. Erikson stated that each individual must establish personal identity. To achieve this, the individual must evaluate their intellectual, emotional, physical and moral resources and liabilities to gain a clearer view of who they are and what they want to become. Vocational, ideological and moral identities are established when adolescents reach the formal operations stage. Development of these areas "enables them to explore alternative ideas and courses of action" (Rice, 1996, p. 37). As students gain intrapersonal insight when they achieve formal operations, their self-perceptions of strengths and weaknesses for other intelligence categories may change.

Socialization

Social judgment changes significantly during young adolescence. Silcock (1984, para. 1) compared 75 eleven year olds' and 75 fourteen year olds' "ability to judge other people's perspectives." He found that the 14 year olds are "much more able to consider social situations and reason people's reactions" (para. 30) than the children age eleven could. He stated that even mid-adolescents exhibited some difficulty "considering other views and feelings" (para. 34). He believes that the ability to judge other perspectives is a gradual process that continues until adulthood.

Adolescence is a period of heterosociality, a stage "in which the individual's pleasure and friendships are found with those of both sexes" (Rice, 1996, p. 282). If an adolescent has difficulty with this task, they may feel anxiety and fear about their sexuality resulting in lowered self-esteem. Young adolescents move from hostile attitudes toward the opposite sex, as they held in primary years, to teasing and shyness. Later in adolescence, teasing gives way to poise, manners, conversation and confidence in social situations (Rice, 1996). Interpersonal skills are necessary for social development to happen smoothly.

Physical Changes

Adolescents undergo enormous physical changes. This is a "time of growth and change second only to infancy in sheer velocity" (George & Alexander, 1993, p. 2). Adolescence is a unique transition time between childhood and adulthood. The rapid changes usually happen earlier for girls. For some children, adolescence is a time of "storm and stress" (George & Alexander, 1993, p. 4), while others transition smoothly. Hormone fluctuations sometimes cause mood swings. Increased nutritional requirements

from rapid growth rates can cause swings from excitability to lethargy. Physical characteristics of this age group create the need for frequent physical movement, adequate rest, a proper diet, changed personal hygiene needs, and coping skills to help with changes in physical maturation (George & Alexander, 1993). Physical awkwardness, rapid growth, and developmental changes may lower young adolescents' self-perceptions in the Body/Kinesthetic intelligence.

Emotions

Adolescents with higher self-esteem tend to deal more directly and positively with problems than do peers with lower self-esteem. Adolescents with lower self-esteem use reactive coping strategies to deal with stress, possibly due to the lack of self-confidence, to deal with the problem directly. "[A]dolescents ... who have confidence in themselves and perceive that they have social supports are more likely to deal directly with difficult and stressful situations" (Chapman & Mullis, 1999, para. 13).

Adolescents gradually gain behavioral and emotional autonomy. Behavioral autonomy is the ability to make choices without excessive input from others (Rice, 1996). Emotional autonomy is the ability to be free from "childish emotional ties with parents" (Rice, 1996, p. 336). While behavioral autonomy needs increase quickly, adolescents' need for emotional autonomy changes slowly. The degree that adolescents seek emotional autonomy changes with factors such as parental involvement, race and socio-economic status (Rice, 1996).

Thornburg proposed seven developmental tasks of adolescents:

1. becoming aware of increased physical changes;

2. organizing knowledge and concepts into problem-solving strategies;

3. learning new social/sex roles;

4. recognizing one's identification with stereotype;

5. developing friendships with others;

6. gaining a sense of independence; and

7. developing a sense of morality and values. (George & Alexander, 1993, p. 5)

Past Research Connecting Multiple Intelligences and Young Adolescents

Morris and LeBlanc (1996, para. 1) compared the "self-perceived intelligences of [eighth grade] students to teacher nominations." They reported that "little research currently exists relating such intellectual conditions to public school students," and finally contended that "virtually none exists as to how grade 8 students and their homeroom teachers perceive dominant student intelligences" (Morris & LeBlanc, 1996, para. 3).

Morris and LeBlanc (1996) believed that the sole use of IQ scores to determine acceptance in special school programs underestimated the talent of some individuals and was not a good indicator of students' potential. They provided insight to educational trends at the time of their study.

> Many students are unaware of their inner talents, skills, competences, or to coin Gardner's term, "intelligences." They often perceive themselves as educational "washouts." Such "talented" youngsters sometimes fail to realize that they may indeed have a learning strength in, at least, one of Gardner's dimensions. (Morris & LeBlanc, 1996, para. 35)

Finally, they stated that public schools focus on students' academic weaknesses, thus lowering self-esteem, "at the expense of developing some of their other strengths, or

talents" (Morris & LeBlanc, 1996, para. 35). Demaray and Malecki (2003, para. 27) define self-esteem as the result "when both self-evaluation and aspirations are high."

School Structure

A Brief History of Educational Structures for the Middle Level

The history of school structure also plays a role in how adolescents view themselves. Certain practices in the current educational system were designed and implemented specifically in response to physical, emotional, and cognitive needs of the young adolescent.

During the early 1900s, small rural schools serving sparsely populated regions required very little age grouping. As the population grew and became more concentrated in areas, schools were separated into grammar (elementary) and high schools. Most parents sought an elementary education for their children. Parents who could afford continued education sent their children to high school, prep school, academy, finishing school and eventually college (George & Alexander, 1993).

The grammar school consisted of eight grades, and the high school housed four grades. Junior high schools emerged due to dissatisfaction with the 8-4 plan and overcrowding of schools during a population boom following World War I (Phi Delta Kappa, 2002). Parents and educators became more concerned with preparing youth for college and wanted to start college preparatory subjects earlier. Early junior high schools provided enriched curriculum for college bound students and vocational education for students preparing for the job market. By 1960, the first major shift happened in school structure. Four of every five high school graduates attended a 6-3-3 (elementary, junior high, high school) program (George & Alexander, 1993; Manning, 2000).

Even though the junior high became popular very quickly, it also received much criticism. Educators felt the departmental organization of the junior high was not developmentally responsive to the young adolescents' needs and interests. Proponents of middle schools provided several reasons for their position that the junior high was not an appropriate organization structure for young adolescents and recommended creation of an organization with a more positive educational environment.

Middle school proponents believed that middle schools should be grouped sixth through eighth grades. Less physical and psychological differences existed between sixth and eighth graders than seventh and ninth graders. Proponents also argued that social patterns were more similar for students in grades 6, 7, and 8. Ninth graders' social maturity more closely reflected that of older students. Restructuring middle schools helped ease the transition from self-contained elementary classrooms to departmentalized high schools. Middle schools continued general education while providing many varied opportunities for exploration and individualization (George & Alexander, 1993; Russell, 1997). Middle schools kept some of the positive program contributions of the junior high school: "core curriculum, guidance programs, exploratory education, and vocational and home arts" (Manning, 2000, para. 6). The middle school reduced the use of competitive practices and departmentalization of subject matter, while adding team teaching and interdisciplinary teaming (Manning, 2000).

Structure and Purpose of Middle Schools

Middle schools traditionally housed sixth through eighth grades. Program concepts intended to create a developmentally responsive environment for young adolescents included 1) interdisciplinary teaming/block scheduling, 2) guidance services

(often referred to advisor/advisee model), 3) exploratory curriculum, 4) developmentally appropriate teaching strategies, 5) transition/articulation services, 6) core curriculum, or appropriate required curriculum/learning skills (Russell, 1997, para. 3).

The Carnegie Council on Adolescent Development (1989) recommended eight goals of effective middle schools. "Goal 1: Create small communities for learning where stable, close, mutually respectful relationships with adults and peers are considered fundamental for intellectual development and personal growth" (Phi Delta Kappa, 2002, para. 6). "Goal 2: Teach a core academic program that results in students who are literate ... and who know how to think critically, lead a healthy life, behave ethically, and assume the responsibilities for citizenship" (Phi Delta Kappa, 2002, para. 8). "Goal 3: Improve academic performance through fostering the health and fitness of young adolescents, by providing ... access to health care and counseling services, and a health-promoting school environment" (Phi Delta Kappa, 2002, para. 10). "Goal 4: Re-engage families in the education of young adolescents by ... communicating with families about the school program and the students' progress" (Phi Delta Kappa, 2002, para. 7-12).

Middle schools should be staffed with teachers specializing in the needs of young adolescents. "Gone are the days of staffing the junior high with teachers awaiting the opportunity for secondary school pedagogy" (Parker, 2002, para. 26). However, Scales (1996, para. 31) reported that "only about one in five middle level teachers receives any specialized preparation about early adolescence during his or her undergraduate preservice programs."

Faculty should be allowed to collaborate during time provided during the daily schedule. This time allows them to plan cross/curricular activities, discuss professional

development, address student needs, and meet with parents and community members. When faculty invest time and involvement in student development and achievement, students prosper (Parker, 2002; George & Alexander, 1993).

Advocates for middle schools and young adolescents pinpointed the needs of these youths, and strive to create the best learning environment for them. Edward Hallowell wrote: "What is connectedness? It is a sense of being a part of something larger than oneself. It is a sense of accompaniment. It is a feeling in your bones that you're are not alone" (Parker, 2002, para. 30). This is the essence of the middle school.

Developmental Responsiveness

Educators, parents, and researchers have explored many school designs to find curriculum and concepts that are developmentally responsive to the needs of young adolescents. Russell (1997) conducted a case study of 10 schools at various transition points from junior high to middle school. She found that three middle-level concepts (appropriate required curriculum, developmentally appropriate teaching strategies, and interdisciplinary teams) positively related to two or more student achievement scores. Mathematics achievement positively correlated to all middle school program concepts except for advisor/advisee. Language arts scores correlated to no middle school programs except advisor/advisee, which was negative.

Developmentally responsive middle schools seek to engage adolescents. Careful planning, routines and hard work create safe stable environments for youth (Scales, 1996). Middle schools provide many opportunities for all students to be involved. Assemblies, class trips, music programs, student council and various clubs provide adolescents with a chance to develop and explore talents while connecting with adults

and peers. Interdisciplinary teaming and interdisciplinary projects have the "double effect of enhancing learning while connecting middle schoolers" (Parker, 2002, para. 19). Middle schools are "designed to embrace the uniqueness of [young] adolescents and distinguish their school experience from the elementary years past and secondary years to come" (Parker, 2002, para. 6).

Gender Differences

Differing self-perceptions on the multiple intelligence survey may be attributed to gender. Past research regarding cognitive, social, physical, and emotional perspectives of girls and boys provided insight to their self-perceptions.

Cognitive Abilities

Cognitive development may differ for males and females. Brain research showed that the effect of stress on the brain of adolescents has an opposite effect on boys and girls. Stress through competition, or by other means, seems to facilitate learning in boys, but competition actually inhibits learning in girls. Long-term stress caused actual structural changes in neurons in the hippocampus (Wilson & Horch, 2002). This change may promote learning in males, but hinder learning in females (Wilson & Horch, 2002).

Snyder (2000) compared grade point averages and learning styles of 128 high school students. Several significant gender differences emerged. "[F]emale students were stronger on intrapersonal, linguistic, musical, prefers working alone, visual, interpersonal, [and] self motivated, ..." "[M]ale students were stronger on bodily/kinesthetic, logical, spatial, and working with others" (Snyder, 2002, para. 19) She also discovered that 81% were tactile/kinesthetic.

As children reach adolescence, most evidence shows an increasing disparity in mathematics scores between genders. Children exhibited little difference in effort and ability until adolescent years. The University of Minnesota Talented Youth Mathematics Program followed students for two years. Despite efforts to support, motivate, and encourage girls, their enthusiasm for mathematics decreased. Researchers felt this was possibly due to peer pressure and competition (Manning, 1998).

Males tended to be risk takers while females showed more reluctance. This may explain males' higher achievement in math, and is consistent with the research indicating that stress and risk taking, promotes cognitive development in males. "[F]emales' reluctance to guess on multiple choice tests, as well as their tendency to skip more difficult questions, regardless whether the format is true-false, multiple choice or relationship analysis" (Manning, 1998, para. 6) may affect their performance in mathematics even though "females are just as capable of mathematical analysis as males" (Manning, 1998, para. 7).

Socialization

Several studies revealed connections between adolescents' interpersonal abilities and their social cognitive capabilities. Walsh and Kurdek (1983) found that older children understand elements of friendship (why friends are important, different kinds of friendships, trust, jealousy, conflict resolution, and terminating a friendship) better than younger children. They provided evidence showing girls have "higher understanding of friendship" than boys (Walsh & Kurdek, 1983, p. 65). Demaray and Malecki (2003, para. 40) supported these findings and added that girls "rated overall support from teachers, classmates and friends higher in importance than boys."

A 1996 study by Jarvinen and Nicholls supported prior research indicating that female and male adolescents hold different beliefs regarding social goals, satisfaction and success. Females held intimacy, the desire to feel close to others, higher than males. They "were also more satisfied with their social relationships" (Jarniven & Nicholls, 1996, p. 440). Males responded higher than females in areas involving agency (the desire to influence others). Boys also reported lower satisfaction with social relationships. O'Dea and Abraham (1999, para. 1) asserted that females regard friendships as more important than males. They found "females rated their ability to form close friendships significantly higher and of greater importance than did males."

Physical Perspectives

O'Dea & Abraham (1999, para. 26) discovered that "males had a more positive self-concept related to physical appearance than did females." Also, "Students did not consider this to be an important self-concept subscale." Both males and females rated athletic competence as the least important self-concept subscale. Males conveyed greater self-esteem than females, but females showed higher self-concept in the ability to form intimate friendships. This indicated that boys regarded themselves as better able to function on their own compared to the girls, and girls perceived themselves more able to establish relationships with others compared to the boys.

Emotions

"[F]emale adolescents were more likely to utilize support resources such as spiritual, family, and other social support systems [to deal with stress and problems] than males" (Chapman & Mullis, 1999, para. 14). Females showed more self-reliance when engaging in demanding situations or seeking spiritual support. Males tended to avoid

problems or persons causing problems. Chapman and Mullis (1999) attributed this to society's expectations of girls and boys. Females are allowed to solicit social help, while males are expected to be more self-sufficient. "Girls may be ... more [emotionally] dependent than boys in middle and late adolescence" (Rice, 1996, p. 337).

Socio-Economic Status

Economic status of students may cause differing self-perceptions on the multiple intelligence survey. Past research regarding cognitive, social, and emotional perspectives of low income students provided insight to reasons for possible trends in their self-perceptions.

Cognitive Abilities

Low socio-economic status correlated positively with school dropout rates. Rice (1996) outlined several reasons that may contribute to this trend.

> Students from these families often lack positive parental influences and examples. ...Teachers are often prejudiced against youth from low socio-economic families, showing preferential treatment to students from higher status families....Low socio-economic students receive fewer rewards for doing well and staying in school....Lower socio-economic students do not possess the verbal skills of their middle-class peers. (Rice, 1996, p. 387)

New research by Turkheimer and Plomin (as cited in Weiss, 2003) showed that the effect of genes on IQ doesn't translate to children living in poverty. Past research investigated the relationship between genetics and IQ on middle-class and wealthy children. For those groups, genes and IQ were correlated. A new study focused on low socio-economic children. Researchers found that poverty was a greater factor in IQ

determination than genetic predictors. " 'In study after study, the evidence is overwhelming that there is a substantial genetic input to IQ,' Plomin said. '...it leads to an interesting possibility that although it's true for the [middle- and upper-class] populations that have been studied ... it's not going to mean much if you're in an impoverished environment'" (Weiss, 2003, para. 24). This research indicated that lower responses for verbal/linguistic, math/logical, and average grade may be expected from lower socio-economic students.

Socialization

Jarvinen and Nicholls (1996) studied the social beliefs that adolescents hold regarding peer relationships. They discovered that students who earn lower grades "have more problems not only relating to teachers but also relating to one another" (p. 440). They found that interpersonal skills did correlate to how students performed in school. However, their "findings [were] more consistent with findings that children's conceptions of friendship are not significantly related to sociometric status" (Jarvinen & Nicholls, 1996, p. 440.) This means that children from all socio-economic levels had the ability to form close friendships. At the same time, children living in poverty tended to earn lower grades, which does correlate to lower interpersonal skills. "Peer influences on low socio-economic youth are often antischool and delinquency prone, emphasizing early marriage for girls and gang activities for the boys" (Rice, 1996). "Much of the research on dropouts and at-risk youth shows that these students feel alienated in the school environment" (George & Alexander, 1993, p. 13). General social beliefs of the group may indicate that lower interpersonal scores on the multiple intelligence survey would correlate to lower reported grade averages.

Emotions

"Low income mothers from rural areas tend to encourage the development of [emotional] dependency in their daughters and to foster interdependency in the family" (Rice, 1996, p. 337). However, effects of poverty on self-esteem were inconsistent. Studies showed higher socio-economic status (SES) girls often have lower self-esteem than their middle SES and low SES counterparts. Added pressure on the high SES group to perform academically, be physically attractive, and be involved in social activities may have caused this (Rice, 1996).

Learning and Other Disabilities

Learning disabilities and other disabilities may cause differing self-perceptions on the multiple intelligence survey. Past research regarding cognitive and social development of students with learning disabilities provided insight to reasons for their self-perceptions.

Cognitive Abilities

"Each child processes new information in ways that are related to environmental, emotional, sociological, physiological, and psychological elements" (Green, 1999, para. 7). Research showed that diverse learners use significantly different learning styles than their high achieving peers. Using teaching and counseling styles that match students' individual learning styles resulted in "increased test scores and positive outlook[s] on learning" (Green, 1999, para. 8).

Hieman and Precel (2003) compared 190 learning-disabled [LD] college students and 191 without a learning disability. Students without disabilities tended to choose humanities and social sciences as courses of studies, and LD students chose mathematics

and sciences more frequently than their peers. Learning disabled students chose fields of study that required little reading.

Students with and without LD used different learning strategies. To memorize information, students without LD used written strategies such as summaries, short notes and index cards. They also reported that a good lecturer was beneficial. Students with LD "devised unusual strategies or tricks, usually not written ones, to help them remember, such as singing or chanting a text, imagining various associations, marking the text in a special way, or making diagrams or sketches" (Hieman & Precel, 2003, para. 24). "Students with LD preferred additional oral explanations or visual explanations, which included graphs, highlighting, and so forth, whereas nondisabled students preferred written examples" (Hieman & Precel, 2003, para. 25).

Students with disabilities shared concerns about testing. They worried about limited time and stated they had difficulty concentrating during exams. Learning disabled students experienced stress, nervousness, frustration, helplessness and feelings of uncertainty during tests, while non-learning disabled students reported physical symptoms such as headaches, pains and trembling (Hieman & Precel, 2003).

Montague and Applegate (2000) conducted a case study to determine perceptions, persistence, and performance by learning and non-learning disabled students on mathematical word problems. They found that LD students perceived the problems as harder than their peers, although they spent the same amount of time trying to solve the problems. Montague and Applegate noted that this was inconsistent with the notion that the problems were more difficult, and that LD students would cognitively give up. They noted that LD students lack the problem-solving strategies that their peers possess,

especially strategies that facilitate problem representation. They recommended "explicit instruction in strategies for mathematical problem solving" for students exhibiting this problem (Montague & Applegate, 2000, para. 32).

Melrose (1997) wrote that while some students have significant disabilities, they also have many abilities. She states,

> These abilities and talents can be represented by Gardner's theory. Clearly there is a need for greater attention to be placed on abilities, strengths, and talents of students who have been labeled learning disabled. Perhaps one day the label will be changed to reflect the learning [abilities] (para. 1).

Socialization

"Social skills deficits are some of the major difficulties facing adolescents with disabilities" (Kolb & Maxwell, 2003, para. 31). A small group of disabled students' parents participated in Kolb & Maxwell's (2003) study to determine the parental interpretation of social skills and critical social skills. The students' disabilities included cognitive, learning and emotional. Parents agreed that adolescence was a critical time to develop social skills. Parents defined social skills as getting along with others and exhibiting traits of character. Their main concerns focused on specific skills (interpersonal and intrapersonal) needed to develop relationships. They listed discernment of the motives of others, communication skills, empathy, interpreting social cues, self-awareness and managing emotions (self-control) as critical (Kolb & Maxwell, 2003).

Interestingly, Demaray and Malecki (2003) found that children with disabilities place significantly higher importance on support from classmates and close friendships than their non-disabled peers. Both LD and non-LD students had similar responses to questions regarding importance of support from teachers and parents.

Race and Nationality

Race and nationality differences may cause differing self-perceptions on the multiple intelligence survey. Past research regarding race and nationality provided insight into reasons for possible trends of their self-perceptions.

Adolescents from various backgrounds develop greater self-esteem when they develop ethnic identity. "Ethnic identity is the sum total of group members' feelings about those symbols, values, and common histories that identify them as a distinct group.... It provides a sense of historical continuity and a sense of belonging" (Rice, 1996, p. 202). Several studies indicated that adolescents who integrate strong cultural identity and involvement in the "dominant society" (Rice, 1996, p. 202) feel the highest degree of self-esteem. Black, Hispanic, Asian and white adolescents reported that marginality, identifying with neither the dominant nor the ethnic culture, is the worst option for acculturation (Rice, 1996). The ability of students to develop a positive identity with a group may affect intrapersonal and interpersonal views.

Past studies show that black students attending predominantly white schools have lower self-esteem than when they attend segregated schools (Rice 1996, p. 414). Desegregated schools have certain advantages, but this is not one. Other research concludes that when black students form close friendships and gain group acceptance, self-esteem is higher. Cross-cultural comparisons of Indian, American, Australian and

Irish adolescents showed that "American students had higher self-concepts and self-esteem than did the others" (Rice, 1996, p. 414).

Researchers compared black, Mexican American, and white students' career aspirations. "Results suggested that there seemed to be more gender than ethnic differences in students' career aspirations" (Rice, 1996, p.414)

English Language Learners

Learning needs of English language learners (ELL) may cause differing self-perceptions on the multiple intelligence survey. Past research regarding cognitive language development provided insight into reasons for possible trends in their self-perceptions.

As of 1990 (Donoghue), eleven percent of all Americans lived in non-English speaking households. English as a Second Language programs should incorporate four general goals. Students must be able to carry on and understand conversational English and topics of interest of their peer group. Students must be able to read materials written in English with "comprehension, ease, and enjoyment" (Donoghue,1990, p. 492). Students must be able to write correctly, and eventually creatively. And, students must be able to recognize differences between their own culture and that of their English-speaking peers (Donoghue, 1990).

Cognitive Language Development

Cognitive development may look different for young adolescent students struggling to learn a new language. Using Bloom's Taxonomy, a scale of linear cognitive development for ESL students was created. Levels 1-3, knowledge/recalling, comprehension/recombining, and application/communicating, were all considered

survival skills. Levels 4-6, analysis/informing, synthesis/generalizing, and evaluating/judging, were academic language skills needed for instruction comprehension (Donoghue, 1990).

Donoghue (1990) provided several instructional strategies educators can use to promote language development of ESL students. Examples included: bridging (tying English words to concepts they already understand), chunking (the process of imitating phrases of the language), and creating (combining words or phrases into unique sentences). Although acquisition of language for these students emphasizes verbal/linguistic skills, other intelligences are used to connect ideas and promote retention of learned information.

Development of a particular intelligence, such as the Verbal/Linguistic intelligence as it relates to language acquisition, requires three conditions (Reiff, 1997). First, the child must have the opportunity to learn. This requirement may not have been met for all ESL learners. Some students enroll in classes having no formal education in their native country. Second, the culture must place value on the development of that particular intelligence. Therefore, depending on the cultural values in the country the child comes from, certain intelligences may be more developed than others, and this may not reflect trends by American children. Third, the individual must place value on developing intelligence. English language learners may choose to focus on certain intelligences as a means of surviving in new surroundings, while development of other intelligences may decline.

Reiff (1997, para. 2) states that "when a student's cultural style differs from school culture, cultural incompatibility, or dissonance, often occurs." She suggests that

culturally responsive teaching practices include the use of authentic assessments, multiple intelligences, multiple learning styles and the cultural backgrounds and interests of students.

The Role of Music in Development

Adolescent Culture

Past informal survey results revealed that young adolescents have high self-perceptions for Music/Rhythmic skills. In order to better understand how that relates to adolescent growth and development, past research was reviewed to find connections between music and cognitive, emotional, and social development.

Adolescents enjoy a variety of music. Rice (1996) highlighted musical preferences of adolescents. Adolescents tend to listen to includes ballads of love, the doubt that love solves all problems, everyday living, the problem of spending time together, problems of youth, blatant sexuality, relationship problems, and problems of the world. Rice discussed heavy metal music and the controversy surrounding it. "The adolescent boys' enthusiasm for heavy metal music did not appear to be motivated by defiance or rebellion toward parents" (Rice, 1996, p. 265). Music with dismal lyrics reflected adolescents' concern for the world. This type of music relieved some feelings of alienation and anger because they felt a shared bond with others. Rice (1996) noted another study that found a correlation between youths who display reckless sensation seeking behavior and heavy metal music. However, the music was not found to be a contributing factor in this kind of behavior, but the behavior indicated a tendency for liking the music.

Cognitive Implications

Music instruction showed a "positive effect on cognitive development" (Green, 1999, para. 10). Brain research concluded that musical experiences are "multimodal, involving auditory, visual, cognitive, affective, and motor systems" (Green, 1999, para. 10). Both hemispheres of the brain are active when processing music. Music also stimulates formation of nerve connections in the brain. (Green, 1999, para. 10)

Emotional Intelligence

Research presented a connection between music and emotional intelligence. Gardner (1983) emphasized the importance of interpersonal skills involved in the socialization of musicians. Philosophers of music have focused on the "intrapersonal growth of emotional knowledge and understanding which is part of the musical experience" (Kaschub, 2002, para. 11). Musical intelligence involves thinking and feeling processes that are intertwined (Kaschub, 2002).

> [F]eeling and thinking work together, not as separate entities, for three primary reasons: 1) Feelings can help observers detect essential characteristics of their surroundings, 2) the feeling of a particular mood or emotion can organize the focus of perception and determine what an observer abstracts from a multiple stimulus situation, and 3) both types of feeling provide an additional basis for discriminating, comparing, classifying, abstracting, weighting, relating, and comprehending perceptual input. (Stokes, 1994, para.)

Music reflects cultural moods and values. Specific events may cause certain emotions to be associated with music, but emotions may differ for individuals. "As the

factors that shape the growth of each person are unique to the individual, the meaning of music to each will differ" (Kaschub, 2002, para. 25).

Summary

Young adolescents differ cognitively, physically, emotionally, and socially. Most seventh and eighth grade students still operate in the concrete operations stage, while only a few have matured to formal operations. This developmental stage characterizes their ability to introspect. The ability to know one's self and judge other's perspectives greatly increases with development and age during this period of growth. As these young people reach late adolescence they gain behavioral and emotional independence.

Middle schools and junior high schools serve different purposes. Junior highs sprang forth from the need to begin college preparation earlier. Middle schools evolved from the junior high model. The intent of the middle school was to provide a developmentally responsive atmosphere. Differences between the two models include age grouping, departmentalization and degree of competitive practices. Middle schools also incorporate team teaching and interdisciplinary teaming.

Males and females differ developmentally. Stress causes cognitive growth in males, but hinders it in females. Females regard intimacy higher than males, while boys feel a stronger need to be able to influence others. Both genders viewed physical appearance as not very important. During adolescence, a disparity in mathematics and science abilities begins. Boys start to advance more quickly than girls. Some researchers believe this related to the tendency of males to take more risks than females.

Students living in poverty often lack resources needed for growth and success. Parental influence is often unavailable, and teachers sometimes exhibit favoritism to middle-class peers. New research indicated that IQ is affected when children live in poverty and are not able to experience ideas and language outside their immediate environment. These adolescents also have more difficulty forming and maintaining friendships.

Learning-disabled students use different learning styles than their non-learning-disabled counterparts. They tended to use non-traditional learning strategies to help them remember information. This included singing, imagery, highlighting, sketching and diagramming. They were concerned about limited test times. Parents of LD children regarded the ability to form and develop relationships as the most important social skill. This was also highly valued by the LD children.

When adolescents of varied races and nationalities develop ethnic identity and identify with the common culture, they exhibit the highest self-esteem. English language learners may have difficulty learning in an environment that is incompatible with the culture in which they were raised.

Music plays a large role in adolescent development. Not only does it add to or identify the culture of the time, it provides opportunities for cognitive and emotional development. Research indicated that musical experiences stimulate both sides of the brain and promote brain growth.

METHODOLOGY

Methods

Seventh and eighth grade students attending a middle school and junior high school in Iowa completed self-profiles which revealed their multiple intelligence strengths and weaknesses. Each participant completed the survey in October and May of the same school year. Survey responses were analyzed to determine reliability of the test instrument and student responses, and to identify self-perception trends for individual sub-groups. Trends were then compared to research so that recommendations could be made to guide instructional practices.

Research Questions

The following research questions guided the study:

1) Do resulting patterns of high mean scores in the Interpersonal and Music/Rhythmic categories and low mean scores in the Intrapersonal category continue with a formal survey of the self-perceptions of young adolescents from a larger sample population?

2) How do the resulting patterns of responses on the formal survey relate to the following:

d) emotional development of young adolescents?

e) cognitive development of young adolescents?

f) physical development of young adolescents?

3) Do statistical differences occur in young adolescents' self-perceptions when comparing:

i) seventh and eighth grade students; indicating that self-perceptions have changed with one year's development?

j) middle school and junior high school students; indicating school structure may affect young adolescent self-perceptions?

k) female and male students; indicating that they have different learning styles or learning needs?

l) low socio-economic status students and moderate to high socio-economic status students; indicating they have different perceptions of their multiple intelligences?

m) learning disabled and non-learning disabled students; indicating that they have different perceptions of their multiple intelligences?

n) students with disabilities other than learning disabilities and non-disabled students; indicating that they have different perceptions of their multiple intelligences?

o) students of varied races; indicating that they have different perceptions of their multiple intelligences?

p) ESL and English as a first language students; indicating that they have different perceptions of their multiple intelligences?

4) Do trends exist that will give educators, parents and students better understanding of how young adolescents, as a group, perceive their intelligences?

Participants

Seventh and eighth grade students from Evans Middle School, Ottumwa, Iowa and Washington Junior High School, Washington, Iowa participated in the study during the 2002-2003 school year. Evans Middle School was a public seventh and eighth grade school with a total student population of 821 (Iowa Department of Education, 2003b). There were 15.0 students per teacher (Jackson, 2001a). Forty-eight percent of the student population received free or reduced-price lunches (38% receive free and 10% receive reduced) (Iowa Department of Education, 2003b). Evans was 90% white, 2% African American, 1% American Indian, 1% Asian and 7% Hispanic (Jackson, 2001a).

Washington Junior High School was a public school seventh through 9th grade building with a total student population of 437 (Iowa Department of Education, 2003b). There were 12.9 students per teacher (Jackson, 2001b). Twenty-five percent of the student population received free or reduced-price lunches (18% receive free and 6% receive reduced) (Iowa Department of Education, 2003b). Washington was 91% white, 2% African American, 0% American Indian, 0% Asian and 7% Hispanic (Jackson, 2001b).

The demographic break down proved similar for both schools. The number of students who received free or reduced-price lunches differed by 23%, indicating that Evans Middle School served a larger population of low-income families.

School Setting

Evans Middle School (EMS) was organized in 6 grade level teams and 2 exploratory teams. Three student/teacher teams composed each grade level. Approximately 125 students per team shared the same science, math, English, social

studies and reading teachers. Students were "off team" for exploratory classes. Each team of teachers used one 40-minute period each day for individual preparation and collaborated with their team teachers during another 40-minute period each day. Teams discussed and created team policies for student expectations, grading, and late work; organized and planned team projects and activities; discussed and solved student concerns; and met with parents and the administrative team. Students had the same team of teachers, and class schedule, other than changing exploratory classes each trimester, all year. Students with learning disabilities received resource services differently on each team. One team at EMS at each grade level included resource students in all academic classrooms. The other two teams provided pull out programs for students with math, reading, and English goals on their Individual Education Plan.

Washington Junior High School (WJHS) is organized by block scheduling. There were approximately 125 students per grade level. Students attended four 80-minute academic or exploratory blocks per day, a 50-minute homeroom period during the middle of the day and a 25-minute homeroom period at the end of the day. Schedules changed every quarter. Seventh grade students had math for four quarters, science for two quarters, English for two quarters, and social studies for two quarters. Eighth graders had similar schedules, but math was only three quarters. There was one grade level teacher for each academic area except for mathematics and eighth grade United States history. Four teachers shared the seventh grade math classes and two teachers shared eighth grade math classes, so students may have had one to four different math teachers during the year. Each team of grade level teachers met twice a month after school to discuss student concerns and meet with administration. Teachers had one block each day for planning

and other meetings. Planning periods usually coincided for each department. This allowed teachers in one academic area time to plan together. Most students with learning disabilities received resource services in regular academic classrooms. A small number of learning disabled students did not attend regular classes.

Measures

The test instrument (see Appendix 1) was a modified version of a Behavior Observation record published by Teacher Created Materials (1999), and a Multiple Intelligence Profile written by Armstrong (2002). Modifications were made on the survey to simplify wording for the participants. The survey contained seven sections, one section for each of Howard Gardner's original intelligence areas. Each section was composed of five statements that students were to rate from one to five, where one meant the student perceived themselves not at all like the statement, and five meant the student perceived themselves definitely like the statement. For example, a statement that students rated in the Visual/Spatial section was, "I think in images and pictures." In the Music/Rhythmic category students rated the statement, "I am highly aware of sounds within the environment."

The multiple intelligence surveys included a section at the beginning that asked the student to share demographic, economic and other information so that the data could be disaggregated into subgroups to look for trends. Students reported the month and year they were born, current grade in school, race, handedness, gender, if they had a learning disability or other disability, if they received free or reduced lunches, if English was their second language, and what grade they averaged in school. Teacher supervisors

administering the surveys received specific instructions to read to the students in order to standardize directions for all participants (see Appendix 2).

Students also reported their perception of the average grade they earned in school. They were asked to circle the letter grade they felt best showed the average of all of their classes combined. Each letter grade was then assigned a numerical value. An A+ equaled a score of 11, A = 10, A- = 9 and so on (see Table 4.2). A mean score for the average grade was then calculated for the entire group as well as for each subgroup.

Reliability

Fall and spring multiple intelligence survey results were compared using the Pearson Correlation test to determine if the test instrument would evoke a reliable response from participants. If the test correlation was high, little change in student self-perceptions occurred from fall to spring. This would indicate that cognitive, physical, and emotional development did not greatly change student perceptions during the school year. Each intelligence category, including the average grade that students perceive they earn overall in school, was reliable (see Table 3.1). A comparison of fall and spring results for this test instrument revealed the following: Intrapersonal reliability at .510, Interpersonal at .527, Body/Kinesthetic at .577, Verbal/Linguistic at .653, Math/Logical at .625, Visual/Spatial at .516, Music/Rhythmic at .641 and Average Grade at .704. Student self-perceptions of Average Grade achieved in school had the highest reliability score. Verbal/Linguistic (.653), Music/Rhythmic (.641) and Math/Logical (.625) were the most reliable categories on the multiple intelligence survey. Categories that generated lower reliability scores included Intrapersonal (.510), Visual/Spatial (.516), and Interpersonal (.527). After determining reliability for the test instrument using fall and

spring survey results, only fall tests were used for comparing subgroups' responses of self-perception. This decision was made because it was the first time participants responded to questions on the test instrument.

Table 3.1 - Reliability of Fall and Spring Results

**. Correlation is significant at the 0.01 level (2 tailed).

Correlations

Intrapersonal	Fall	Spring
Pearson Correlation	1	.510**
Sig. (2-tailed)	.	0
N	192	192
Pearson Correlation	.510*	1
Sig. (2-tailed)	0	.
N	192	192

Correlations

Interpersonal	Fall	Spring
Pearson Correlation	1	.527**
Sig. (2-tailed)	.	0
N	192	192
Pearson Correlation	.527*	1
Sig. (2-tailed)	0	.
N	192	192

Correlations

Body/Kinesthetic	Fall	Spring
Pearson Correlation	1	.577**
Sig. (2-tailed)	.	0
N	192	192
Pearson Correlation	.577*	1
Sig. (2-tailed)	0	.
N	192	192

Correlations

Verbal/Linguistic	Fall	Spring
Pearson Correlation	1	.653**
Sig. (2-tailed)	.	0
N	192	192
Pearson Correlation	.653*	1
Sig. (2-tailed)	0	.
N	192	192

Table 3.1 - Reliability of Fall and Spring Results – continued

**. Correlation is significant at the 0.01 level (2 tailed).

Correlations

Math/Logical	Fall	Spring
Pearson Correlation	1	.625**
Sig. (2-tailed)	.	0
N	192	192
Pearson Correlation	.625*	1
Sig. (2-tailed)	0	.
N	192	192

Correlations

Visual Spatial	Fall	Spring
Pearson Correlation	1	.516**
Sig. (2-tailed)	.	0
N	192	192
Pearson Correlation	.516*	1
Sig. (2-tailed)	0	.
N	192	192

Correlations

Music/Rhythmic	Fall	Spring
Pearson Correlation	1	.641**
Sig. (2-tailed)	.	0
N	192	192
Pearson Correlation	.641*	1
Sig. (2-tailed)	0	.
N	192	192

Correlations

Average Grade	Fall	Spring
Pearson Correlation	1	.704**
Sig. (2-tailed)	.	0
N	192	192
Pearson Correlation	.704*	1
Sig. (2-tailed)	0	.
N	192	192

Procedures

One team of seventh grade and one team of eighth grade students at Evans Middle School in Ottumwa were asked to participate. The social studies teacher on each team distributed and collected student and parent consent forms, administered the surveys, and matched the fall and spring surveys for each student. Social studies teachers were asked to volunteer because all resource students attended their classes and would have an opportunity to participate.

All seventh and eighth grade students at Washington Junior High were asked to participate. Homeroom teachers distributed and collected student and parent consent forms, administered the surveys, and collected and matched fall and spring surveys. All students, including mainstreamed and self-contained resource students, attended homeroom, thus ensuring their opportunity to participate in the study.

In Ottumwa, 112 seventh-graders completed the survey in the fall and spring, and 105 eighth-graders completed the survey both times. Of those, 45 seventh-graders and 45 eighth-graders (90 total students) chose to participate in the study. In Washington, 114 seventh-graders completed the survey both times and 126 eighth-graders finished the survey in the fall and spring. Of the Washington students, 48 seventh-graders and 54 eighth graders (102 total students) chose to participate in the study.

The two social studies teachers at Evans Middle School in Ottumwa matched their students' fall and spring surveys, stapled each pair together and cut off the names. Each homeroom teacher at Washington Junior High delivered the surveys to the guidance counselor who matched and stapled the fall and spring surveys and cut off the student names. This process ensured privacy of each participant.

The Pearson Correlation test determined reliability of the test instrument. Statistical analysis revealed reliability with each category scoring from .510 to .653. The question that asked students to report the average grade they earned in school was most reliable, generating a score of .704.

Evans Middle School and Washington Junior High operate with different schedule structures, pedagogical approaches, school size, and degree of poverty. The schools share similar race/ethnic make-ups. Forty-two percent of students from each

school who were asked to participate in the project accepted the invitation. Comparison of fall and spring surveys proved reliability of the test instrument. Fall results were then analyzed to find self-perception trends for the group as a whole and for individual subgroups.

DATA ANALYSIS AND FINDINGS

The purpose of this study was to compare self-perceptions young adolescents hold regarding their multiple intelligences. Past informal survey results showed high student perceptions in Interpersonal and Music/Rhythmic intelligences and low perceptions in Intrapersonal intelligence. Seventh graders were compared to eighth graders to determine if significant cognitive, emotional or physical growth had occurred in a one-year time span. Differences in seventh and eighth grade responses may indicate that student growth was occurring so rapidly that generalizations about young adolescent self-perceptions could not be made. Self-reported data, perceptions of multiple intelligences, was also disaggregated for various subgroups to determine if those groups of young adolescents have specific learning needs. Educators can then use this information to tailor teaching and learning strategies.

The test instrument, a multiple intelligence self-profile showing perceived strengths and weaknesses, was analyzed for reliability of student responses. Averages (mean scores) for each category were calculated. Students reported one letter grade to represent the average of all the grades they earn in school. Data was then disaggregated according to required reporting groups as mandated on the No Child Left Behind Act (Paige, 2002), as well as by handedness. T-test comparisons were run for each subgroup to determine if there were any significant differences in self-perceptions reported by students.

Multiple Intelligence Self-Perceptions of Young Adolescents

The ranges of responses were similar for all categories on the fall survey except for Visual/Spatial (see Table 4.1). The minimum response for any category could be 5 if the participant chose "1 –Not at all like me," and the maximum response could be 25 if the participant chose "5 – Definitely like me." Ranges of responses for individual students in each category could be a low of 5 to a high of 25. Mean ranges resulted as follows: Intrapersonal = 20, Interpersonal = 21, Body/Kinesthetic = 19 Verbal/Linguistic = 17, Math/Logical = 19, Visual/Spatial = 15, Music/Rhythmic = 18.

The mean for each category varied: Intrapersonal = 15.84, Interpersonal = 18.62, Body/Kinesthetic = 15.95, Verbal/Linguistic = 17.55, Math/Logical = 17.03, Visual/Spatial = 17.04, Music/Rhythmic = 18.28. The highest mean scores were Interpersonal (.527 reliability) and Music/Rhythmic (.641 reliability). The lowest mean scores were Intrapersonal (.510 reliability) and Body/Kinesthetic (.577 reliability). These results also correlated to past informal survey data.

Intrapersonal generated a low mean score and moderate degree of reliability. The closer the reliability rating is to 1.000, the more reliable responses are to match from fall to spring. The mean score is the combined students' average from 5-25 where 5 occurs when a student answers all questions "Not at all like me" and "25 occurs when students answer all questions "Definitely like me." This indicated that students do not feel that their intrapersonal skills are well developed.

Body/Kinesthetic self-perceptions related to former research by George and Alexander (1993) where they explain that physical growth and development is rapid and of concern to young adolescents. Music/Rhythmic had a high mean score from

participants and a higher degree of reliability. This finding also correlated to past informal survey results.

Average grade in school as perceived by participants was rated from 1-11. Eleven was assigned to an average grade of "A", 10 was "A-", 9 was "B+" etc. The range in responses started at 3 (D+) to 11 (A) (see Table 4.2). The mean response for all participants equaled 8.95 (B+).

Table 4.1 **Descriptive Statistics**

Category	N	Minimum	Maximum	Mean	Std. Dev.
Intrapersonal	192	5	25	15.84	3.64
Interpersonal	192	4	25	18.62	4.09
Body/Kinesthetic	192	6	25	15.95	4.10
Verbal/Linguistic	192	8	25	17.55	3.96
Math/Logical	192	6	25	17.03	3.96
Visual/Spatial	192	10	25	17.04	3.84
Music/Rhythmic	192	7	25	18.28	4.23
Average Grade	192	3	11	8.95	1.85

Table 4.2

Average Grade Earned in School

Average Grade Earned in School	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	F
Numeric Equivalent	11	10	9	8	7	6	5	4	3	2	1	0

Students were asked to choose one letter grade that represented the average grade that they earned overall in school.

Seventh and Eighth Grade

Data was compared for various subgroups. Both schools data were combined in order to compare all seventh graders' responses to all eighth graders' responses. The

purpose for this test was to determine if physical, cognitive, or emotional growth had changed self-perceptions from seventh to eighth grade. Significant differences in student responses would inhibit the ability to generalize about young adolescents' learning styles. No significant differences were found between seventh and eighth grade students' perceptions in any intelligence category or average grade earned in school when using a t-test (see Table 4.3).

Table 4.3

T-Test Comparison of Seventh and Eighth Grade

seventh grade (N=92) eighth grade (N=100)

Category	Grade	Mean	Significance	Mean Difference
Intrapersonal	7	15.45	.152	-0.75
	8	16.20		
Interpersonal	7	18.42	.526	-0.38
	8	18.80		
Body/Kinesthetic	7	16.48	.086	1.02
	8	15.46		
Verbal/Linguistic	7	17.63	.794	0.15
	8	17.48		
Math/Logical	7	17.30	.361	0.52
	8	16.78		
Visual/Spatial	7	17.14	.731	0.19
	8	16.95		
Music/Rhythmic	7	18.18	.775	-0.18
	8	18.36		
Average Grade	7	8.90	.715	-.10
	8	9.00		

(Significance at $p < .01$)

At this point, further data analysis was performed for the various subgroups as outlined in the research questions.

Middle School (Ottumwa) and Junior High (Washington)

George & Alexander (1993), Manning (2000), Russell (1997), Phi Delta Kappa (2002), and Parker (2002) suggested several components that responsive middle schools implement. The middle school and junior high that participated in this study exercised different degrees of the middle school model. T-testing was used to compare the survey responses of Evans Middle School students with Washington Junior High School students. Significant differences resulted in how participants perceived their strengths in the area of Intrapersonal skills ($p<.005$, sig. at .01). The Verbal/Linguistic category was nearly significant with a p score of .014. See Table 4.4 and Figure 4.1.

Table 4.4

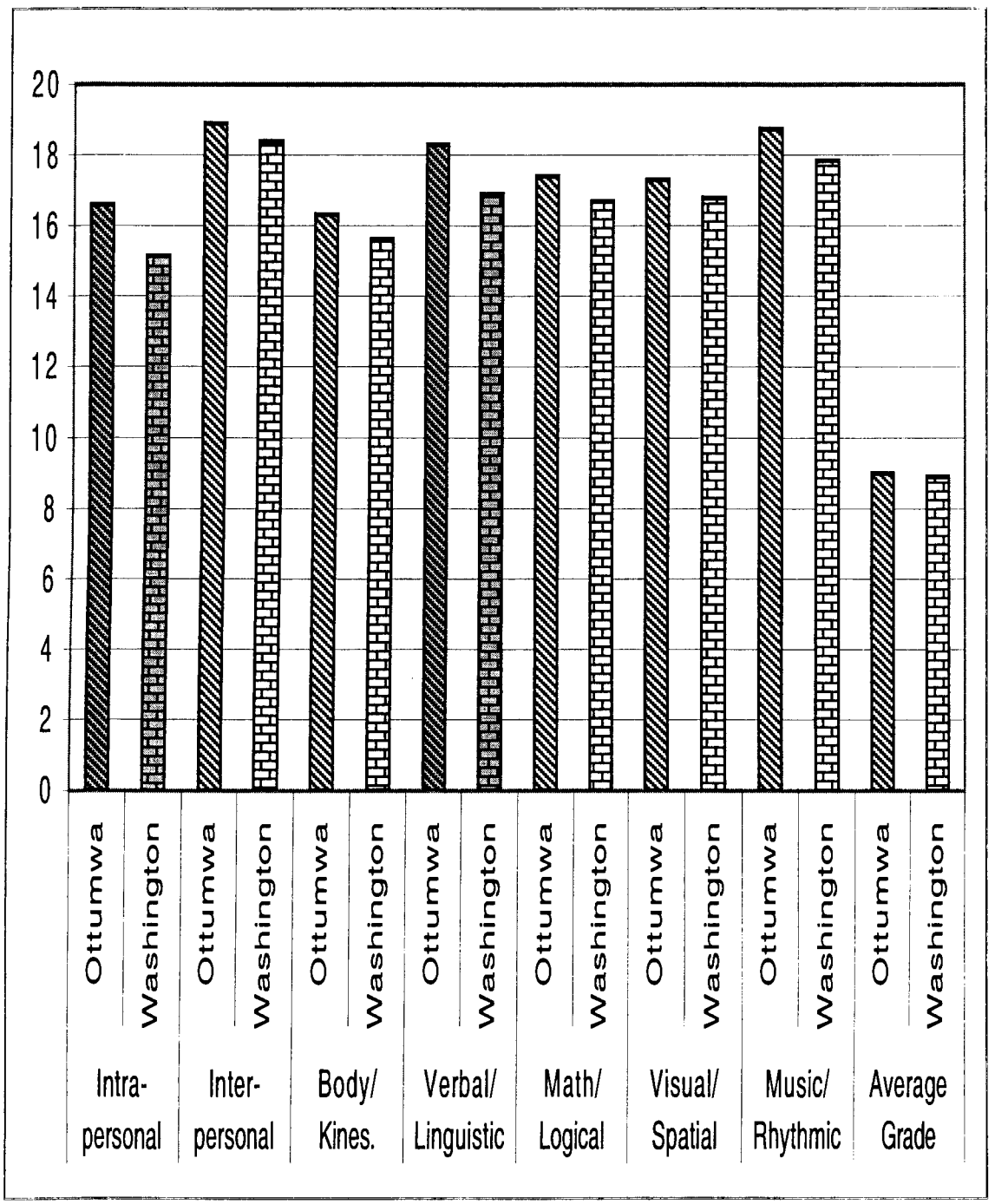
T-Test Comparison of Middle School and Junior High

Ottumwa (N=90) Washington (N=102)

Category	School	Mean	Significance	Mean Difference
Intrapersonal	Ottumwa	16.62	.005*	1.48
	Washington	15.15		
Interpersonal	Ottumwa	18.89	.394	0.51
	Washington	18.38		
Body/Kinesthetic	Ottumwa	16.32	.236	0.70
	Washington	15.62		
Verbal/Linguistic	Ottumwa	18.30	.014*	1.41
	Washington	16.89		
Math/Logical	Ottumwa	17.40	.226	0.69
	Washington	16.71		
Visual/Spatial	Ottumwa	17.30	.383	0.49
	Washington	16.81		
Music/Rhythmic	Ottumwa	18.74	.150	0.88
	Washington	17.86		
Average Grade	Ottumwa	8.99	.802	.07
	Washington	8.92		

* significance at $p<.01$

Figure 4.1 – Middle School and Junior High Mean Scores



Gender

Several intelligence categories showed significant differences in participant responses when gender was compared (see Table 4.5). Body/Kinesthetic was significant at p=.010. Females rated themselves lower than males. In the Math/Logical category, females also rated themselves lower than males with a significance of p<.001. Males rated themselves lower than females in the Music/Rhythmic category where p<.001. Finally, Verbal/Linguistic was nearly significant, where males rated themselves lower than females where p <.011. Females held self-perceived strengths in Verbal/Linguistic and Music/Rhythmic, and males reported self-perceived strengths in Body/Kinesthetic and Math/Logical. See Table 4.5 and Figure 4.2.

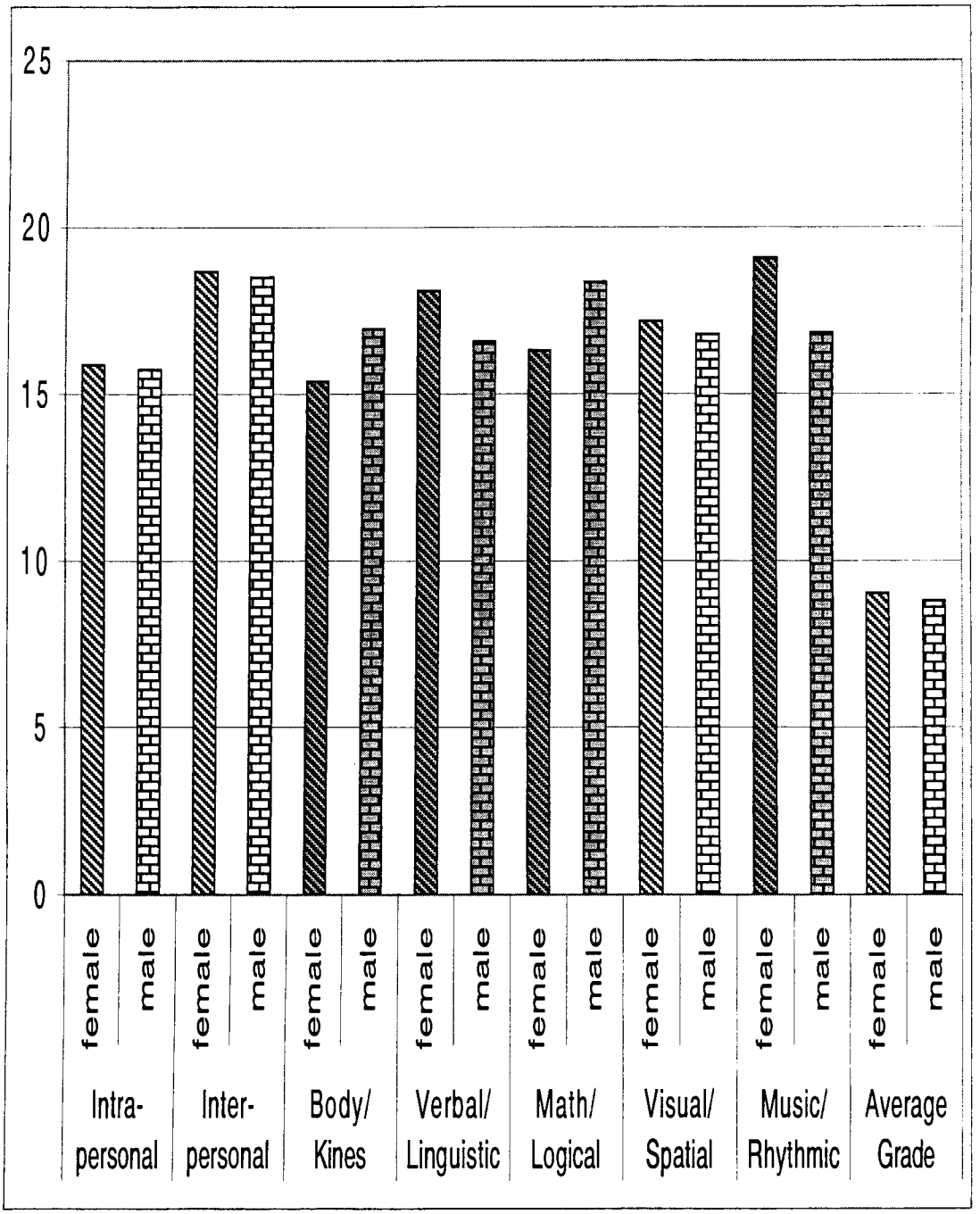
Table 4.5

T-Test Comparison of Female and Male Students
Female (N=123) Male (N=69)

Category	Gender	Mean	Significance	Mean Difference
Intrapersonal	female	15.89	.778	0.16
	male	15.74		
Interpersonal	female	18.68	.776	0.18
	male	18.51		
Body/Kinesthetic	female	15.38	.010*	-1.57
	male	16.96		
Verbal/Linguistic	female	18.10	.011*	1.52
	male	16.58		
Math/Logical	female	16.29	.000*	-2.06
	male	18.35		
Visual/Spatial	female	17.18	.510	0.38
	male	16.80		
Music/Rhythmic	female	19.08	.000*	2.24
	male	16.84		
Average Grade	female	9.04	.382	.24
	Left	8.80		

* significance at p<.01

Figure 4.2 - Female and Male Mean Scores



Socio-Economics

When data was disaggregated by free/reduced lunch (as reported by participants), no significance was found in any intelligence category (see Table 4.6). However, Interpersonal and Math/Logical had the greatest mean differences. The Interpersonal category showed a difference of 1.38, and the Math/Logical mean differed by 1.32. In each of these categories, full pay meal students perceived themselves to have higher intelligence more areas than free or reduced lunch students. There was a significant difference in the perceived average grade between the groups ($p<.002$). Students receiving free or reduced lunches viewed themselves as earning lower grades in school. See Table 4.6 and Figure 4.3.

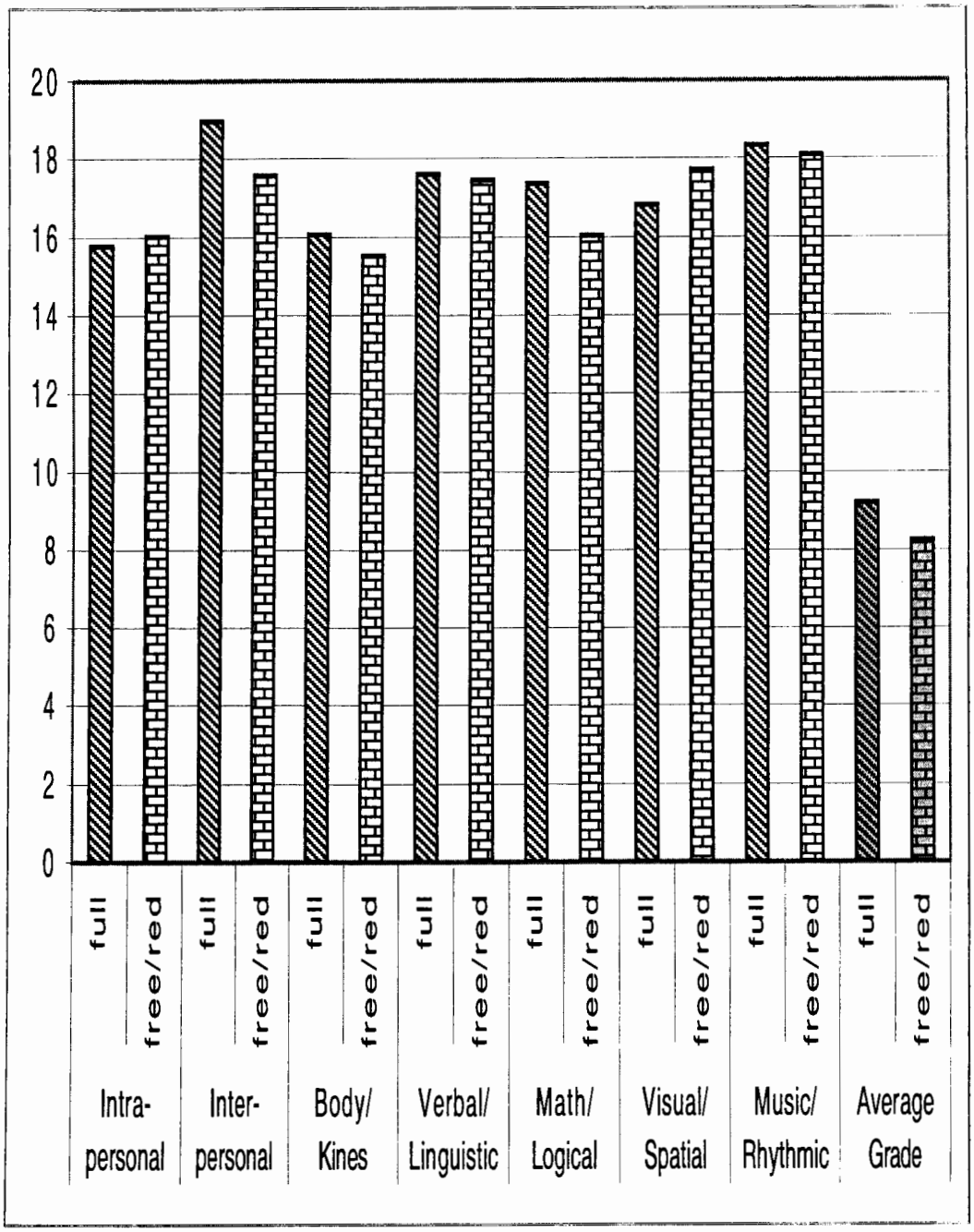
Table 4.6

T-Test Comparison of Full Pay Meal Students to Free or Reduced Pay Meal Students
Full Pay (N=144) Free/Reduced Pay (N=48)

Category	Pay	Mean	Significance	Mean Difference
Intrapersonal	full	15.78	.690	-0.24
	free/red	16.02		
Interpersonal	full	18.97	.043	1.38
	free/red	17.58		
Body/Kinesthetic	full	16.09	.406	0.57
	free/red	15.52		
Verbal/Linguistic	full	17.59	.818	0.15
	free/red	17.44		
Math/Logical	full	17.36	.045	1.32
	free/red	16.04		
Visual/Spatial	full	16.81	.153	-0.92
	free/red	17.73		
Music/Rhythmic	full	18.33	.746	0.23
	free/red	18.10		
Average Grade	full	9.19	.002*	.97
	free/red	8.23		

* significance at $p<.01$

Figure 4.3 - Full Pay Meal and Free/Reduced Meal Student Mean Scores



Learning Disability

Only 8 of the 192 participants reported they had a learning disability. A significant difference did appear in the Average Grade reported by this subgroup (see Table 4.7). The Intrapersonal category had a p score of .063, and Math/Logical showed a p score of .096. These were the lowest p scores of the intelligence categories. Strongly rated categories for the learning disabled group were Body/Kinesthetic (.959), Visual/Spatial (.950) and Music/Rhythmic (.946). In Visual/Spatial and Music/Rhythmic, learning disabled students reported higher perceptions of intelligence than regular education students. The learning disabled students reported their average grade (mean) at 6.63, or a C+/B-, compared to 9.05 (B+) reported by the regular education students. See Table 4.7 and Figure 4.4.

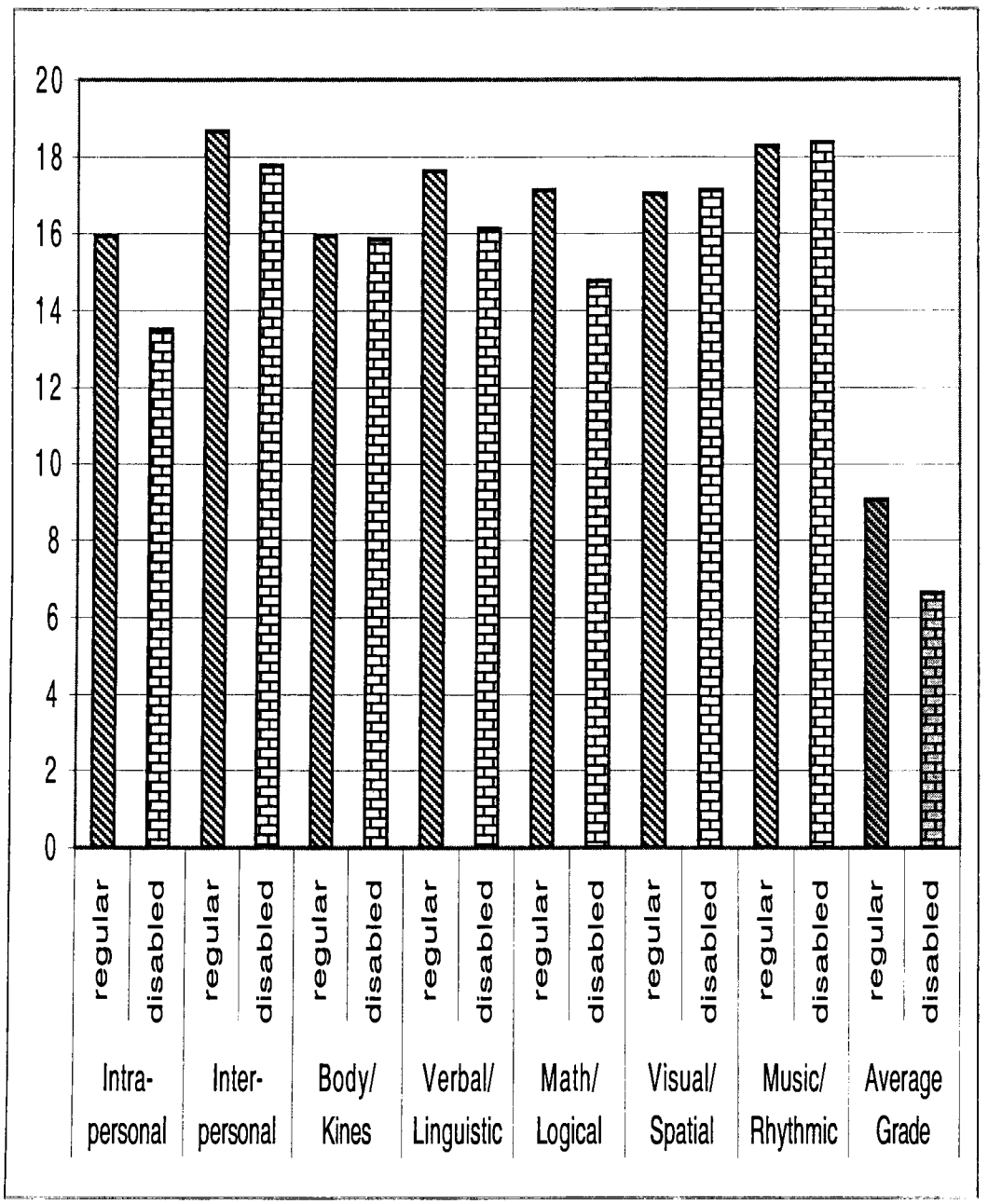
Table 4.7

T-Test Comparison of Regular Education Students to Learning Disabled Students
Regular Education (N=184) Learning Disabled (N=8)

Category	Education	Mean	Significance	Mean Difference
Intrapersonal	regular	15.94	.063	2.44
	disabled	13.50		
Interpersonal	regular	18.66	.541	0.91
	disabled	17.75		
Body/Kinesthetic	regular	15.95	.959	0.13
	disabled	15.88		
Verbal/Linguistic	regular	17.61	.300	1.49
	disabled	16.13		
Math/Logical	regular	17.13	.096	2.38
	disabled	14.75		
Visual/Spatial	regular	17.04	.950	-0.09
	disabled	17.13		
Music/Rhythmic	regular	18.27	.946	-0.10
	disabled	18.38		
Average Grade	regular	9.05	.000*	2.43
	disabled	6.63		

* significance at p<.01

Figure 4.4 - Regular Education and Learning Disabled Student Mean Scores



Race

No significant differences were found when data was disaggregated for race (see Table 4.8).

Table 4.8

T-Test Comparison of Non-White to White Students

Non-White (N=21) White (N=171)

Category	Race	Mean	Significance	Mean Difference
Intrapersonal	non-white	15.62	.771	-0.25
	White	15.87		
Interpersonal	non-white	17.90	.398	-0.80
	White	18.71		
Body/Kinesthetic	non-white	15.57	.657	-0.42
	White	15.99		
Verbal/Linguistic	non-white	18.05	.545	0.56
	White	17.49		
Math/Logical	non-white	16.76	.742	-0.30
	White	17.06		
Visual/Spatial	non-white	17.81	.333	0.86
	White	16.95		
Music/Rhythmic	non-white	18.29	.991	0.02
	White	18.27		
Average Grade	non-white	8.33	.103	-.70
	White	9.03		

* significance at p<.01

English as a Second Language

No significant differences were found when the subgroup English as a Second Language (ESL) students were compared to the rest of the group (see Table 4.9).

Table 4.9

T-Test Comparison of English as First Language (EFL) to English as a Second Language (ESL) Students
EFL (N=178)
ESL (N=14)

Category	Language	Mean	Significance	Mean Difference
Intrapersonal	EFL	15.83	.864	-0.17
	ESL	16.00		
Interpersonal	EFL	18.63	.857	0.21
	ESL	18.43		
Body/Kinesthetic	EFL	15.95	.985	0.19
	ESL	15.93		
Verbal/Linguistic	EFL	17.52	.662	-0.48
	ESL	18.00		
Math/Logical	EFL	17.08	.556	0.65
	ESL	16.43		
Visual/Spatial	EFL	17.01	.696	-0.42
	ESL	17.43		
Music/Rhythmic	EFL	18.39	.172	1.61
	ESL	16.79		
Average Grade	EFL	9.02	.088	.87
	ESL	8.14		

* significance at p<.01

Summary

The multiple intelligence self-profile was reliable. Several trends about young adolescent self-perceptions were discovered. Educators can use this information to enhance teaching and learning strategies. No significant differences in responses of seventh and eighth graders, right- and left-handed students, students of different races and students for whom English is their second language were identified.

T-test comparisons revealed significant differences in several areas. Middle school students rated themselves higher than junior high school students in every

category, and were significantly higher in Intrapersonal skills. Females reported self-perceptions of intelligence significantly higher in Verbal/Linguistic and Music/Rhythmic than males, while males were significantly higher in Math/Logical and Body/Kinesthetic than females. Students receiving free or reduced lunch prices and students with learning disabilities reported themselves as earning lower grades in school than their full pay or non-learning disabled peers, but did not respond significantly different in any Multiple Intelligence category.

Past informal survey results mirrored the results in this study. Self-perceptions of intelligences by the seventh and eighth grade participants were high for Interpersonal and Music/Rhythmic intelligence and low for Intrapersonal intelligence.

CONCLUSIONS AND RECOMMENDATIONS

This study compared several subgroups of young adolescents' self-perceptions regarding Multiple Intelligences. Past informal survey result patterns where young adolescents rated themselves high in Interpersonal and Music/Rhythmic skills and low in Intrapersonal skills were consistent with current findings. A new trend also emerged with the larger sample group. Seventh and eighth graders also view themselves as weak in Body/Kinesthetic activities, which include balance and dexterity. Educators can utilize these findings to improve instruction and promote understanding of age related needs.

Individual Intelligence Results for the Group

Student responses from fall to spring varied for each intelligence section (see Table 3.1). Each category, including Average Grade, showed positive correlation from fall to spring with significance at $p>.001$, rejecting the null hypothesis that fall and spring results were unrelated.

Intrapersonal and Interpersonal

Intrapersonal (.510) and Interpersonal (.527), showed the most change from fall to spring, but were still considered a positive correlations (see Table 3.1). This finding agreed with research. George and Alexander (1993) suggested that adolescents function in the concrete operations stage. They reach formal operations when they are able to abstract concepts, reflect on their own thinking, and consider other people's perspectives. This is a cognitive and emotional change that occurs during adolescence. Lower correlation scores in Intrapersonal and Interpersonal intelligences indicated that students

slightly changed their perceptions and beliefs in these areas. This would support the idea that growth is happening in these areas.

Intrapersonal intelligence had one of the greatest ranges in responses (5-25) and the lowest mean score of any category (see Table 4.1). This data also supported the idea that adolescence is a time of growth and change in one's ability to know one's self, create goals, manage feelings and manage behavior (Shearer, 2003). The low mean score indicated that students do not feel that their intrapersonal skills are as strong or developed as the other intelligences they possess. This finding directly connects intrapersonal intelligence of young adolescents to their cognitive and emotional development. As adolescents develop the ability to think and adapt behavior to their situations, their intrapersonal perceptions should increase.

Interpersonal intelligence produced a range in responses from 4-25 (see Table 4.2). However, unlike intrapersonal intelligence, it generated the highest mean score of 18.62. This indicated that young adolescents hold friendships, relationships, and their ability to understand social situations in high regard. These skills are necessary for cognitive, emotional, and physical development to smoothly occur.

Body/Kinesthetic

Body/Kinesthetic (.577) perceptions showed some change from fall to spring, but it was still considered a positive correlation (see Table 3.1). Body/Kinesthetic variability supported past research that stated adolescence is a "time of growth and change second only to infancy..." (George & Alexander, 1993). Rapid physical growth and change may alter self-perceptions of young adolescents.

Body/Kinesthetic results showed a lower correlation, lower mean and a range of 6-25 (see Table 4.1). This trend was similar to intrapersonal intelligence. These results paralleled previous research literature (George & Alexander, 1993; Rice 1996). Adolescents' rapid physical growth may change their perceptions for this category (George & Alexander, 1993). The awkwardness created from physical changes and the speed at which these changes occur may leave adolescents feeling uncoordinated, out of balance or uncomfortable with acting, dancing, or working with others (Shearer, 2003). Each of these feelings could contribute to lower mean responses by participants.

Music Rhythmic

Music/Rhythmic (.641) showed positive correlations for fall and spring responses (see Table 3.1). This suggests that students' perceptions changed very little during that time. Research that stated adolescents enjoy music and find genres that meet their emotional needs (Rice, 1996). Music also positively impacted cognitive and emotional development (Stokes, 1994; Green, 1999; and Kaschub, 2002). Researchers showed that adolescents underwent substantial growth cognitively and emotionally during adolescence (George & Alexander, 1993; Rice, 1996), and music may aid that development.

Verbal/Linguistic

Verbal/Linguistic showed positive correlation at .653 (see Table 3.1). This suggests that students' perceptions in this category changed the least of the multiple intelligence categories from fall to spring. This may indicate that instructional practices and physical, emotional, and cognitive growth had little affect on students' perceptions

regarding their ability use language, understand words, read, write, and speak (Shearer, 2003).

Math/Logical

Math/Logical (.625) showed strong positive correlations (see Table 3.1) from fall to spring. This suggests that students' perceptions in this category changed very little in this category during that time. Students' views of their ability to calculate, reason, problem solve, and classify changed very little. This may indicate that perceptions of these skills were affected very little by instructional practices and physical, emotional, and cognitive growth.

Visual/Spatial

Visual/Spatial (.516) perceptions showed the most change from fall to spring, but is still considered a positive correlation (see Table 3.1). Student perceptions may have been affected by growth or instructional practices. This area may warrant further study. Researchers would first need to decide if instructional practices that were frequently used by teachers in sixth, seventh, and eighth grades included visual representations of information. If no obvious instructional changes were made from grade to grade, then adolescent growth should be looked at as the cause of the change in student perceptions.

Average Grade

The strongest correlation was found in the Average Grade (.704) category (see Table 3.1). This indicated that students did not believe that the average grade they earned in school changed from the fall to the spring. In light of the No Child Left Behind Act (Paige, 2002), this category may warrant further investigation. The Act placed a burden on educators to raise test scores for lower achieving students. It may be interesting to see

if research correlates students' standardized test results and the grades they earn. If there is a correlation, teachers may be able to more easily identify students needing assistance. Because this study showed students' perceptions, it may be possible that changing the view students hold regarding their ability to perform in school, may impact their openness to learning and changing.

Multiple Intelligence Self-Perceptions of Young Adolescents

The degree of variety in student responses, noted by the range for each intelligence category, illustrated how different young adolescents are in their experiences, strengths and abilities (see Table 4.1)."[M]iddle schoolers differ enormously in their personalities, talents, growth patterns, and coping skills.... [Young] adolescents show ... much variability in their backgrounds, life experiences, values, and aspirations..." (George & Alexander, 1993, p.4). Educators should vary instructional strategies to accommodate the variety of learning styles and needs of young adolescents.

Seventh and Eighth Grade

Before extensive analysis could be conducted, a comparison of seventh and eighth grade responses needed to be performed to determine if rapid growth, as mentioned by George and Alexander (1993), significantly changed student self-perceptions during the school year. Prior informal survey results indicated that there could be a discrepancy in responses of beginning of the year seventh graders and beginning of the year eighth graders. However, formal results with a larger sample population proved no significant differences (see Table 4.3). The greatest difference in mean scores resulted in Intrapersonal (-0.75, lower for seventh graders), Interpersonal (-0.38, lower for seventh graders) and Body/Kinesthetic (1.02, higher for seventh graders). Lower perceptions of

Intrapersonal and Interpersonal skills for seventh graders aligned with past research by George and Alexander (1993) stating that adolescents are developing these skills. Body/Kinesthetic results may be a direct effect of rapid physical development of young adolescents. According to George and Alexander (1993), this is a "time of growth and change second only to infancy in sheer velocity." Students experiencing rapid growth changes may feel uncoordinated, awkward, and unsure of their sense of timing, ability to manipulate objects, and use fine or gross motor skills (Shearer, 2003). This may contribute to the variability in students perceptions for the Body/Kinesthetic category.

Middle School (Ottumwa) and Junior High (Washington)

Middle school students in Ottumwa rated themselves higher in each Intelligence category compared to their junior high counterparts in Washington (see Table 4.4). Both schools practiced various components of the middle school model, which may explain this result. Evans Middle School used interdisciplinary teaching and curricular alignment, teaching teams, exploratory classes, core curriculum, daily teacher team collaboration time, yearlong teacher/student class schedules, guidance services, and reduced competitive practices. Washington Junior High used block scheduling, exploratory classes, core curriculum, and guidance services.

Significant differences occurred in Intrapersonal and Verbal/Linguistic categories. The smallest difference occurred in Average Grade (0.07). Evans Middle School is two times larger than Washington Junior High and has twice the poverty rate (Iowa Department of Education, 2003b; Jackson, 2001a, Jackson, 2001b). Evans Middle School also has 2 more students per teacher than Washington Junior High (Jackson, 2001a, Jackson, 2001b). The hypothesis that student self-perceptions would be lower for the

poorer students attending the more populated school arose because it would seem they have less support and resources. It was concluded that the school structures were the primary cause of the variance in student responses in the intrapersonal category.

From 1993 to 2002 researchers such as Russell, George & Alexander, Manning, and Parker concluded that implementing the different concepts of the middle school model was developmentally responsive for young adolescents. While the junior high in this study does incorporate some elements of the middle school such as block scheduling, a guidance program, exploratory classes and core curriculum, the middle school included several other components that have repeatedly been noted to having a strong effect on young adolescent development. At the middle school, no ninth graders attended, interdisciplinary teaming, including team planning time each day and team teaching occurred, no distinct department areas existed within the school structure, more exploratory curriculum was included, students had year long relationships with their core teachers, more transition/articulation services were provided for incoming sixth graders and exiting eighth graders, and non-competitive practices were more widely implemented (George & Alexander, 1993; Russell, 1997; Manning, 2000; Parker, 2002; Phi Delta Kappa, 2002). Parker (2002) wrote that the essence of a middle school is that students don't feel alone, but feel like they are a part of something bigger than themselves. Perhaps this study provided evidence that middle schools do accomplish this goal.

Gender

From 1983 to 2003 researchers such as Chapman & Mullis, Demaray & Malecki, O'Dea & Abraham, and Walsh & Kurdek found identified differences in cognitive, emotional, physical, and social development of girls and boys. In this study, their self-

perceptions for Intrapersonal and Interpersonal Intelligences were closely matched (see Table 4.5). The mean difference for Intrapersonal was 0.16 and for Interpersonal was 0.18. Girls were only slightly higher than boys in each of these categories. This was consistent with past research regarding male and female social and emotional expectations.

Boys rated themselves significantly higher than girls in Body/Kinesthetic ($p<.010$) and Math/Logical(see Table 4.5). O'Dea and Abraham (1999) found that males had higher self-esteem and self-concept than age equal females regarding the physical attribute of appearance. This is not the same subscale as Body/Kinesthetic intelligence, but may be related, thus adding an interesting facet to this particular intelligence that may warrant further research.

Males ranked themselves significantly higher than females in Math/Logical ($p<.001$) (see Table 4.5). This directly reflected past research from 1998 to 2000 by Manning and Snyder regarding math performance and gender. Manning (1998) suggested laboratory experiences and hands-on learning approaches would "promote gender equity." Manning also reported that females were less likely to take risks compared to males. Teachers could provide an environment where girls are not penalized for taking risks.

Females rated themselves significantly higher in Verbal/Linguistic ($p<.011$), and Music/Rhythmic ($p<.001$) (see Table 4.5). Perhaps this related to females need for intimacy in relationships as noted by Jarvinen and Nichols (1996). O'Dea and Abraham (1999) found that compared to males, females felt they had a greater ability to form and maintain close friendships. Verbal skills may aid in relationship development and

retention. Musical intelligence has been associated with emotional intelligence and global perception of situations since 1994 by Green, Kaschub, and Stokes. In the categories where no significant differences occurred (Intrapersonal, Interpersonal, Visual/Spatial and Average Grade), females had higher mean scores than males each time. These findings paralleled those of Snyder (2000, para. 19) who reported that "female students were stronger on intrapersonal, linguistic, musical, ... , visual and interpersonal [subscales]" than males. "[M]ale students were stronger on bodily/kinesthetic, logical, spatial, and working with others."

Socio-Economics

Student perceptions of the Average Grade earned in school showed significant differences when data was disaggregated (see Table 4.6) for free/reduced meal students and full pay students. Low socio-economic students reported significantly lower grades in school ($p<.002$) than their peers. This matched recent research reported by Weiss (2003). There were no significant differences in any intelligence category. Rice (1996) noted that poor students often lacked resources such as positive parental support and lacked verbal skills, and were often treated with prejudice by adults at school. Weiss (2003) exposed new research connecting an impoverished environment and lower IQ. If these students feel they have similar levels of intelligences as defined on the Multiple Intelligence Self-Profile, perhaps the lack of resources noted by Rice (1996) and Weiss (2003) inhibited work completion and development of positive study habits, which would directly affect the grade they achieved in school.

Interestingly, low socio-economic students had lower mean scores in Interpersonal skills and Math/Logical skills (see Figure 4.3). Free/reduced meal

participants had higher self-perceptions, according to mean scores, in Intrapersonal Intelligence and Visual/Spatial Intelligence. Their scores were the closest to their classmates in Verbal/Linguistic and Music/Rhythmic categories. Poverty students may need extra assistance developing positive friendships and math/problem solving skills.

Learning Disability

Comparison of data for learning disabled students and regular education students produced significant results for Average Grade ($p<.001$) (see Table 4.7). The mean difference for Average Grade was 2.43. This translated to a difference in average grade achieved in school of almost one letter grade. Regular education students' mean was 9.05 (B+) compared to learning disabled students' mean of 6.63 (B-/C+).

Learning disabled students reported lower mean scores than their regular education counterparts in every intelligence category except for Visual/Spatial and Music/Rhythmic (see Figure 4.4). This may indicate that these categories are stronger intelligences for the group. It is important to note, that the highest degree of correlation between groups was also for Visual/Spatial (0.950), Music/Rhythmic (0.946) and Body/Kinesthetic (0.959). Even though Visual/Spatial and Music/Rhythmic were the highest categories for the learning disabled group, they were still statistically the same as the regular education group. Educators may promote learning for this subgroup by using visual or spatial representations of data such as diagrams, use of color, highlighting, varying font, charts, etc. and by using music or rhythms as learning aids.

The largest mean differences occurred in Intrapersonal skills (2.44), Math/Logical skills (2.38) and Verbal/Linguistic skills (1.49). Although these differences weren't

statistically significant, these categories indicated weaker self-perceptions for learning disabled students.

Race

No significant differences were found when data was disaggregated for race (see Table 4.8). Mean differences were less than one in all categories.

English as a Second Language

No significant differences were found when data was disaggregated for students who speak a language other than English at home (ESL) (see Table 4.9). Mean differences were less than one in all categories except for Music/Rhythmic. English speaking students rated themselves higher than ESL students in the Music/Rhythmic category.

Summary

Trends did arise that educators may use to help young adolescents assimilate information and gain understanding. As a group, young adolescents feel comfortable in interpersonal situations, are still developing intrapersonal understanding, and rapid physical growth causes low self-perception in body/kinesthetic activities.

The middle school environment seemed to have a positive overall affect on students' self-perceptions. Students attending the middle school had significantly higher self-perceptions in Verbal/Linguistic skills and Intrapersonal skills.

Girls rated themselves significantly higher than boys in Verbal and Musical skills, and significantly lower than boys in Math and Body/Kinesthetic skills. This correlated with several studies. If girls value intimate friendships more than boys do, communication or verbal skills will be important in maintaining those relationships. Also,

girls tend not to take risks to the same degree as boys. This reluctance or fear of failure, can inhibit their willingness to try new things.

Low socio-economic students viewed their Multiple Intelligences as similar to peers, but reported significantly lower average grades in school. Their lack of performance in school may be attributed to inequity in their home and learning environments. A lack of physical, emotional and social resources may contribute to the grade disparity.

Learning-disabled students reported significantly lower average grades in school and lower mean scores in Intrapersonal and Math/Logical skills. Their strengths, as a subgroup, were in Visual/Spatial and Music/Rhythmic categories.

No significant differences were found when data was disaggregated for race, English as a Second Language students, or grade level of students.

Recommendations for Utilizing Results

The data revealed perceived weaknesses of the group. Educators could support development of the weaker intelligences by incorporating them in review situations or by promoting them with risk free learning activities, such as journaling to strengthen intrapersonal skills.

Educators may choose to focus on specific findings in this study as determined by the population of students they serve. Young adolescents as a group rated themselves high in Interpersonal intelligence and Music/Rhythmic intelligence. Activities that promote use of these skills include class discussions, using body language, group or pair work, games, activities, the use of music for background sound, the use of music in the form of jingles or tunes, rhyming, tapping and chanting (Teacher Created Materials,

1999). Young adolescents' reported weak areas were Intrapersonal and Body/Kinesthetic. Educators can promote Intrapersonal development of these skills by using individual student activities that ask students to express themselves in a variety of ways. Allowing students to move about in the classroom and use hands-on activities enhances Body/Kinesthetic development (Teacher Created Materials, 1999).

In this study, the middle school environment seemed to have a positive effect on student self-perceptions. The junior high had implemented some of the middle school concept elements, but could still provide a more developmentally responsive environment.

Girls need the opportunity to work in a risk-free environment. Past research was consistent with current findings. Girls rated themselves significantly lower in math and body/kinesthetic skills and significantly higher in verbal and music skills. Past studies by Stokes (1994), Green (1999), and Kaschub (2002) correlated music skills with emotional intelligence and global learning styles.

Students from low socio-economic backgrounds may possess the same degree of intelligence as their peers, but may lack resources to be successful in school. Educators should provide consistent expectations for all students. Guidance counselors in cooperation with educators may support emotional wellness, teach problem solving strategies, and promote study habits.

Learning disabled students tended to be hands-on and visual/spatial learners. They also reported strong self-perceptions in the Music/Rhythmic intelligence category. Educators may facilitate learning for this group by creating an activity based learning environment that incorporates musical elements.

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APPENDIX 1 – STUDENT QUESTIONNAIRE

First Name: _____ Middle Initial: ____ Last Initial: ____ Date: _____

Month you were born _____ Year you were born _____

Please check all that apply:

Current Grade: ☐ seventh ☐ eighth

Race: ☐ White ☐ Asian ☐ Hispanic ☐ Black ☐ American Indian

Handedness: ☐ right ☐ left

Gender: ☐ Male ☐ Female

Do you have a learning disability? ☐ yes ☐ no
Do you have any other disability? ☐ yes ☐ no
Do you receive free or reduced lunches? ☐ yes ☐ no
Is English your second language? ☐ yes ☐ no

What grade do you average in school (please circle one only)?

A A- B+ B B- C+ C C- D+ D D- F

Multiple Intelligences Self Profile

Directions:
Step 1: Read each statement.
Step 2: Using the scale below give each statement a number that best represents your response.

1 – Not at all like me. 2 = A little like me. 3 = Somewhat like me. 4 = A lot like me. 5 = Definitely like me.

Section ONE

____ a. I have a deep sense of awareness of my inner feelings, my strengths, and my weaknesses.
____ b. I have a strong sense of independence, strong will, and am self-directed.
____ c. I prefer my own private world/time to large group functions.
____ d. I like to be alone to pursue personal hobbies, interests, or projects.
____ e. I have a deep sense of self-confidence.

Section TWO

____ a. I like being with people more than being alone.
____ b. I have many friends.
____ c. I enjoy socializing in a variety of environments.
____ d. I learn best through cooperative (group) activities.
____ e. I am good at communicating, organizing, and sometimes even manipulating people (getting them to do what I want them to.)

Section THREE

____ a. I learn best by moving, touching, and/or acting out information.
____ b. I use a lot of hand gestures and body movement when talking to friends.
____ c. I move, tap, or fidget while seated for a long time in one spot.
____ d. I enjoy taking things apart and putting them back together again.
____ e. I can mimic other people's mannerisms and actions well.

Section FOUR

____ a. I enjoy reading, writing, and listening.
____ b. I enjoy jokes, tall tales, and stories.
____ c. I easily remember names, places, dates, and other trivia.
____ d. I can spell accurately and have a highly developed vocabulary.
____ e. I like crossword puzzles or playing word games.

Section FIVE

____ a. I enjoy doing science experiments.
____ b. I can do math problems easily and quickly in my head.
____ c. I can group, order, analyze, interpret, and predict data.
____ d. I enjoy strategy games (e.g. chess) and like to win.
____ e. I ask a lot questions about how things work.

Section SIX

____ a. I think in images and pictures.
____ b. I like to draw, paint, sculpt, and engage in other activities.
____ c. I read maps, charts, or diagrams more easily than text.
____ d. I doodle a lot on notebooks.
____ e. I tend to daydream while learning new information.

Section SEVEN

____ a. I am highly aware of sounds within the environment.
____ b. I typically play music when working or relaxing.
____ c. I can easily remember melodies or songs.
____ d. I generally know when music or a note is off key.
____ e. I like to sing, hum, and keep rhythm.

Add the scores for each section and write the total in the corresponding blanks below.

Section ONE _____ **Section FIVE** _____

Section TWO _____ **Section SIX** _____

Section THREE _____ **Section SEVEN** _____

Section FOUR _____

Thank you for taking time to complete this survey.

APPENDIX 2 – SURVEY ADMINISTRATOR INSTRUCTIONS

Survey Instructions

Please hand out the surveys.

Say: *If you choose not to participate, please leave the survey blank and wait quietly for others to finish.*

Please write your name on the survey. We will remove your name later after we match this survey with the one you took last fall. Mrs. Schloss will never see your name or know who completed the surveys.

Please write down the month and year you were born. Check the box next to the grade you are currently in. Mark all boxes that apply to your race. Mark whether you're left or right handed. If you feel you use both hands equally, mark both boxes. Otherwise, just mark your dominant hand. Please read the next four boxes and mark "yes" or "no" for each question.

Under the question that says, "What grade do you average in school?" Please circle the letter grade that describes you overall. For example, if you get mostly Bs and an occasional C or C+, you would circle B-. Or, if you get mostly Bs and an occasional A or A-, you would circle B+.

Now look at the survey. (**Read Directions with the students to ensure the reliability of the survey instrument.**) **Say:** *Read each statement. You should rank each statement from 1 to 5.* ***Do not order the statements in each section from one to five.*** *You may have a section that is mostly 5s, and another one that is mostly 2s or 3s. That's ok. When you finish reading and rating each statement, please add the scores for each section and write the total in the spaces at the end.*

When students finish the survey, please collect them all.

Thank you for your time!