THE RELATIONSHIPS BETWEEN MOTIVATIONAL FACTORS AND THE DOMAINS OF EXCELLENCE IN HIGH SCHOOL STUDENTS

by

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DEDICATION

I dedicate this dissertation to my parents, Helen Louise Dahnke and John Edward Dahnke, for teaching me to value learning and instilling in me the desire for excellence. I also dedicate the accomplishment of this project to my husband, Laurence Blackburn Munz, for his continuous support and encouragement, without which I could not have completed my research. Finally, I dedicate this work to my children, Elise, Bryce, Karlyle, and Siena, for tolerating my studies, respecting my educational endeavors, and inspiring my study of motivation.
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ABSTRACT

THE RELATIONSHIPS BETWEEN MOTIVATIONAL FACTORS
AND THE DOMAINS OF EXCELLENCE IN HIGH SCHOOL STUDENTS

Lida Dais Dahnke Munz

The positive relationship between motivation and excellence with 308 high school students in Northwest Florida was investigated in this study. The research design consisted of the administration of 3 instruments, providing numerical descriptions of how 4 higher order independent variables (goal motivation, acknowledgement motivation, association motivation, and parent-inspired motivation) and 2 higher order dependent variables (analytical excellence and interaction excellence) were related. Student responses to the Inventory of School Motivation, the Parental Attachment Questionnaire, and the Multiple Intelligences Developmental Assessment Scales provided quantitative data. Factor analytic, MANOVA, and step-wise regression statistics revealed both theory- and data-based positive relationships among higher order motivational and excellence variables.
CHAPTER I

INTRODUCTION

Statement of the Problem

In the realm of education, many variables affect learning and determine whether instruction will be effective or not. Many of these factors are related or intertwined with one another. One of the most critical pieces of the educational puzzle is motivation. If students are not motivated to learn, they are unlikely to learn, and there is little chance that instruction will be effective. Within the concept of motivation, there are many factors that can affect whether strategies for increasing educational motivation are effective or not.

Motivation has been studied from educational and psychological standpoints for years. Researchers have described motivation as an innate personality trait (Galton, 1869/1979), a task specific orientation (Heggestad, 1997), a behaviorally developed attitude (Bandura, 1997), or a perception of how individuals describe why they succeed or fail (Weiner, 1990). Some researchers have examined motivation in academic situations (Ames, 1990; Cordova & Lepper, 1996; Keller, 1987), in social environments (Bandura), and in leadership arenas (Frederick, 2000; Shtogren, 1999). Even though all of these experts define motivation and its foundational bases differently, they all come to
the conclusion that motivation is pivotal to the achievement of success (Ames; Bandura & Schunk, 1981; Driscoll, 2000; Gottfried & Fleming, 2001; Weiner, 1989).

Great debate continues, however, as to which motivational factors are the most crucial to the achievement of excellence or success. In fact, the importance of specific motivational factors to the achievement of excellence may vary from ability domain to ability domain. For example, the motivational factor of task involvement may be more crucial in the domain of music and the achievement of musical excellence; whereas, the motivational factor of affiliation may be more important in the domain of interpersonal relations and leadership achievement.

Purpose of This Study

The purpose of this study is to determine the relationship between a variety of motivational factors and the achievement of success within domains in academic settings. These relationships will be examined as they pertain to high school students in the Northwest Florida area. The motivational factors that will be examined include the following: (a) striving for excellence, (b) sense of competence, (c) recognition, (d) sense of purpose for the future, (e) sense of purpose for school, (f) task involvement, (g) competition, (h) social concern, (i) affiliation, (j) group leadership, (k) perceived parental support, (l) child-parent attachment, and (m) parental fostering of autonomy. The additional demographic factors of (a) parental educational level, (b) ethnicity, and (c) gender will also be examined as they relate to the achievement of success or to other motivational factors.
The above mentioned motivational factors, or factors that can lead to increased motivation, will be examined to determine their relationship or correlation with high school students’ success in a variety of domains. The three major areas that these domains will cover include intellectual, physical, and social success. The specific domains to be studied within these major domains are: (a) academic, (b) creative, (c) individual sports, (d) team sports, (e) community involvement, and (f) leadership. Success within these domains will be examined by measuring multiple abilities, skills, and capabilities of students.

Each of the motivational factors to be studied along with the instruments used to examine each factor are presented in Appendix A. The domains to be examined and the parallel multiple abilities to be measured are also summarized in Appendix A. The specific groups of students to be studied are shown as intact classes, clubs, teams, or groups which represent each domain of exhibited expertise, success, or excellence.

Relevance of the Problem

The concept of motivation within educational systems has been studied for generations. Many debates exist as to the validity of some of the findings of these studies. The arena of educational motivation is a continually evolving area of thought; therefore, the viewpoints regarding the importance of motivational factors within the educational realm are continually changing.

To be able to provide the most appropriate and best suited instruction for students in each of the domains to be explored in this study, instructors, curriculum designers, coaches, and student advisors must understand the motivations of the students they
teach. In addition, these professionals should be provided with contemporary, research-based information about relationships among motivators and specific academic ability domains.

**Research Questions**

Many possibilities exist for exploration in the area of educational motivation. The concepts of differing motivational factors are critical to the understanding of educational motivation and its instructional and potential learning implications. Several major areas of motivation will be examined within this study in the realm of motivation and its effectiveness in high school education. In this context, the major question that will be explored is: What types of motivation or factors within motivation are related to the exhibition of success or expertise within specific domains? Related, or underlying, questions that will be explored in this research are listed below.

1. Do students within specific domains of excellence exhibit similar motivational or excellence factors within their groupings?

2. What are the main motivational factors related to success in the domains that students are exposed to in high school? Can these factors be reduced?

3. Are the domains of excellence that high school students are involved in based on the areas of excellence? Can these groupings be reduced?

4. Are group differences evident in the higher order (composite) motivational factors?

5. Are the motivational factor relationships different for each of the major domain groups in the study?
Investigative Measures

The research presented in this study involves the use of multiple measures. The intent of this study is to examine interrelations between motivational factors and differing aspects of the exhibition of excellence. Some of the motivational measures examined in this research may be considered demographic factors or personality traits. All of the motivational variables, however, have one thing in common: They have all been studied by researchers and theorized to have some relationship to motivation or are thought to be an aspect of motivation. Each of these motivational factors will be defined and described in detail in the literature review section of this research.

The instruments used to measure the motivational factors in this study are the Inventory of School Motivation (McInerney & Swisher, 1995), the Parental Attachment Questionnaire (Kenny, 1991), and a researcher-designed Student Questionnaire. Each of these instruments will be described in the Methods section of this study and are reproduced in their entirety in Appendixes B, C, and D. The Marlowe-Crowne Social Desirability Scale Short Form C (Reynolds, 1982) is also used to measure the extent to which participants exhibit social desirability in their answers to the other surveys they are administered. This instrument is reproduced in Appendix E. Much research has been conducted on the motivational factors involved in this study. Specific studies relevant to each of the variables and factors discussed in this research are described in the literature review section along with definitions of each of the factors examined.

The factors relating to the exhibition of excellence also entail multiple measures and may be considered the dependent measures in this research. These factors are determined by the domains they represent and fall into categories that depict areas of
interest for high school students. Each of these factors is well documented and will be defined and described in detail in the literature review section of this research.

The excellence factors in this study were measured using the Multiple Intelligences Developmental Assessment Scales (MIDAS) (Shearer, 1999a). An expert rating system was used to examine the exhibition of excellence factors in this study. A researcher-designed Teacher, Coach, and Advisor Questionnaire was used to determine this factor as it relates to the exhibition of excellence. Both of these instruments will be described in the Methods section of this research and are reproduced in their entirety in Appendixes F and G.

Definition of Terms

Many of the terms involved in the study of motivation are terms used in everyday language. Some of the terms, however, include evolving definitions of new terminology. Researchers continue to explore new areas, ideas, and concepts within the motivational arena; therefore, some of the terms involved in this research may be specific to motivational research or may possess atypical definitions within educational and psychological studies. The terms necessary to this study are listed below.

Affiliation. To feel or sense attachment, connection, or association with others (Hinkley, McInerney, & Marsh, 2001), which feeling may be based on commonalities or similar group associations (Klein & Schnackenberg, 2000).

Attribution. Reason for success or failure, due to effort or ability (Murphy & Alexander, 2000).

Autonomy. “Independence or freedom” (Stein, 1990, p. 92) to act at one’s will.
**Competence.** Possession of a sense of worth, value, or superiority in performance as compared to the performance of others (Wigfield, Eccles, Yoon, Harold, Arbreton, Freedman-Doan, et al., 1997).

**Ego goal orientation.** Emphasis on demonstrating ability to achieve recognition (Butler, 1999); similar to performance goal orientation.

**Empowerment.** Possessing the power or authority to act (Stein, 1990).

**Enablement.** To be given power, authority, or right (Stein, 1990).

**Excellence.** The quality of being superior (Stein, 1990) or exhibiting superior performances (Wilson & Keil, 1999).

**Expertise.** The display of skill, knowledge, or mastery (Stein, 1990).

**Extrinsic motivation.** Desire to complete tasks based on “rewards given for appropriate behavior” (Murphy & Alexander, 2000, p. 17).

**Factor.** Subsets of variables that are correlated to one another (Whitley, 1996)

**Goal.** “Personal criteria for success” (Murphy & Alexander, 2000, p. 17).

**Group leadership.** The capacity to guide or direct other people (Stein, 1990).

**Innovative capacity.** The ability to think creatively and to develop unique solutions to problems and situations (Shearer, 1997; Sternberg, 1994).

**Intrapersonal ability.** The capacity to know one’s own strengths, motivations, goals, and feelings accurately (Zahra, 1996; Bogod, 2001).

**Interpersonal ability.** The capacity to appropriately and effectively respond to other people and to understand their feelings and intentions (Bogod, 2001; Brualdi, 1996).
Intrinsic motivation. “Refers to an interest that people acquire by participating in an environment or context” (Murphy & Alexander, 2000, p. 17).

Kinesthetic ability. The capacity to use or manipulate one’s hands or body in a skillful or expressive manner (Bogod, 2001; Brualdi, 1996).

Leadership. The capacity to guide or direct others (Stein, 1990).

Logical ability. The capacity to use one’s reasoning powers to understand and evaluate a complex problem or situation (Shearer, 1997).

Mastery goal orientation. Reflects an emphasis on “learning, understanding, and developing ability” (Friedel, Hruda, & Midgley, 2001, p. 1).

Mathematical ability. The capacity to use numerical skills effectively to solve problems, think scientifically, or discern relationships and patterns between concepts and or concrete items (Bogod, 2001; Shearer, 1999b).

Motivation. A need, desire, or condition that causes a person to act (Mish, 1993) or the energy underlying a behavior (Conti & Amabile, 1999).

Perceived self-efficacy. Belief in one’s capabilities to organize and execute courses of action required to produce given attainments” (Bandura, 1997, p. 3).

Performance goal orientation. Emphasis on “demonstrating ability, often relative to others, to be judged ‘able’ to do a task” (Friedel et al., 2001, p. 1).

Perseverance. The act of persisting in a state or undertaking an enterprise in spite of opposition (Mish, 1993).

Positive attitude. The possession of a manner, disposition, or feeling toward something that is laudable, hopeful or good (Stein, 1990).
**Proximal goal setting.** The systematic use of defining and achieving results through the use of short-term goals (Bandura & Schunk, 1981).

**Self-actualization.** To develop fully individual capabilities or talents (Weiner, 1989). It is the highest level in Maslow’s hierarchy of needs (Maslow, 1987).

**Self-concept.** Personal perception about one’s abilities (Berliner & Calfee, 1996).

**Self-determination.** Implies the existence of choice, autonomy of action, and “internal locus of causality” (Berliner & Calfee, 1996, p. 78).

**Self-efficacy.** A person’s judgments of his or her capabilities to execute a course of action required to attain a specific performance (Bandura, 1997).

**Self-image.** Personal impression of one’s capabilities (Berliner & Calfee, 1996).

**Service learning.** To acquire knowledge or skills through service to one’s community or other organization (Scales, Blyth, Berkas, & Kielsmeier, 2000).

**Spatial ability.** The capacity to think visually or orient one’s self spatially (Bruaidi, 1996).

**Success.** A result or outcome that is favorable (Stein, 1990) or desirable (Berliner & Calfee, 1996).

**Task orientation.** The individual seeking of mastery and competency within a task or domain (Murphy & Alexander, 2000).

**Technical ability.** The capability to use technical skills, such as numbers, scientific reasoning, computers and other media, in an effective manner (Shearer, 1997).

**Verbal-linguistic ability.** The capacity to use language effectively as a vehicle of expression or communication (Bogod, 2001; Zahra, 1996).
CHAPTER II
REVIEW OF THE LITERATURE

Theoretical Framework

Many theories are related to the concept of motivation within the educational domain. Some of the major areas relevant to this research are (a) the delineation of motivation, (b) theories on the achievement of expertise, (c) attribution theory, (d) self-efficacy theory, and (e) goal-setting strategies. These theories will be used as a foundation for this study of motivation and the achievement of excellence. Each theory will be examined in a variety of academic domains and settings.

Delineation of Motivational Aspects

Many theories link motivation and the achievement of excellence. Some of these theories are behaviorally oriented (Heckhausen, 2000), related to specific task achievement (Eccles, Wigfield, & Schiefele, 1998), individual interest concepts (Alexander, Kulikowich, & Jetton, 1994), and goal oriented theories (Bandura & Schunk, 1981). Some of the most recent theories linking achievement and motivation are based on cognitively oriented ideas such as self-regulation concepts (Pintrich & Schrauben, 1992), self-knowledge (Borkowski & Muthukrisni, 1995), and personal control (Bandura, 1997).
The above theories and overall facets of educational motivation were chosen as a basis of this study due to their specific application to motivation in academic environments. These aspects of motivation focus on why and how excellence is achieved in a variety of academic and academically related settings.

As mentioned above, motivation can be defined and delineated in several different ways using a variety of different theories. The most appropriate definition and breakdown of motivational factors for this study is determined by dissecting motivation into a set of factors that fit into the three broad categories: (a) personal motivational factors, (b) parentally induced motivational factors, and (c) demographically founded motivational factors. The 16 motivational factors measured in this study fit into the three major motivational categories listed above. These motivational factors are depicted as they relate to these three categories in model form in Appendix A and are listed in tabular form in Table 1.

*Exhibition of Excellence, Achievement, and Success*

A variety of theories have been applied to the achievement of excellence or exceptional success derived from motivational factors. Within the study of excellence or high achievement, specific studies have been conducted in the areas of academic achievement (Bandura, Barbaranelli, Caprara, & Pastorelli, 1996; Gottfried & Fleming, 2001), intellectual abilities (Gardner, 1993), creative excellence (Conti & Amabile, 1999), sports achievement (Frederick, 2000), and social successes (Anderman & Anderman, 1999; Klein & Schnackenberg, 2000; Ryan, Hicks, & Midgley, 1997). All of these domains of exhibited excellence have been examined separately in their
relationship to motivational factors in this study. This research includes an examination of the synthesis of motivational and achievement of excellence factors.

Table 1
Motivational Factors in Groupings by Survey Instrument

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<th>Inventory of school motivation (personal motivational factors)</th>
<th>Parental attachment questionnaire (parentally induced motivational factors)</th>
<th>Student questionnaire (demographically founded motivational factors)</th>
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<td>Parental support</td>
<td>Parental educational level</td>
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<tr>
<td>Sense of competence</td>
<td>Parental attachment</td>
<td>Ethnicity</td>
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<tr>
<td>Recognition</td>
<td>Fostering autonomy</td>
<td>Gender</td>
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<td>Sense of purpose (future)</td>
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<td>Sense of purpose (school)</td>
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<td>Social concern</td>
<td></td>
<td></td>
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<tr>
<td>Affiliation</td>
<td></td>
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<tr>
<td>Group leadership</td>
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Ericsson and Charness (1994) have studied expert performances and excellence from a variety of perspectives. They define an expert as an individual who exhibits high levels of performance in a specific domain. When attempting to study the effects of motivation or the achievement of excellence, the high-achieving individual is what must
be examined. Maslow (1971) expressed this concept in stating, “If you want to find how fast a human being can run, then it is no use to average the speed of a ‘good sample’ of the population; it is far better to collect Olympic gold medal winners and see how well they can do” (p. 7). This is the main concept that was used for this study in the choice of subjects. Intact groupings of students who demonstrate excellence in their specific domains have been examined to determine whether they exhibit different aspects of motivation than the control groups of students examined in the study.

One of the main focuses of exceptional performances described by Ericsson and Charness (1994) is that of individual differences that may account for the achievement of excellence within specific domains. One of the most influential theoretical representatives of this concept of individual differences is expressed by Gardner (1993) in his theory of multiple intelligences. In Gardner’s theory, the individual expression or exhibition of excellence is referred to as exhibited excellence within a specific domain rather than adhering to the idea that the exhibition of abilities in a domain is the indication of unique intelligences.

The source of these abilities or the exhibition of excellence within a domain is not in question in this study. The only question to be explored in this research is the relationship between the exhibited excellence and the stated motivational factors. These motivational factors may or may not be a source of that excellence.

*Attribution Theory*

One theory that is related to the study of motivation and the achievement of excellence is that of attribution. This theory has been studied for decades (Weiner, 1990)
and has been the crux of many motivational debates. The importance of this theory in this research is in its relationship to the motivation to learn or excel in a specific educationally oriented domain.

Many educational psychologists and instructional experts have studied the concept of attribution in its relationship to educational motivation. Some of the early theories are based on the work of Freud, Heider, Kelley, and Weiner (Berliner & Calfee, 1996; Weiner, 1989). Although these theories have changed and evolved through the years (Weiner, 1990), a student’s personal attribution of successes or failures continues to have a major impact on student motivation for future learning endeavors. Some of the major distinctions within this theory are whether an outcome can be attributed to internal or external factors and whether those factors are stable or controllable (Berliner & Calfee).

Students’ judgments about their own abilities and the linking of those abilities to the causes of their successes or failures are critical to motivational theories (Ames, 1990). The most crucial factor in this relationship is that learners believe they have control over an outcome and the belief that their efforts have an effect on their achievement of success. Without this belief, motivation and its importance in the educational domain become questionable.

*Self-Efficacy Theory and Goal Orientation*

The concept of self-efficacy is related to the idea of learner confidence and to the concept within attribution theory that effort does make a difference in personal educational outcomes. Efficacy can be related to many aspects of life. As related to
education, students generally must believe that they can learn before they actually do. Although there are cases where students learn without the conscious belief that they can learn, or even the explicit idea that they are learning (Ames, 1990), this concept is not explored in this study. As Bandura et al. (1996) states, “Unless people believe that they can produce desired effects by their actions, they have little incentive to act” (p. 1206).

Bandura’s (1997) theory of self-efficacy is based on a concept of “triadic reciprocal causation” (p. 6). Within this triad, the three major classes of determinants are behavior, personal factors, and the environment. One of the major factors in the theory of self-efficacy is that of control. Individuals will continually attempt to strive for competence and mastery over aspects of their environments. This controlling desire is based on the idea that “behavior is pursued for the feelings of efficacy derived from it” (p. 13). Bandura further divides this controlling desire into the aspects of an inborn desire for control (a push of genetics) and the anticipated benefits of this control (a pull from the environment).

One of the major techniques that Bandura and Schunk (1981) suggest to increase self-efficacy, and therefore increase motivation to learn, is “through proximal goal setting” (p. 586). The concept of proximal goal setting is designed to direct students to set subgoals that will provide “immediate incentives and guides for performance” (p. 587). In other words, by setting smaller, more achievable goals, learners who are successful will increase their efficacy, their sense of control, and their overall confidence in the learning environment.

Within this study, the type of goal setting used by students is measured in several ways. Long-range and more proximal goal-setting tendencies are exhibited in several of
the motivational factors measured. The propensity to set goals based on ego or task orientations is also explored in several of the factors described in the next section. Competitive and mastery goal orientations are also explored in this research and relate to several of the measured motivational factors described in more detail in the following sections.

Motivational Impacts on Learning

As most people know, learning events can be positive or negative experiences. Many studies have been conducted to show that “learning can be fun” (Cordova & Lepper, 1996, p. 715). When observing classrooms in the early years of education, (particularly preschool and kindergarten), researchers have found that great enthusiasm for learning is portrayed with strong evidence for intrinsically motivated learning. Only a few years later, however, this excitement for learning has dissipated into boredom, mischief, and, at times, disgust. This transition causes educators to lean more and more heavily on extrinsic forms of motivation. The question of why this transition from students full of intrinsic motivation to students that exhibit little or no intrinsic motivation occurs has been studied by many teachers, parents, and researchers. Several researchers have found that students’ intrinsic motivation has been eroded by the ineffective uses of a variety of motivational factors in classroom settings (Gottfried & Fleming, 2001; Hall, Clifton, Kobylak, Hladkyj, & Perry, 2001).

Motivation has been shown to be correlated, to some degree, or through other linking factors, to success in school (Gaskill, 2001; Gottfried, Fleming, & Gottfried, 1994). Since the beginnings of academic history, researchers have noted the link
between the broad concept of motivation and the achievement of success in a variety of differing domains (Fairclough, 1995; Gottlieb, 2000; Palmer, 2001). But, there is still much debate as to which aspects of motivation are the factors that are those related to the achievement of success.

By studying motivational factors, researchers hope to find some relationships that may lead to increases in motivation, or at least the sustaining of motivation, as students progress through their education. The application of findings from a variety of studies are being implemented in today’s educational system, and many theories of student motivation are being applied without the solid empirical evidence necessary to achieve lasting results in sustaining or improving student motivation. This study is designed to identify or further break down some of the theorized motivational factors that can improve student motivation and, therefore, increase potential student learning.

Motivational Factors

The motivational factors studied in this research are broken down into three main categories: (a) personal, (b) parental, and (c) demographic. These factors are depicted in Appendix A along with the measures of three separate instruments that are used to identify these factors. A total of 16 motivational factors, or potential demographic factors that may act as motivational factors, are listed and described in this section with their applicability to the support of motivation and their relevance to the achievement of excellence. The 3 demographic factors are included as precursors to motivation and listed along with the other 13 motivational factors, since they are to be studied and examined similarly to these motivational factors.
Striving for Excellence

The term *striving for excellence* is related to the debate of whether motivation is an emotional or behavioral type of response (Lazarus, 1999). Both arguments support the idea that motivation to achieve or the striving for excellence may come from a variety of sources depending on the individual, the environment, and the specific task at hand. The striving for excellence factor, as it is measured in this study, examines the concept of striving to excel without looking deeply at the roots for that response. The propensity to strive for excellence may be a stable or an unstable factor. This factor may be considered a trait or a state. The measurement of this striving factor may be based on task orientations, parental goal setting, individual personality traits, or many other factors; but all these preparatory factors that feed into the attribute of striving for excellence are contained in this factor.

Heggestad (1997) found that factors related to striving for excellence could be factored into a motivational construct, which is related to the increased achievement of students. Heggestad also determined that striving for excellence is correlated to a trait of competitive excellence. Both of these factors are positively related to success and negatively related to achievement anxiety factors (Heggestad).

Sense of Competence

For decades researchers have viewed competence as “a basic human psychological need” (Wanlass, 2000, p. 513). This sense of competency can be reflected in the attainment of successes in a variety of different domains, or it can be merely the perceived attainment of successes. Competency beliefs have been shown to provide
some information about motivation and its long-term stability (Gottfried & Fleming, 2001). This relationship between competency and motivation has also been depicted as consistent in individuals throughout related, but not identical, domains (Wigfield et al, 1997).

Achievement goals are related differently to views of personal competency depending on whether task-involvement or ego-involvement (Butler, 1999) situations are in use. Butler (1999) and Harackiewicz and Elliot (1993) found that competency moderated attitudes and behaviors in the ego-involving situations more than in the task involving situations. This finding indicates that the factor of a sense of competency is more crucial in ego-involving situations than in task-involving situations.

**Recognition**

Hinkley et al., (2001) examined several types of social goals in their research. They found that one type of goal, identified as a social approval goal, is exhibited as students seek recognition or praise from either teachers or peers for their schoolwork or extracurricular activities. Social approval goals may have positive outcomes, such as the seeking and maintenance of group, social, and cultural identities (Deyhle, 1995) or these types of goals may elicit negative consequences for valued academic outcomes (Urdan & Maehr, 1995). In either case, social approval or recognition has been shown to have an impact on motivation, achievement, and success in school.
Sense of Purpose (Future)

The factor that reflects an individual’s sense of purpose for the future can be seen as a long-range goal. The ability or propensity of an individual to set and actively seek to achieve long-range goals is related to many other motivational variables. These variables include the goal orientation an individual assumes. Long-range or future-related goal orientations are consistent with a learning orientation rather than a performance orientation (Dweck, 1986).

Sense of Purpose (School)

A sense of purpose for school-related activities supports a short-range goal orientation. This type of goal orientation can be explained as parallel to performance goal orientations (Dweck, 1986) and may be more likely to be related to ego goal orientations rather than task orientations (Nicholls, 1984). A sense of purpose, as it relates to school, can also be related to the achievement of proximal goals as described by Bandura and Schunk (1981) and can be useful to the achievement of success by breaking down tasks into short-range goals.

Task Involvement

Task involvement is defined as the intent of individuals to improve their performance or mastery (Bergin, 1995) as compared to the intention of improving in relationship to others or gaining other types of reinforcement such as competitive rewards and external approvals (Udvari & Schneider, 2000). This type of involvement, however, is not mutually exclusive of ego involvement or competitive motives.
A high degree of task involvement has been determined to be foundational for the development of the construct of academic intrinsic motivation (Gottfried et al, 1994), which is thought to be one of the most influential aspects of motivation and highly correlated to academic achievement (Gottfried & Fleming, 2001).

Task involvement is also related to the concept of the influences of mastery goal situations rather than competitive goal situations (Bergin, 1995). In comparing mastery goal orientations or task involvement situations, researchers have determined that these two motivational factors support an increased level of achievement. This increased level of achievement was shown as compared to competitive and extrinsically stimulated motivation, especially in individuals who already possess traits consistent with high achievement and greater interest in the domain to begin with (Bergin).

**Competition**

A competitive motive is, to a certain extent, the antithesis of a task motive; however, both types of motivation can be present in one individual depending on the task, the situation, or the intent of the individual. As compared to mastery motivation, competitive motives have been found to be negatively correlated to achievement in the vast majority of learning situations (Bergin, 1995).

It has been found by some researchers, however, that a competitive orientation towards achievement can have positive effects (Frederick, 2000). According to Frederick’s research, this positive correlation with achievement is very specific to the type of individual and the learning situation. Frederick found, for example, that in sports
or physically related domains, competitiveness is more highly correlated with success and achievement than in academic situations.

Similarly, Udvari and Schneider (2000) determined that competitive motives can have a positive influence on the achievement of individuals who already exhibit a high degree of success or have experienced higher achievement as compared to their peers in the past. In other words, competitive motivations are positively correlated with achievement, if the students being assessed are typically “winners.” An example of competitively oriented students who also exhibit successful achievement as a whole are academically gifted students (Goldstein & Wagner, 1993).

**Social Concern**

The central characteristic of social concern is that students act out of empathy for the interests of other students (Hinkley et al., 2001). This social concern is a construct with the properties of cooperation and collectivism (Ames, 1990). The value of this factor of cooperative learning has been shown to moderate the effect of failure when compared to competitive learning structures (Urdan & Maehr, 1995). A social-concern goal orientation has also been seen to relate more strongly to mastery goals than to performance goals. Mastery goals are in turn more correlated with achievement and success than failure (Anderman & Anderman, 1999).

Similar to cooperative learning, the effects of social responsibility and the related area of service learning have been studied in relationship to academic achievement for many years. When comparing students with substantial hours of service learning with students who do not participate in service learning, researchers found that a higher
degree of motivation could be attributed to service learning students because of their increased social concern and service time (Scales et al., 2000). The students studied by Scales et al. who were involved in service learning not only exhibited higher motivation than other students, but they significantly increased their self-efficacy and maintained their pursuits of better grades. The results of Scales’ study indicate service learning can positively affect students’ academic success.

In a similar study, Anderman and Anderman (1999) hypothesized that social goals are related to student achievement. They also found that specific types of social goals, such as those related to both social approval (the recognition factor previously described) and social concern, are related to particular achievement goals.

Affiliation

Several researchers have studied the effects of affiliation and informal cooperation and examined their relationship with student achievement. Klein and Schnackenberg (2000) found that high-affiliation individuals expressed significantly more continuing motivation and exhibited more on-task group behaviors than their peers. These researchers found greater learning and higher achievement were obtained by individuals who participated in cooperative learning and high-affiliation situations (Klein & Schnackenberg).

Group Leadership

In studying group leadership, Baruto (1998) found several interesting connections with other factors. His results showed strong relationships between leaders’
sources of motivation and leaders’ use of influence tactics, supporting a dispositional perspective. Baruto also found that the situational predictors of leaders’ behaviors include their perception of sources of motivation and perceptions of others’ behavior. The relationships between dispositional and situational variables were determinants in predicting leaders’ behaviors and motivational attributes (Baruto).

In another study of leadership and academic success, Gorenflo-Gilbert (1999) found relationships between the factors within the implicit theory of leadership, academic goal orientation, and perceived leadership ability. Gorenflo-Gilbert determined that goal orientation interacted with perceived ability. She also found differences in the perceived controllability and stability of leadership ability in learning and performance-oriented students (Gorenflo-Gilbert).

**Parental Attachment**

The factor of parental attachment is conceptualized as an enduring affective bond between a child and one or both parents (Kenny, 1991). This bond serves as a secure base for the other two parental factors of (a) fostering autonomy and (b) the providing of emotional support. The evidence of this factor in an individual, therefore, allows for the development of the next two parental motivational factors. Parental attachment has been found to be linked with a variety of excellence, achievement, and success-oriented factors such as increased confidence and task involvement (Gottfried et al, 1994; Kenny). This factor has been extensively studied in children and younger students and is expected to carry over into later years of achievement of excellence.
Parental Support

The parental role of providing emotional support was designed to encompass such subfactors as parental understanding, acceptance, and interest, and student satisfaction with the help they receive from their parents (Kenny, 1991). The factor of parental support has been shown to be correlated with the motivational factors of perceived competence and the understanding of personal control. These two factors of perceived competence and control understanding are considered to be predictors of children’s performance and achievement (Grolnick, Ryan, & Deci, 1991). Using a linear type of logic, it would be expected that parental support as a construct should also be correlated to achievement and exhibition of success in academic environments.

Parental Fostering of Autonomy

Parental fostering of autonomy or independence has been shown to be a critical variable in student success (Gottfried et al., 1994). This factor includes the parents’ respect for their child’s autonomy as well as their facilitation of that autonomy (Kenny, 1991). The fostering of autonomy through parental building of this inner resource in children has also been shown to be a predictor of a child’s successful performance and academic achievement (Grolnick et al., 1991).

Parental Educational Level

Parental educational levels can have a positive effect on the motivation of students and their achievement due to the ability of parents to teach their children appropriate learning skills (Gottfried et al., 1994). This factor can also have a positive
effect on children’s perceptions of their own potential based on the successes of their parents in the educational and other academic realms (Grolnick et al., 1991).

**Ethnicity**

Research has shown variability of motivational levels and interest in specific school-related activities based on ethnicity. It was specifically noted by Weiner (1989, 1990) and Eccles et al. (1998) that attribution of successes can differ because of ethnicity and other socially prescribed factors. This attribution could, in turn, be theorized to affect motivation and achievement of success.

**Gender**

Gender differences in motivational levels are often found in motivational research, especially when examining motivational levels in physically oriented activities (Frederick, 2000). Several motivational studies found that gender differences exist in relationship to competitive levels for male and female students in a variety of academic and sports-related situations (Bergin, 1995; Frederick; Udvari & Schneider, 2000). This finding was particularly pronounced in the more male-dominated sports and in the more male-role dominated academic subjects, such as mathematics and science (Frederick).

Research has also suggested that females endorse relationship and responsibility goals more than males, whereas males endorse status goals more than females (Patrick, Hicks, & Ryan, 1997; Ryan et al., 1997). Anderman and Anderman (1999), who confirmed this finding, however, found no connection between these goal orientations and achievement.
Domains of Exhibited Excellence

The three major domain categories of exhibited excellence to be explored in this study are (a) intellectual, (b) physical, and (c) social. These domain categories are depicted along with each individual domain in Appendix A. The majority of the domains within the domain categories are delineated using the theory of multiple intelligences developed by Howard Gardner (1993). The domains that were chosen as areas of exhibited excellence in this study were selected to cover as many areas of excellence as possible. Gardner attempted to design his theory of multiple intelligences to cover as many domains as possible as well.

For this reason, the Multiple Intelligences Developmental Assessment Scales (MIDAS) was selected to determine in which areas a student exhibits excellence. Although Gardner’s (1993) theory and the domains chosen for this study depict many of the same factors, there is a minor difference in the basis for these factors. The factors in this study are not considered intelligences, but are seen as domains or areas in which students may exhibit excellence. To some researchers, this may be seen only as a semantic difference, but to those involved in the study of intelligence, a great differentiation may exist between an area of exhibited excellence and an actual delineation between individual intelligences. The definition of a specific intelligence as an activity requiring distinctly different mental activities does not apply to this study. Within this research, the terminology of domains of exhibited excellence is chosen specifically to examine what is exhibited rather than examining the reasoning or intellectual activities that are involved in the exhibited achievement or excellence.
Several additional domains beyond those described by Gardner will be examined to bring creative, logical, and leadership aspects of the exhibition of excellence into the study. These areas are also assessed by the MIDAS instrument. The developer of this instrument added several additional domains to those already identified in Gardner’s theory (Shearer, 1999a). Shearer determined that innovative, logical, and leadership capabilities could also be areas where students exhibit excellence and added those domains to the MIDAS.

These domains of exhibition of excellence are listed below:

1. verbal or linguistic excellence,
2. mathematical excellence,
3. logical excellence,
4. musical excellence,
5. innovative excellence,
6. spatial excellence,
7. kinesthetic excellence,
8. interpersonal excellence,
9. intrapersonal excellence, and
10. leadership excellence.

In defining excellence in each of the above 10 domains, several different viewpoints can be used. Excellence, as defined within these domains, may be described as (a) an intelligence, (b) a well-developed or preferred learning style, (c) a mental strength, (d) an innate talent, or (e) an exhibited area of achievement or success. All these descriptions have similar outcomes; however, for this research, the latter term of
exhibited excellence to be studied is listed and described in the following sections. Each domain is described in terms of (a) exhibited skills and abilities, (b) the types of attributes exhibited by students who excel in each domain, and (c) the careers or fields that are related to each domain of excellence.

These domains of excellence described here are not mutually exclusive and can be combined to cover one domain or can overlap to include some of the same skill areas. Some of these domains of exhibited excellence can also be related to each other or are inclusive of the exhibition of similar talents, skills, or areas of expertise.

Verbal or Linguistic Excellence

The exhibition of verbal or linguistic excellence is seen in the ability to use words and language in a superior manner (Gardner, 1993) as a vehicle of expression or communication (Brualdi, 1996). This type of excellence refers to an individual’s capability to manipulate language effectively and to express oneself rhetorically or poetically (Brualdi). A subset of this domain of excellence may be shown in cross-cultural verbal excellence (Gardner).

The types of students who exhibit excellence in this domain generally possess highly developed auditory skills, use mnemonics well, possess good memory skills, and are typically good speakers. Individuals who are talented in this area also show sensitivity to sounds, rhythms, meanings of words, and functions of language (Zahra, 1996; Shearer, 1999b). They also tend to think in words and symbols rather than in pictures (Bogod, 2001). The skills involved in verbal or linguistic excellence include (a)
listening, (b) speaking, (c) writing, (d) story telling, (e) explaining, (f) teaching, (g) using verbal humor, (h) understanding syntax and meaning of words, (i) remembering information, (j) convincing others of their point of view, and (k) analyzing language usage. Some of the careers where these skills are exhibited include poet, journalist, writer, teacher, lawyer, politician, and translator (Bogod).

**Mathematical Excellence**

Mathematical excellence is exhibited as competence in the areas of ordering objects, making numerical analogies (Gardner, 1993), and using scientific or mathematical thinking (Brualdi, 1996). As with several of the domains of excellence discussed here, Gardner refers to the interrelationship between logical-mathematical skills and the musical skills, especially in rhythmic composition. Mathematical ability in isolation has also been shown, but is a rare occurrence. This ability to calculate enormously well without the development of other intellectual skills is generally noted in cases or profiles of idiot savants (Bogod, 2001).

Logical-mathematical excellence can also be termed as the ability to (a) use reason, (b) think logically, (c) use numbers effectively, (d) discern patterns between concepts and things, and (e) solve problems scientifically (Brualdi, 1996). In many cases, mathematical and logical skills are closely interrelated (Gardner, 1993). Learners who possess this skill also exhibit the ability to think conceptually in logical and numerical patterns. They tend to show curiosity about the world around them. They also seek to find connections between pieces of information, generally enjoy experiments, and seek answers to concrete and abstract problems (Bogod, 2001).
The types of students who exhibit excellence in this area generally possess sensitivity to logical and numerical patterns (Zahra, 1996). The skills involved in mathematical excellence include (a) classifying and categorizing, (b) working with abstract concepts to figure relationships, (c) performing complex mathematical calculations, and (d) working with geometric shapes. Some of the careers where these skills are exhibited include engineer, computer programmer, accountant, and mathematician (Bogod, 2001).

**Logical Excellence**

Logical excellence can be exhibited separately from mathematical excellence when using pure reason without numerical concepts. Although these two areas of expertise are difficult to separate, they can be seen in isolation in some cases (Shearer, 1999b). This type of excellence can be seen in the ability to relate cause-and-effect connections and to understand relationships among complex interactions (Shearer).

The types of students who exhibit excellence in this area generally possess strong skills in abstract thinking. The skills involved in logical excellence include (a) problem solving, (b) handling long chains of reasoning to make logical conclusions, and (c) conducting controlled experiments. Some of the careers where these skills are exhibited include scientist, researcher, and engineer (Bogod, 2001).

**Musical Excellence**

Musical excellence is exhibited in the ability to differentiate and create using tonal and rhythmic variations (Gardner, 1993). This type of excellence is exhibited in the
sensitivity to rhythm, pitch, timber, and tone (Shearer, 1999b). Learners who excel in this area are generally extremely sensitive to environmental sounds (Bogod, 2001).

The types of students who exhibit excellence in this domain generally possess the ability to produce or appreciate rhythm, pitch, and timber differentiations (Zahra, 1996). Musical excellence can range from general musical ability to specific instrumental abilities to vocal abilities and to sheer appreciation of music (Shearer, 1999b). The skills involved in musical excellence include (a) singing, (b) whistling, (c) playing musical instruments, (d) recognizing tonal patterns, (e) composing music, (f) remembering melodies, and (g) understanding the structure and rhythm of music. Some of the careers where these skills are exhibited include musician, singer, composer, and disc jockey (Bogod, 2001).

*Innovative Excellence*

Innovative excellence is exhibited as the ability to work creatively. The uses of artistic, divergent, and imaginative measures are expressions of innovative excellence (Shearer, 1999b). The types of students who exhibit excellence in this domain generally possess the ability to improvise and create unique answers, arguments, and solutions (Shearer). The skills involved in innovative excellence include (a) brainstorming, (b) problem solving, (c) creative thinking, (d) unconventional processing, and (e) open-minded thinking. Some of the careers where these skills are exhibited include graphic artist, composer, computer designer, creative engineer, inventor, and architectural designer.
**Visual or Spatial Excellence**

Visual or spatial excellence is exhibited in the ability to think accurately in two or three dimensions (Shearer, 1999b). Learners who excel in this domain tend to think in pictures rather than in words and use vivid mental images to retain information (Bogod, 2001).

The types of students who exhibit excellence in this domain generally possess a capability to perceive the visual and spatial world accurately and to perform rotations or transformations on concrete structures or abstract images (Zahra, 1996). Learners with well-developed spatial skills also generally possess good sense of direction (Bogod, 2001). The skills involved in visual or spatial excellence include (a) building puzzles; (b) reading; (c) writing; (d) understanding charts, graphs, and maps; (e) sketching; (f) painting; (g) creating visual metaphors and analogies; (h) manipulating images; (i) constructing projects; (j) fixing physical items; (k) designing practical objects; and (l) interpreting visual images. Some of the careers where these skills are exhibited include navigator, sculptor, visual artist, architect, interior designer, mechanic, and engineer (Bogod).

**Kinesthetic Excellence**

Kinesthetic excellence, sometimes termed bodily or kinesthetic awareness, is exhibited as well-developed coordination. This excellence is expressed as the ability to think in movements and to use the human body in skilled and complicated ways for expressive or goal-oriented activities (Shearer, 1999b).
The type of student who exhibits excellence in this domain generally possess the ability to control one’s own body movements and handle objects skillfully (Zahra, 1996). Kinesthetic excellence is also shown in an accurate sense of timing and coordination for the whole body or for use of the hands for manipulating objects (Shearer, 1999b). Students who excel in this area generally have a good sense of balance and good eye-hand coordination (Bogod, 2001). The skills involved in kinesthetic excellence include (a) dancing, (b) physical sports conditioning, (c) hands-on experimenting, (d) using body language, (e) making crafts, (f) acting, (g) miming, (h) using hands to build or create, and (i) expressing emotions through the body. Some of the careers where these skills are exhibited include athlete, coach, dancer, actor, firefighter, and artisan (Bogod).

Intrapersonal Excellence

Intrapersonal excellence is exhibited as the ability to contemplate and understand one’s self (Shearer, 1999b). This excellence may also entail effectively planning to achieve personal goals. It involves the reflecting and monitoring of one’s thoughts and feelings. Intrapersonal excellence also refers to the capacity to accurately know one’s self.

The type of student who exhibits excellence in this domain generally possess the ability to assess one’s own feelings and discriminate among these feelings to successfully guide behavior and accurately assess one’s own strengths, weaknesses, desires, and intelligences (Zahra, 1996). Intrapersonal excellence includes knowing oneself, possessing of goal awareness, monitoring feelings, and managing behavior
The skills involved in intrapersonal excellence include (a) recognizing one’s own strengths and weaknesses; (b) reflecting and analyzing oneself; (c) possessing an awareness of inner feelings, desires, and dreams; (d) evaluating thinking patterns; and (e) understanding one’s role in relationships with others. Some of the careers where these skills are exhibited include researcher, theorist, and philosopher (Bogod, 2001).

**Interpersonal Excellence**

Interpersonal excellence is exhibited as the ability to understand another person (Shearer, 1999b). This type of excellence includes the possession of empathy and the recognition of distinctions between people. The appreciation of the perceptions of others and a sensitivity to the moods, motives, and intentions of others exhibit a well developed interpersonal excellence (Shearer).

The students who exhibit excellence in this domain generally possess the capacity to discern and respond appropriately to the moods, temperaments, motivations, and desires of other people (Zahra, 1996). Interpersonal excellence refers to the capacity to respond appropriately to other people and understand their feelings (Brualdi, 1996). Learners who excel in interpersonal areas try to see things from other people’s points of view. They are generally good organizers and attempt to maintain peace and cooperation in group settings. These individuals, however, may be tempted to resort to manipulation as a means of maintaining positive social situations (Bogod, 2001).

In many cultures, interpersonal and intrapersonal excellence are related to one another (Brualdi, 1996). Either of these areas of expertise can build on the other or enhance the other. The skills involved in interpersonal excellence include (a) seeing
things from other perspectives, (b) listening, (c) using empathy, (d) understanding the moods and feelings of others, (e) counseling, (f) cooperating in group situations, (g) noticing the actions of others, (h) understanding motivations and intentions, (i) communicating verbally and nonverbally, (j) building trust and relationships, (k) supporting conflict resolution, and (l) establishing positive relationships with others. Some of the careers where these skills are exhibited include counselor, therapist, psychologist, salesperson, politician, and business person (Bogod, 2001).

Leadership Excellence

Leadership excellence is exhibited as the ability to gain the support of others and to convince them to act on that guidance. The uses of directing, guiding, conducting and organizing principles are expressions of leadership excellence (Shearer, 1999b). Leadership excellence refers to the capacity to guide or control other people through an understanding of their motivations (Brualdi, 1996). The types of students who exhibit excellence in this domain generally possess the ability to take control or influence others (Zahra, 1996).

The skills involved in leadership excellence include controlling, directing, guiding, influencing, and commanding. Some of the careers where these skills are exhibited include military officer, commercial pilot, company president, orchestra conductor, schoolteacher (Bogod, 2001), and many other disciplines that look to leaders for direction. This area of excellence may be exhibited in combination with a variety of other areas of excellence as well.
CHAPTER III

METHODS

Restatement of the Problem

In the realm of education, many factors affect learning and determine whether students will be successful or not. Motivation and excellence are both well-studied areas of the educational realm. Many of the factors within motivation and excellence are related or intertwined with one another. The purpose of this study is to determine the relationship between a variety of motivational factors and the achievement of success within many domains in academic settings. These relationships will be examined as they pertain to high school students in the Northwest Florida area.

Research Design

The research design for this study was an analytical (quantitative) survey which provided a numerical description of how 13 dependent motivational variables, 3 dependent demographic variables, and 10 independent excellence variables were related in a sample of high school students. The 13 dependent motivational variables include (a) striving for excellence, (b) sense of competence, (c) recognition, (d) sense of purpose for the future, (e) sense of purpose for school, (f) task involvement, (g) competition, (h) social concern, (i) affiliation, (j) group leadership, (k) parental attachment, (l) fostering
autonomy, and (m) parental support. The 3 dependent demographic variables include (a) parental education, (b) ethnicity, and (c) gender. The 10 independent excellence variables include (a) verbal-linguistic excellence, (b) mathematical excellence, (c) logical excellence, (d) musical excellence, (e) innovative excellence, (f) spatial excellence, (g) kinesthetic excellence, (h) interpersonal excellence, (i) intrapersonal excellence, and (j) leadership excellence.

Several different surveys were used in the data collection of this study. Student responses to the Inventory of School Motivation by McInerney & Swisher, (1995); the Parental Attachment Questionnaire by Kenny, (1990); the Multiple Intelligences Developmental Assessment Scales (MIDAS) by Shearer (1999b), and a researcher-designed survey were collected to obtain the motivational, demographic, and personal data which provided the quantitative data for this study.

Survey methods of data collection were chosen because of the wide variety of data that was necessary to complete this analysis. Considered as a method of systematic data collection, the survey has a long historical tradition (Borg & Gall, 1993). Studies involving surveys account for a substantial proportion of the research done in the field of education. Survey research generally utilizes a variety of instruments and methods to study relationships, effects of treatments, longitudinal changes, and comparisons between groups. The particular method or methods selected depends on the types of inferences that will be made from the data. The surveys administered in this case were used to explore relationships between multiple variables. Research experts have determined that researchers who are aware of the possibilities for investigating
relationships in their survey data will make more substantial research contributions than those who limit their data analysis to single variable descriptions (Borg & Gall).

The following statistical procedures were applied to the data analysis: (a) descriptive statistical analysis of the demographic data using mean comparisons and $t$ tests, (b) factor analysis of the three primary instruments and the demographic data, (c) multivariate analysis to determine group differences, and (d) step-wise multiple regression to determine the combined predictive ability of the dependent motivational variables given the independent excellence variables.

Participants

The primary participants in this study were 310 high school students in the Northwest Florida region. Twelve intact groups were chosen to depict expertise or higher levels of success and excellence in the chosen domains. Three control groups, with a total of 74 students, were also chosen to depict average levels of exhibited success. The results for 2 students surveyed were not used due to incomplete data. The final number of participants for the study was 308.

The ages of these participants ranged from 15 to 18 years. The overall ethnic composition and gender of the students in four high schools studied within northwest Florida was collected. The groups of students chosen roughly depict the gender and ethnicity of the schools as a whole. The composition of the four schools by gender and ethnicity are shown in Table 2. Also exhibited in this table is the gender and ethnicity distribution for the 308 students actually surveyed. As noted, the entire sample was similar in gender and ethnicity by percentage to the students as a whole in the county.
None of the specific excellence groups varied from the general percentages by gender or ethnicity as compared to the county as a whole by more than 20 percentage points. There was an overall tendency within the excellence groups to have a slightly higher percentage of the ethnic groups of Asian and Other and a lower percentage of the ethnic group of Black.

Table 2

*High School Students by Ethnicity and Gender*

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<thead>
<tr>
<th>Gender</th>
<th>Asian</th>
<th>Black</th>
<th>Caucasian</th>
<th>Hispanic</th>
<th>Other</th>
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<tbody>
<tr>
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<td>Male</td>
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<td>39  43</td>
<td>164  149</td>
<td>736  771</td>
<td>42  46</td>
<td>2   2</td>
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<td>High School 2</td>
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<td>33  42</td>
<td>125  137</td>
<td>829  825</td>
<td>26  21</td>
<td>3   2</td>
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<td>High School 3</td>
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</tr>
<tr>
<td>55  49</td>
<td>67   81</td>
<td>98   21</td>
<td>56  48</td>
<td>12  10</td>
<td></td>
</tr>
<tr>
<td>High School 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25  35</td>
<td>106  105</td>
<td>670  675</td>
<td>21  23</td>
<td>6   5</td>
<td></td>
</tr>
<tr>
<td>Sample Group</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9   13</td>
<td>6    10</td>
<td>119  127</td>
<td>6   4</td>
<td>8   6</td>
<td></td>
</tr>
</tbody>
</table>

A variety of domains were chosen to depict areas of excellence within the high schools’ populations. The areas chosen were samples of students from the major domain areas discussed in the literature review. An attempt was made to obtain students from each domain so that a large enough number of participants would be collected to conduct sound statistical analyses. The major domain areas, specific domains, and the exhibited areas of excellence are shown in Table 3. The specific intact groups and cell sizes for each of the domains of excellence are also listed.

Table 3

*Exhibition of Areas of Excellence by Groups, Gender, and Cell Size*

<table>
<thead>
<tr>
<th>Major domain area</th>
<th>Specific domain</th>
<th>Area of excellence</th>
<th>Class, club, team, group</th>
<th>Cell size</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intellectual</td>
<td>Academic</td>
<td>Verbal linguistic</td>
<td>Honors History</td>
<td>8</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mathematical logical</td>
<td>Honors Math 1</td>
<td>7</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mathematical logical</td>
<td>Honors Math 2</td>
<td>9</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Creative</td>
<td>Musical</td>
<td>Orchestra</td>
<td></td>
<td>15</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Spatial innovative</td>
<td>Graphic Arts 1</td>
<td></td>
<td>12</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Spatial innovative</td>
<td>Graphic Arts 2</td>
<td></td>
<td>10</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Physical</td>
<td>Sports</td>
<td>Kinesthetic</td>
<td>Team 1</td>
<td>13</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Team 2</td>
<td>0</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Individual 1</td>
<td>10</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Individual 2</td>
<td>0</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Social</td>
<td>Community</td>
<td>Interpersonal</td>
<td>Service club</td>
<td>15</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Leadership</td>
<td>Leadership</td>
<td>Leaders club</td>
<td>14</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>None</td>
<td>Control</td>
<td>Mathematics 1</td>
<td>12</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mathematics 2</td>
<td>13</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mathematics 3</td>
<td>10</td>
<td>14</td>
<td></td>
</tr>
</tbody>
</table>
The availability and selection of the excellence groups was based on opportunistic scheduling and the facilitation of the teachers, coaches, or advisors of the student groups. The sample group as a whole represents approximately one third of the groups approached to participate in the study. All the instructors who declined participation gave the reason of inability to schedule the class time necessary for their students to participate in the data collection.

Secondary participants in this study were the instructors, teachers, coaches, and advisors of the primary participants in the study. These secondary participants were necessary to give expert judgments on the success and achievement levels of the students they teach, coach, and advise. One expert rater from each domain and the control group was surveyed, with a total of 11 experts. They were asked to give a rating from 1-5 for each of the students they teach, coach, or advise.

A variable called *expert rating* is listed in Appendix A in addition to the other nine excellence variables measured. To determine this variable, each of the instructors, coaches and advisors from the intact groups that were chosen to represent each of the areas of excellence above were asked to rate their students from 1-5 on their exhibition of excellence in the domain examined. These expert ratings were compared to the students’ scores on the MIDAS as a measure of consistency between measured excellence and expert identification. These ratings were also compared with the data from the motivational instruments.
Procedures

A proposal for this research project was presented to the Institutional Review Board for Human Subjects at The University of West Florida. This board reviewed the procedures for this research as it related to human subjects used in research and granted their approval to proceed with the proposed study. A copy of this approval is provided in Appendix H.

Responses of 9th-, 10th-, 11th-, and 12th-grade students were collected from high schools in the Northwest Florida Region. Four schools were included in this study. These schools were selected from the total schools in the studied county as indicative of the high school population in the county by ethnicity, gender, and socio-economic status. The only school in the county that was not surveyed was the charter high school, which is colocated with the local community college. This school was not demographically similar to the other four schools in the county. The charter school also did not offer the variety of activities necessary to compile students from a variety of excellence groups.

The total sample of the study was clustered into groups that depicted specific types of exhibited excellence based on the students’ membership in that group. In the majority of the cases in this study, intact groups were selected. The control group for this research was chosen by selecting a course that would be taken by the majority of average high school students. It was determined that a basic algebra class would represent the general population of this study. If a student was found to be in two groups, for example the control group and one of the excellence groups, the student’s data was removed from the control group. This circumstance only occurred on five occasions. If students were
surveyed in one excellence group, they were not surveyed again in another excellence group. The potential for this circumstance only occurred on two occasions.

The participants of this study were given an Informed Consent Form from 1 to 7 days before they were administered the instruments of the study. The Informed Consent Form is shown at Appendix I. The students were all given the opportunity to participate in the study or to work on other class-related work, with no repercussions for nonparticipation. The participation rate for each group averaged 88%. Since the majority of the participants of the study were minors, the student’s parents were asked to sign the Informed Consent and were given the opportunity to receive the results of their children’s MIDAS.

The survey instruments were administered to the 310 students involved in this study in an academic setting. During the data collection sessions from 5 to 25 students were present. Typically, the students were asked to fill out their questionnaires and measurements in classroom settings or sporting situations. Usually only one sitting was needed to complete all the instruments. For one of the high schools, a second sitting was needed to complete the instruments for a few of the students, since this school did not use a block scheduling system and a full time block was not available to allow for all students to complete the entire package of surveys and questionnaires.

The instruments were introduced by the researcher in approximately 5 minutes at each administration. The same researcher administered all the instruments for all the participants in the study. The same set of instructions was given to each group with a description of how the questions were to be answered and how the answer sheets were to be filled out. Instructions were given for each instrument and questions were answered
as they arose. The total time it took for students to complete the instruments was between 55 minutes and 1 hour and 45 minutes. All the groups were able to work at a desk or table during the administration of the surveys and all data collection was conducted in a quiet setting.

Secondary participants were permitted to take their surveys to their offices, homes, or other locations where they could complete them at their leisure. Secondary participants included instructors, advisors, and coaches, all of whom were well acquainted with the primary participants’ capabilities and were good judges of the level of excellence the students exhibited in the specific domains being studied.

To maintain consistency of data collection, all measures were given in less than a 3-month period during the spring semester of 2002. Also to support this consistency, one researcher administered the instruments to all the students surveyed; the measurements were all taken using a standardized set of procedures and using one set of instructions.

Measures

A total of six different instruments were used to obtain measures of motivational factors and exhibition of excellence in a variety of domains. Two scales and a student questionnaire were used to measure motivational factors. A social desirability scale was given to determine reliability of the data given by the primary participants. To determine the excellence factors, one instrument was given to the primary participants, and a teacher questionnaire was given to the secondary participants to measure the exhibition of excellence. All of these instruments are described below.
Motivational Instruments

Inventory of School Motivation. This 64-item, 5-point, Likert-type scale inventory, shown in Appendix B, was validated as a motivational instrument, based upon the personal investment model and designed for use in cross-cultural settings (McInerney & Swisher, 1995). This inventory consists of the 10 subscales: (a) striving for excellence, (b) sense of competence, (c) recognition, (d) sense of purpose for the future, (e) sense of purpose for school, (f) task involvement, (g) competition, (h) social concern, (i) affiliation, and (j) group leadership. Reliability for this measure is given as Cronbach’s alpha coefficients ranging from .54 to .71. The higher the score, the more the student exhibits interest in the motivational factor or attributes of that factor.

The developers of the Inventory of School Motivation, McInerney and Swisher (1995), designed their instrument to explore motivational factors in a wide variety of student populations, paying particular attention to differing ethnic groups. The developers of this instrument used the instrument on a variety of groups, including groups that appear to be particularly disadvantaged. Besides validating their instrument and determining the main factors that were derived from their studies, McInerney & Swisher found that some ethnic groups exhibited differing values for some of the factors examined in their instrument. For example, a group of American Indian students was found to place a greater value on (or exhibited higher levels of the factors) of Affiliation and Social Concern than other ethnic groups studied.

McInerney and Swisher (1995) also found through their research that some of the variables in the Inventory of School Motivation could accurately predict students’ retention and success in school. The variables of sense of purpose, sense of competence,
recognition, and task involvement were demonstrated to be related to a student’s completion and success in school (McInerney & Swisher). The Educational Testing Services of ETS Test Collection (2002) granted permission to use the Inventory of School Motivation in this study (D. Markison, personal communication, May 18, 2001).

*Parental Attachment Questionnaire.* This 55-item, 5-point, Likert-type scale questionnaire, shown in Appendix C, was designed to assess young adults’ perceptions about their parents’ attitude towards them and their relationship with their parents (Kenny, 1990). This questionnaire contains three subscales that measure the affective quality of attachment, the parental fostering of autonomy, and the parental role in providing emotional support (Kenny, 1991). A test-retest reliability of .92 was given for the entire measure, with reliabilities for individual scales ranging from .82 to .91. Cronbach’s alpha coefficient was given as .96, .88, and .88 for each of the three scales. Internal consistency for the entire measure was .93 for males and .95 for females. Construct validity was obtained by correlating each of the factors in the three subscales with the Moos Family Environmental Scale. All the factors in the Parental Attachment Questionnaire were positively correlated with the factors in the Moos Scale as expected and not correlated with those factors with which they were not expected to correlate (Kenny, 1991).

The Parental Attachment Questionnaire has been used with both high school and college students. The developer of this instrument found that the instrument revealed no significant differences between ratings assigned to mothers and fathers. She also determined that instructing students of separated, divorced, or remarried parents to “respond with reference to the living parent or the parent to whom you feel closer”
allowed for scores that were calculated for the best attachment characteristics (Kenny, 1990, p. A-10). Kenny also found a small but statistically significant correlation ($r = .22, p < .04$) between the social desirability and the parental fostering of autonomy scales of this instrument. The Educational Testing Services of the ETS Test Collection (2002) granted permission to use the Parental Attachment Questionnaire instrument in this study (D. Markison, personal communication, May 31, 2001).

**Student Questionnaire.** This questionnaire, shown in Appendix D, was given to the primary participants, high school students, to measure the demographic factors of (a) parental educational levels, (b) ethnicity, and (c) gender. The instrument was also used to obtain a listing of student activities and levels of involvement in all domains in question. This instrument was designed and developed by the researcher of this study.

This instrument was designed to collect the demographic data required for this research. No statistical analyses of this questionnaire have been conducted. The Student Questionnaire collected only the three factors listed above and was not used to determine whether these factors were prerequisites to the achievement of excellence, but to determine if any correlation existed between these demographic factors and any other motivational or excellence factors in the study.

**Marlowe-Crowne Social Desirability Scale Short Form C.** This 13-item scale, shown in Appendix E, was developed from a larger 33-item scale (Reynolds, 1982). The social desirability scale measures an individual’s tendency to give self-reports that are not accurate. This instrument is designed to identify participants that give the researcher the expected or socially accepted response rather than giving true assessments. The reason for giving this measurement is to determine whether the primary participants are
giving responses that are accurate to the best of their knowledge and not biased by social constraints. Reliability for this scale is given as .75 to .90. Concurrent validity was examined via correlations with other social desirability instruments.

Many forms of this instrument have been used to determine whether participants involved in research are answering questions to the best of their knowledge or if they are merely giving the answers that they believe are expected by the researcher or determined to be the most socially acceptable or consistent with the participants’ social norms (Reynolds, 1982). The Educational Testing Services of the ETS Test Collection (2002) granted permission to use the Marlowe-Crowne Social Desirability Scale Short Form C instrument in this study.

Excellence Instruments

Multiple Intelligences Developmental Assessment Scales (MIDAS). This 119-item set of scales, shown in Appendix F, was developed by an educational researcher to measure interest, performance, evaluation, and success in domains based upon the multiple intelligences theory of Howard Gardner (Shearer, 1999b). Reliability and validity of the MIDAS were determined through a 10-year period of development and evaluation. The validity of the MIDAS was examined in terms of content validity, construct validity, concurrent validity, predictive validity, and contrasted criterion groups. Validity coefficients ranged from .54 to .80 when the same trait was measured using a different method, including comparisons with IQ scores. The mean alpha reliabilities for each of the scales ranged from .76 to .87. This instrument included the eight subscales of (a) verbal-linguistic, (b) mathematical, (c) logical, (d) musical, (e)
spatial, (f) kinesthetic, (g) interpersonal, and (h) intrapersonal, as defined in Gardner’s theory of multiple intelligence (1993), along with two additional scales of innovative, and leadership.

In recent years, many researchers have studied the concept of multiple intelligences. Several researchers (Bogod, 2001; Brualdi, 1996; Gardner, 1993; Shearer, 1997; Zahra, 1996) have determined that specific intelligences, skill areas, or abilities can be broken out and examined by domain. The developer of the Multiple Intelligences Developmental Assessment Scales (MIDAS), Brandon Shearer (1999a), has determined the existence, through extensive testing and factor analysis, of Gardner’s original eight multiple intelligences. As mentioned, Shearer (1999b) added two other domains to those originally described by Gardner and filtered the area of logic out of Gardner’s mathematical-logical domain, as well as adding the domains of innovation and leadership excellence. The naturalistic intelligence within Gardner’s theory is not explored with a corresponding domain excellence in this study.

The MIDAS has been used in a variety of academic and nonacademic settings. It has been tested on all age groups and three separate instruments have been developed to be used with children, teens, and adults (Shearer, 1997). The main finding for these instruments is that individuals exhibit differing levels of interest and achievement of success in different areas. The MIDAS has been used in conjunction with learning styles and has been helpful to the teaching profession in reaching students who may not exhibit interest or excellence in the more prominent domains of verbal and mathematical learning (Shearer, 1999b). The designer and developer of this instrument, Dr. Brandon Shearer (1999a), granted permission to use the MIDAS instrument in this study.
Teacher, Coach, and Advisor Questionnaire. This measurement, shown in Appendix G, was given to the secondary participants of this study to determine the subfactor of an expert rating, within the super latent variable of the exhibition of excellence. The teachers, coaches, and advisors who were given this measurement were asked to rate their students from 1 to 5 as to their exhibition of excellence within their domain of expertise. The scale was designed with a rating of 1 being a student that exhibits low excellence and a rating of 5 being a student that exhibits high excellence in that domain. This instrument was designed and developed by the researcher of this study.

This instrument was designed to allow the experts in each field or domain chosen to give their opinion of the excellence exhibited by each student in the study. The Teacher, Coach, and Advisor Questionnaire was added to this study to determine whether the expert ratings would be consistent with the results of the primary participants’ scores of the MIDAS. The correlation between the MIDAS scores and the expert ratings were examined to determine whether any or all of the other excellence factors would be consistent with the expert ratings.

Data Collection Procedures

Once the design of this study was developed and Institutional Review Board approval was completed (Appendix H), the county school district was contacted to obtain approval to survey students within that county. The study was described to the county’s director of curriculum and the county’s director of community affairs. The county representatives granted approval to survey the students and recommendations
were given on principal and teacher involvement in the administration of the study instruments.

All the high schools in the school district were contacted by the researcher and asked to participate in this study. Of the five potential high schools in the county, four participated. The school that did not participate was a charter high school colocated with the local community college and did not support the types of activities to represent the desired domains of excellence. The four participating schools were all county public schools. The principals were given a thorough explanation of the study and gave their consent for the teachers and students at their schools to participate in this study.

After permission was given by the principals, teachers in each of the desired excellence areas were contacted along with teachers who taught groups of students who could be categorized as the control group. All teachers and students who were administered surveys were given informed consent forms (Appendix I). Students were given the consent forms several days prior to the date of survey administration and only participated in the survey if they brought back consent forms signed by their parents. In all cases, students were given the option of completing the surveys and questionnaires or working on other school related activities. Several students openly stated that they did not want to participate in the study, and a total of approximately twelve percent of all potential participants chose not to participate or did not bring back their consent forms.

All participants were assured that results of the surveys were confidential and that the coding system was used only to facilitate the follow-up. Many of the students and their parents were interested in the results of the MIDAS. Results of this survey were returned to those interested in their own personal scorings and interests along with
an explanation of the scoring method. Once the results of the MIDAS were returned to students, all names were removed from the data and original student forms were destroyed. Expert rating forms were also destroyed after the ratings were linked to the student code numbers. To further assure confidentiality, the only source of the data for this study belongs to the researcher and is not available to any outside sources.

Methodological Assumptions

The following assumptions were made regarding the research data gathered during this study:

1. Each student completed the self-report survey with accuracy. This assumption is confirmed through the results of the Marlowe-Crowne Social Desirability Scale. The survey information was of a self-report nature and relied on the honesty and accuracy of responses. The primary participants of this study were given the Marlowe-Crowne Social Desirability instrument to determine whether the honesty and accuracy of responses were suspected to be in question. A very small percentage of students (less than 1%) scored marginally on this instrument, and none of the students scored in the unacceptable range for this instrument.

2. The sampling for each intact group was large enough that the findings could be generalized to similar groups within the population of ninth-, tenth-, eleventh-, and twelfth-grade students in the studied county. With a group size of 308 and overall composite group sizes of between 74 and 141 students, the sample size was sufficiently large for the statistics to be run on these groups.
with the number of composite variables examined. Of course, larger samples would be desirable and add power to the analysis. As a general rule of thumb, a minimum of 200 participants is considered fair and 300 participants is considered good for most statistics. A sample size of 300 is desirable for factor analysis using loading markers greater than .50. A smaller sample can be used for loadings greater than .80 (Tabachnick & Fidell, 2001). For regressions, the sample size should be about 200 for medium models and there should be at least 10 participants for each variable measured (Tabachnick & Fidell). Since seven variables are examined in answering the regression question, at least 70 participants would be needed in each group. In all cases listed above, the sample size is minimally sufficient to generalize.

Limitations

The following limitations were known to exist in this research project:

1. The data-collecting instruments were limited to the areas of motivational measurement and beliefs in excellence in specific subject areas.

2. This study did not attempt to evaluate the effectiveness of various motivational techniques in use in the participating school systems.

Data Analysis Procedures

The data for the three main survey instruments, Inventory of School Motivation, Parental Attachment Questionnaire, and the Multiple Intelligences Developmental Assessment Scales (MIDAS), were all collected on Scantron forms, with participants
filling in bubble forms to choose their responses. These forms were separate from their question forms for these instruments. The Marlowe-Crowne Social Desirability Scale Short Form C data was collected on a Scantron form with the questions included on the form. The Student Questionnaire and the Teacher Questionnaire forms were both researcher designed and allowed for collection of information on demographics and interests. This additional information facilitated the grouping of the students.

The Scantron data were electronically transferred into spreadsheet format, and the questionnaire data were manually added to the spreadsheets. All data were checked for accuracy and completeness. To minimize the possibility of missing data, student surveys were checked before they left the survey administration area. If data were missing, the students were asked to complete the missing items.

In the few cases of small amounts of missing data, the method of mean score replacement was used to fill in small numbers of missing data, which is considered acceptable for low amounts of missing data (Stevens, 1996). In situations where large quantities of data were missing or where there was a pattern of missing data, those cases were dropped. Only two cases needed to be removed from the study due to extensive missing data.
CHAPTER IV

RESULTS

Overview

The purpose of the study was to examine the relationship between motivational factors and achievement of excellence in specific ability domains for high school students in the Northwest Florida area. In this chapter, data are presented and analyzed for each research question in this study.

Presentation of the Data

This study involved 308 primary participants from four different high schools in the Northwest Florida area. These students formed 15 different classes, teams, or groups. Nine teachers, coaches, and advisors acted as the secondary participants in this study. The secondary participants’ data are only used in relation to the primary participants.

The students were divided into seven different excellence domains and a control group. The groupings of students are exhibited in Table 4 with total numbers for each group and the numbers of males and females in each group. This grouping of students is parallel to the groupings listed earlier in Table 3. Some of the groups are consolidations of previously listed classes. For example, as listed in Table 3, two classes of graphic arts were surveyed. These two classes are listed on Table 4 as the creative group. Similarly,
the academic group includes the honors history students and the honors mathematics students. The team sports group consists of two soccer teams and the individual sports group consists of a golf and a track team. The numbers of participants listed in Table 4 indicate the excellence groups and conceptual factors they are representative of according to their scores on the MIDAS.

Table 4

*Domain Groups and Numbers of Participants*

<table>
<thead>
<tr>
<th>Group number</th>
<th>Excellence groups</th>
<th>Conceptual factors characterizing group based on MIDAS scores(^a)</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Control</td>
<td>None</td>
<td>35</td>
<td>39</td>
</tr>
<tr>
<td>2</td>
<td>Academic</td>
<td>Mathematics</td>
<td>24</td>
<td>26</td>
</tr>
<tr>
<td>3</td>
<td>Creative</td>
<td>Spatial, innovative, or intrapersonal</td>
<td>22</td>
<td>18</td>
</tr>
<tr>
<td>4</td>
<td>Band or orchestra</td>
<td>Music</td>
<td>15</td>
<td>14</td>
</tr>
<tr>
<td>5</td>
<td>Team sports</td>
<td>Kinesthetic</td>
<td>13</td>
<td>17</td>
</tr>
<tr>
<td>6</td>
<td>Individual sports</td>
<td>Kinesthetic</td>
<td>12</td>
<td>11</td>
</tr>
<tr>
<td>7</td>
<td>Leadership</td>
<td>Verbal or leadership</td>
<td>14</td>
<td>16</td>
</tr>
<tr>
<td>8</td>
<td>Community involvement</td>
<td>Interpersonal</td>
<td>15</td>
<td>19</td>
</tr>
</tbody>
</table>

\(^a\)The conceptual factors listed are those MIDAS scales on which a group scored significantly higher than other groups.
Findings in Relation to Research Question 1

Do students within specific domains of excellence exhibit similar motivational or excellence factors within their groupings?

The eight primary groups, which include the seven excellence groups and the control group, were examined using two-tailed $t$ test mean comparisons. These statistics indicate that many of the membership groupings chosen for the 308 participants in this study were indicative of the types of excellence they were expected to exhibit based on study measures and on the domains that they represent. This question is answered partially in an attempt to determine whether the groups of students actually exhibit the excellence factors they were selected to exhibit. In general, the groups were indicative of the excellence factors that they were expected to exhibit based on their domain of excellence through class memberships. This finding substantiated the idea that the students in the chosen excellence groups do, in fact, exhibit excellence within that area. Not all of the groups, however, were indicative of the excellences they were expected to depict.

An example of the verification of excellence factors within the excellence domains can be seen in the group of band or orchestra students. The group of students categorized in the overall domain of intellectual and the subdomain of creative or musical was the group that scored the highest in the excellence area of music, according to their mean score on the music scale of the MIDAS. The highest or extreme mean scores for each of the excellence areas are shown in Table 5 along with the total group average mean that they were compared to in the paired $t$ tests and their significance.
levels \((p)\). A significance level of \(p < .05\) was generally used to indicate a significant group difference.

**Table 5**

*Differences in Means for Individual Excellence Factors Groups Compared to Total Average Means Using Two-Tailed t Tests From the Multiple Intelligences Developmental Assessment Scales*

<table>
<thead>
<tr>
<th>Excellence factors</th>
<th>Group with significant differences in means</th>
<th>Domain group</th>
<th>Total group</th>
<th>(p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Music</td>
<td>Academics</td>
<td>59.72</td>
<td>55.37</td>
<td>.024</td>
</tr>
<tr>
<td></td>
<td>Band or orchestra</td>
<td>66.96</td>
<td>55.37</td>
<td>.001</td>
</tr>
<tr>
<td></td>
<td>Community</td>
<td>59.74</td>
<td>55.37</td>
<td>.020</td>
</tr>
<tr>
<td>Kinesthetic</td>
<td>Team sports</td>
<td>57.50</td>
<td>50.10</td>
<td>.006</td>
</tr>
<tr>
<td></td>
<td>Leaders</td>
<td>55.57</td>
<td>50.10</td>
<td>.054(^a)</td>
</tr>
<tr>
<td>Mathematics</td>
<td>Academic</td>
<td>54.60</td>
<td>51.01</td>
<td>.003</td>
</tr>
<tr>
<td>Spatial</td>
<td>Creative</td>
<td>59.20</td>
<td>51.94</td>
<td>.037</td>
</tr>
<tr>
<td>Linguistic</td>
<td>Leadership</td>
<td>59.63</td>
<td>52.98</td>
<td>.078(^a)</td>
</tr>
<tr>
<td>Interpersonal</td>
<td>Community</td>
<td>63.63</td>
<td>56.51</td>
<td>.024</td>
</tr>
<tr>
<td>Intrapersonal</td>
<td>Academic</td>
<td>56.18</td>
<td>53.37</td>
<td>.004</td>
</tr>
<tr>
<td></td>
<td>Leadership</td>
<td>58.30</td>
<td>53.37</td>
<td>.020</td>
</tr>
<tr>
<td></td>
<td>Community</td>
<td>56.85</td>
<td>53.37</td>
<td>.030</td>
</tr>
<tr>
<td>Leadership</td>
<td>Leadership</td>
<td>59.77</td>
<td>53.44</td>
<td>.037</td>
</tr>
<tr>
<td></td>
<td>Community</td>
<td>60.37</td>
<td>53.44</td>
<td>.005</td>
</tr>
<tr>
<td>Logic</td>
<td>Community</td>
<td>59.14</td>
<td>54.60</td>
<td>.027</td>
</tr>
<tr>
<td>Innovative</td>
<td>Band or orchestra</td>
<td>55.89</td>
<td>50.81</td>
<td>.058(^a)</td>
</tr>
</tbody>
</table>

*Note.* An expanded table with all of the group means is shown in Appendix J.\(^a\)

\(^a\)In three cases no group was significantly different at \(p < .05\) level; however, the greatest differences are listed in the table.
A similar comparison of the differences in means was conducted when examining the group differences in means for the motivational factors. Again, the seven excellence groups and the control group were examined using two-tailed $t$ test mean comparisons. Within the motivational factors, some factors logically depicted significant differences in means between excellence domain groups as compared to the other domain groups and some did not. An example of this concept of logically significantly higher difference in means between a group and the mean might be that the motivational factor of group leadership would be aligned with the group chosen to represent the leadership domain; however, these types of correlations were not commonly represented in the statistical analysis. Within the motivational factors listed in Table 6, several unexpected lower differences in means were exhibited for these factors.

Examples of unusual lower means or a reverse effect occur in the motivational factors of striving, competence, recognition, purposefulness (school), competition, and social concern. For these factors, the most significant differences were with lower means, which again is the opposite of what would be expected by theorists of general extrinsic or behavioral motivational theory (Bandura et al., 1996; Driscoll, 2000). However, this would not be an unusual finding for theorists who emphasize intrinsic motivation or motivation as a trait rather than a more malleable state (Conti & Amabile, 1999; Cordova & Lepper, 1996).

In general, the motivational factor means for the excellence domain groups in Table 6 did not exhibit significant differences in means with the total average mean in an expected pattern, except that the more extrinsically associated motivational factors, were more dominant in their association in a negative manner. This result may indicate that
these types of motivation do not elicit excellence or the achievement of success in the excellence groups studied.

Table 6

*Differences in Means for Individual Motivational Factors Groups Compared to Total Average Means Using Two-Tailed t Tests From the Inventory of School Motivation*

<table>
<thead>
<tr>
<th>Motivational factors</th>
<th>Group with significant differences in means</th>
<th>Domain group</th>
<th>Total group</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Striving</td>
<td>Team sports</td>
<td>15.50</td>
<td>16.82</td>
<td>.044</td>
</tr>
<tr>
<td>Competence</td>
<td>Individual sports</td>
<td>16.93</td>
<td>19.51</td>
<td>.011</td>
</tr>
<tr>
<td>Recognition</td>
<td>Academics</td>
<td>17.38</td>
<td>20.32</td>
<td>.001</td>
</tr>
<tr>
<td></td>
<td>Band/Orchestra</td>
<td>16.41</td>
<td>20.32</td>
<td>.002</td>
</tr>
<tr>
<td></td>
<td>Team sports</td>
<td>19.08</td>
<td>20.32</td>
<td>.038</td>
</tr>
<tr>
<td>Affiliation</td>
<td>Creative</td>
<td>13.51</td>
<td>12.41</td>
<td>.002</td>
</tr>
<tr>
<td>Group leadership</td>
<td>Creative</td>
<td>22.43</td>
<td>19.67</td>
<td>.013</td>
</tr>
<tr>
<td>Purposefulness (school)</td>
<td>Leadership</td>
<td>4.43</td>
<td>5.02</td>
<td>.047</td>
</tr>
<tr>
<td>Competition</td>
<td>Academic</td>
<td>24.66</td>
<td>27.30</td>
<td>.006</td>
</tr>
<tr>
<td></td>
<td>Team sports</td>
<td>25.86</td>
<td>27.30</td>
<td>.036</td>
</tr>
<tr>
<td>Social concern</td>
<td>Band/Orchestra</td>
<td>12.89</td>
<td>15.03</td>
<td>.012</td>
</tr>
<tr>
<td>Task orientation</td>
<td>Individual Sports</td>
<td>4.62</td>
<td>3.93</td>
<td>.091</td>
</tr>
</tbody>
</table>

*Note.* An expanded table with all of the group means is shown in Appendix J. For the motivational factors of purposefulness (future), purposefulness (school), and task orientation, no significantly extreme differences in means were indicated.

*a* In several cases, factors exhibited a significant inverse relationship.

*b* In one case, no group was significantly different at $p < .05$ level; however, the greatest difference is listed in the table.
The parentally inspired motivational factor’s group means were also analyzed in comparison with the total group means using two-tailed $t$ test mean comparisons. As shown in Table 7, the three same groups (the academic achievement group, the band and orchestra group, and the leadership group) exhibit the highest scores on the three individual parental motivational factors. Three of these comparisons were significant, as listed in Table 7. These results not only confirm the link between the three parental motivational factors, but also exhibit a link between parentally inspired motivation and the achievement of success within these groups that is different from the achievement of success in other domains examined in this study. Findings based on these results will be discussed further in chapter 5.

Table 7

*Differences in Means for Individual Motivational Factors Compared to Total Average Means Using Two-Tailed $t$ Tests From the Parental Attachment Questionnaire*

<table>
<thead>
<tr>
<th>Excellence factors</th>
<th>Group with significant differences in means</th>
<th>Domain group</th>
<th>Total group</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parental attachment</td>
<td>Academic</td>
<td>89.26</td>
<td>83.39</td>
<td>.003</td>
</tr>
<tr>
<td></td>
<td>Band/Orchestra</td>
<td>88.03</td>
<td>83.39</td>
<td>.054</td>
</tr>
<tr>
<td></td>
<td>Leadership</td>
<td>88.50</td>
<td>83.39</td>
<td>.052</td>
</tr>
<tr>
<td>Parental autonomy</td>
<td>Academic</td>
<td>48.44</td>
<td>47.07</td>
<td>.054</td>
</tr>
<tr>
<td></td>
<td>Band/Orchestra</td>
<td>50.37</td>
<td>47.07</td>
<td>.025</td>
</tr>
<tr>
<td>Parental support</td>
<td>Academic</td>
<td>47.14</td>
<td>44.24</td>
<td>.002</td>
</tr>
<tr>
<td></td>
<td>Leadership</td>
<td>46.93</td>
<td>44.24</td>
<td>.051</td>
</tr>
</tbody>
</table>

*Note.* An expanded table with all of the group means is shown in Appendix J.
The differences in the domain group means compared to the total average means are exhibited in Tables 5, 6, and 7. An additional comparison was completed using the two-tailed \( t \) test statistical analysis to compare the differences in the excellence factors for the means of the excellence group domain as compared to the control group means rather than as compared to the overall average means. Some planned comparisons based on expected differences from other groups were conducted as well as conducting comparisons where group differences were already depicted. In this comparison, only the positive, or higher group means, were examined. In other words, only the positive correlations between group means and the motivational factors were analyzed.

Some of the same results are depicted in Table 8 as are shown in Table 5, except that some of the results are more extreme, because the comparisons are being made between individual groups rather than between individual groups and the total average mean for all the groups. Again, in general, the excellence domain groups depicted higher means for the excellence factors, as would be expected, and are shown in Table 8 with their significances.

Only a small percentage of the results were unexpected. The majority of the factors depicted higher means as compared to the control groups as expected. There were some unusually higher means for several of the factors. These factors included the linguistic factor, which was highest for the leadership group; the logic factor, which was highest for the leadership and community groups; and the innovative factor, which was the highest for the band and orchestra group.

Another additional comparison was completed using the two-tailed \( t \) test statistical analysis to compare the differences in the motivational factors for the
Table 8

*Differences in Means for Excellence Factors Compared to Control Group Means Using Two-Tailed t Tests From the Multiple Intelligences Developmental Assessment Scales*

<table>
<thead>
<tr>
<th>Excellence factors</th>
<th>Group with significant differences in means</th>
<th>Domain group</th>
<th>Control group</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Music</td>
<td>Band/Orchestra</td>
<td>66.96</td>
<td>49.90</td>
<td>.000</td>
</tr>
<tr>
<td>Kinesthetic</td>
<td>Team sports</td>
<td>57.50</td>
<td>47.58</td>
<td>.010</td>
</tr>
<tr>
<td>Mathematics</td>
<td>Academic</td>
<td>54.60</td>
<td>47.65</td>
<td>.015</td>
</tr>
<tr>
<td>Spatial</td>
<td>Creative</td>
<td>59.20</td>
<td>50.86</td>
<td>.062&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Linguistic</td>
<td>Leadership</td>
<td>59.63</td>
<td>49.11</td>
<td>.017</td>
</tr>
<tr>
<td>Interpersonal</td>
<td>Leadership</td>
<td>62.46</td>
<td>53.48</td>
<td>.034</td>
</tr>
<tr>
<td></td>
<td>Community</td>
<td>63.63</td>
<td>53.48</td>
<td>.003</td>
</tr>
<tr>
<td>Intrapersonal</td>
<td>Academic</td>
<td>57.58</td>
<td>53.37</td>
<td>.008</td>
</tr>
<tr>
<td></td>
<td>Leadership</td>
<td>58.30</td>
<td>53.37</td>
<td>.001</td>
</tr>
<tr>
<td></td>
<td>Community</td>
<td>56.85</td>
<td>53.37</td>
<td>.005</td>
</tr>
<tr>
<td>Leadership</td>
<td>Leadership</td>
<td>59.77</td>
<td>49.60</td>
<td>.010</td>
</tr>
<tr>
<td></td>
<td>Community</td>
<td>60.37</td>
<td>49.60</td>
<td>.001</td>
</tr>
<tr>
<td>Logic</td>
<td>Leadership</td>
<td>58.86</td>
<td>52.53</td>
<td>.018</td>
</tr>
<tr>
<td></td>
<td>Community</td>
<td>59.14</td>
<td>52.53</td>
<td>.035</td>
</tr>
<tr>
<td>Innovative</td>
<td>Band or orchestra</td>
<td>55.89</td>
<td>49.88</td>
<td>.013</td>
</tr>
</tbody>
</table>

*Note.* An expanded table with all of the group means is shown in Appendix J.<sup>a</sup>

<sup>a</sup>In one case, no group was significantly different at p < .05 level; however, the greatest difference is listed in the table.
excellence domain group means as compared to the control group means rather than as compared to the total average means. Some planned comparisons were conducted based on expected differences from other groups as well as conducting comparisons where group differences were already depicted. In these comparisons, both positive and negative, higher group means and lower group means, were examined in comparison to the control group means. In this case, Table 9 can be viewed in reference to Tables 6 and 7, where the comparisons were made with the total group means.

The significant group differences between the excellence domain group means and the control group means for the motivational factors depict a similar pattern to the comparison of the group means to the overall group mean. In this case, similar to the results in Table 6, the factors of Striving, Competence, Recognition, Social Concern, and Competition exhibited negative comparisons. In other words, these groups had lower mean scores on the factors than the control group. All significant differences between these means are shown on Table 9. Although one of the significantly lower mean factors is different than in Table 6, these factors all still represent more extrinsic motivational factors.

Just as when comparing the overall group means, the three parental factors exhibit significant group differences in means with the three groups of academic, music, and leadership. These differences are slightly more extreme than shown in the comparisons from Table 7 and include two more significant group differences than previously shown.
Table 9

*Differences in Means for Motivational Factors Compared to Control Group Means Using Two-Tailed t Tests From the Inventory of School Motivation and the Parental Attachment Questionnaire*

<table>
<thead>
<tr>
<th>Motivational factors</th>
<th>Group with significant differences in means</th>
<th>Domain group</th>
<th>Control group</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Striving</td>
<td>Team sports</td>
<td>15.50</td>
<td>18.88</td>
<td>.004</td>
</tr>
<tr>
<td>Competence</td>
<td>Individual sports</td>
<td>16.94</td>
<td>21.35</td>
<td>.005</td>
</tr>
<tr>
<td>Recognition</td>
<td>Band or orchestra</td>
<td>16.41</td>
<td>23.19</td>
<td>.000</td>
</tr>
<tr>
<td>Social Concern</td>
<td>Community</td>
<td>13.85</td>
<td>16.63</td>
<td>.006</td>
</tr>
<tr>
<td>Affiliation</td>
<td>Creative</td>
<td>13.51</td>
<td>12.11</td>
<td>.017</td>
</tr>
<tr>
<td>Competition</td>
<td>Team sports</td>
<td>25.86</td>
<td>29.60</td>
<td>.007</td>
</tr>
<tr>
<td>Parental attachment</td>
<td>Academic</td>
<td>89.26</td>
<td>77.95</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>Music</td>
<td>88.03</td>
<td>77.95</td>
<td>.050</td>
</tr>
<tr>
<td></td>
<td>Leadership</td>
<td>88.50</td>
<td>77.95</td>
<td>.014</td>
</tr>
<tr>
<td>Parental autonomy</td>
<td>Academic</td>
<td>48.44</td>
<td>44.45</td>
<td>.019</td>
</tr>
<tr>
<td></td>
<td>Music</td>
<td>50.38</td>
<td>44.45</td>
<td>.052</td>
</tr>
<tr>
<td></td>
<td>Leadership</td>
<td>49.50</td>
<td>44.45</td>
<td>.018</td>
</tr>
<tr>
<td>Parental support</td>
<td>Academic</td>
<td>47.14</td>
<td>40.26</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>Music</td>
<td>46.07</td>
<td>40.26</td>
<td>.021</td>
</tr>
<tr>
<td></td>
<td>Leadership</td>
<td>46.93</td>
<td>40.26</td>
<td>.003</td>
</tr>
</tbody>
</table>

*Note.* An expanded table with all of the group means is shown in Appendix J. For the motivational factors of purposefulness (future), purposefulness (school), and Task orientation, no significantly extreme mean difference was indicated.

*a* In several cases, factors exhibited significant inverse relationships.

*b* In one case, no group was significantly different at \( p < .05 \) level; however, the greatest difference is listed in the table.
Findings in Relation to Research Question 2

*What are the main motivational factors related to success in the domains that students are exposed to in high school? Can these groupings be reduced?*

Since this study researched a large number of motivational and excellence variables, factor reduction was a method chosen to make the analyses of these variables more manageable and more statistically sound. The method of factor reduction was also chosen to determine the underlying structure within the original variables.

In general, factor analysis is useful in reducing the number of factors involved in research as well as combining factors of like dimensions. Factor analysis can be defined as a statistical technique by which numerous variables are correlated with one another, and factors are identified, consisting of groups of variables that correlate highly with one another (Crowl, 1996). One way to analyze several items of subfactors within a composite variable is to form subgroups among the items to determine whether there is an underlying structure in the data (Stevens, 1996).

Factor reduction can be used to limit the complexity of a large set of variables in a correlational model. Factor analysis is generally recommended to address the problem of analyzing the structure of the correlations among a large number of variables by defining a set of common underlying dimensions, known as factors (Hair, Anderson, & Tatham, 1995). Within this study, a large number of motivational and excellence variables were reduced into a more simplified model containing a significantly smaller number of composite variables.

To simplify the interpretation of the variance in circumstances, such as in this study where a large set of variables is analyzed, a rotation of factors may be conducted.
An orthogonal rotation was chosen in this study, not only to minimize the number of principle factors, but also to maintain the new factors being uncorrelated and decreasing collinearity problems. A varimax rotation was conducted, which tends to load high on a small number of variables (Stevens, 1996).

After the data in this study were examined in relationship to each of the individual factors in this study, a factor reduction was attempted to determine whether a smaller number of stronger motivational and excellence factors could be determined. The original factors, loadings, groupings based on those loadings, and a renaming of the composite factors are exhibited Tables 10 and 11. The original motivational factors and excellence factors researched in this study, as depicted in Appendix A and Table 1, were combined into higher order factors using this method of factor reduction. A loading of greater than .50 was used to determine the higher order or composite factors.

The reduction of the 13 original motivation factors as determined by the Inventory of School Motivation and the Parental Attachment Questionnaire are depicted in Table 10. These 13 variables are listed as they loaded on four higher order motivational factors. Not only did the original motivational factors load high on the four composite factors, but the factors loaded in a logical manner also allowed these new composite factors to be renamed. These new higher order factors are given the composite labels of Goal Motivation, Acknowledgement Motivation, Association Motivation, and Parent-Inspired Motivation.

The composite factor of Goal Motivation includes the original factors of striving for excellence, sense of competence, sense of purpose for the future, sense of purpose for school, and task involvement. These five factors are compiled to complete the composite
Table 10

Reduction of Motivational Factors

<table>
<thead>
<tr>
<th>Reduced factors and original factors</th>
<th>Renamed composite factor and loadings</th>
<th>Cross loadings with M1</th>
<th>M2</th>
<th>M3</th>
<th>M4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Motivation 1</strong></td>
<td>Goal motivation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Striving for excellence</td>
<td>.803</td>
<td>.803</td>
<td>.162</td>
<td>.135</td>
<td>.149</td>
</tr>
<tr>
<td>Sense of competence</td>
<td>.548</td>
<td>.548</td>
<td>-.363</td>
<td>-.232</td>
<td>-.031</td>
</tr>
<tr>
<td>Sense of purpose (future)</td>
<td>.609</td>
<td>.609</td>
<td>.318</td>
<td>.275</td>
<td>.230</td>
</tr>
<tr>
<td>Sense of purpose (school)</td>
<td>.718</td>
<td>.718</td>
<td>.150</td>
<td>.209</td>
<td>.187</td>
</tr>
<tr>
<td>Task involvement</td>
<td>.546</td>
<td>.546</td>
<td>.208</td>
<td>-.091</td>
<td>.268</td>
</tr>
<tr>
<td><strong>Motivation 2</strong></td>
<td>Acknowledgement motivation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recognition</td>
<td>.716</td>
<td>.260</td>
<td>.716</td>
<td>.275</td>
<td>.157</td>
</tr>
<tr>
<td>Group leadership</td>
<td>.751</td>
<td>.250</td>
<td>.751</td>
<td>.132</td>
<td>.291</td>
</tr>
<tr>
<td>Competition</td>
<td>.868</td>
<td>.119</td>
<td>.868</td>
<td>.044</td>
<td>.132</td>
</tr>
<tr>
<td><strong>Motivation 3</strong></td>
<td>Association motivation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social concern</td>
<td>.789</td>
<td>.277</td>
<td>.222</td>
<td>.789</td>
<td>.301</td>
</tr>
<tr>
<td>Affiliation</td>
<td>.890</td>
<td>.045</td>
<td>.100</td>
<td>.890</td>
<td>.112</td>
</tr>
<tr>
<td><strong>Motivation 4</strong></td>
<td>Parent-inspired motivation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parental support</td>
<td>.952</td>
<td>.058</td>
<td>.132</td>
<td>.253</td>
<td>.952</td>
</tr>
<tr>
<td>Parental attachment</td>
<td>.852</td>
<td>.153</td>
<td>.142</td>
<td>.197</td>
<td>.852</td>
</tr>
<tr>
<td>Fostering autonomy</td>
<td>.896</td>
<td>.034</td>
<td>.152</td>
<td>.185</td>
<td>.896</td>
</tr>
</tbody>
</table>

Table 11

*Reduction of Excellence Factors*

<table>
<thead>
<tr>
<th>Reduced factors and original factors</th>
<th>Renamed composite factor and loadings</th>
<th>Cross loadings with E1</th>
<th>E2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellence 1</td>
<td>Analytical excellence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kinesthetic</td>
<td>.591</td>
<td>.591</td>
<td>.180</td>
</tr>
<tr>
<td>Mathematics</td>
<td>.864</td>
<td>.864</td>
<td>.204</td>
</tr>
<tr>
<td>Spatial</td>
<td>.854</td>
<td>.854</td>
<td>.172</td>
</tr>
<tr>
<td>Logic</td>
<td>.653</td>
<td>.653</td>
<td>.431</td>
</tr>
<tr>
<td>Innovation</td>
<td>.758</td>
<td>.758</td>
<td>.465</td>
</tr>
<tr>
<td>Intrapersonal</td>
<td>.558</td>
<td>.558</td>
<td>.431</td>
</tr>
<tr>
<td>Excellence 2</td>
<td>Interactive excellence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Music</td>
<td>.588</td>
<td>.219</td>
<td>.588</td>
</tr>
<tr>
<td>Linguistic</td>
<td>.833</td>
<td>.272</td>
<td>.833</td>
</tr>
<tr>
<td>Leadership</td>
<td>.863</td>
<td>.261</td>
<td>.863</td>
</tr>
<tr>
<td>Interpersonal</td>
<td>.920</td>
<td>.230</td>
<td>.920</td>
</tr>
</tbody>
</table>

*Note.* E1 = Excellence 1. E2 = Excellence 2.

factor of Motivation 1 and renamed Goal Motivation, since all the original factors indicate a goal orientation and the concept of striving for goals, particularly oriented on future achievement. The composite factor of Acknowledgement Motivation includes the original factors of recognition, group leadership, and competition. These three factors are compiled to complete the composite factor of Motivation 2 and renamed Acknowledgement Motivation, because all these factors indicate an acknowledgement
orientation along with the concept of being recognized for achievement and competing for that acknowledgement. The composite factor of Association Motivation includes the original factors of social concern and affiliation. These two factors are compiled to complete the composite factor of Motivation 3 and are renamed Association Motivation, since these factors represent an association-related orientation to motivation. The composite factor of Parent-Inspired Motivation includes the original factors of parental support, parental attachment, and the fostering of autonomy. These three factors are compiled to complete the composite factor of Motivation 4 and are renamed Parent-Inspired Motivation, since these factors are related to the motivational aspects of learning and excellence that parents can influence.

The cross loadings for each of the higher order factors are also depicted in Table 10 and show that the original factors load more strongly on their respective higher order factors, using .50 as the loading marker cut off. None of the original factors loaded with higher than .32 on any other higher order factors, strengthening the assumption that a .50 loading cut off is a good delineator. Not only do the original factors load well on the four composite factors, but they also logically fit into the grouping described by the composite factors.

Findings in Relation to Research Question 3

*Are the domains of excellence that high school students are involved in based on the areas of excellence? Can these groupings be reduced?*

As mentioned, a large number of motivational and excellence variables were researched in this study. Similar to the motivational variables, factor reduction was the
method chosen to make the analyses of these variables more manageable and more statistically sound and to determine the underlying structure within the original excellence variables. Factor reduction was used to limit the complexity of the large set of variables in the model, while not only minimizing the number of principle excellence factors, but also maintaining that the new excellence factors are uncorrelated. The original excellence factors researched in this study, as depicted in Appendix A and Table 3, were combined into higher order factors using this method of factor reduction.

The original excellence factors were reduced in the same manner as the original motivational factors. A loading factor of greater than .50 was again chosen to determine the higher order or composite factors. The original lower order factors loaded well on the two higher order factors. The two composite factors were compiled from the nine multiple intelligences and the two additional factors of logic and innovation as determined by the Multiple Intelligences Developmental Assessment Scales (MIDAS).

Similar to the original motivational factors, the original excellence factors loaded in a logical manner so as to allow for the naming of the composite factors. The two higher order excellence factors were named Analytical Excellence and Interactive Excellence and are depicted with their loadings on Table 11. Cross loadings are also listed in Table 11 with only three of the original factors loading higher than .3 on a second higher order factor. These three factors still show at least a .2 differential in loadings from one higher order factor to another.

The original model depicted in Appendix A was used to derive a simplified model which depicts the higher order motivational and composite variables. The simplified model using the composite factors from the factor reduction is depicted in
Appendix K. A simplification of the eight groups was also determined by using the two main excellence variables as parallel factors to the groups. The two excellence variables were aligned conceptually with the excellence groups based on the findings in Table 5 and the expanded table of excellence means in Appendix J, which depicts the excellences that are actually statistically exhibited by each of the original groups. The composite groups are shown in Table 12 with the original groups and the parallel excellence factors. The total number of participants for each composite group is also depicted.

Table 12

*Composite Groups With Parallel Excellence Factors*

<table>
<thead>
<tr>
<th>Composite groups and original groups</th>
<th>Composite excellence factors with original excellence factors</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td></td>
<td>74</td>
</tr>
<tr>
<td>Composite group 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Academic</td>
<td>Analytical excellence</td>
<td>141</td>
</tr>
<tr>
<td>Academic--creative</td>
<td>Mathematic or logic</td>
<td></td>
</tr>
<tr>
<td>Team sports</td>
<td>Spatial or innovative</td>
<td></td>
</tr>
<tr>
<td>Individual sports</td>
<td>Kinesthetic</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Kinesthetic</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Intrapersonal</td>
<td></td>
</tr>
<tr>
<td>Composite group 2</td>
<td>Interactive excellence</td>
<td>93</td>
</tr>
<tr>
<td>Orchestra</td>
<td>Music</td>
<td></td>
</tr>
<tr>
<td>Leadership</td>
<td>Leadership or linguistic</td>
<td></td>
</tr>
<tr>
<td>Community involvement</td>
<td>Interpersonal</td>
<td></td>
</tr>
</tbody>
</table>
Findings in Relation to Research Question 4

*Are group differences evident in the higher order (composite) motivational factors?*

A multivariate analysis was conducted on the three composite groups and the differences in the higher order motivational factors. The analysis was conducted with the motivational factors as the dependent variables, the groups as the independent variables, and ethnicity and gender as covariates. After determining that differences did exist between the composite groups, a post hoc analysis was conducted to determine how the groups differed individually.

The three groups (as listed in Table 12) differed over the four higher order motivational factors (as listed on Table 10). These differences are depicted in Table 13 with their significance levels (p) when this analysis was first run without the covariates. The composite factors were derived by use of multipliers which normalized the factors so that they could be used additively.

Table 13

*Multivariate Analysis of Composite Factors*

<table>
<thead>
<tr>
<th>Higher order motivational factors</th>
<th>$F$</th>
<th>$R^2$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal motivation</td>
<td>3.68</td>
<td>.024</td>
<td>.026</td>
</tr>
<tr>
<td>Acknowledgement motivation</td>
<td>5.82</td>
<td>.037</td>
<td>.003</td>
</tr>
<tr>
<td>Association motivation</td>
<td>3.69</td>
<td>.024</td>
<td>.026</td>
</tr>
<tr>
<td>Parent-inspired motivation</td>
<td>3.92</td>
<td>.025</td>
<td>.021</td>
</tr>
</tbody>
</table>
After determining the differences between the three composite groups and finding the model predictive percentages, a post hoc test was conducted to determine where the differences existed. The Tukey Honestly Significant Difference (HSD) post hoc comparison with a Tukey-Kramer modification was chosen to find which groups were exhibiting the differences and as an appropriate procedure for considering pairwise contrasts where simple contrasts are necessary. The Tukey-Kramer modification of this post hoc comparison was specifically selected to accommodate the unequal numbers of participants within the groups in this study (Lomax, 1992).

The multivariate analysis and the post hoc tests were run first using the actual mean scores and composite scores. Then the same statistics were run using z scores to standardize the scores due to differences in the ranges of the original scores. Using z scores also allow for more thorough examination of the post hoc differences in means for the motivational factors within each group. The results are shown in Table 14.

The composite factor of Goal Motivation includes the original factors of striving for excellence, sense of competence, sense of purpose for school, sense of purpose for the future, and task involvement. When examining Goal Motivation for group differences, it was found that the control group and the interactive excellence group exhibited a significant pairwise difference ($p = .022$).

The composite factor of Acknowledgement Motivation includes the original factors of recognition, group leadership, and competition. When examining Acknowledgement Motivation for group differences, it was found that the control group and the analytical excellence group exhibited a significant pairwise difference ($p = .004$).
It was also found that the control group and the interactive excellence group exhibited a significant pairwise difference \((p = .013)\).

The composite factor of Association Motivation includes the original factors of social concern and affiliation. When examining Association Motivation for group differences, it was found that the control group and the interactive excellence group exhibited a significant pairwise difference \((p = .042)\).

The composite factor of Parental-Inspired Motivation includes the original factors of parental support, parental attachment, and fostering of autonomy. When examining Parental Inspired Motivation for group differences, it was found that the control group and the analytical excellence group exhibited a significant pairwise difference \((p = .027)\).

The differences in means for the \(z\) scores shown in Table 14 support the post hoc significance results. Where there is a smaller mean difference, such as when comparing the analytical and interactive excellence groups for Acknowledgement Motivation (mean difference of -.02), the difference exhibited is less significant \((p = .982)\). Where there is a larger mean difference, such as when comparing the control group with the analytical excellence group for Acknowledgement Motivation (mean difference of .46), the difference exhibited is more significant \((p = .004)\).

In examining the overall differences from the post hoc comparison, the two excellence groups (analytical and interactive excellence groups) did not show a significant difference under any of the composite factor situations. The control group exhibited a significant difference when compared to the interactive excellence group in all four of the composite motivational factor situations. When comparing the control
group to the analytical excellence group, the only exhibited significant difference was under the Acknowledgement Motivation factor.

Table 14

Post Hoc Comparison Using Multivariate Analysis Using Tukey Honestly Significant Difference With a Tukey-Kramer Modification

<table>
<thead>
<tr>
<th>Composite factors</th>
<th>Composite group</th>
<th>Compared to</th>
<th>Mean difference</th>
<th>( p )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal motivation</td>
<td>Control</td>
<td>Analytical</td>
<td>.30</td>
<td>.092</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>Interactive</td>
<td>.41</td>
<td>.022</td>
</tr>
<tr>
<td></td>
<td>Analytical</td>
<td>Interactive</td>
<td>.11</td>
<td>.680</td>
</tr>
<tr>
<td>Acknowledgement motivation</td>
<td>Control</td>
<td>Analytical</td>
<td>.46</td>
<td>.004</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>Interactive</td>
<td>.43</td>
<td>.013</td>
</tr>
<tr>
<td></td>
<td>Analytical</td>
<td>Interactive</td>
<td>-.02</td>
<td>.983</td>
</tr>
<tr>
<td>Association motivation</td>
<td>Control</td>
<td>Analytical</td>
<td>.06</td>
<td>.890</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>Interactive</td>
<td>.37</td>
<td>.042</td>
</tr>
<tr>
<td></td>
<td>Analytical</td>
<td>Interactive</td>
<td>.31</td>
<td>.053</td>
</tr>
<tr>
<td>Parental motivation</td>
<td>Control</td>
<td>Analytical</td>
<td>-.09</td>
<td>.778</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>Interactive</td>
<td>-.40</td>
<td>.027</td>
</tr>
<tr>
<td></td>
<td>Analytical</td>
<td>Interactive</td>
<td>-.30</td>
<td>.059</td>
</tr>
</tbody>
</table>

Further multivariate analyses were completed with covariates of ethnicity and gender added to the models. The multivariate analysis found minimal changes with the covariates of ethnicity and gender added to the model. In the case of ethnicity as a covariate, the model is only slightly improved with increases in \( R^2 \) values for Acknowledgement Motivation and slightly higher significances than shown in Table 13.
In the case of gender as a covariate, the model is not improved significantly for any of the factors shown in Table 15.

Table 15

*Multivariate Analysis of Composite Factors With Covariate Results*

<table>
<thead>
<tr>
<th>Higher order motivational factors</th>
<th>$F$ value</th>
<th>Model ($R^2$)</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethnicity as covariate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goal motivation</td>
<td>3.74</td>
<td>2.4%</td>
<td>.025</td>
</tr>
<tr>
<td>Acknowledgement motivation</td>
<td>5.31</td>
<td>4.6%</td>
<td>.005</td>
</tr>
<tr>
<td>Association motivation</td>
<td>3.46</td>
<td>2.6%</td>
<td>.033</td>
</tr>
<tr>
<td>Parent-inspired motivation</td>
<td>3.66</td>
<td>2.8%</td>
<td>.027</td>
</tr>
<tr>
<td>Gender as covariate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goal motivation</td>
<td>3.52</td>
<td>2.9%</td>
<td>.031</td>
</tr>
<tr>
<td>Acknowledgement motivation</td>
<td>5.82</td>
<td>3.7%</td>
<td>.003</td>
</tr>
<tr>
<td>Association motivation</td>
<td>3.67</td>
<td>2.4%</td>
<td>.027</td>
</tr>
<tr>
<td>Parent-inspired motivation</td>
<td>3.78</td>
<td>2.8%</td>
<td>.024</td>
</tr>
</tbody>
</table>

Findings in Relation to Research Question 5

*Are the motivational factor relationships different for each of the domain groups in the study?*

Regression analysis was used to determine the composite factor relationships among the three groups (control, analytical excellence, and interactive excellence). The
motivational factor relationships are shown in Table 16 using the four composite motivational factors to predict the two composite excellence factors. Each of the models is depicted with the order relationship of the four motivational factors along with the percentage of excellence that each model can predict ($R^2$) and the significance of each of the factors individually.

Table 16

Regression for Each Composite Group

<table>
<thead>
<tr>
<th>Factor relationships from most to least influential</th>
<th>Model $(R^2)$</th>
<th>$F$</th>
<th>Stanardized beta</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Group</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Analytical excellence</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No significant predictors</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interactive excellence</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acknowledgement motivation</td>
<td>.154</td>
<td>13.15</td>
<td>-.39</td>
<td>.001</td>
</tr>
<tr>
<td>Excellence group 1 (analytic)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Analytical excellence</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goal motivation</td>
<td>.072</td>
<td>10.76</td>
<td>-.27</td>
<td>.012</td>
</tr>
<tr>
<td>Acknowledgement motivation</td>
<td>.101</td>
<td>7.75</td>
<td>-.19</td>
<td>.044</td>
</tr>
<tr>
<td>Interactive excellence</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acknowledgement motivation</td>
<td>.088</td>
<td>13.37</td>
<td>-.30</td>
<td>.001</td>
</tr>
<tr>
<td>Parent-inspired motivation</td>
<td>.122</td>
<td>5.31</td>
<td>.19</td>
<td>.023</td>
</tr>
<tr>
<td>Excellence group 2 (interactive)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Analytical excellence</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goal motivation</td>
<td>.211</td>
<td>24.34</td>
<td>-.46</td>
<td>.001</td>
</tr>
<tr>
<td>Interactive excellence</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goal motivation</td>
<td>.113</td>
<td>11.62</td>
<td>-.34</td>
<td>.001</td>
</tr>
</tbody>
</table>
The order of the relationships of the factors changed within each of the three groups depending on the excellence factor that was being examined. The relationships also shifted when predicting composite excellence factors and comparing models from group to group. Models were designed using a significance of less than .05 for entry into any of the models. A tabular description of each of the models is listed in Table 16. A verbal description of each model is also given below.

When devising a model for predicting Analytical Excellence for the control group, there were no significant predictors ($p < .05$). When devising a model for predicting Interactive Excellence for the control group, the composite factor of Acknowledgement Motivation gave a predictive $R^2$ value of 15.4% and was the only factor that was significant ($p < .05$).

When devising a model for predicting Analytical Excellence for the Composite Group 1, the analytical group, the composite factor of Goal Motivation gave a predictive $R^2$ value of 7.2% ($p < .05$). A second model was devised using Goal Motivation and adding Acknowledgement Motivation, which gave a predictive $R^2$ value of 10.1% ($p < .05$). When devising a model for predicting Interactive Excellence for the Composite Group 1, the analytic group, the composite factor of Acknowledgement Motivation gave a predictive $R^2$ value of 8.8% ($p < .05$). A second model was devised using Acknowledgement Motivation and adding Parental Inspired Motivation, which gave a predictive $R^2$ value of 12.2% ($p < .05$).

When devising a model for predicting Analytical Excellence for the Composite Group 2, the interactive group; the composite factor of Goal Motivation gave a predictive $R^2$ value of 21.1% ($p < .05$). When devising a model for predicting Interactive
Excellence for the Composite Group 2, the interactive group; the composite factor of Acknowledgement Motivation gave a predictive $R^2$ value of 11.3% ($p < .05$).

A general result of these findings is that there are more significant motivational factor predictors for both the excellence groups than for the control group. There are also more motivational factor predictors for the analytic excellence group than for the interactive excellence group. The composite motivational factor of Association Motivation was not a significant predictor for any of the groups in predicting either of the composite excellence factors.

Additionally, the only significant motivational predictor that was positively aligned with an excellence factor was in the case of predicting Interactive Excellence for the analytic excellence group. The composite motivational factor of Parental-Inspired Motivation elicited a positive standardized beta factor and was significant ($p < .05$) as the second factor entered into this model.
CHAPTER V
CONCLUSIONS

Discussion of Findings

Several different findings can be drawn from the data and results presented in chapter 4.

1. Some of the excellence domain groups indicated by class identification corresponded to the excellence categories by study measures and corroborated the idea that some of the excellence groupings were actually indicative of specific domains of excellence.

2. The means for the domain group motivational factors did not conform to the expected significant differences.

3. The 13 motivational variables were reduced to fewer, uncorrelated variables.

4. The 10 excellence variables were reduced to fewer, uncorrelated variables.

5. Group differences were found to exist in the higher order motivational variables.

6. Motivational factor relationships differed from group to group.

Each of these six major findings listed above and a number of minor findings are discussed in more detail in the sections that follow.
Groups Were Indicative of the Indicated Excellence

In general, the groups of students chosen to participate in this study were from intact groups. Except for the control group, the groups were chosen to contain high school students who exhibited excellence in specific domains. An example of this selection process is shown in that the students chosen to depict mathematics excellence were taken from honors mathematics classes. The other excellence groups were selected in a similar manner.

To ensure that these groups would actually exhibit a measurable factor that exhibits their excellence in their respective domain, the Multiple Intelligences Developmental Assessments Scales (MIDAS) was administered to all the groups. The descriptive statistics between the eight primary groups, which include the seven excellence groups and the control group, indicate that most of the groupings chosen for the 308 participants in this study were, in fact, indicative of the types of excellence based on study measures. Most of the group results indicated that the participants in each excellence group did exhibit excellences based on the domains they represented.

One of the main indicators of this finding was shown when comparing the groups that exhibited the highest means on the individual excellence factors. This finding was consistent in that most of the excellence groups were good indicators of excellence domains. This observation was further substantiated by examining the study measures for participants in the original excellence groups as defined by class participation.
Means for the Group Motivational Factors Which Produced Unexpected Significant Differences

Although the group means for the motivational factors produced significant differences from many of the groups as compared to either the overall group mean or the control group mean, there were some unexpected differences. The most interesting differences were those where the domain group means produced significant differences from the control group mean in the negative direction. Many of the factors where this effect was shown could be considered external types of motivational factors. These motivational factors were all part of the Inventory of School Motivation and were given the factor names of (a) striving for excellence, (b) sense of competence, (c) recognition, (d) competition, and (e) social concern. Although only one of these factors, recognition, actually depicts an external emphasis, the other four factors all include questions that are oriented towards external types of motivation rather than internal or intrinsic types of motivation.

Some examples of these types of questions are listed in Table 17 with the factors they were used to identify and the way the questions might be rephrased to make them more intrinsic-motivation oriented questions. One of the reasons that the types of questions in Table 17 gained higher scores with the control group (the group that was chosen as not exhibiting excellence) was that the types of motivation being depicted in these questions reflect a performance-goal orientation (Dweck and Leggett, 1988) rather than a learning-goal orientation. The division of factors and the questions within each factor into intrinsic or extrinsic types of questions could make a major difference in the delineation of the factors in this survey and its ability to differentiate excellence. Several
theorists have differentiated goals and motivations by an intrinsic versus extrinsic
delineation (Cordova & Lepper, 1996; Gottfried et al., 1994; Kohn, 1993). A variety of
terminology has been used to make this differentiation. This delineation can be termed
performance- versus learning goal-orientations (Dweck and Leggett); some call it
mastery versus helpless patterns (Diener and Dweck, 1978); others use the competitive
versus individualist terminology (Ames, 1990); some term it attributional theory
(Weiner, 1990); and some use the locus of control theory to differentiate these types of
motives (Frederick, 2000). In all of these cases, theorists are attempting to break down
motivations into the two categories of internal and external motives.

Table 17

Factors and Externally Oriented Survey Questions

<table>
<thead>
<tr>
<th>Factor</th>
<th>Externally oriented questions</th>
<th>Rephrasing for intrinsic intent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Striving</td>
<td>I work hard because I want the teacher to notice what I say.</td>
<td>I work hard because I want to learn more.</td>
</tr>
<tr>
<td>Competence</td>
<td>I want to do well at school to show I can do it.</td>
<td>I want to do well at school.</td>
</tr>
<tr>
<td>Recognition</td>
<td>I want to be praised for my schoolwork.</td>
<td>(N/A)</td>
</tr>
<tr>
<td>Purposefulness</td>
<td>I need to know that I am getting somewhere with schoolwork.</td>
<td>I need to know that my schoolwork is useful.</td>
</tr>
<tr>
<td>(school)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social concern</td>
<td>It makes me unhappy if my friends aren’t doing well at school.</td>
<td>(N/A)</td>
</tr>
<tr>
<td>Competition</td>
<td>I work harder if I’m trying to be better than others.</td>
<td>I work harder if I’m trying to improve myself.</td>
</tr>
</tbody>
</table>
In this study, it is apparent that these two types of motivation have great bearing on a student’s ability to succeed in a wide variety of domains. The motives that are more externally oriented are stronger in the less successful students; whereas, the factors that depict the more internal motivations are exhibited more highly in the successful, or excellence-grouped, students. As Dweck and Leggett (1988) note, students who are trying to improve themselves are more successful than the students who are trying to prove themselves.

*The Motivational Variables Were Reducible*

The method of factor reduction was used in this study to determine the underlying structure within the original variables, including a varimax rotation of the factors. The 13 original motivation factors and demographic factors were determined by the scales involved in the two motivational instruments administered in this study: the Inventory of School Motivation and the Parental Attachment Questionnaire. The reduction of these 13 factors produced four higher order motivational factors. A loading factor of greater than .50 was chosen to determine the higher order or composite factors. Not only did the original motivational factors load well on the four composite factors, but they loaded in a logical manner that allowed these new composite factors to be defined based on their original components. These new higher order factors were given the composite labels of: Goal Motivation, Acknowledgement Motivation, Association Motivation and Parent Inspired Motivation.
The Excellence Variables Were Reducible

The factor reduction method with the varimax rotation was used to reduce the original excellence factors in the same manner as with the original motivational factors. A loading factor of greater than .50 was again chosen to determine the higher order or composite factors. The original lower order factors loaded well on the two higher order factors. The two composite factors were compiled from the 11 existing excellence factors as determined by the MIDAS.

Similar to the original motivational factors, the original excellence factors loaded in a logical manner to allow for the defining of the composite factors. The two higher order excellence factors were given the composite labels of Analytical Excellence and Interactive Excellence. These two factors also loaded in such a manner depicting that the more internal variables were included in the first factor and the more external factors were included in the second factor.

This finding in the factorization of the excellence factors may be considered inconsistent with multiple intelligence theories. The finding is, however, consistent with the more standard and generally accepted theories of the existence of only two types of intelligence categories. This finding was even depicted in this study when such factors as sports and musical excellences were included.

Group Differences Exist in the Higher Order Motivational Variables

The multivariate analysis conducted on the three composite groups indicated significant differences in the four higher order motivational factors. The three composite groups were determined by compiling the original groups based on the factors analysis
of the excellence factors rather than using the original theoretical method stated the literature review chapter of this study. These three groups were the control group and the two excellence groups of analytical excellence and interactive excellence. The analysis was conducted with the motivational factors as the dependent variables and the groups as the independent variables. Ethnicity and gender were added individually to the multivariate analysis as covariates.

The three groups differed over the four higher order motivational factors. These differences were significant when this analysis was run with or without the covariates. The multivariate analysis found only minimal changes with the covariates of ethnicity and gender added to the model. In the case of gender as a covariate, the model was not improved. In the case of ethnicity as covariate, the model was only slightly improved with increases in $R^2$ values and slightly higher significances.

These group differences were exhibited in models that were able to predict from 2.4% to 3.7% of the variations between groups. The significances for all of these differences were within acceptable limits ($p < .05$). The major concept involved in this finding is that the different groups that represented differing excellence areas are actually driven by different motivational factors or at least slightly different proportions of these factors.

**Motivational Factor Relationships Differ Between Groups**

Regression analysis was used to determine the motivational composite factor relationships for each of the groups. Each of the models was depicted with differing order relationships for the following four motivational factors: Goal Motivation,
Acknowledgement Motivation, Association Motivation, and Parent-Inspired Motivation. Each model presented percentages of prediction of between 7.2% and 12.2% for the analytical excellence group and between 11.3% and 21.1% for the interactive excellence group. Each model was also significant as a whole ($p < .05$). Several of the factors were significant individually ($p < .05$) for each of the three groups. The order of the relationships of the factors changed within groups depending on which composite excellence factor was being predicted.

The composite factor of Parent-Inspired Motivation was the only factor in all the models under all of the cases of the excellence groups in the stepwise regressions that was positively aligned with the prediction of excellence. All of the other composite motivational factors were negatively aligned with the prediction of excellence. In other words, these factors were negatively correlated with the exhibition of excellence. This finding indicates that Parental Motivational factors are important for the students in the analytical excellence groups to achieve excellence in the Interactive Excellence areas.

The composite factors of Goal Motivation and Acknowledgement Motivation were significant factors in several of the models for each of the composite groups, including the control group. This factor varied in strength from prediction of 7.2% to 15.4% ($p < .05$). This finding indicates that the motivational factors included in the composite factors of Goal Motivation and Acknowledgement Motivation were individually significant factors in the prediction of the composite excellence factors for each of the models. The prediction capability of these two composite factors, however, was negative as indicated by the negative standardized beta factors. The two composite motivational factors of Goal Motivation and Acknowledgement Motivation were good
predictors of excellence in these cases; however, they indicated that they were not positively associated with excellence.

*Motivational Factors and Their Correlation to Excellence*

One of the minor findings for the first question of this study is that for the overall higher means for several of the motivational factors in the control group, some extrinsic motivational factors do not correlate with the achievement of success in the studied domains. In general, the individual motivational factors did not correlate with the excellence domains in an expected pattern, except that the more extrinsically associated motivational factors were more dominant in the control group. This finding might indicate that these types of motivational factors do not elicit excellence or the achievement of success in the domains studied.

Another of the minor findings in relation to the first question of this study is that all three of the individual parental-motivational factors loaded more strongly on the same three original groups of academic excellence, musical excellence, and leadership excellence. This result could indicate that parentally founded motivational factors are a major factor in success in those three domains or that parental factors are more necessary in the achievement of excellence in these areas.

*Findings Related to the Literature Review*

Consistent with the review of the literature, the majority of the motivational factors studied in this research were correlated with the achievement of success in a portion of the domains studied. A large number of researchers cited in the literature
review theorized that motivational factors would predict or facilitate success or achievement in academic situations. After reviewing the information in chapter 3 of this study, it can be concluded that there are a great number of motivational factors that are in some way linked to the achievement of excellence (Ames and Archer, 1988; Bandura et al., 1996; Driscoll, 2000; Gottfried & Fleming, 2001). This study has attempted to find some order in the correlation of motivational factors and their importance to differing domains of excellence. To a certain extent, this task has been accomplished, but, of course, much more research could be conducted to clarify these motivational factors, their higher order factors, and their relationships to the achievement of excellence.

As mentioned in the introduction to this research, motivation is pivotal to the achievement of success. This concept is well researched and documented (Ames, 1990; Cordova & Lepper, 1996; Keller, 1987); however, the specifics of which motivational factors are the most critical to achieving success in specific domains is not as thoroughly researched. The research in this study is meant to help answer this question and to lend assistance to teachers, coaches, advisors, and other educators in their search for understanding how to motivate their students to achieve and excel in their specific domains of interest.

The most important aspect of the research in this study has been to determine which motivational factors are the most crucial to the achievement of excellence or success in the specific domains represented by the groups of high school students examined. Although much more study could be conducted in this area, findings in this research can assist educators of students within the domains studied to help their students learn and achieve their goals. One of the main findings that supports high
school students’ achievement of excellence (that is no surprise to many educators) is that parental support is important to student success in many domains researched (d’Ailly, 2001).

This finding may seem obvious in that students will be more successful if they have parents who are willing to support their efforts, but the finding that this factor is important, though not significant, across all the domains examined is critical to note. Some of the support factors that parents provide can be found in many aspects of parenting. For example, interest in children’s school assignments can be viewed as supportive; taking children to band practice consistently can be considered supportive; even allowing children to choose some of their extra-curricular activities can be an aspect of parental facilitation of motivation.

These and many other aspects of parental support need to be examined and encouraged by educators in an attempt to impact student success in a positive manner. It may be evident to many researchers that these parental support factors are important to students’ motivation and consequently their achievement, but there likely are many parents who do not understand the importance of their support. Educators may need to help parents learn this fact as much as they themselves need to help their students learn about the specific subject matter they teach.

As mentioned, the purpose of this study was to determine the relationship between a variety of motivational factors and the achievement of success within domains in high school academic settings. The finding in this study that the relationship between the motivational factors changes among the domains examined and may even be inversely related to excellence is important to the educators attempting to influence their
students. This finding supports the idea that different motivational factors may be necessary to achievement within different domains. For example, a soccer coach may need to emphasize different types of motivation than a music teacher. In other words, there is not one equation of motivational factors that can be used to motivate all groups of students in every domain with equal achievement outcomes. This finding also supports the concept that some types of motivation may not be effective, but may actually have a negative effect on the achievement of excellence.

The relevance of the question of which motivational factors are the most important or most effective in a student’s achievement of success in a specific domain has been the major focus in this study. Since the study of motivation in academic settings is a continually evolving field, some of the aspects of this research are still developing. But the question of how to provide the most appropriate and best-suited instruction for students in each of the domains explored in this study is still a crucial problem. This research has been designed in an attempt to begin to answer some of these questions and to find some underlying structure to the relationships among motivational factors in specific domains.

The instructors, coaches, student advisors, curriculum designers, and all other educators involved in the teaching, instructing, and, consequently, the motivating of students, must understand the motivations of the students they teach. These professionals should be provided contemporary, research-based information about the relationships among motivational factors within specific academic ability domains. The findings in this research have begun to dissect the motivational factors of high school students in
hopes that educators will be able to design teaching strategies and curriculum more effectively to help their students achieve success.

The multiple measures presented in this study were used to determine the strength and relationships of motivational factors within specific domains. The examination of the interrelation among motivational factors and differing aspects of the exhibition of excellence was explored with an emphasis on determining which motivational variables were the most effective in each domain. The usefulness of the findings in this study have direct bearing on the teaching methods used by teachers and coaches as well as by curriculum designers and other educators. To determine their effectiveness on a wide range of students, it will take (a) some translation of these findings into related teaching strategies and curriculum methods and (b) some additional testing and research of these methods.

Though not a new concept, this research brings out a recurring theme in today’s educational system: the importance of parental support. What is blatantly evident in this finding is that educators need to find methods to encourage parental support and parental involvement in the education of their children if these students are to excel in any of the domains researched. Similarly, the finding in this study that motivational goal factors and acknowledgement factors are significant in a negative manner in each of the domains should be used in the design of motivation for students. This finding can be used by educators in the development of their instruction. It is significant to note that motivational factors can actually have a reverse effect on students. Again, the translation of this finding into curriculum design would need to be implemented and researched in a systematic manner so as to find the most effective use of these motivational factors.
To address findings that relate to the multiple intelligences theory and their relationship to motivation, one must consider the factor analysis associated with the third question in this study. This analysis asks whether the domains of excellence in which high school students are involved can be reduced to fewer factors as compared to the motivational factors that most strongly affect them. The findings as to whether these domains and their parallel multiple intelligence factors could be collapsed indicate that, as far as motivation is concerned, these domains can be grouped into two major groups rather than the seven multiple intelligences examined. This is not to say that application of the multiple intelligence theory is not an important consideration in education and in teaching; the theory just may not be as critical to the analysis of motivational factors and the achievement of success. Using the multiple intelligences theory in the design of curriculum is still a valid factor in instilling confidence and providing a variety of learning modalities to students (Gardner, 1993; Shearer, 1997).

Limitations of the Study

This study examined only high school students in one northwest Florida county. To determine its broader application, other populations would need to be examined. Although all of the major instruments used in this research were well validated in previous research, they were not previously used in combination. The comparison of the motivational variables with the domains of excellence in this study would need to be replicated using different groups to determine an application to a wider population.
Suggestions for Future Research

Although many domains were explored in this research, there are more that could be examined in future studies. This type of study could also be conducted on different age groups to determine whether the correlations and groups differences apply to other populations. The age group studied, however, was chosen due to the broad areas of interest within this group. Younger groups do not always have as many differing interests and activities, and older groups may tend to focus more on specific areas. For this reason, older groups may give even more dramatic group differences, significances, and correlations.

Final Conclusion

With the many and varied findings and conclusions discussed in this study, one stands out. The motivation of students to excel and achieve success in differing domains includes a complex set of interactions between a variety of motivational and demographic factors. Many different motivational factors are important to student achievement in each of the domains researched in this study. Furthermore, the relationships between these factors and strength of these factors varies from domain to domain. It is imperative that teachers, coaches, student advisors, and other educators understand how motivational factors affect the students they are teaching and influencing. It has been the main goal of this study to improve educator understanding of the importance of motivation and its many and varied facets and impacts on the achievement of success.
REFERENCES


82nd annual meeting of the American Educational Research Association, Seattle, WA.


Primary Control, Secondary Control, and Failure. Paper presented at the 82nd annual meeting of the American Educational Research Association, Seattle, WA.


Appendix A

Figure A1. Motivational Factors and the Domains of Excellence--Original Model
Control 3

Motivation

ISM Inventory of School Motivation

PAQ Parental Attachment Questionnaire

Survey Data

Expert Rating Scale

MIDAS Multiple Intelligences Development Assessment Scales

E Striving for Excellence

SC Sense of Competence

R Recognition

F (Future) Sense of Purpose

O (School) Sense of Purpose

T Task Involvement

C Competition

S Social Concern

A Affiliation

L Group Leadership

PS Parental Support

PA Parental Attachment

PFA Fostering Autonomy

PE Parental Education

TH Ethnicity

G Gender

Motivational Factors and Domains of Excellence

M Motivation

Personal

Parental

Demographic

E Excellence

Academic

Creative

Individual

Physical

Team Sport

Community

Leadership

Super-latent Variable

Latent Factor Domains

Specific Demonstration Domains

Expert Identification

V Verbal

M Mathematical

Logical

U Musical

I Innovative

S Spatial

K Kinetic

I Intrapersonal

I Interpersonal

ER Expert Rating

Intact Groups

Control 1

Control 2

Control 3

Hon. History

Hon. Math

Orchestra

Graphic Art

Golf

Tennis

Girls Soccer

Boys Soccer

Leader Club

Comm. Group

Leader Club
Appendix B

Inventory of School Motivation
Inventory of School Motivation

The following pages contain statements that describe school achievement and the kinds of feelings and experiences frequently reported by students.

Please respond to each item by circling the number on a scale of 1 to 5 that best describes your experiences and feelings. The level of agreement for each statement is listed below.

<table>
<thead>
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<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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<tbody>
<tr>
<td></td>
<td>Strongly Agree</td>
<td>Agree</td>
<td>No Opinion</td>
<td>Disagree</td>
<td>Strongly Disagree</td>
</tr>
</tbody>
</table>

1. I am always trying to do better in my schoolwork.
2. When I am improving in my schoolwork I try even harder.
3. I try hard to make sure I am good at my schoolwork.
4. I try hard at school because I am interested in my work.
5. The harder the problem, the harder I try.
6. I work hard at school so that I can go to college.
7. When I get good marks I try harder at school.
8. I work hard to try to understand something new at school.
9. I often worry that I am not very good at school.
10. At times I feel that I’m not good at anything at school.
11. I often think that there are things I can’t do at school.
12. I wish I had a little more confidence in my schoolwork.
13. I feel I always need help with difficult schoolwork.
14. I always choose easy work at school so I don’t have trouble.
15. Other students have helped me a lot with my schoolwork.
16. I want to be praised for my schoolwork.
17. Praise from my parents for schoolwork is important to me.
18. Praise from my teachers for my schoolwork is important to me.
19. At school I work best when I am praised.
20. Praise from my friends for schoolwork is important to me.
21. Getting merit certificates would make me work harder at school.
22. I like to be encouraged for my schoolwork.
<table>
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<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Strongly Agree</td>
<td>Agree</td>
<td>No Opinion</td>
<td>Disagree</td>
<td>Strongly Disagree</td>
</tr>
</tbody>
</table>

23. I work hard because I want the teacher to notice what I say.
24. I care about other people at school.
25. I like to help other people to do well at school.
26. I enjoy helping others with their schoolwork.
27. It makes me unhappy if my friends aren’t doing well at school.
28. I like working with other people at school.
29. I try to work with friends as much as possible at school.
30. It is very important for students to help each other at school.
31. I can do my best work at school when I am working with others.
32. I do better work by myself at school.
33. I try to work with friends as much as possible at school.
34. I like working with other people at school.
35. When I work in groups at school I don’t do my best.
36. It is important for me to be a group leader.
37. I often try to be the leader of a group.
38. I work hard at school to be put in charge of things.
39. I work hard at school because I want the class to take notice of me.
40. At school I don’t like being in charge of a group.
41. I work hard because I want to feel important in front of school friends.
42. I work harder if I’m trying to be better than others.
43. I want to do well at school so that I can have a good future.
44. I aim my schooling towards getting a good job.
45. I try hard to do well at school so I can get a good job when I leave.
46. I like to see I am improving in my schoolwork.
47. I need to know that I am getting somewhere with schoolwork.
48. I want to do well at school to have something better to look forward to than my parents.
49. I want to do well at school to show I can do it.
<table>
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<tr>
<td></td>
<td>Strongly Agree</td>
<td>Agree</td>
<td>No Opinion</td>
<td>Disagree</td>
<td>Strongly Disagree</td>
</tr>
</tbody>
</table>

50. It is good to plan ahead to complete my schooling.
51. It is good for me to plan ahead so I can do well at school.
52. I am bright enough to continue my schooling to the end of high school.
53. Winning is important to me.
54. I work best in class when I can get some kind of reward.
55. I work in school for rewards from the teacher.
56. I try to please my teachers at school.
57. I want to be better at classwork than my classmates.
58. I am happy only when I am one of the best in class.
59. I want to do well at school to show I can do it.
60. Having other people tell me that I did well is important to me.
61. Finishing first is very important to me.
62. I work harder if I’m trying to be better than others.
63. I don’t mind working a long time at schoolwork that I find interesting.
64. The more interesting the schoolwork the harder I try.
Appendix C

Parental Attachment Questionnaire
Parental Attachment Questionnaire

The following pages contain statements that describe family relationships and the kinds of feelings and experiences frequently reported by students.

Please respond to each item by circling the number on a scale of 1 to 5 that best describes your parents, your relationship with your parents, and your experiences and feelings.

Please provide a single rating to describe your parents and your relationship with them. If only one of your parents is living, or if your parents are divorced, respond with reference to your living parent or the parent towards whom you feel closer.

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<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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</thead>
<tbody>
<tr>
<td>Not at All</td>
<td>Somewhat</td>
<td>A Moderate Amount</td>
<td>Quite a Bit</td>
<td>Very Much</td>
</tr>
<tr>
<td>(0-10%)</td>
<td>(11-35%)</td>
<td>(36-65%)</td>
<td>(66-90%)</td>
<td>(91-100%)</td>
</tr>
</tbody>
</table>

In general my parents . . .

1. are persons I can count on to provide emotional support when I feel troubled.
2. support my goals and interests.
3. live in a different world.
4. understand my problems and concerns.
5. respect my privacy.
6. restrict my freedom or independence.
7. are available to give me advice or guidance when I want it.
8. take my opinions seriously.
9. encourage me to make my own decisions.
10. are critical of what I do.
11. impose their ideas and values on me.
12. have given me as much attention as I want.
13. are persons to whom I can express differences of opinion on important matters.
14. have no idea what I am feeling or thinking.
15. have provided me with the freedom to experiment and learn things on my own.
16. are too busy or otherwise involved to help me.
17. have trust and confidence in me.
18. try to control my life.
19. protect me from danger and difficulty.
20. ignore what I have to say.
21. are sensitive to my feelings and needs.
22. are disappointed in me.
23. give me advice whether I want it or not.
24. respect my judgment and decisions, even if different from what they would want.
25. do things for me, which I could do for myself.
26. are persons whose expectations I feel obligated to meet.
27. treat me like a younger child.
During recent time spent together, my parents were persons . . .

28. I looked forward to seeing.
29. with whom I argued.
30. with whom I felt relaxed and comfortable.
31. who made me angry.
32. I wanted to be with all the time.
33. towards whom I felt cool and distant.
34. who got on my nerves.
35. who aroused feeling of guilt and anxiety.
36. to whom I enjoyed telling about the things I have done and learned.
37. for whom I felt feelings of love.
38. I tried to ignore.
39. to whom I confided my most personal thoughts and feelings.
40. whose company I enjoyed.
41. I avoided telling about my experiences.

Following time spent together, I leave my parents . . .

42. with warm and positive feelings.
43. feeling let down and disappointed by my family.

When I have a serious problem or an important decision to make . . .

44. I look to my family for support, encouragement, and/or guidance.
45. I seek help from a professional, such as a therapist, college counselor, or clergy.
46. I think about how my family might respond and what they might say.
47. I work it out on my own, without help or discussion with others.
48. I discuss the matter with a friend.
49. I know that my family will know what to do.
50. I contact my family if I am not able to resolve the situation after talking it over with my friends.

When I go to my parents for help . . .

51. I feel more confident in my ability to handle the problems on my own.
52. I continue to feel unsure of myself.
53. I feel that I would have obtained more understanding and comfort from a friend.
54. I feel confident that things will work out as long as I follow my parent’s advice.
55. I am disappointed with their response.
Appendix D

Student Questionnaire
Student Questionnaire

Name __________________________________________________  # ____________

Group/Area _________________________ Teacher/Advisor/Coach _______________

Please circle the most accurate response below.

Age:  15  16  17  18  19  20

Grade level:  9  10  11  12

Gender:  M  F

Ethnicity:  White  Hispanic  Black  Asian  Other _____

Parent’s Educational Level:  High School  College Degree  Advanced Degree

______________________________________________________________________

______________________________________________________________________

Using the scale below, answer the following questions.

1  2  3  4  5

Highly    Medium    Low

______________________________________________________________________

Circle one number for each item below.

1. How motivated do you consider yourself overall?  1  2  3  4  5

2. How motivated do you consider yourself in this subject area?  1  2  3  4  5

3. How much excellence do you consider yourself to exhibit in this area?  1  2  3  4  5
List the activities you are involved in now.

__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________

List any additional activities you have been involved in previously in your high school years.

__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
Appendix E

Marlowe-Crowne Social Desirability Scale Short Form C
Marlowe-Crowne Short Form C

T  F  1. It is sometimes hard for me to go on with my work if I am not encouraged.

T  F  2. I sometimes feel resentful when I don’t get my way.

T  F  3. On a few occasions, I have given up doing something because I thought too little of my ability.

T  F  4. There have been time when I felt like rebelling against people in authority even though I knew they were right.

T  F  5. No matter who I am talking to, I’m always a good listener.

T  F  6. There have been many occasions when I took advantage of someone.

T  F  7. I’m always willing to admit it when I make a mistake.

T  F  8. I sometimes try to get even rather than forgive and forget.

T  F  9. I am always courteous, even to people who are disagreeable.

T  F  10. I have never been irked when people expressed ideas very different from my own.

T  F  11. There have been many times when I was quite jealous of the good fortune of others.

T  F  12. I am sometimes irritated by people who ask favors of me.

T  F  13. I have never deliberately said something that hurt someone’s feelings.
Appendix F

Multiple Intelligences Developmental Assessment Scales
TEEN MIDAS (Multiple Intelligence Developmental Assessment Scales)

MUSICAL

1. **As a child, did you have a strong liking for music or music classes?**
   A= A little.
   B= Sometimes.
   C= Usually.
   D= Often.
   E= All the time.
   F= I don’t know.

2. **Did you ever learn to play an instrument?**
   A= No.
   B= A little.
   C= Fair.
   D= Good.
   E= Excellent.
   F= I don’t know.

3. **Can you sing ‘in tune’?**
   A= A little bit.
   B= Fair.
   C= Well.
   D= Very well.
   E= Excellent.
   F= I don’t know.

4. **Do you have a good voice for singing with other people in harmony?**
   A= A little bit.
   B= Fair.
   C= Good.
   D= Very good.
   E= Excellent.
   F= I don’t know.

5. **Did you ever play an instrument, play with a band or sing with a group?**
   A= Never.
   B= Every once in a while.
   C= Sometimes.
   D= Often.
   E= Almost all the time.
   F= I don’t know. Does not apply.
6. **Do you spend a lot of time listening to music?**
   A= Every once in a while.
   B= Sometimes.
   C= Often.
   D= Almost all the time.
   E= All the time.
   F= I don’t know.

7. **Do you ever make up songs or write music?**
   A= Never.
   B= Once or twice.
   C= Every once in a while.
   D= Sometimes.
   E= Often.
   F= I don’t know.

8. **Do you ever drum your fingers, whistle or sing to yourself?**
   A= Every once in a while.
   B= Sometimes.
   C= Often.
   D= Almost all the time.
   E= All the time.
   F= I don’t know.

9. **Do you often have a favorite tune on your mind?**
   A= Every once in a while.
   B= Sometimes.
   C= Often.
   D= Almost all the time.
   E= All the time.
   F= I don’t know.

10. **Do you often like to talk about music?**
    A= Never.
    B= Every once in a while.
    C= Sometimes.
    D= Often.
    E= Nearly all the time.
    F= I don’t know.

11. **Do you have a good sense of rhythm?**
    A= Fair.
    B= Pretty good.
    C= Good.
    D= Very good.
    E= Excellent.
    F= I don’t know.
12. Do you have a strong liking for the SOUND of certain instruments or musical groups?
   A= Every once in a while.
   B= Sometimes.
   C= Often.
   D= Almost all the time.
   E= All the time.
   F= I don’t know.

13. Do you think you have a lot of musical talent or skill that hasn’t been brought out?
   A= Every once in a while.
   B= Sometimes.
   C= Usually.
   D= Almost always.
   E= Always.
   F= I don’t know.

14. Do you often have music on while you work, study or relax?
   A= Every once in a while.
   B= Sometimes.
   C= Usually.
   D= Almost always.
   E= Always.
   F= I don’t know.

KINESTHETIC

15. In school, did you generally enjoy sports or gym class more than other school activities?
   A= Not at all.
   B= A little.
   C= About the same.
   D= Enjoyed sports more.
   E= Enjoyed sports much more.
   F= I don’t know.

16. How often do you play sports or other physical activities?
   A= Every once in a while.
   B= Sometimes.
   C= Often.
   D= Almost always.
   E= All the time.
   F= I don’t know or does not apply.
17. Have you ever performed in a school play or taken lessons in acting or dancing?
   A= Never.
   B= Maybe once.
   C= A couple of times.
   D= Often.
   E= Almost all the time.
   F= I don’t know.

18. Do you or other people (like a coach) think that you are coordinated, graceful or a good athlete?
   A= No.
   B= Maybe a little.
   C= About average.
   D= Better than average.
   E= Superior.
   F= I don’t know.

19. Did you ever take lessons or have someone teach you a sport such as bowling, karate, golf, etc.?
   A= No.
   B= Rarely.
   C= Sometimes.
   D= Often.
   E= Nearly all the time.
   F= I don’t know.

20. Have you ever joined teams to play a sport?
   A= Never.
   B= Rarely.
   C= Sometimes.
   D= Often.
   E= Almost all the time.
   F= I don’t know.

21. Do you often do physical work or exercise?
   A= Rarely.
   B= Sometimes.
   C= Often.
   D= Almost all the time.
   E= All the time.
   F= I don’t know. Does not apply.
22. Are you good with your hands at things like card shuffling, magic tricks or juggling?
   A= Not very good.
   B= Fair.
   C= Good.
   D= Very good.
   E= Excellent.
   F= I don’t know.

23. Are you good at doing precise work with your hands such as sewing, making models, tying flies, typing or have good handwriting?
   A= Not at all.
   B= Fairly good.
   C= Good.
   D= Very good.
   E= Excellent.
   F= I don’t know.

24. Do you enjoy working with your hands on projects such as mechanics, building things, preparing fancy food or sculpture?
   A= Never or rarely.
   B= Sometimes.
   C= Often.
   D= Almost all the time.
   E= All the time.
   F= I don’t know or doesn’t apply.

25. Are you good at using your body or face to imitate people such as teachers, friends, or family?
   A= Not at all.
   B= A little bit.
   C= Fair.
   D= Good.
   E= Very good.
   F= I don’t know.

26. Are you a good dancer, cheerleader or gymnast?
   A= Not at all.
   B= Fairly good.
   C= Good.
   D= Very good.
   E= Excellent.
   F= I don’t know.
27. Do you learn better by having something explained to you or by doing it yourself?
   A= Always better by explanation.
   B= Sometimes better by explanation.
   C= No difference.
   D= Usually better by doing it.
   E= Always better by doing it.
   F= I don’t know.

MATH/LOGIC

28. As a child, did you easily learn math such as addition, multiplication and fractions?
   A= Not at all.
   B= It was fairly hard.
   C= Pretty easy.
   D= Very easy.
   E= Learned much quicker than all the kids.
   F= I don’t know.

29. Have you ever had extra interest or skill in math?
   A= Very little or none.
   B= Maybe a little.
   C= Some.
   D= More than average.
   E= A lot.
   F= I don’t know.

30. How have you done in advanced math classes such as algebra or calculus?
   A= Didn’t take any.
   B= Not very well.
   C= Fair (C’s).
   D= Well (B’s).
   E= Excellent (A’s).
   F= I don’t know or does not apply.

31. Have you ever had any interest in studying science or solving scientific problems?
   A= No.
   B= A little.
   C= Average.
   D= More than average.
   E= A great deal.
   F= I don’t know.
32. Are you good at playing chess or checkers?
   A= No.
   B= Fairly good.
   C= Good.
   D= Very good.
   E= Excellent.
   F= I don’t know.

33. Are you good at playing cards or solving strategy or puzzle-type games?
   A= Not at all.
   B= A little.
   C= About average.
   D= Better than average.
   E= Excellent.
   F= I don’t know.

34. Do you often play games such as Scrabble or crossword puzzles?
   A= Very rarely or never.
   B= Every once in a while.
   C= Sometimes
   D= Often.
   E= All the time.
   F= I don’t know.

35. Do you have a good system for managing your money or figuring a budget?
   A= Not at all.
   B= Fair.
   C= Good.
   D= Very good.
   E= Superior.
   F= I don’t know.

36. Do you have a good memory for numbers such as telephone numbers or addresses?
   A= Not very good.
   B= Fair.
   C= Good.
   D= Very good.
   E= Superior.
   F= I don’t know.
37. How are you at figuring numbers in your head?
   A= Can not do it.
   B= Not very good.
   C= Fair.
   D= Good.
   E= Excellent.
   F= I don’t know.

38. Are you a curious person who likes to figure out WHY or HOW things work?
   A= Every once in a while.
   B= Sometimes.
   C= Often.
   D= Almost all the time.
   E= All the time.
   F= I don’t know.

39. Are you good at inventing ‘systems’ for solving long or complicated problems?
   For example, organizing a room or big projects?
   A= Not very good.
   B= A little.
   C= Somewhat.
   D= More than average.
   E= Very much so.
   F= I don’t know.

40. Are you curious about nature like fish, animals, plants or the stars and planets?
   A= A little.
   B= Sometimes.
   C= Often.
   D= Almost all the time.
   E= All the time.
   F= I don’t know.

41. Have you ever liked to collect things and learn all there is to know about a
certain subject such as horses, baseball, etc.?
   A= Not at all.
   B= A little
   C= Sometimes.
   D= Often.
   E= Almost all the time.
   F= I don’t know.
42. Are you good at jobs or projects where you have to use math a lot or get things organized?
   A= Not at all.
   B= Fairly good.
   C= Good.
   D= Very good.
   E= Excellent.
   F= I don’t know.

43. Outside of school, have you ever enjoyed working with numbers like figuring baseball averages, gas mileage, budgets, etc.?
   A= Not at all
   B= Every once in a while.
   C= Sometimes.
   D= Often.
   E= Almost all the time.
   F= I don’t know.

44. Do you use good common sense for planning social activities, making home repairs, or solving mechanical problems?
   A= Sometimes.
   B= Usually.
   C= Often.
   D= Almost all the time.
   E= All the time.
   F= I don’t know.

SPATIAL

45. As a child, did you often build things out of blocks or boxes, play with jacks, marbles or jump rope?
   A= Never or rarely.
   B= Every once in a while.
   C= Sometimes.
   D= Often.
   E= All the time.
   F= I don’t know.

46. How well can you do these things: mechanical drawing, hair styling, woodworking, art projects, auto body, or mechanics?
   A= Didn’t take any.
   B= Fair.
   C= Good (C’s).
   D= Very good (B’s).
   E= Excellent (A’s).
   F= I don’t know. Does not apply.
47. How well can you ‘design’ things such as arranging or decorating rooms, craft projects, building furniture or machines?
   A= Never do.
   B= Not very well.
   C= Pretty good.
   D= Good.
   E= Excellent.
   F= I don’t know.

48. Can you parallel park a car on the first try?
   A= Rarely or do not drive.
   B= Sometimes.
   C= Often.
   D= Almost all the time.
   E= All the time.
   F= I don’t know. Does not apply.

49. Are you good at finding your way around new buildings or city streets?
   A= Not at all.
   B= Fairly good.
   C= Good.
   D= Very good.
   E= Excellent.
   F= I don’t know.

50. Are you good at using a road map?
   A= Not at all.
   B= A little bit.
   C= Good at it.
   D= Very good.
   E= Excellent at reading maps.
   F= I don’t know.

51. Are you good at fixing ‘things’ like cars, lamps, furniture, or machines?
   A= Not at all.
   B= Not very good.
   C= Fair.
   D= Good.
   E= Excellent.
   F= I don’t know.
52. How easily do you put things together like toys, puzzles, or electronic equipment?
   A= Not at all.
   B= It was hard.
   C= It was fairly easy.
   D= It was easy.
   E= It was very easy.
   F= I don’t know.

53. Have you ever made your own plans or patterns for projects such as sewing, carpentry, crochet, or woodworking?
   A= Never.
   B= Maybe once.
   C= Every once in a while.
   D= Sometimes.
   E= Often.
   F= I don’t know or doesn’t apply.

54. Have you ever drawn or painted pictures?
   A= Rarely or never.
   B= Every once in a while.
   C= Sometimes.
   D= Often.
   E= Almost all the time.
   F= I don’t know.

55. Do you have a good sense of design for decorating, landscaping or working with flowers?
   A= Not very good.
   B= Fair.
   C= Good.
   D= Very good.
   E= Excellent.
   F= I don’t know.

56. Do you have a good sense of direction when in a strange place?
   A= Not at all.
   B= Fairly good.
   C= Good.
   D= Very good.
   E= Superior.
   F= I don’t know.
57. Are you good at playing pool, darts, riflery, archery, bowling, etc.?
   A= Not at all.
   B= A little.
   C= Fair.
   D= Better than average.
   E= Excellent.
   F= I don’t know.

58. Do you often draw a picture or sketch to give directions or explain an idea?
   A= Never.
   B= Rarely.
   C= Sometimes.
   D= Often.
   E= Almost all the time.
   F= I don’t know.

59. Are you creative and like to invent or experiment with unique designs, clothes,
    or projects?
   A= Very little or not at all.
   B= A little.
   C= Somewhat.
   D= Often.
   E= Almost all the time.
   F= I don’t know.

LINGUISTIC

60. Do you enjoy telling stories or talking about favorite movies or books?
   A= Not at all.
   B= Rarely.
   C= Sometimes.
   D= Often.
   E= Almost all the time.
   F= I don’t know.

61. Do you ever play with the sounds of words like making up jingles or rhymes?
    For example, do you give things or people funny sounding nicknames?
   A= Never.
   B= Rarely.
   C= Sometimes.
   D= Often.
   E= All the time.
   F= I don’t know.
62. Do you use colorful words or phrases when talking?
A= No.
B= Rarely.
C= Sometimes.
D= Often.
E= All the time.
F= I don’t know.

63. Have you ever written a story, poetry or words to songs?
A= Never.
B= Maybe once or twice.
C= Occasionally.
D= Often.
E= Almost all the time.
F= I don’t know.

64. Are you a convincing speaker?
A= Not at all.
B= Every once in a while.
C= Sometimes.
D= Often.
E= Almost all the time.
F= I don’t know.

65. How are you a bargaining or making a deal with people?
A= Not very good.
B= Fair.
C= Pretty good.
D= Good.
E= Excellent.
F= I don’t know.

66. Can you talk people into doing thing your way when you want to?
A= Not at all.
B= Every once in a while.
C= Sometimes.
D= Often.
E= Almost all the time.
F= I don’t know.

67. Do you ever do public speaking or give talks to groups?
A= Very rarely or never.
B= Every once in a while.
C= Sometimes.
D= Often.
E= Almost all the time.
F= I don’t know.
68. How are you at managing or supervising people?
   A= Never do it or not very good at it.
   B= Fair.
   C= Good.
   D= Very good.
   E= Excellent.
   F= I don’t know.

69. Do you have interest for talking about things like the news, family matters, religion or sports, etc.?
   A= A little.
   B= Some interest.
   C= Average interest.
   D= More than average.
   E= A great deal.
   F= I don’t know.

70. When others disagree with you, are you able to easily say what you think or feel?
   A= Rarely.
   B= Every once in a while.
   C= Sometimes.
   D= Often.
   E= All the time.
   F= I don’t know.

71. Do you enjoy looking up words in dictionaries, or arguing with others about “the right word” to use?
   A= Never or rarely.
   B= Every once in a while.
   C= Sometimes.
   D= Often.
   E= Very often.
   F= I don’t know.

72. Are you often the one asked to “do the talking” by family or friends because you are good at it?
   A= Very rarely or never.
   B= Rarely.
   C= Sometimes.
   D= Often.
   E= Almost all the time.
   F= I don’t know.
73. Have you ever been good at imitating the way other people talk?
   A= Not really.
   B= Fairly good.
   C= Pretty good.
   D= Good.
   E= Very good.
   F= I don’t know.

74. Have you ever been good at writing reports for school or work?
   A= Not really. Never do any.
   B= Pretty good.
   C= Good.
   D= Very good.
   E= Excellent.
   F= I don’t know.

75. Can you write a good letter?
   A= No.
   B= Pretty good.
   C= Good.
   D= Very good.
   E= Excellent.
   F= I don’t know.

76. Do you like to read or do well in English classes?
   A= A little.
   B= Sometimes.
   C= Usually.
   D= Often.
   E= All the time.
   F= I don’t know.

77. Do you write notes or make lists as reminders of things to do?
   A= Rarely.
   B= Every once in a while.
   C= Sometimes.
   D= Often.
   E= Almost all the time.
   F= I don’t know.

78. Do you have a large vocabulary?
   A= Not really.
   B= Less than average.
   C= About average.
   D= Above average.
   E= Superior.
   F= I don’t know.
79. Do you have skill for choosing the right words and speaking clearly?
   A= Not at all or rarely.
   B= Sometimes.
   C= Usually
   D= Most of the time.
   E= Almost always.
   F= I don’t know.

INTERPERSONAL

80. Have you had friendships that have lasted for a long time?
   A= One or two.
   B= More than a couple.
   C= Quite a few.
   D= A lot.
   E= A great many long lasting friendships.
   F= I don’t know or doesn’t apply.

81. Are you good at making peace at home, at work or among friends?
   A= Fair.
   B= Pretty good.
   C= Good.
   D= Very good.
   E= Excellent.
   F= I don’t know.

82. Are you ever a ‘leader’ for doing things at school, among friends or at work?
   A= Rarely.
   B= Every once in a while.
   C= Sometimes.
   D= Often.
   E= Almost always.
   F= I don’t know.

83. In school, are you usually part of a particular group or crowd?
   A= Rarely.
   B= Every once in a while.
   C= Sometimes.
   D= Most of the time.
   E= Almost all the time.
   F= I don’t know.
84. Do you easily understand the feelings, wishes or needs of other people?
   A= Sometimes.
   B= Usually.
   C= Often.
   D= Almost always.
   E= Always.
   F= I don’t know.

85. Do you ever offer to ‘help’ other people such as the sick, the elderly or friends?
   A= Sometimes.
   B= Usually.
   C= Often.
   D= Very often.
   E= Always.
   F= I don’t know.

86. Do friends or family ever come to you to talk over personal troubles or to ask for advice?
   A= Every once in a while.
   B= Sometimes.
   C= Often.
   D= Almost all the time.
   E= All the time.
   F= I don’t know or does not apply.

87. Are you a good judge of ‘character’?
   A= Every once in a while.
   B= Sometimes.
   C= Usually.
   D= Almost always.
   E= Always.
   F= I don’t know.

88. Do you usually know how to make people feel comfortable and at ease?
   A= Every once in a while.
   B= Sometimes.
   C= Usually.
   D= Almost always.
   E= Always.
   F= I don’t know.
89. Do you generally take the good advice of friends?
   A= Every once in a while.
   B= Sometimes.
   C= Usually.
   D= Often
   E= Almost always.
   F= I don’t know.

90. Are you generally at ease around (men or women) your own age?
   A= Rarely.
   B= Sometimes.
   C= Usually.
   D= Almost all the time.
   E= Always.
   F= I don’t know.

91. Are you good at understanding your (girlfriend’s or wife’s) (boyfriend’s or husband’s) ideas or feelings?
   A= Every once in a while.
   B= Sometimes.
   C= Usually.
   D= Almost all the time.
   E= All the time.
   F= I don’t know.

92. Are you an easy person for people to get to know?
   A= Not at all.
   B= Pretty hard.
   C= Fairly easy.
   D= Easy.
   E= Very easy.
   F= I don’t know.

93. Do you have a hard time coping with children?
   A= Usually have a hard time.
   B= Sometimes have a hard time.
   C= Usually easy.
   D= Almost always easy.
   E= Always very easy.
   F= I don’t know.
94. Have you ever had interest in teaching, coaching or counseling?
   A= Very little or none.
   B= A little interest.
   C= Some interest.
   D= A lot of interest.
   E= A great deal of interest.
   F= I don’t know or doesn’t apply.

95. Could you do well when working with the public in jobs like sales, receptionist, promoter, police, or waiter?
   A= Fair.
   B= Fairly well.
   C= Well.
   D= Very well.
   E= Excellent.
   F= I don’t know. Does not apply.

96. Do you prefer working alone or with a group of people?
   A= Always alone.
   B= Usually alone.
   C= No preference.
   D= Usually with a group.
   E= Always with a group.
   F= I don’t know.

97. Are you able to come up with unique or imaginative ways to solve problems between people or settle arguments?
   A= Maybe once or twice.
   B= Every once in a while.
   C= Sometimes.
   D= Often.
   E= All the time.
   F= I don’t know.

INTRAPERSONAL

98. Do you have a clear sense of who you are and what you want in life?
   A= Very little.
   B= A little.
   C= Usually.
   D= Most of the time.
   E= Almost all the time.
   F= I don’t know.
99. Are you aware of your feelings and able to control your moods?
   A= Every once in a while.
   B= Sometimes.
   C= Most of the time.
   D= Almost all the time.
   E= Always.
   F= I don’t know.

100. Do you plan and work hard towards personal goals like at school, at work or at home?
   A= Rarely.
   B= Sometimes.
   C= Usually.
   D= Almost all the time.
   E= All the time.
   F= I don’t know.

101. Do you ‘know your own mind’ and do well at making important personal decisions such as choosing classes, changing?
   A= No or every once in a while.
   B= Sometimes.
   C= Usually.
   D= Almost all the time.
   E= All the time.
   F= I don’t know.

102. Are you happy with the work you choose because it matches your skills, interests and personality?
   A= No or rarely.
   B= Sometimes.
   C= Usually.
   D= Almost all the time.
   E= All the time.
   F= I don’t know.

103. Do you generally know what you are good at (or not good at) doing and try to improve your skills?
   A= Every once in a while.
   B= Sometimes.
   C= Usually.
   D= Almost all the time.
   E= All the time.
   F= I don’t know.
104. Do you get very angry when you fail or are frustrated?
   A= Almost all the time.
   B= Sometimes.
   C= Every once in a while.
   D= Rarely.
   E= Almost never.
   F= I don’t know.

105. Have you ever had interest in ‘self improvement’? For instance, do you attend classes to learn new skills or read ‘self-help’ books or magazines?
   A= No.
   B= A little.
   C= Sometimes.
   D= Often.
   E= All the time.
   F= I don’t know.

106. Have you ever been able to find unique or unusual ways to solve personal problems or achieve your goals?
   A= Once or twice.
   B= Every once in a while.
   C= Sometime.
   D= Often.
   E= All the time.
   F= I don’t know.

NATURALIST

107. Have you ever raised pets or other animals?
   A= Never.
   B= Every once in a while.
   C= Sometimes.
   D= Often.
   E= All the time.
   F= I don’t know.

108. Is it easy for you to understand and care for an animal?
   A= Not at all.
   B= Maybe a little.
   C= Fairly easy.
   D= Quite easy.
   E= Very easy.
   F= I don’t know.
109. Have you ever done any pet training, hunting or studied wildlife?
   A= No.
   B= A little.
   C= Sometimes.
   D= Quite a bit.
   E= A great deal.
   F= I don’t know. No opportunity.

110. Are you good at working with farm animals or thought about being a veterinarian or naturalist?
   A= Not at all.
   B= A little.
   C= Some.
   D= Quite a bit.
   E= Very much so.
   F= I don’t know.

111. Do you easily understand differences between animals such as personalities, traits or habits?
   A= Not at all.
   B= A little.
   C= Fairly easy.
   D= Quite easy.
   E= Very easy.
   F= I don’t know.

112. Are you good at recognizing breeds of pets or kinds of animals?
   A= Not at all.
   B= A little.
   C= Somewhat.
   D= Quite good.
   E= Very good.
   F= I don’t know.

113. Are you good at observing and learning about nature, for example, types of clouds, weather patterns, animal or plant life?
   A= Never.
   B= A little.
   C= Some.
   D= Quite a bit.
   E= A great deal.
   F= I don’t know.
114. Are you good at growing plants or raising a garden?
   A= Not at all.
   B= A little.
   C= Somewhat.
   D= Quite a bit.
   E= Very good.
   F= I don’t know.

115. Can you identify or understand the differences between types of plants?
   A= Not at all.
   B= A little.
   C= Somewhat.
   D= Most of the time, yes.
   E= All the time.
   F= I don’t know.

116. Are you fascinated by natural energy systems such as chemistry, electricity, engines, physics or geology?
   A= No.
   B= A little.
   C= Somewhat.
   D= Quite a bit.
   E= A great deal.
   F= I don’t know.

117. Do you have a concern for nature and do things like recycling, camping, hiking or bird watching?
   A= No.
   B= A little.
   C= Some.
   D= A lot.
   E= A great deal.
   F= I don’t know.

118. Have you taken photographs of nature or written stories or done artwork?
   A= No.
   B= A little.
   C= Some.
   D= A lot.
   E= A great deal.
   F= I don’t know.
119. Is spending time with nature an important part of your life?
   A= Not really.
   B= A little.
   C= Somewhat.
   D= Quite a bit.
   E= Very much so.
   F= I don’t know.

You’re Finished!
Appendix G

Teacher, Advisor, and Coach Questionnaire
Teacher, Advisor, and Coach Questionnaire

Name _____________________________________________________ # _________

Group/Area ________________________________

Please circle the most accurate response below.

**Grade level/s teaching/coaching:**  9  10  11  12

**Gender:**  M  F

**Ethnicity:**  White  Hispanic  Black  Asian  Other _____

**Educational Level:**  High School  College Degree  Advanced Degree

______________________________________________________________________

______________________________________________________________________

Using the scale below, answer the following questions.

1  2  3  4  5

Highly  Medium  Low

______________________________________________________________________

Circle one number for each item below.

1. How motivated do you consider yourself overall?  1  2  3  4  5

2. How motivated do you consider yourself in this subject area?  1  2  3  4  5

3. How much excellence do you consider yourself to exhibit in this area?  1  2  3  4  5
Please give a rating from 1 to 5 for all the students in this activity to indicate their level of excellence in this area.

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Circle one number for each student below.

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Appendix H

Letter of Approval from The University of West Florida Institutional Review Board

for Human Subjects
Appendix I

Informed Consent Form
Informed Consent Form

Title of Research: Research for a dissertation examining the relationship between motivational factors and achievement of excellence.

I. Federal and university regulations require us to obtain signed consent for participation in research involving human participants. After reading the attached letter and statements in section II through IV below, please indicate your consent by signing and dating this form.

II. Statement of Procedure: Thank you for your interest in the research project being conducted by Lida Dais Dahnke Munz, an instructor at Okaloosa Walton Community College and a doctoral student at the University of West Florida. This stage of the research project involves collecting the data listed below, including the administration of a short survey and questionnaire. The survey will be given in a group setting in your child’s classroom or taken home and completed. The major aspects of the study are described in the statements below, including the risks and benefits of having your child participate. Your child’s information will be kept in strict confidence with only you, your child and myself having access to results.

I understand that:

1. My child’s Florida Comprehensive Achievement Test (FCAT) scores will be recorded by the researcher and compared to his/her survey and questionnaire results.

2. My child’s report card grades will be recorded by the researcher and compared with his/her survey and questionnaire results.

3. My child will complete a researcher-developed survey and questionnaire developed for the purpose of gathering information related to my child's extra curricula activities and his/her perceptions of internal and external motivational factors.

4. My child will complete the following questionnaires:
   i. The Inventory of School Motivation
   ii. The Multiple Intelligences Development Assessment Scales
   iii. The Parental Attachment Questionnaire

5. The researcher will share study results, pertaining to my child, with me if I wish. I will indicate my request for a conference with the researcher by checking the appropriate space at the end of this consent form.
6. After the data are gathered, my child’s name will be replaced with an identifying code known only by the researcher. At no time will my child’s name be referenced in the study results and/or reports.

7. I may discontinue my child’s participation in this study at any time without penalties or repercussions.

III. Potential Risks of the Study:

There should be no risks involved with this study.

IV. Potential Benefits of the Study:

(1) Data obtained from this study may provide educational professionals information that would allow them to better facilitate learning experiences for study participants.

(2) Information obtained from this study may provide parents with an appreciation of their child’s academic and extra-curricular motivation and enable them to become stronger advocates for their child’s educational experiences.

(3) Students may gain a greater respect for the motivational factors in the learning of their classmates as well as themselves.

(4) Comparison of data should give educators additional information about how motivational and achievement factors interact in classroom situations.

V. Statement of Consent: I certify that I have read and fully understand the Statement of Procedure given above and agree to have my child participate as a subject in the research described therein. Permission is given voluntarily and without coercion or undue influence. It is understood that I may discontinue participation at any time. I will be provided a signed copy of this consent form.

Please schedule a time for me to review my child’s assessment results. _____yes _____no

If yes, please give phone number to contact for scheduling __________________________

If you have any questions or concerns please call Lida Dais Dahnke Munz, the researcher, at (850) 863-9776.

Participant’s Name (Please Print) ________________________ Date ________________________

Parent’s Signature ________________________ Phone ________________________
Appendix J

Differences in means for Individual Excellence Factors--Complete Listing

From the Multiple Intelligences Developmental Assessment Scales
Table J1

*Differences in means for Individual Excellence Factors Complete Listing From the Multiple Intelligences Developmental Assessment Scales*

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<th>Excellence Factors</th>
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Appendix K

Motivational Factors and the Domains of Excellence--Simplified Model
Figure A2. Motivational Factors and the Domains of Excellence--Simplified Model
6/29/01

Ms. Lida Dahnke Munz
636 Powell Dr., N.E.
Fort Walton Beach, FL 32547-1759

Dear Ms. Munz:

The Institutional Review Board for Human Subjects has completed its review of your proposal entitled “The Relationship Between Motivational Factors and Exhibition of Excellence in High School Students” as it relates to the protection of human subjects used in research, and has granted approval for you to proceed with your study. As a research investigator, please be aware of the following:

- You acknowledge and accept your responsibility for protecting the rights and welfare of human research subjects and for complying with all parts of 45 CFR Part 46, the UWF IRB Policy and Procedures, and the decisions of the IRB. You may view these documents on the Office of Research web page at http://www.research.uwf.edu. You acknowledge completion of the IRB ethical training requirements for researchers as attested in the IRB application.

- You will ensure that legally effective informed consent is obtained and documented. If written consent is required, the consent form must be signed by the subject or the subject’s legally authorized representative. A copy is to be given to the person signing the form and a copy kept for your file.

- You will promptly report any proposed changes in previously approved human subject research activities to the Office of Research and Graduate Studies. The proposed changes will not be initiated without IRB review and approval, except where necessary to eliminate apparent immediate hazards to the subjects.

- You are responsible for reporting progress of approved research to the Office of Research and Graduate Studies at the end of the project period. Approval for this project is valid for one year. If the data phase of your project continues beyond one year, you must request a renewal by the IRB before approval of the first year lapses. Project Directors of research requiring full committee review should notify the IRB when data collection is completed.
Ms. Lida Dahnke Munz  
6/29/01  
Page 2

- You will immediately report to the IRB any injuries or other unanticipated problems involving risks to human subjects.

Good luck in your research endeavors. If you have any questions or need assistance, please contact the Office of Research and Graduate Studies at 857-6378.

Sincerely,

Petra Schuler  
Chair  
IRB for Human Subjects

cc: Dr. Douglas Friedrich  
    Dr. Joan Duer

William L. Huth  
Associate Vice Provost  
Research and Graduate Studies
Table J1

*Complete Listing of Differences in Means for Individual Excellence Factors From the Multiple Intelligences Developmental Assessment Scales*

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