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Understanding the Relationship Between the Diligence Inventory-Higher Education Edition and the Myers-Briggs Type Indicator in the Admission of College Students to an Orthopaedics-Based Honors Program

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ABSTRACT

UNDERSTANDING THE RELATIONSHIP BETWEEN THE DILIGENCE
INVENTORY–HIGHER EDUCATION EDITION AND THE MYERS-
BRIGGS TYPE INDICATOR IN THE ADMISSION OF
COLLEGE STUDENTS TO AN ORTHOPAEDICS-
BASED HONORS PROGRAM

by

Michael A. Harstine

Chair: Hinsdale Bernard

ABSTRACT OF GRADUATE STUDENT RESEARCH

Dissertation

Andrews University

School of Education

Title: UNDERSTANDING THE RELATIONSHIP BETWEEN THE DILIGENCE
INVENTORY–HIGHER EDUCATION EDITION AND THE MYERS-BRIGGS
TYPE INDICATOR IN THE ADMISSION OF COLLEGE STUDENTS TO AN
ORTHOPAEDICS BASED HONORS PROGRAM

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Date completed: May 2007

Problem

The Orthopaedic Scholar Institute (OSI) Team realized its need for a more

objective selection and admission process that, as much as possible, quantified the

characteristics desired in OSI students rather than relying solely on referral perception,

intuition, and an interview, but it did not have a clear method or approach to do so.

Administering standardized inventories that highlighted these desired characteristics and

aided in the selection and admission process seemed to be an objective approach to obtain

more quantifiable data. The problem for my study was, therefore, whether the Myers-

Briggs Type Inventory (MBTI) alone could measure a student's diligence and,

subsequently, predict that student's fit in an orthopaedic setting, or whether another objective measure would be necessary to identify these skills.

Method

This ex-post facto study compared the responses from freshmen in a Midwestern liberal arts college on two standardized inventories (i.e., MBTI and Diligence Inventory–Higher Education [DI-HE]). Factor Analysis was completed on the DI-HE. A one-way ANOVA was performed to determine the relationship between the responses.

Results

The findings yielded a relationship between the judger ("J") and the sensor – judger ("SJ") preferences on the MBTI, and the DI-HE. This suggests that the MBTI and the DI-HE could be used in the selection process for admission into the Orthopaedic Scholar Institute because both instruments appear to measure behaviors consistent with diligence; however, the use of the DI-HE in the selection process for OSI appears to be duplicative because of the similarity of results.

Conclusions

In order to conclude that the DI-HE would be a useful instrument in the selection and admission process to the Orthopaedic Scholar Institute, the findings had to demonstrate that candidates with a high level of diligence, as measured by the DI-HE, would be evenly dispersed across MBTI types. Because of the strong relationship between the DI-HE and the "J" (judger) on the MBTI, however, I concluded that the DI-HE is too similar to the MBTI in measuring diligence and should not be administered as a component of the selection process for OSI.

Andrews University

School of Education

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BASED HONORS PROGRAM

A Dissertation

Presented in Partial Fulfillment

of the Requirements for the Degree

Doctor of Philosophy

by

Michael A. Harstine

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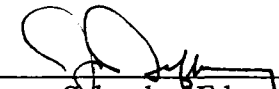
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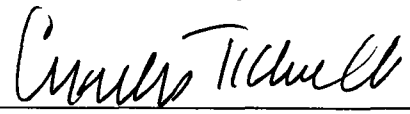
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CHAPTER ONE

INTRODUCTION

Grace College received a sizable Lilly Endowment grant to connect Grace

College students to the orthopaedic industry through the Orthopaedic Scholar Institute

(OSI). Shortly after Carrie A. Yocum and I jointly developed the OSI Program, however,

it became clear to us that we had not developed an effective method for selecting and

admitting students with the characteristics described by representatives of the orthopaedic

industry. My study, therefore, is one of two collaborated dissertations and the

culmination of both my individual and collective efforts with Carrie A. Yocum (2007) to

solve two problems related to the selection and admission of students to the OSI

Program. There will be a significant degree of overlap in the reports of these studies.

Chapter 1 of my study gives context for the Lilly Endowment proposal and grant,

the Lilly-funded OSI initiative, the implementation of OSI, and the model on which the

OSI Program was based. Further, the specific problem on which my study focuses, my

research questions, hypotheses, and rationale are described. Finally, the conceptual

framework from which my study evolved, the theoretical foundation of Carl Jung's

theory of psychological type, the significance of my study, limitations, and delimiters that

are unique to the study are defined.

1

Background to the Problem

Lilly Endowment Inc. is an Indianapolis-based, private philanthropic foundation established in 1937 by three members of the Lilly family. The Endowment exists to support the causes of religion, education, and community development, and emphasizes projects that benefit young people and promote leadership education and financial self-sufficiency in the nonprofit, charitable sector (Lilly Endowment, 2005).

Lilly Endowment views education, at all levels, as indispensable to personal, civic, and economic success. Consequently, its grant-making revolves primarily around its interest in improving education in Indiana, with special emphasis on higher education and programs designed to increase the number of Indiana residents with bachelor degrees. Many of its grant programs are aimed at Indiana's colleges' and universities' abilities to increase the state's educational attainment level and Lilly is encouraged to see the efforts of Indiana colleges and universities to retain more of their graduates in the state. To help these institutions of higher education in their efforts, in December 2003 the Endowment approved a round of grants totaling more than $38 million for nearly every Indiana college and university under a new educational initiative to build and promote economic opportunities for college graduates in Indiana (Lilly Endowment, 2005).

With Lilly's emphasis on retaining intellectual capital in Indiana, there was great potential for Grace College to develop an educational initiative designed to promote economic opportunities for its students and graduates. With three of the five leading orthopaedic corporations in the world, Biomet Orthopedics, Inc. (Biomet); DePuy Orthopaedics, Inc. (DePuy); and Zimmer Holdings, Inc. (Zimmer) located within three miles of the Grace College campus, an initiative to simultaneously address Lilly's desire to maintain intellectual capital in the state and respond to the needs of the global

orthopaedic industry on a local level seemed like a clear opportunity for the college (Grace College, 2003).

According to Brad Bishop, Director of Corporate Communications, Zimmer, Inc., the local orthopaedic industry is growing at a rate of about 12% a year, a trend not expected to slow down as baby boomers continue to age. As expected from worldwide industry leaders, Biomet, DePuy, and Zimmer are three of Kosciusko County's four largest employers and, combined, employ almost 4,200 individuals within the county. Additional businesses in the biomedical cluster increase that employment to more than 5,000 workers (Bishop, 2003).

Despite the historical growth in the industry and the location of its corporate headquarters that make Warsaw, Indiana, the orthopaedic capital of the world (Aeppel, 2006), in 2001 the Indiana Health Industry Forum commissioned Battelle Memorial Institute, one of the nation's leading non-profit research and development organizations, to assist in creating a technology strategy for the health industry in the Kosciusko County region. This formed the first of a series of local industry road maps and built upon the statewide strategy for the health industry completed in 1999 for the Indiana Health Industry Forum (Battelle Memorial Institute, 2001, p. v).

The Battelle study noted that the health sector, which is comprised of various industries including those related to the orthopaedic industry, is one of the fastest growing and most active industry segments across the country, and represents the strongest asset of the Kosciusko region (Battelle Memorial Institute, 2001, p. 3). Additionally, the Battelle study asserted that Kosciusko County lacked a quantity of skilled workers and training programs sufficient to meet the future workforce needs

of the biomedical industries along with the region's other industry and service establishments. This prompted the major biomedical firms to pilfer workers from the other biomedical firms as well as local supplier industries through superior wage and benefit offers; supply companies frequently and repeatedly lost their best employees to the older, larger, and richer biomedical manufacturers (Battelle Memorial Institute, 2001, pp. 13-14).

The Battelle study further noted that the major biomedical firms and their suppliers suffered from the lack of suitable training programs offered through public schools and local institutions of higher education, including Grace College (Battelle Memorial Institute, 2001, p. 14). It was especially notable that links between local industries and educational institutions for the purposes of establishing internship programs and providing input into technical curricula were intermittent at best (Battelle Memorial Institute, 2001, p. 14). While relationships did exist between Grace College and local businesses under the auspices of professional degree programs such as Teacher Education and Social Work, it did not formally exist in academic disciplines such as business, communication, and information technology.

The combination of Lilly's mission and the concerns outlined in the Battelle study caused Grace College to re-evaluate its previously underutilized relationship with the major orthopaedic corporations. Consequently, Grace College sought to address the concern about lack of training programs.

Grace College realized, however, that it did an inadequate job of intentionally connecting students and graduates with the major orthopaedic companies: Biomet, DePuy, and Zimmer. In order for Grace College graduates to compete for the best careers

available in north-central Indiana and throughout the state, Grace College concluded that it had to work more collaboratively to develop and sustain the strength of the orthopaedic industry in the county. While the economic base of the county had historically been strong, there had been concern about the long-term economic well-being of the region, specifically as related to the lack of a qualified orthopaedic industry workforce.

Because of this concern, Grace College investigated its role in providing graduates who would not only be attractive to industry employers, but also desire to live and work in the region upon graduation. It also required that the college re-examine its traditional model for program development and community involvement. Subsequently, a grant from the Lilly Endowment provided the impetus to begin changing the Grace College culture from one of being a traditional academic institution to one driven by workplace concerns. Grace College's effort to respond to the Battelle study's concerns resulted in the Orthopaedic Scholar Institute.

<div align="center">Orthopaedic Scholar Institute</div>

The Orthopaedic Scholar Institute (OSI) is a program at Grace College that emphasizes the outcome of higher education on learning and success in employment. OSI believes that the orthopaedic companies will see OSI as their preferred method to recruit new employees to their respective organizations. After the orthopaedic companies evaluate the impact of this initiative, OSI believes the orthopaedic companies will find increased employee retention, lower training costs, faster promotions, stronger problem-solving skills, and heightened leadership potential because of their contribution to this initiative.

Further, OSI is a system to capitalize on the unique, local, economic opportunities afforded graduates by the orthopaedic industry. OSI provides students with an opportunity to meld liberal learning with marketplace learning and technology.

The formation, development, and maturation of OSI built on the ever-changing needs that companies identified as necessary to remain the orthopaedic leaders in the industry. Grace College remains flexible and adaptable in its delivery of this initiative as orthopaedic partners obtain new information and recognize the need for additional skills by graduates. Grace College has transitioned from a traditional, faith-based, liberal arts institution to one with a clearer understanding of the skills graduates need to secure permanent employment in their chosen disciplines. OSI's mission, "To establish preferred employment opportunities for Grace College graduates in the orthopaedic industry" (Grace College, 2004), is evidence of this transition.

Implementation of OSI

Immediately upon receiving the Lilly grant, a Grace College OSI Team convened, which included a Director, Coordinator, and Consultant. The Director, who was the Dean of Non-Traditional and Community Education at Grace College, was well-respected in the local community. For more than 20 years, he served as moderator for the area's leadership academy, a role in which he had the opportunity to build a strong network of business contacts and community leaders. He served as the liaison between OSI and Grace's administration as well as OSI and the Kosciusko County community. The OSI Coordinator was a Business Department Professor who had the vision for OSI and functioned as the manager of OSI's daily operations. The OSI Consultant was a Social Work Professor, retained to lead the team in the program development phase.

The team's leadership first identified representatives from each of the three primary orthopaedic companies to serve on the OSI Development Group to provide advice and an industry perspective. The process used by the OSI Team involved connecting industry to practice. Rather than waiting for feedback from employers regarding the quality and preparedness of the Grace College graduates after those graduates were already hired, the OSI Team consulted with employers first to seek input about the characteristics they expected of interns and new employees. As described by Mulholland and Derdall (2004), schools that provided employers with the opportunity to express their needs and influence the process of curriculum development up front could produce a much more responsive program for those employers. The OSI Team chose to listen to needs of the orthopaedic representatives up front, and concepts such as diligence and emotional maturity emerged and were predominantly discussed as characteristics these companies desired in interns and employees. The OSI Team chose to commit itself to responding to the need for mature, hard-working students voiced by the orthopaedic industry.

Once the OSI Team determined the characteristics desired by the orthopaedic industry, the team selected the Social Work Program at Grace College as its programming framework because the Social Work Program already had an established infrastructure of goals, policies, curriculum, assessment, and experiential learning. Using the Social Work Program as a model, OSI created a series of training modules and experiences designed to strengthen students' existing skills and better prepare them for placement in an orthopaedic context. Much of the proposed process for placing and following students in an orthopaedic internship was also based on the social work model.

Additionally, the development of a portfolio, which was intended to showcase students' skills and provide them opportunities to fill the gap between their real and ideal selves, was also based on the social work model.

After developing a programming framework for OSI, the OSI Team began the process of recruiting, selecting, and admitting students to OSI. Initially, this process occurred through the individual selection of business students by the OSI Coordinator because he had access to numerous students with intrinsic interest in corporate employment. Later, upon the OSI Coordinator's appeal, the Grace College faculty referred additional students for consideration; however, aside from a profile consisting primarily of the emotional maturity, diligence, and goodness of industry fit domains, he provided no other specific admission criteria.

Once the OSI Team identified its first cohort, it designed a series of training modules to further develop the students' skills, which the Development Group previously outlined. Training modules included topics such as group dynamics, negotiation, and image management. A critical training module, however, clearly emerged: the Myers-Briggs Type Indicator (MBTI). Initially intended to help OSI students understand themselves and others better, the MBTI became a recurring theme through most of the modules. Most of the students had some familiarity with it already, so the training focused not only on the MBTI types and preferences, but also on the strengths and pitfalls of these types in organizational and group settings.

Because it emerged as a theme through the training modules, it became apparent to the OSI Team that the MBTI could be one means to assess students' fit with the OSI Program and ultimately within the orthopaedic industry. The MBTI made sense not only

to students, but also to faculty and staff because it was widely used on campus. Grace College introduces the MBTI to freshmen early in their first semester on campus. The intent is to help the students understand both themselves and others better, and prepare them for the strengths and pitfalls of their preferences in an academic setting.

As the MBTI is widely used on campus, faculty have an understanding about its wider applications and relevance. Corporately, there seemed to be a general understanding about the applications and relevance of the MBTI in work and group settings. This understanding, combined with the availability of extensive MBTI research related to "type" in various social systems, led to the realization of its potential value and use in the training modules with students.

Following this realization, the OSI Team educated faculty about the desired characteristics and profile of an OSI candidate and again requested faculty referrals of prospective students, this time for OSI's second cohort. Surprisingly, faculty referrals yielded a cohort that was predominantly introverted, sensing, and judging ("ISJ") in terms of MBTI preference. Based on their MBTI types, this cohort seemed to reflect the diligence desired in OSI students; however, when observed by the OSI Team in the training modules, they did not seem to reflect the other skills to the extent the team expected and wanted.

The OSI Team concluded that, because of their familiarity with MBTI types, when the team described the ideal characteristics of an OSI candidate, the faculty may have equated the OSI profile with particular MBTI types. Specifically, they appeared to have equated the characteristics of the ideal OSI candidate with the "ISJ" (introvert, sensing, and judging) MBTI preference, perhaps without thoroughly understanding the

influence of "emotional maturity" regardless of type or perhaps because of their over-

emphasis on the characteristic of "diligence."

It became clear with the second OSI cohort that a more objective means of

selection and admission was necessary to determine students' compatibility with and

suitability for this innovative experience based on the skills recommended by the OSI

Development Group.

Statement of the Problem

While the OSI Team realized its need for a more objective selection and

admission process that, as much as possible, quantified the characteristics desired in OSI

scholars rather than relying solely on referral perception, intuition, and an interview, it

did not have a clear method or approach to do so. In hindsight, while much of its

program's organization was based on the Social Work Program's model, it neglected to

take advantage of the Social Work Program's highly structured gatekeeping (i.e.,

selection and admission) process. Thus far, the selection and admission process was

initiated by either the OSI Team through an appeal to faculty for referrals, or the OSI

Coordinator through observation and selection of students enrolled in his business

courses. Students who were thought to possess the desired characteristics then

interviewed with the OSI Coordinator who (a) concluded that they would be good fits

with the OSI Program and subsequently admitted them to OSI, (b) questioned their

goodness-of-fit and referred them for a second interview with the OSI Consultant, or (c)

denied their admission because they would not fit well in the program.

Administering standardized inventories that highlighted these desired

characteristics and aided in the selection and admission process seemed to be an objective

approach to obtain more quantifiable data. Consequently, the OSI Team began investigating methods to predict the student who possessed the characteristics identified by the OSI Development Group. Inventories measuring the skills and characteristics identified by the Development Groups seemed fitting instruments; however, there was concern about overlap in the characteristics assessed and, subsequently, unnecessary testing of students.

The problem, therefore, for my dissertation study was whether the MBTI alone was a sufficient measure of a student's skills related to diligence and, subsequently, a predictor of that student's fit in an orthopaedic setting, or whether another objective measure would be necessary to identify these skills. Carrie Yocum's (2007) study is related to whether the MBTI alone is a sufficient measure of a student's skills related to emotional maturity, and subsequently, a predictor of that student's fit in an orthopaedic setting or whether another objective measure would be necessary to identify these skills.

Purpose of Study

While thus far the referral of students for OSI had been an intuitive process, there was no evidence to demonstrate that this process accurately identified students with the skills and characteristics the orthopaedic companies desired. Further, the informal referral process produced a predominantly "ISJ" (introvert, sensing, and judging) cohort of OSI students, which theoretically meant that faculty perceptions of emotionally mature and diligent students might have been those who were introverted, sensing, judgers ("ISJ") per the MBTI.

The OSI Team defined emotionally mature students as those characterized in part by the ability to use their less preferred MBTI type if the context required. The OSI Team

defined diligent students as those who willfully exert effort to strive to complete a goal. It was reasonable to assume, then, that given these definitions a breadth of MBTI preferences would have been referred for consideration. So, this phenomenon (of a predominantly "ISJ" cohort) seemed unaccounted for in that, based on our definitions of emotional maturity and diligence, we had expected representation of a broader range of MBTI preferences in the second OSI cohort, not the disproportionate number of "ISJs" (introvert, sensing, and judging) that we had. The "Ts" (thinkers) and "Fs" (feelers) were more evenly represented. We began to question whether faculty referred students who had the faculty member's own preferred MBTI characteristics (i.e., "ISJ" [introvert, sensing, and judging] faculty referred "ISJ" students) rather than the characteristics of diligence and emotional maturity based on the researchers' definitions.

The purpose of my study, therefore, was to determine an accurate and objective method to identify students who display the characteristics of diligence for application for admission to the Orthopaedic Scholar Institute. The method for identifying the characteristic of emotional maturity was studied by Yocum (2007). My research questions focused on whether the MBTI was a sufficient tool to measure diligence or whether the DI-HE instrument would provide greater accuracy.

Main Research Questions

The four main research questions for my study are:

1. What is the relationship between MBTI type (as measured by "SJ" [sensor and judger] and "NP" [intuitor and perceptor]) and diligence level (as measured by the DI-HE) among freshmen?

2. Are there significant differences in diligence by MBTI type "S" (sensor) and

"N" (intuitor)?

    3. Are there significant differences in diligence by MBTI type "J" (judger) and

"P" (perceptor)?

    4. Are there significant differences in diligence by gender?

Main Hypotheses

    1. There is a significant difference in the diligence level of freshmen by MBTI

type "SJ" (ensor and judger) and "NP" (intuitor and perceptor).

    2. There is a significant difference in diligence level by MBTI type "S" (sensor)

and "N" (intuitor).

    3. There is a significant difference in diligence level by MBTI type "J" (judger

and "P" (preceptor).

    4. There is a significant difference in diligence level by gender.

Rationale for the Study

    A challenge emerged for OSI when implementing its program: how to select and

admit students who possessed not only the academic skills, but also the transferable skills

identified by the Development Group. When the OSI Team began recruiting for OSI,

they asked for faculty referrals of students who were diligent and emotionally mature.

The result was a group of predominantly "ISJ" (introvert, sensing, and judging) students.

Consequently, the OSI Team questioned whether diligent and emotionally mature

students, as defined by the OSI Team, were actually just ISJ's on the MBTI or whether

diligent and emotionally mature students were reflected in a broader range of MBTI

types.

    Subsequently, because the OSI Development Group expressed the need for

emotionally mature and diligent students and because OSI had, at best, inconsistent success with the intuitive referral process, our research focused on whether the MBTI and the Emotional Competence Inventory–University edition (ECI-U), and MBTI and the Diligence Inventory–Higher Education edition (DI-HE) could serve as objective methods, either individually or in combination, to identify student characteristics of emotional maturity and diligence for use in the process of selection and admission to the Orthopaedic Scholar Institute.

Conceptual Framework

Understanding an institution's fundamental beliefs about epistemology (knowing and truth), ontology (being), and axiology (ethics and doing) is foundational to understanding that institution's philosophy of education. For it is through the educational philosophy that institutions of higher education develop a framework for students to understand and experience the world through curricula and campus life activities. Through their educational philosophy, institutions ideally create cohesion, clarification, and distinction in all their initiatives related to learning, vocational preparation, character development, world view development, and scholarship.

The notion of a "corporate" educational philosophy may be unlikely, however, in the context of a liberal arts institution where a professor's autonomy (both pedagogical and philosophical) is supremely valued. The configuration of an institution's curriculum and its underlying educational philosophy often seems a reflection of the individual faculty member rather than the corporate community in which the professor teaches.

One challenge in operationalizing a personal philosophy of education is the vulnerability of a belief system that may not be shared by others in the institution. As in

all belief systems, while there may be tacit, surface agreement about its basic tenets and principles, the actual application of faculty members' educational philosophy may serve to highlight the real and significant differences in their perceived purposes of higher education. Should education be about vocational preparation? Learning for learning's sake? The construction of new knowledge? The needs of the student more than the needs of society? Aristotle (1943) raised these same questions about education in the ideal state when he noted that "the existing practice is perplexing; no one knows on what principle we should proceed—should the useful in life, or should virtue, or should the higher knowledge, be the aim of our training; all three opinions have been entertained" (p. 321).

Two commonly held educational philosophies that address the questions Aristotle proposed are perennialism and essentialism. Perennialists believe in a highly academic, rigorous, and intellectual curriculum. Education is crucial because it develops mental discipline and rationality, both of which are needed in preparation for life. The extent to which students find relevance in their studies is not crucial to a perennialist. A number of scholars have noted that math, science, and literature in particular expose learners to both the rigors of logical thought as well as the great ideas that have endured throughout history (Kauchak & Eggen, 2005; Kienel, Ollie, & Berry, 1995; Ryan & Cooper, 2004). The ideal perennialist curriculum would have students study classic, primary works dominated by those of Western culture, which has resulted in criticism by those suggesting that works by women, minorities, and Eastern, Hispanic, African cultures be included as well (Ryan & Cooper, 2004).

The second commonly held educational philosophy, essentialism, suggests a critical core of information that all people should possess in order to preserve society.

Schools adopting this philosophy emphasize basic skills and expect students to master specific academic subjects. Essentialists want to ensure that the educational system produces a literate and skilled workforce able to compete in a modern, technological society. As such, essentialists find a place in the curriculum for current topics that train students to be productive members of society (Kauchak & Eggen, 2005; Kienel et al., 1995; Ryan & Cooper, 2004). Historically, an essentialist approach has been emphasized in education, which was "perceived as preparation for some future purpose—for college vocation, or to become a contributing member of society" (Kienel et al., 1995, p. 278).

Though Kienel et al. (1995) were referring to elementary or secondary schools when declaring essentialism as the foundational approach to education, this essentialist approach has considerable significance for our studies because it emphasizes the development of fundamental skills necessary for students to evolve into productive, informed members of the workforce. It was these types of students that OSI was most interested in admitting to its program.

This duality of orientations, that of academic versus practical (Shye & Aranya, 1975) and perennial versus essential, leads to a second challenge in operationalizing an educational philosophy: determining whether the value of a liberal arts education is instrumental, meaning it leads to other things of value ("What can you do with it?"), or whether it is intrinsic, inherently valuable, and an end in itself ("What kind of person does it help you become?") (Mannoia, 2000, p. 15). Alaby (2002) addressed similar questions of polarity in his research when he explored "the relationship between means and ends, presuming that the character of the means affects both its users and the character of its ends" (p. 3). These classic questions—whether education is a means to an

end or an end in and of itself—are at the root of determining the fundamental philosophy of institutions of higher education.

Further, professionally based university programs that produce students with technical competencies, such as those needed in the orthopaedic industry, must continually respond to the changing needs of and developments in the profession, industry, and education. In responding to these changes, they are accountable to students by providing them with an educational foundation that leads to marketable skills, and to employers who are demanding certain skills and attributes in new employees (Mulholland & Derdall, 2004). This accountability is also described by Carnevale and associates (1990), who proposed that it is not sufficient for workers to simply have strong technical skills, they must also have "personal management skills to maintain self-esteem, set goals, and be motivated" (p. 11). The challenge for institutions of higher education then becomes how to teach both the technical skills and the transferable skills, such as emotional maturity and diligence, which seem equally important to employers.

There appears to be a disconnect, however, between the skills that employers identify and the ability of higher education to deliver those skill sets to students. Industry has been critical of higher education in noting its over-emphasis on theory versus real-world experiences (Baker & Phillips, 1999; Shivpuri & Kim, 2004), failure to teach oral and written communication skills graduates need (Baker & Phillips, 1999; Willis & Taylor, 1999), and failure to provide adequate leadership and interpersonal skills (Baker & Phillips, 1999).

Although both philosophical strains were observed in our faculty, the OSI Team concluded that OSI is best viewed from an essentialist perspective. Faculty influenced by

an essentialist philosophy would emphasize basic workplace skills in an effort to instill both core knowledge and a core skill set in students, which ideally would increase students' employability. Employability from an essentialist's perspective could be thought of in terms of "transfer of learning," an educational concept dealing with the ability to use learning gained in one situation or in solving one problem to help with another learning situation in either the same or different context (Alkin, 1992; Guthrie, 2003; Husen & Postlethwaite, 1985). An essentialist would theoretically value the productive work and productive relationships that result from this transfer of learning.

Jung's Theory of Psychological Type

Similarly, Carl Jung also believed in meaningful work and meaningful relationships. Jung (1933) believed that there is an "intimate . . . intermingling of bodily and psychic traits" that permits inferences about their relationship to each other, however obscure those inferences might be (p. 74). His psychological type theory is thus based on his conclusion that because character is the "fixed individual form of a person," then "a general characterology must teach the significance of both physical and psychic features" (Jung, 1933, p. 74).

Psychology has made many attempts to understand what Jung called "characterology." Until early 20th-century discoveries, however, psychology was much like the natural sciences of the Middle Ages, which was arbitrary and dispensed with empirical data to explain the relationship between the body and the mind (Jung, 1933, p. 76). One of the difficulties in psychology has been the subjective experiences of the scholar and the impossibility of separating these experiences from one another into distinctive attributes about themselves (as scholars) or others (Jung, 1933). Additionally,

the ability to measure this vast realm and determine fact or reality from perception or unreality is challenging. For example, early attempts to classify psychic attributes were made by the elements (i.e., air, water, earth, and fire), or by the stars (e.g., Aquarius, Gemini, Libra), and eventually by Greek medicine (i.e., phlegmatic, sanguine, choleric, and melancholic) (Jung, 1933).

Jung (1933), therefore, limited his work to investigating and classifying the psychic data that could be inferred from external characteristics. An early result of this work to classify these psychic attributes was his descriptive study of the psyche from which he developed theories about its structure, applied these theories, and constructed a set of psychological types. According to Jung (1926), "type is a characteristic model of a general attitude (q.v.) occurring in many individual forms. . . . In so far as such an attitude is habitual, thus lending a certain stamp to the character of the individual, I speak of a psychological type" (p. 612).

Jung believed that all people are born with certain mental and emotional possibilities, which he identified as the capacity to observe and organize. He believed that humans need these mental tools to pursue their natural impulses to relate meaningfully to the world and to people through productive work and significant relationships (Fitzgerald & Kirby, 1997). Jung defined preferences as inborn, natural ways of using a particular mental tool that shape a person's perspective and development, much like a preference for right- or left-handedness shapes the ways in which people learn to perform physical tasks (Fitzgerald & Kirby, 1997).

According to Jung (1933), psychic skills are available for use in a habitual, unconscious manner just as psycho-motor skills are available for behavior. If the psychic

skill could be labeled after the "subjective understanding of these results" consistently influenced behavior, then the "circle of an individual's destiny" could be closed (p. 86). The psychic skills were a demonstration of the efficiency and trustworthiness of individuals' preferred functions. His psychological type theory, therefore, "offer[ed] a system of comparison and orientation which makes possible something that has long been lacking, a critical psychology" (Jung, 1933, p. 94).

Further, Jung believed that, although people have access to all of the mental tools he identified and use each of them to some extent to function effectively, they nevertheless have a natural preference for certain ways of approaching these tools (Myers, McCaulley, Quenk, & Hammer, 2003). This, in turn, shapes the ways in which these tools are developed and used, thus creating different patterns of development and of operating in the world (Fitzgerald & Kirby, 1997).

Jung identified two attitudinal orientations related to the direction and flow of an individual's energy:

1. *Extraversion* is when people direct their energy and attention primarily to the external world.

2. *Introversion* is when people direct their energy primarily to their inner world of ideas, values, and experiences (Fitzgerald & Kirby, 1997; Higgs, 2001).

Jung later identified two opposite preferences, which he referred to as psychological functions and which mediate the way an individual handles information:

1. Perception (gathering information), which is exercised through *Sensing* or *Intuition*.

2. Judgment (structuring, prioritizing, making rational judgments), which is

exercised through *Thinking* or *Feeling* (Fitzgerald & Kirby, 1997; Higgs, 2001;

Lawrence, 2001; Myers et al., 2003; Ryckman, 1985).

Because individuals develop preferences for one of the perception opposites and

one of the judgment opposites early in life, the preferred opposite is "used more often,

developed more completely, and remain more comfortable for an individual than the

corresponding, non-preferred opposite" (Fitzgerald & Kirby, 1997, p. 5). According to

Jung (1926), if "one of these functions habitually prevails, a corresponding type results"

(p. 14).

Though research suggests that it is virtually impossible for one person to have

developed both of the opposites equally well (Fitzgerald & Kirby, 1997), type

development is seen as a lifelong process of striving for excellence in those functions that

hold the greatest interest and becoming at least competent in the other less interesting but

essential functions (Higgs, 2001; Myers et al., 2003). Further, type theory assumes that an

individual's type itself does not change over the life span; however, the expression of

type may change based on stage of life and circumstances (Myers et al., 2003).

Jung's theory of psychological types provided the assumptions and set the tasks

for the initial construction of the Myers-Briggs Type Inventory (MBTI) and for all of the

revisions. These assumptions are that true preferences exist and can be more confidently

identified in persons with good type development than in persons with inadequate

development; that people can indicate on a self-report inventory their preferences, which

combine to form type; and that preferences are dichotomized and the two poles of a

preference are equally valuable, each in its own sphere (Myers et al., 2003).

It was through the use of this personality preference inventory, the MBTI, that the

OSI Team combined students' natural and valuable personality preferences with an essentialist educational philosophy to evaluate their suitability for selection and admission to OSI, an orthopaedic industry-driven program in which Grace College students who possess exceptional soft skills and technical skills can demonstrate their diligence and emotional maturity in the context of an orthopaedic manufacturing-based internship.

Significance of Study

The practical contributions of our research relate to the OSI Program specifically. We wanted to determine a more objective identification, selection, and admission process. Relying on the perceptions and intuition of referral sources did not reliably lead us to diligent students and emotionally mature students as studied by Yocum (2007) regardless of MBTI type. A more objective process of identification, selection, and admission will subsequently affect OSI procedures. Further, it should help faculty and other referral sources develop a clearer understanding of the profiles of OSI students most likely to be successful and good fits in the orthopaedic industry.

My study will also contribute to the overall knowledge base related to diligence and MBTI preferences, specifically as they relate to business and industry. More specifically, while there has been considerable research regarding aspects of diligence, this study should contribute to the knowledge base as it relates to college graduates transitioning into the corporate world.

Wider applications may also apply to the admissions processes in higher education, especially those related to discipline-specific, professional degree, and honors programs.

Limitations

Our dissertations are focused only on determining an objective method to select students who display the characteristics of emotional maturity (Yocum, 2007) and diligence and admit them to the Orthopaedic Scholar Institute.

OSI is housed within a Midwestern, liberal arts, Christian college, itself located in a community commonly described as the orthopaedic capital of the world (Aeppel, 2006). These studies, therefore, may not be generalizable to larger or public institutions nor may they be indicative of student characteristics and transferable skill domains identified by non-orthopaedic businesses and industries.

Delimitations

Representatives from the orthopaedic companies identified specific characteristics needed for the selection and admission of OSI students. Those characteristics were summarized in terms of three domains: (a) emotional maturity (Yocum, 2007), (b) diligence, and (c) goodness of fit within the organization. Our studies, therefore, are limited to those characteristics, specifically the first two domains as these are characteristics of the student applicant as opposed to the corporate environment.

Although there are other traits related to employability, our studies focus on emotional maturity (Yocum, 2007) and diligence because those two competencies were clearly and repeatedly cited as desirable by the orthopaedic industry representatives when meeting with the OSI personnel.

The freshman cohort enrolled at Grace College in the fall semester of the 2004-2005 academic year completed the Myers-Briggs Type Inventory (MBTI) on campus at that time. Our studies, therefore, are limited to the representative sample of students who

took the MBTI in the fall of 2004 and subsequently chose to participate in this dissertation research by taking the Emotional Competence Inventory–University edition (ECI-U) and the Diligence Inventory–Higher Education edition (DI-HE) in the spring of 2005. These students were selected because this same cohort of students was the focus of the OSI recruiting efforts for the following year.

Our studies will not focus on the MBTI traits of thinking ("T") or feeling ("F") because there was no over-representation of these preferences in the first OSI cohort. Further, MBTI research has clearly demonstrated that thinking ("T") or feeling ("F") are the only two preferences that are gender specific (Myers et al., 2003, pp. 157-158) and, therefore, more likely to be correlated to the gender of students referred to OSI rather than the transferable skill set of all students referred to OSI.

In reviewing the literature for support of diligence (one's control of effort) as more than just an aspect of the judging ("J") preference on the Myers-Briggs Type Inventory, similar constructs emerged related to the effort component, but still had a strong emphasis on personality preference, similar to the MBTI "J" type. While the literature revealed research related to the broad concept of motivation, the review of that literature was beyond the scope of this research study; therefore, only the more specific constructs of self-efficacy, striving, volition, and conation were reviewed.

Outline for the Remainder of the Dissertation

Chapter 1 reviewed the Orthopaedic Scholar Institute as an initiative funded by the Lilly Endowment, Inc., to retain intellectual capital in Kosciusko County by identifying exceptional Grace College students for selection and admission in orthopaedic company internships. In doing so, selecting emotionally mature and diligent students for

admission into OSI emerged as the focus of these dissertation studies. Because the OSI Program is grounded in an essentialist educational philosophy and selecting students is driven by Jung's Theory of Psychological Type, the research studies hypothesized the relationships between (a) MBTI type and emotional maturity (Yocum, 2007) and (b) MBTI type and diligence.

Chapter 2 reviews the literature on the Myers-Briggs Type Inventory, specifically as it relates to college students. Additionally, it reviews the literature on transferable skills, the construct of diligence, and the practice of selecting and admitting students in higher education programs.

Chapter 3 outlines the setting, population, methodology, and instrument used in my study. Chapter 4 describes the findings of my study, while chapter 5 summarizes my study, and provides conclusions and recommendations related to the identification of diligent students. Chapter 6 discusses the experience of collaborated dissertations.

CHAPTER TWO

LITERATURE REVIEW

Introduction

This study focused on whether the Myers-Briggs Type Indicator (MBTI) could sufficiently determine emotional maturity and diligence for admission to OSI or whether other methods were needed. While the OSI Team was familiar enough with the MBTI to know that it had been well researched, was grounded in theory, and was used extensively in both education and business and industry, it nonetheless questioned whether the MBTI would sufficiently measure all the characteristics that they desired when selecting and admitting OSI students to its program, namely the transferable skills of emotional maturity and diligence.

The literature review, therefore, discusses how the MBTI relates to college students and enhances our ability to more objectively identify students at Grace College for selection and admission to the Orthopaedic Scholar Institute (OSI). This chapter reviews the MBTI instrument and discusses how the MBTI has been used to understand college students with specific characteristics. The literature review also discusses the research related to transferable skills. Further, there is a review of diligence and its complementary constructs. The chapter concludes with a review of the research related to the selection and admission process to higher education programs.

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Myers-Briggs Personality Type Inventory

The MBTI, developed in the United States by the mother-and-daughter team of Katharine Briggs and Isabel Myers, was intended to make Jung's theories understandable and useful in people's lives by putting the effects of each preference to practical use (Higgs, 2001; Myers et al., 2003). The MBTI, well documented with thousands of scientific studies conducted during a 50-year period, has ongoing research to support its application (Hirsh & Kummerow, 1998; Myers et al., 2003; Ryckman, 1985) and is the most widely used personality inventory in the world with 2 million administrations given annually (Fitzgerald & Kirby, 1997; Myers et al., 2003).

In making the MBTI useful in people's lives, it is important to note that the intent of the MBTI is not to measure psychological traits that are considered good or bad or of which the person has too much or too little (Myers et al., 2003). Rather, the intent of the MBTI is "to sort people into equally valuable groups to which, in accordance with Jung's theory, they already belong" (Myers et al., 2003, p. 11). Equal justice is given to corresponding opposites, which themselves are equally legitimate alternatives and without intrinsic superiority (Myers et al., 2003).

In general, the MBTI opposites provide insights into how individuals interact with the world, collect data, make decisions, and live their lives based on the assumption that seemingly random behavior is actually orderly and consistent with how people choose to use their perception and judgment (Myers et al., 2003).

The MBTI identifies eight personality preferences that are organized into four dichotomies. Responses to questions on the MBTI determine representation by a letter of one of the dichotomies (i.e., E–I, S–N, T–F, J–P) and the four pairs are then combined

into one's "type" (see Appendix B). MBTI "types" describe, rather than prescribe, personality preferences. The MBTI identifies preferences, not skills, abilities, or competencies. Further, the MBTI assumes that all preferences are equally valuable, important, and necessary and all can be used by every person (Hirsh & Kummerow, 1998; Myers et al., 2003).

In addition to the three sets of opposites developed by Jung discussed previously (preferences in perception, judgment, and orientation), Myers and Briggs developed an additional set (approaches to the structure and organization of one's environment), which they termed judging and perception (Bayne, 2004; Fitzgerald & Kirby, 1997; Higgs, 2001; Hirsh & Kummerow, 1998; Myers et al., 2003). This addition resulted in four sets of opposites identified by the MBTI personality inventory as noted in Table 1. The table provides a brief description of each pair of opposites and the similarities and differences of those opposites.

These MBTI descriptors were used by the OSI Team to help the OSI students understand their own type preferences and their propensity to respond in a particular way in a corporate context. Our use of the MBTI with these OSI students led us to consider ways in which MBTI research itself related to college students.

MBTI Application to College Students

College students have attracted considerable attention from MBTI researchers. The type instrument, for example, has been used in multiple ways to study the correlations between MBTI type and variables discussed below, such as psychological development, campus retention, residential development, academic achievement,

Table 1

MBTI Preferences Vocabulary

ENERGIZING (orientation of energy)

Extravert (E)	Introvert (I)
External/exterior	Internal/interior
Outside thrust	Inside pull
Talk thoughts out	Keep thoughts in
Breadth	Depth
Involved with people, things	Work with ideas, thoughts
Interaction	Concentration
Action	Reflection
Do-think-do	Think-do-think

PERCEIVING (processes of perception)

Sensing (S)	Intuition (N)
Present orientation	Future possibilities
What is real	What could be
Practical	Theoretical
Facts	Inspirations
Perfecting established skills	Learning new skills
Utility	Novelty
Step-by-step	Insight-by-insight
The five senses	The sixth sense, a hunch

DECIDING (processes of judgment)

Thinking (T)	Feeling (F)
Logical system	Value system
Head	Heart
Objective	Subjective
Justice	Mercy
Critique	Compliment
Principles	Harmony
Reason	Empathy
Firm but fair	Compassionate

Table 1—*Continued.*

LIVING (orientation to the outside world)	
Judging (J)	**Perceiving (P)**
Decide about information	Attend to/gather information
Regulate	Flow
Control	Adapt
Settled	Tentative
Run one's life	Let life happen
Set goals	Seek options
Closing off	Opening up
Organized	Flexible

Note. From *Introduction to Type in Organizations* (p. 2), by S. K. Hirsch and J. M. Kummerow, 1998, Palo Alto, CA: CPP.

interpersonal and professional skills, and multicultural impact. Additionally, the MBTI

has been used for leadership and career development with college students. While there

has been broad application of the MBTI with college students, our specific problem was

whether the MBTI alone could measure a student's transferable skills related to diligence

or emotional maturity or whether another objective measure would be necessary to

identify these skills.

Like the honors nature of the OSI Program, Wittig, Schurr, and Ruble (1986)

determined that "IN" (introvert and intuitor) type preferences were the distinguishing

characteristics of students admitted to an honors college. They noted that the "S–N"

dichotomy (sensor and intuitor) was significant when comparing the honors students with

non-honors students. This was important for us to note because the S–N dichotomy,

which indicates how students gather information from their environment, was a common

type variable in both of our studies.

Another study comparing Academic Decathletes and National Merit Finalists found the two groups to be similar from a type perspective. In this group of academically gifted students, "INP" (introvert, intuitor, perceptor) was the preferred MBTI type (Robinson, 1994).

While Williams (1992) found that the "ENP" type (extrovert, intuitor, perceptor) was the most frequent preference among gifted and talented students, a characteristic indicating good potential for inclusion in OSI, the "ENP" type is not without its challenges. Their need for autonomy may appear to be a "misuse of freedom" if they do not find success in some area of their life (Hammer, 1996, p. 153). This conclusion is relevant to OSI because in referring a new cohort of OSI candidates, the faculty seemed to identify the polar opposite typology, "ISJ" (introvert, sensing, judging), a group they may have perceived as more willing or able to follow established rules.

When considering the applicant pool for OSI selection and admission, positions such as resident assistants are strong indicators of leadership skills. Anchors and Hay (1990) reported that resident assistants at a selected university had significantly greater preference for extraversion, thinking, and judging ("ETJ") than the student body as a whole. Likewise, Hardy-Jones and Watson (1990) compared the type profiles of resident assistants over a 10-year period and found consistent preferences for extraversion and judging ("EJ"), and Petty (1985) concluded that the extraverted, thinking, and judging ("ETJ") profile most frequently described college student leaders. Brush (1989) was the only researcher who found a strong "N" (intuitor) type among the resident advisors studied at a liberal arts college.

In researching college students in various student life and academic pursuits based

on their MBTI type, introverts ("I") obtained higher grades (Anchors, Robbins, & Gershman, 1989), and planned to work while in college (Provost & Anchors, 2003). Extroverts ("Es") developed a greater sense of autonomy and purpose and developed interpersonal relationships (Anchors & Robinson, 1992), and were helped by active involvement in campus life (Provost, 1985).

Athletes appeared to be another applicant pool from which to draw OSI candidates. Possessing the diligence and emotional maturity to simultaneously meet the rigor of academics, practice, and competition seemed to be a good indicator of the ability to transfer these skills to a work environment. In studies of athletes, sensing types ("S") were more likely to be involved in athletics (Ruble, Mahan, & Schurr, 1987) and represented most frequently among male scholarship athletes (Chesborough, 1994).

MBTI research suggests caution, however, when recruiting "S" type students. Two universities found "S" type (sensing) students more frequently represented in dropout rates (Waymire, 1995). While male intuitive types ("N") developed interpersonal relationships and autonomy (Anchors & Robinson, 1992) and intuitives ("I") anticipated their academic achievement more than other types (Provost & Anchors, 2003), intuitive types were also frequently among those with substance abuse records (Anchors & Dana, 1989).

When considering other indicators of success in higher education, judging types ("J") developed purpose and autonomy and selected majors sooner than other types (Anchors, Gershman, & Robbins, 1987) and received higher grades than other types (Anchors et al., 1989; Chesborough, 1994). Perceiving types ("P") more often considered the possibility of dropping out (Provost & Anchors, 2003) and were more frequently

among judicial offenders (Griffin & Salter, 1993) or substance abuse offenders (Anchors & Dana, 1989; Provost, 1991). Academic self-esteem was found to correlate with "ENJ" (extrovert, intuitor, judging) types (Schaefer, 1994) and goal-orientation and purpose aligned with "ETJ" types (Anchors & Robinson, 1992).

MBTI research has also led to some conclusions about type preferences of students in professional degree versus strictly academic educational environments. Machir (1992) did not find type differences among ROTC students and the general student population; however, O'Connor (1993) found that "INJ" (introvert, intuitor, judging) type was a significant predictor of grades for cadets at the U.S. Coast Guard Academy. Thinking-judging ("TJ") types were the most frequent among students at a Midwestern law school (Gilchrist, 1991), but Berryhill (1991) did not find a predominant type among students at a Southern seminary. In an 8-year study, Power and Lundsten (1994) found a strong judging ("J") preference among MBA students.

With the same typology as the majority of the students referred to the first OSI cohort (i.e., introvert, sensing, judging), "ISJ" types were rated more highly by faculty on skills such as explaining, negotiating, asking, and instructing in another professional degree program: dental school (Dunning, Lange, & Adams, 1990). An overrepresentation of "Js" (judging) was found among another group of dental students (Erskine, Westerman, & Grandy, 1986).

Gable (1988) studied students in 15 allied health professional fields and found that all were characterized by sensing ("S") and all but one (respiratory therapy) were characterized by judging ("J"). Among nursing majors, Schurr, Henriksen, Alcorn, and Dillard (1992) did not find any differences in classroom achievement among the MBTI

types.

Further studies in professional programs, such as the engineering field, also identified some typology tendencies. For example, McCaulley (1990) found judging ("J") to be a predominant type. Sensing types ("S") scored higher on examinations when the test problems were similar to the homework problems; however, they tended to solve practice problems to the neglect of concepts and principles (McCaulley, Godleski, Yokomoto, Harrisberger, & Sloan, 1983). In their study of engineering students, Felder, Forrest, Baker-Ward, Dietz, and Mohr (1993) found a slightly higher passing rate for "J" (judging) types as compared to "P" (perceptor) types; "S" (sensing) types tended not to fare as well as "N" (intuitive) types.

As discussed, there is considerable research about college students, MBTI types, and variables such as honors programs, athletic status, professional degree programs, leadership position, and interpersonal and professional characteristics. The significance of the MBTI instrument to the OSI Program, however, has been its use for college-student career development. Typically, the use of the MBTI in the area of career development has been related to increasing students' self-awareness about college and work, exploring career development strategies with them, and determining their suitability for various college majors and career fields (Provost & Anchors, 2003). The Center for Applications of Psychological Type database regarding occupational membership by each of the 16 MBTI types provides a valuable foundation for the OSI Team to assist students in evaluating the compatibility between their type and the frequency of this type within certain occupations (Provost & Anchors, 2003).

MBTI Criticisms

As discussed previously, the MBTI has been heavily used in research with college students and others. There are criticisms, however, about the definitive conclusions offered by its proponents regarding the MBTI's validity and reliability without sufficient empirical evidence to support these claims (Pittenger, 2005).

For instance, some claim that as much as one-half of the material published on the MBTI has been produced for psychological type organizations such as the Center for Applications Psychological Type. This conflict of interest suggests a lack of critical scrutiny of the research (Coffield, Moseley, Hall, & Ecclestone, 2004).

Another criticism of the MBTI is that there is limited evidence of bimodal distributions, the danger of which is oversimplifying multifaceted personality functions (Coffield et al., 2004; McCrae & Costa, 1989). Additionally, certain methods of establishing validity are limited due to its ipsative nature (Higgs, 2001). One disadvantage is the ability to make accurate predictions about an individual's behavior using the four-letter formula since using dichotomous scores reduces the ability of a continuous scale to predict behavior (Coffield et al., 2004; Hunter & Schmidt, 1990) and may greatly increase the rate of Type I errors (Maxwell & Delaney, 1993).

Other criticisms relate to its questionable test–retest reliability. For example, the limited motivation on the part of the participant to provide accurate responses, especially undergraduate students taking the MBTI as part of their classroom experience, affects reliability (Boyle, 1995; Hammer, 1996). Further, in general, most test–retest studies are conducted on relatively small samples and very few studies have had samples large enough to allow for comparison of the 16 types (Hammer, 1996).

MBTI Summary

The MBTI was intended to take Jung's theories about psychological type and put them into practical use. The purpose of this instrument is to describe the personality preferences of individuals according to categories in which they already belong, rather than to measure the amount of a characteristic or trait they may have. The MBTI provides insight into people's behavior by describing them according to eight equally valuable personality preferences organized into four dichotomies. The MBTI has been used extensively with college students, including for career development.

Students at Grace College take the MBTI as part of their freshman experience to increase their self-awareness and to assist them in various areas of campus life, including major selection and interpersonal relationships. While some have expressed criticisms about the MBTI, it remains one of the most highly used instruments, having over 2 million administrations per year (Myers et al., 2003). Despite the criticisms, the purpose for which we chose to include the MBTI in our study was not compromised because we wanted to know whether the MBTI would help us identify emotionally mature and diligent students or whether another instrument might be a better indicator.

Research on Transferable Skills

While the MBTI types of the OSI students provided the OSI Team with insight into each student's personality preferences, the purpose of OSI has been to train these students to apply the skills they learned in academic and other environments to a new context regardless of their MBTI preference. When the OSI Team worked with the Development Group to determine the characteristics they desired in new employees and

interns, many of our discussions focused on this concept of transferring skills, which the Development Group ultimately identified as the skills that facilitated an employee's goodness of fit in the workplace, workplace success, or being good at one's job as perceived by the organization.

The field of career services commonly defines this as "transferable skills," or those abilities acquired based on life and work experience, liberal arts education, extra-curricular activities, and community involvement (McKay, 2005). Also referred to as professional competencies and soft skills, transferable skills are not specific to any one academic discipline; rather, they are the cognitive, academic, interpersonal, and communication skills that are necessary to demonstrate competency in many different work settings (Buckley, 1999). Transferable skills are universal skills that transfer from one type of work to another without much effort on the worker's part and without training from the employer (Bolles, 1994; Buckley, 1999; Government of Canada, n.d.).

Both research and anecdotal reports outline the transferable skills believed to optimize a graduate's employability skills and personal qualities beyond specific degree requirements (Debling & Behman, 1996). For example, in 1988, with funding from the U.S. Department of Labor, the American Society for Training and Development conducted a research study to explore the ramifications of a workforce "ill-equipped in a broad spectrum of basic workplace skills" (Carnevale et al., 1990, p. xiii). They concluded that employers want the following skills:

1. The Foundation Skill: Learning to Learn

2. Competence: Reading, Writing, and Computation

3. Communication Skills: Oral Communication and Listening

4. Adaptability: Creative Thinking and Problem Solving

5. Personal Management: Self-Esteem, Motivation/Goal Setting, Employability/Career Development

6. Group Effectiveness: Interpersonal Skills, Negotiation, and Teamwork

7. Influence: Organizational Effectiveness and Leadership (Carnevale et al., 1990).

Research about employability and transferable skills concluded that "employers want a new kind of worker with a broad set of workplace skills" (Carnevale et al., 1990, p. 2). Carnevale's research identified transferable skills consistent with the findings of others who studied workplace skills including the skills and qualities employers look for in graduates (National Association of Colleges and Employers, 2004; Smith, Wolstencroft, & Southern, 1989; Willis & Taylor, 1999), prospective employer and faculty perceptions of skills and abilities needed by business school graduates (Tanyel, Mitchell, & McAlum, 1999), workplace competencies and foundational skills (Act Inc., 2000), and competencies and skills important in career development (Mannoia, 2000; Zekeri, 2004).

In 1990, the U.S. Department of Labor commissioned a study on essential workplace skills to improve the preparation of our nation's workers (Sheckley, Lamdin, & Keeton, 1993), the results of which were outlined in a report by the Secretary's Commission on Achieving Necessary Skills (SCANS). The findings of the report were "intended to set the agenda for what students are taught in the nation's schools and how workers are trained and retrained for the high-skill, high wage jobs of the future" (Act Inc., 2000, p. 1). The workplace competencies and foundation skills identified through

this report, and outlined in Table 2, reflect many of the transferable skills communicated to the OSI Team by the Development Group.

For example, the Development Group identified transferable skills they desired in new employees and interns. While the Development Group did not use terms such as interpersonal and team membership skills, thinking skills, and personal qualities, two characteristics they did desire that became the focus of our research—emotional maturity and diligence—are reflected in the competencies and skills described in the Table 2.

Sheckley, Lamdin, and Keeton (1993) noted that most of the groups studying the competencies that increase one's employability skills relied on the research base provided by Carnevale and colleagues (1990). Regardless, Sheckley and colleagues (1993) noted that, overall, there remained remarkable agreement amongst various researchers on the skills necessary for optimal employability.

In addition to empirical research such as that cited previously, many reports exist in the trade industry about the transferable skills desired by employers. For example, goal setting, motivation, communication, team and group work, interpersonal and human relations, problem solving, and self-awareness skills are frequently cited. From these various reports, the characteristics of emotional maturity and diligence emerged as patterns. These categories, while similar to the preceding studies on transferable skills, have particular relevance to our research in that, while the Development Group recognized that OSI students would have a technical skill set by nature of their college degrees, they were most interested in the transferable skills of emotional maturity and diligence.

Table 2

Essential Workplace Skills

Workplace Competencies	Foundation Skills
Resources	**Basic skills**
Allocates time	Reading
Allocates money	Writing
Allocates materials and facility resources	Arithmetic
Allocates human resources	Mathematics
	Listening
Information	Speaking
Acquires and evaluates information	
Organizes and maintains information	**Thinking skills**
Interprets and communicates information	Creative thinking
Uses computers to process information	Decision making
	Problem solving
Interpersonal	Seeing things in the mind's eye
Participates as a member of a team	Knowing how to learn
Teaches others	Reasoning
Serves clients/customers	
Exercises leadership	**Personal qualities**
Negotiates to arrive at a decision	Responsibility
Works with cultural diversity	Self-esteem
	Social
Systems	Self-management
Understands systems	Integrity/honesty
Monitors and corrects performance	
Improves and designs systems	
Technology	
Selects technology	
Applies technology to task	
Maintains and troubleshoots technology	

Note. From *Workplace Essential Skills: Resources Related to the SCANS Competencies and Foundation Skills* (p. 2), by ACT, Inc., 2000, Iowa City, IA: Author.

The relationship between the skills and characteristics that employers cite as essential and the percentage of employers who use these skills in selecting new employees are outlined in Table 3. This is compared to the skills and characteristics that colleges and universities cite as important.

Table 3

Skills Important to Employers

Skills and Characteristics	Importance to Employers	Importance to Colleges	% Employers Use in Employee Selection
Interpersonal skills	1[a]	4	94[a]
Ethics and integrity	2[a]	2[a]	83
Leadership	3[a]	7	88[a]
Perseverance	4	9	77
Knowledge	5	1[a]	89[a]
Adaptability and life skills	6	T10	77
Continuous learning	7	6	72
Multicultural tolerance	8	5	52
Career orientation	9	T10	65
Social responsibility	10	3[a]	47
Health	11	8	20
Artistic appreciation	12	T10	14

Note. From "Do Employers and Colleges See Eye to Eye? College Student Development and Assessment," by S. Shivpuri and B. Kim, 2004, *NACE Journal, 65,* p. 6.
[a] Denotes the three highest ranked skills.

Shivpuri and Kim's (2004) research yielded the necessity and importance of both technical skills, such as those related to writing and computing, and transferable skills, such as planning and teamwork. It also highlighted a degree of dissonance between the skills that employers cited as important (interpersonal skills and leadership) and those that colleges view as important (knowledge and social responsibility). Conversely, there

is relative consistency between the skills that employers view as important and the percentage that use those skills in hiring employees. As expected, the five characteristics ranked highest by employers were the same five that the greatest percentage of employers used in selecting new employees.

Though Mannoia (2000) suggested that "liberal arts institutions can claim all of these transferable skills as outcomes" in their graduates (p. 24), Koffel (1994) asserted that "a disparity exists between educators who emphasize the study of ideas, discussion of concepts and thoughts and the business community and employers who emphasize skills" (p. 2). Further, Koffel (1994) alleges that educators spend too much time "discussing theories . . . and searching for concepts" while employers who hire graduates "want to see results and want their employers to be able to *do* something with their knowledge" (p. 2). Koffel (1994) contends that to offset the problem of workers who lack the requisite transferable skills, educators must change how they teach, though not necessarily what they teach. Employers have suggested increasing experiential learning and providing opportunities for internships and for role-playing organizational situations as means for universities to produce more well-rounded students (Willis & Taylor, 1999).

A review of the literature resulted in the identification of both a variety of transferable skills and a gap between the needs of employers and the emphasis in higher education. It appeared that OSI could fill this gap. By identifying students with the transferable skills that the Development Group thought were necessary for success in an orthopaedic context (i.e., emotional maturity and diligence) OSI could admit and select students who can "do" something with their knowledge.

Constructs Related to Diligence

Encompassing such attributes as persistence, perseverance, endurance,

conscientiousness, and vigilance, the concept of diligence describes an essential

characteristic of OSI students requested by the orthopaedic industry and is defined as

"steady, earnest, and energetic effort" (Bernard, 1995, p. 99). In discussing the causes of

success and failure, Hunter and Barker (1987) said,

> The only [cause] completely under our control is effort: we can determine how much
> effort we will expend. People do not exercise control over ability, task difficulty, or
> luck. Consequently, we put forth effort if we believe that the effort will influence the
> outcome. . . . Research on high achievers, whether in mathematics, athletics, the arts,
> science, or business, reveals that successful people exert enormous effort (Gardner
> 1983, Bloom 1985). (p. 51)

Diligent students are the types of students the OSI Team wants to identify through

a selection method for admission to the Orthopaedic Scholar Institute. These are the types

of students, diligent and effort expending, that the orthopaedic industry sees as valued

future employees.

Constructivist theory of learning links the definition of diligence used in my

dissertation to students currently in an educational context. According to constructivist

theory of learning, experiences help create reality, which in turn develops one's belief

system. Beliefs, however, can be changed by different experiences (Joyce, Weil, &

Calhoun, 2004; Slavin, 1994). Constructivist learning theory implies a certain self-

directed effort on the part of the learner in order to change behaviors and succeed. By

experiencing successful completion through effort, learners gain confidence and are

motivated to be diligent again, and engage in more complex challenges.

In reviewing the literature for support of diligence (one's control of effort) as

more than just an aspect of the judging ("J") preference on the Myers-Briggs Type Inventory, similar constructs emerged related to the effort component, but still had a strong emphasis on personality preference, similar to the MBTI "J" type. While the literature revealed research related to the broad concept of motivation, the review of that literature was beyond the scope of this research study; therefore, only the more specific constructs of self-efficacy, striving, volition, and conation were reviewed.

Self-efficacy

Self-efficacy, a subjective aspect of empowerment, refers to the belief that one has "the ability to produce . . . events in life" (Bandura, 1982, p. 122). Similar to the definition used in this dissertation, Bandura (1999) posited that knowledge structures, formed from thinking and behavior that is modeled from activities and from the synthesis of acquired knowledge, serve as a guide to a complex pattern of behaviors. He suggested that unless people believe that they can produce desired effects by their actions, they have little incentive to act or to persevere in the face of difficulties (Bandura, 1999; Ryckman, 1985). Further, and perhaps more importantly, judgments of self-efficacy also determine how much effort people will expend on activities and how long they will persist on challenge tasks and in adverse situations (Ryckman, 1985). Self-efficacy means that the individual believes he or she has the capacity and skills to achieve a desired outcome (Saarni, 2000).

Bandura noted that people regulate their behavior based on both external standards set by others as well as standards they set for themselves. As people develop standards for themselves, they strive to meet these standards. Behavior, therefore, can

become self-governed and self-regulated (Payne, 1997; Robbins, Chatterjee, & Canda, 2006).This self-regulation of motivation and action operates partly through people's internal standard and their evaluations of their own behavior. People seek self-satisfaction by fulfilling valued goals, and they are motivated by discontent with substandard performances. Consequently, discrepancies serve as motivation for action (Bandura, 1999).

Personal Striving

While Bandura focused primarily on self-efficacy as a perceptual, cognitive mechanism to account for personality functioning and change (Ryckman, 1985), Emmons (1986) focused his research on personal strivings, or accomplishing through behavior what a person is trying to carry out. Emmons viewed "strivings" as what a person is trying to do and what helps to organize and integrate an individual's goals (Emmons & King, 1988, 1989).

People actively seek out, create, and control their environments according to their psychological partiality (Buss, 1987; Emmons & Diener, 1986; Emmons & King, 1989), and personal strivings represent those recurrent, enduring goals that individuals seek in their everyday behavior (Emmons, 1991).

Interestingly, Emmons's research demonstrated that people who ranked high in their perception of life satisfaction expected to be successful, saw strivings as important and valued (Emmons, 1986), and experienced physical and psychological impact when strivings conflicted with other life issues (Emmons & King, 1988). Similar to Bandura's self-efficacy, the potential satisfaction from strivings must outweigh the fear of failure if

action is to be taken (Huitt, 1999; Ryckman, 1985).

Volition

Likewise, volition, or "buckling down to achieving one's goals," is also a "self-regulatory mental process that engages the mind for the transition of goals or intentions into actions" (Bernard & Schuttenberg, 1995, p. 93). The concept of volition, however, focuses on the use of will, or the freedom to make choices, take responsibility, initiate behavior, and carry out plans (Baumeister, Braslavsky, Muraven, & Tice, 1998; Huitt, 1999). Additionally, covert volition involves controlling the use of one's own action and overt volition involves one's controlling the environment (Corno, 1993). In contrast, Pervin (1992, 1996, 1999) attributes greater complexity to volition than simple effort, which does not in and of itself explain phenomenon such as environmental, bio-physical, and instinctual influences on decision making.

Conation

The tripartite classification of mental activities, cognition (knowing), affection (valuing), and conation (striving), has not been equally addressed in the literature; the most emphasis has been on cognition and the least on conation (Hilgard, 1980; Hilgard, Leary, & McGuire, 1991). McDougall, who suggested that this was because conation, a behavioral domain that deals with striving, volition, and the will, was not easily measured, observed that

> although our modes of striving are so various, ranging from intense bodily activity to intellectual activity that involves a minimum of bodily expression, we find the same words suitable for describing this striving aspect common to all such activities. We say we are trying, striving, endeavoring, paying keen attention, making an effort, working hard, doing our utmost, exerting ourselves, concentrating all our energies; in

technical terms, we are manifesting conation. (Atman, 1987, p. 15, 1988a, p. 6, 1988b, p. 1; Atman & Hanna, 1987, p. 20)

Conation, an obscure term used in literature, is similar to the effort in diligence in that it includes behavior directed toward action or change including volition, striving (*The American Heritage Dictionary of the English Language*, 2000; Kolbe, 1990), "vectored energy: i.e., personal energy that has both direction and magnitude" (Atman, 1987, p. 15). Conation refers to the connection of knowledge and affect to behavior; it is the personal, intentional, planful, deliberate, goal-oriented, or striving component of motivation—the proactive aspect of behavior (Huitt, 1999).

In discussing this type of directed energy, Atman (1988a) concluded that individuals must work hard, exert themselves, and focus all of their energies in order to complete tasks. Her model, "The Conation Cycle," described concrete behaviors to systematically examine the process of goal-directed striving and managing one's own energy through consciously setting and achieving goals. She emphasized that "striving does not happen in the abstract: humans strive toward goals" (Atman, 1987, p. 21) and her model was for those who discover the challenge of the thrill of that striving (Atman, 1987).

The significance of Atman's conation cycle and striving procedures appears to be an increased awareness of the consequences of one's action and the awareness that goals must be realistic, feasible, and accomplished within a specific time frame (Atman, 1987). Likewise, internalizing these strategies also requires "the ability to mobilize and maintain them when situations demand" (Corno, 1989, p. 2).

In the Conation Cycle, the individual's behavior, described as goal-focused

striving, is guided by the goals he or she chooses and is characterized by its natural flow

of energy.

> A central skill in the goal setting/accomplishment process is time control. In its
> simplest form time control means "make a list for tomorrow." At a more complex
> level, time control involves the conscious use of a timed deadline as a "ramrod" to
> enforce a structure on an otherwise potentially undisciplined state of mind. (Atman,
> 1987, pp. 21-22)

For example, Parkinson's Law, which states that the work expands to fill the

limits of the time available, applies to discipline of the mind (Muczyk & Saber, 2001;

Parkinson, n.d.). Instead, individuals should work towards developing the conative

components of the mind that enhance self-direction, self-determination, and self-

regulation. People need to set attainable goals, plan routes to those goals, systematically

and consistently put goals and plans into action, reflect on the results, and manage the

emotions related to success or failure (Huitt, 1999). Figure 1 illustrates this conation

cycle.

Like Atman and Huitt, Bernard was also interested in goal setting and systematic

plans of action as they relate to his construct of diligence.

Diligence

Bernard (1991) first ventured into diligence, as this dissertation study defines it,

when he began investigating how students could be held more responsible for effort in

their educational results (Glasser, 1990; Newman, 1989). He desired to develop an

instrument to measure students' involvement and effort in their own education. His initial

approach, broader than the current operationalized definition used in this dissertation

study, was a reflection of effort toward holistic development and included constructs
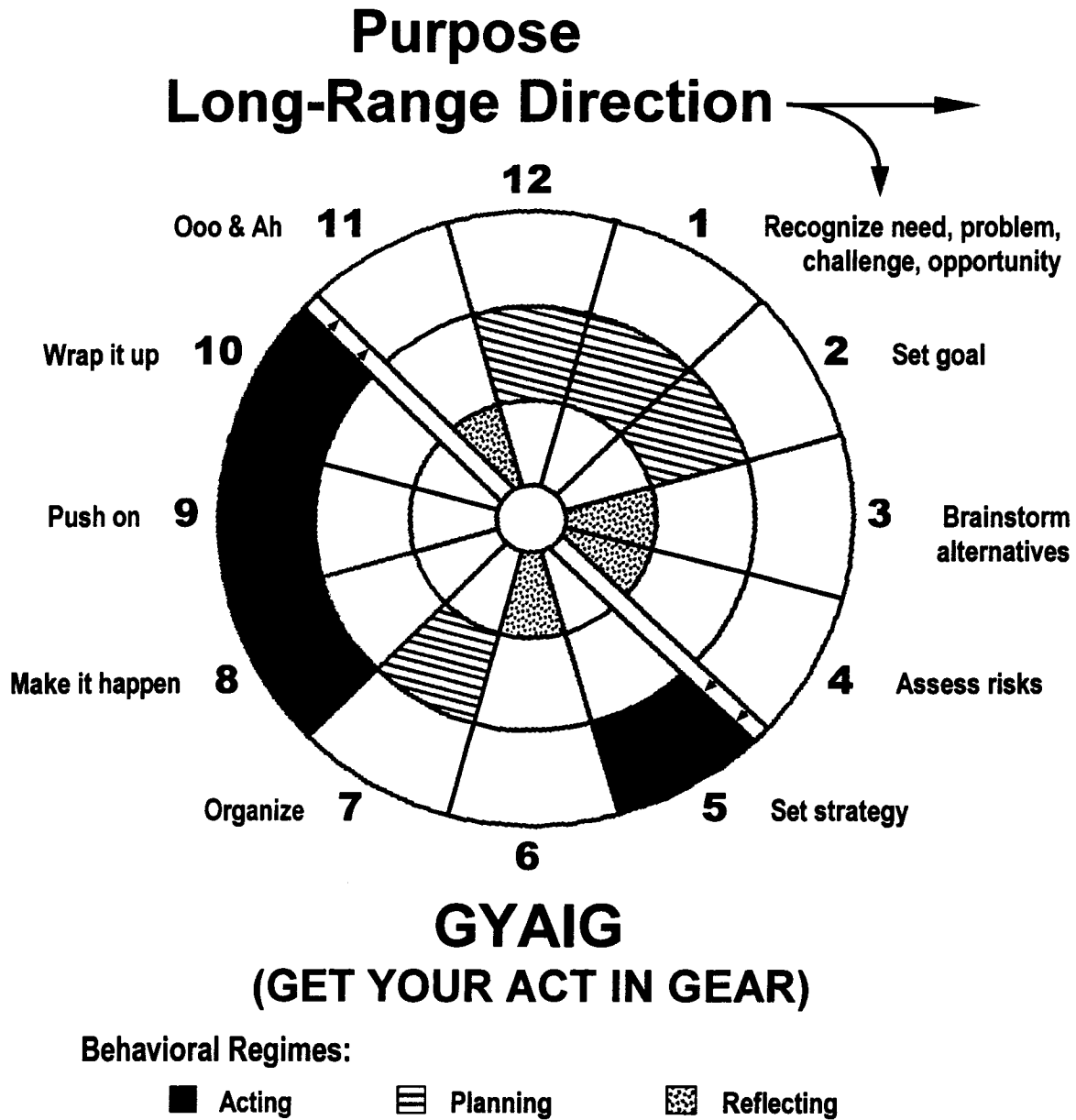
Figure 1. *Conation cycle.*

Note. From "The Role of Conation (Striving) in the Distance Education Enterprise," by K. S. Atman, 1987, *The American Journal of Distance Education, 1,* p. 20. Reprinted with permission.

such as motivation, concentration and assimilation, conformity and responsibility, discipline, and devotedness and spirituality (Bernard, 1991; Bernard & Thayer, 1993; Bernard, Thayer, & Streeter, 1993)

In his initial study, Bernard (1991) found a significant correlation between students' ability and competence scores, and between students' diligence and competence scores. A significant multiple correlation coefficient resulted between competence and a linear combination of diligence and ability. This study was Bernard's first attempt to identify when students did not expend effort and he found that, "although no statistical relation was found between diligence and ability, the two variables combined to predict 37 percent of the variance in academic performance" of students (Bernard et al., 1993, p. 213). The original Diligence Inventory attempted to "operationalize student effort through a compilation of a number of goals. . . . The hypothesis [was] that the quality of student performance [was] linked to the extent of attainment of [those] goals" (Bernard et al., 1993, p. 216).

Bernard and Schuttenberg (1995) adapted the high-school version for higher education with the Diligence Inventory–Higher Education (DI-HE), which was to be used with university undergraduate and graduate students. They preserved much of the content and wording of the high-school tool and paid attention to reliability, validity, and demographic trends when comparing the content of both instruments.

Bernard and Schuttenberg tested the results of the new instrument using a large cohort of students at various levels of study at a midsized university. Item analysis was done on the new instrument (DI-HE) in order to compare its reliabilities with the original DI-HS. The five-factor structure remained the most stable again on the DI-HE. The five

factors had eigenvalues ranging from 9.48 to 1.04 and accounted for 29% of the variance

in diligence; however, many of the items in the factors changed in the instrument.

Additionally, the factors themselves clustered differently and received new labels

(Bernard & Schuttenberg, 1995).

Factor I (Motivation) and Factor IV (Discipline) for the DI-HE remained the most

stable. The underlying theme of these two factors aligns with the intent of my research

study because the common definitions of motivation and discipline would be similar to

the transferable skill labeled diligence by the orthopaedic industry. The entire DI-HE

provided a reliability coefficient alpha of .900 and the DI-HS was .902, which suggest

that the instrument will continue to measure the construct diligence (Bernard &

Schuttenberg, 1995).

The new instrument study also established construct validity by the method of

known group difference. Groups known to be diligent and groups hypothesized not to be

diligent were given the instrument, and a significant difference in diligence occurred

(Bernard & Schuttenberg, 1995).

With the development of the DI-HE version, there was a slight modification to the

definition of diligence, which resulted in the definition used in this study: "Diligence is

defined as an expression or reflection of the steady, earnest, an energetic effort

expended" (Bernard & Schuttenberg, 1995, p. 99). Additionally, the modified five factors

became motivation, concentration and assimilation, conformity and citizenship,

discipline, and responsibility instead of motivation, concentration and assimilation,

conformity and responsibility, discipline, devotedness and spirituality. This modification

reduces the researcher's anticipation of the Christian college sample being relevant from

a holistic sense of diligence, but perhaps aligns the instrument more with the "effort" component emphasized. The new factors had scale reliabilities of .858 for Factor I (Motivation), .776 for Factor II (Concentration and Assimilation), .587 for Factor III (Conformity and Citizenship), .615 for Factor IV (Discipline), and .762 for Factor V (Responsibility) (Bernard & Schuttenberg, 1995).

Bennett (1994) replicated Bernard and Schuttenberg's 1995 study to further test the factor analytic structure of its scales, reliabilities, construct, and content validities of the DI-HE. Additionally, she wanted to keep attention on the interrelationships of the diligence characteristics, which were under a student's control. Like the current study, she tested the DI-HE against another personality variable, locus of control (Rotter, 1966). She found that there was no significant correlation between ability and diligence but did find a correlation between diligence and achievement. She also found a correlation between diligence and locus of control.

Results of the item analysis for Bennett (1994) compared favorably to the 48-item DI-HE (Bernard & Schuttenberg, 1995). Factor I (Motivation) of Bennett's research had loadings ranging from .626 to .389 on 13 items. Factor II (Organization) had factor loadings from .662 to .215 on 10 items. Factor III (Concentration and Assimilation) with 11 items had loadings from .545 to .323. Factor IV (Conformity) with 7 items had factor loadings from .598 to .237. Factor V (Devotion) had loadings from .635 to .266, but only had 4 items in the factor.

Cronbach's alpha reliability coefficient for Bennett's (1994) study was .905, which compared very well to the .904 in Bernard and Schuttenberg's study. Her five sub-scales range was from .486 to .868 compared to the Bernard and Schuttenberg study

(1995), which was .587 to .858.

Jasinevicius, Bernard, and Schuttenberg (1998) had concerns that parallel my

problem statement related to identifying students to admit into OSI when they said,

> With an increasing applicant pool and the escalating cost of professional education,
> the importance of predicting the performance of dental students cannot be
> overemphasized. Admission committees want to select students who will succeed,
> and student service personnel need methods of predicting and enhancing the success
> of students who may be in academic difficulty. (p. 294)

While their 1998 study refers to the selection process for dental school and not business

internships as in the current research, the role of the admissions committee in predicting

success is equally burdensome.

In their study, 190 dental students took the DI-HE (Jasinevicius et al., 1998).

After factor analysis, they eliminated five items and used a four-factor approach to

determine diligence. Factor I (Motivation) had 27 items with a coefficient alpha of .92.

Factor II (Concentration) had 15 times with a coefficient alpha of .82. Factor III

(Responsibility) had 4 items with a coefficient alpha of .60. Factor IV (Introspection) had

4 items with a coefficient alpha of .56. The total 50-item revised instrument had a

coefficient alpha of .92 (Jasinevicius et al., 1998).

They found females (n=55) had a significantly higher score than their male

(n=111) counterparts (190.82 versus 181.96; p=.012). Additionally, females also had

statistically higher scores for two subscales (Motivation and Responsibility) (Jasinevicius

et al., 1998).

My research study seeks to identify whether Bernard and Schuttenberg's (1995)

DI-HE as operationalized by the DI-HE instrument measures an element of "steady,

earnest, and energetic effort" (Bernard & Schuttenberg, 1995) that is different from the

MBTI dichotomy of judging ("J") and perceiving ("P").

Relationship Between Diligence and MBTI

While diligence is not articulated as overtly in the MBTI literature as it is in this study, there is similarity between many of the words used when describing individuals with a judging ("J") preference in MBTI vernacular and those used in describing diligence. The following are descriptors of the "Judging" orientation:

1. Work best when they can plan their work and work their plan

2. Avoid rushing before a deadline

3. Enjoy organizing and finishing tasks

4. Keep the focus on what needs to be completed, ignoring other things that come up

5. Feel more comfortable once a decision has been made on a thing, situation, or person

6. Seek structure and schedules

7. Like to make lists of things to do

8. Like to get work done before playing

9. Want to agree on schedules, timetables, and reasonable deadlines

10. Expect others to follow through and count on this

11. Focus on purpose and direction

12. Concentrate on task completion (Hirsh & Kummerow, 1998; Martin, 1997).

As noted previously, judging ("J") personality types use an approach that permits them to have reserves of energy and time and gives them the freedom to enjoy doing

things. The opposite dichotomy (perceiving "P") would not have the reserves available because deadlines are necessary for motivation. Judging personalities manage their time, responsibilities, and activities in a well-ordered way. They would suggest that if they were not organized, then effort and resources would be wasted. When a task is left unfinished, it creates tension for the "J" and this tension depletes energy that can be used to exert effort tending to other matters (Quenk, Hammer, & Majors, 2001; Thomson, 1998).

Not wanting to waste earnest effort, "Js" are challenged by the ambiguity and the uncertainty associated with change. They prefer to have every part of the change or transition as clearly defined as possible so that they can move through the whole process as efficiently as possible. Once "Js" are "on board" they will put forth great effort to complete the change (Barger & Kirby, 1995).

Literature Related to Selection and Admission

Thus far, reviewing the literature informed us regarding prior research about the MBTI, emotional maturity (see Yocum, 2007), and diligence. Additionally, it helped us understand how the constructs of emotional maturity and diligence are consistent with transferable skills in workplace settings. Our problem statement did not become clear, however, until we focused on the selection and admission of students in higher education programs.

Our studies focused on establishing an objective selection and admissions process for OSI, which required that we determine how other professional degree programs selected and admitted students. The research did not describe any academic programs in

which a formal admissions process was necessary for selection or continuation in the program. The research did, however, support the premise that various professional degree programs have an admission or selection process and that academic programs or disciplines do not.

One might define "profession" as those occupations that have in common the credentials (i.e., learned skills and formal knowledge) that require some degree of higher education and are prerequisites for holding a job (Freidson, 1986). To obtain these professional skills and knowledge, one would attend a professional school that "offers an intensive educational program composed of training both in the theory and practice of a distinct, specialized body of knowledge" (Brockmeyer & Fowler, 1982, p. 117). Professional degree programs, therefore, lead to occupations that are designed to achieve specific objectives or core sets of technical competencies (often connected to specialized accreditation standards); select and admit qualified students; require supervised praxis or internships; provide systematic evaluation before, during, and after training; and often produce graduates who obtain licensure or professional credentials necessary to practice (another form of "selection" and accountability) (Brockmeyer & Fowler, 1982; Moore & Urwin, 1991; Uno, Blackwell, & Leonardson, 1981).

The process of selection and admission to OSI evolved with the realization that the OSI Team was trying to transform a traditional academic program into a professional degree program in that it wanted to identify students with a set of technical skills they had acquired in their major and transferable skills they had acquired through life experiences. Specifically, the OSI Team sought to create a more objective set of selection and admission criteria to produce more valid, even more equitable, selection decisions (Riggs,

Riggs, & Sandlin, 1992) while recognizing that the fairness of a selection method rests on the fairness of the criterion used (Dobson, Krapljan-Barr, & Vielba, 1999).

In both undergraduate and graduate-level professional degree programs such as law, MBA programs, social work, medical school, priesthood, teacher education, graduate level psychology, physical therapy, nursing and dental hygiene, and public accountancy (Dawson, 1984; Dobson et al., 1999; Korman, Stubblefield, & Martin, 1968; Plante, Manuel, & Tandez, 1996; Ruscio, 1998; Seymour & Gramet, 1995; Shye & Aranya, 1975; Tatham, 1976; Uno et al., 1981; Younes, 1998), there was some level of formality or objectivity in the selection and admission of students.

The significance of the "gatekeeping" and selection process is to "guard the gate of the profession" by screening candidates to assure that only the best qualified and most suited enter the program, receive a responsible education, and subsequently exit the program into the profession (Moore & Urwin, 1991; Riggs et al., 1992). Likewise, the selection process for OSI will not be valid if it does not result in the selection of those students who will be the best fits within an orthopaedic internship.

Researchers have criticized the admission and selection process and note that, while criterion validation is desirable, many programs use selection criteria that have not been subjected to the necessary validation assessment (Riggs et al., 1992). While one aspect of the OSI screening and selection process has validated psychometric properties (Myers-Briggs Type Indicator), the remaining components of the process (i.e., referral, interview, class observation) do not. The Emotional Competence Inventory–University edition and the Diligence Inventory–Higher Education, for which psychometric properties exist, were introduced into the OSI selection process via our studies.

The selection and admission processes in professional degree programs yielded definitions, purposes, and concerns about admission processes that were helpful to us as we evaluated other professional degree programs' admission criteria against our own OSI programming needs. Additionally, various admission criteria emerged, many of which had relevance to the selection and admission of the OSI students discussed in our research.

Though discussing law and professional school admissions, Brockmeyer and Fowler (1982) defined admission as "the first-time selection of students from an applicant pool for enrollment, class membership and matriculation in an educational program of a professional school" (p. 117). This definition was similar to that used by the OSI Team: To select individuals from the current pool of Grace College students to participate in OSI activities and eventually obtain an orthopaedic internship.

There appeared to be a common purpose for the existence of admission standards regardless of the various criteria that professional degree programs use. For example, Younes (1998) noted that "similar admission standards may exist among professions with common underlying principles geared to safeguard the right of applicants to due process while attempting to balance the needs of educational institutions" (p. 147). To this end, professional degree programs have a selection and admission process regardless of the level of education (i.e., undergraduate or graduate). Ultimately, a distinction of professional degree programs is the "gatekeeping" process into, through, and exiting a program while considering the needs of both the student and the institution.

Without a careful gatekeeping process to determine a student's suitability for admission to a professional degree program, educators in these programs then have the

responsibility of producing the desired characteristics in students they admitted to the program that were absent upon entry (Roose, Mitchell, & Rudman, 1985). In the case of the OSI Program, this underscores our responsibility to accurately identify and select students who already possess the characteristics preferred by the Development Group rather than to produce those characteristics in students through their participation in the OSI Program. Consequently, the literature review supported our need to develop an admission or gatekeeping process to identify students who already possessed these characteristics.

Concerns emerged, however, about the selection and admission of students in professional degree programs. For example, Roose, Mitchell, and Rudman (1985) expressed concern that most teacher education programs do not regularly attract academically capable students and, without a strong selection process, risk preparing individuals who do not possess the qualities necessary to meet the demands of rigorous professional degree programs or the profession itself. Likewise, if the OSI Team failed to accurately identify students for selection and admission into OSI, we would risk placing students in orthopaedic internships for which students were unprepared and with whom the orthopaedic companies were dissatisfied.

In addition to definitions, purposes, and concerns about the admission process in professional degree programs, the research included discussion about the tools used in the admission process. Though the explicit distinction between screening tools (e.g., reference letters and interviews) and admission criteria (Miller & Koerin, 1998) is beyond the scope of our research, examination of the research related to the student selection and admission criteria for professional degree or training programs indicated

that both quantitative and qualitative tools are used. These tools are generally categorized as academic (e.g., the GRE, GPA, SAT, GMAT, CPA exam, grades in specific courses, speaking and writing samples) and non-academic (e.g., applications, personal essays, references, supervisor evaluations, faculty interviews, faculty observation in the classroom, community service, admission committee decisions) in nature. The level of contact between the student-applicant and faculty (or the interview requirement) may be a function of program or enrollment size whereby smaller institutions have greater use of the personal evaluation and are more capable of selectively admitting students based on established selection criteria (Uno et al., 1981).

One caveat surfaced regarding the use of established selection criteria, particularly that which is standardized or quantitative in nature. Boyatzis (2002) suggested that "the overemphasis or reliance on measures of selected competencies for screening applicants," and the convenience of doing so, might result in our students becoming what we measure (p. 161).

While non-academic traits such as personality, maturity, disposition, and professional values were used as criteria for selection and admission, there appeared to be neither a standardized measure of these characteristics nor agreement on the predictive validity of these non-academic traits. For example, Miller and Koerin (1998) noted that few studies examining the relationship between admissions criteria and student performance have emphasized non-academic variables. It is understandable, however, why selection may be heavily biased toward academic criteria since this criteria may have greater face validity and may correspond more closely with a graduate's job description (Ruscio, 1998; Uno et al., 1981). Whereas the literature noted the difficulty in

understanding the relationship between work performance and personality characteristics, the predictive validity of non-academic characteristics such as emotional maturity and diligence was not the focus of our research. Instead, we focused on the presence or absence of these characteristics, not the relationship between those characteristics and students' actual performance.

Objective criteria in the admission process were often used; however, there was not agreement among researchers regarding the level of effectiveness of qualitative and non-standardized measures when admitting students to professional degree programs. For example, some researchers suggested that quantitative measures alone may be insufficient selection mechanisms (Shye & Aranya, 1975). In fact, some researchers suggested that in many programs, intuitive, convenient, or common sense criteria and predictors were used in selection and admission criteria (Riggs et al., 1992), or even *should* be used (Paolillo, 1982; Shye & Aranya, 1975), to make individualized admissions decisions, but warned that professional judgments must be accompanied by clear, nondiscriminatory, and non-arbitrary interpretations (Cole, 1991; Moore & Urwin, 1991; Younes, 1998). While intuition and common sense criterion seemingly have their place in the selection and admission process, these over-emphasized aspects of the OSI selection and admission process subsequently resulted in our studies.

Whether or not to use standard, quantitative, or academic measures versus non-standard, qualitative, or non-academic measures was unclear. For example, researchers noted that while non-standard admission criteria such as reference letters had little value, faculty interviews were the best predictors of student performance (Miller & Koerin, 1998). In contrast, other research suggested that even using an intensive admission

process, including an interview, may not identify students with characteristics that make them suitable for admission (Vigilante, 1983). Likewise, trusting the ability of the educator to evaluate students' ability to perform in the classroom setting may produce data that can be used as selection criterion (Riggs et al., 1992). Additionally, even with the identification of a variety of selection criteria, the ability of these criteria to objectively select candidates (Riggs et al., 1992), their merit in screening applicants for admission (Paolillo, 1982), or their usefulness in predicting candidates' success in a specific program (Dobson et al., 1999) or after graduation (Uno et al., 1981) has been questioned. Ultimately, the use of multiple tools in the decision-making process may prove most useful, particularly when factors such as maturity and emotional stability contribute to achievement (Miller & Koerin, 1998, p. 3).

The OSI Team, therefore, questioned whether the MBTI alone could profile the desired qualities for students' selection into OSI. Ruscio's (1998) criticism of the predictive validity of a standardized test, the GRE, related to the fallible nature of the criteria used, specifically the unreliability of faculty ratings because of subjective and retrospective biases. Ruscio (1998) asserts that the "large intercorrelations among all of the ratings provide strong evidence for a halo effect" (p. 569), so it was not surprising that grades correlated with faculty's global impression of each student given that the same faculty members assigned both the grades and the ratings. This criticism is particularly salient to the OSI selection and admission process because it is plausible that, despite OSI Team concerns about the specific characteristics of a student, he or she may be particularly well-liked by the OSI Team (i.e., have enough compensating factors) and thus accepted into OSI despite these concerns.

Ruscio (1998) questioned whether "alternative assessments of ability, such as tests of creative or practical skills" (p. 569), could predict meaningful outcomes better than the GRE, though, as Uno, Blackwell, and Leonardson (1981) asserted, "it will only be possible to identify relevant student selection criteria after the determination and quantification of the criterion variable of . . . performance is made" (p. 321). It became clear to us that, while on the one hand the tool that we intended to use in the admission and selection of OSI students—the MBTI—was an objective descriptor of type preferences and a standardized instrument, on the other hand it was merely descriptive of students' characteristics rather than a measurement of those characteristics. Further, we were not certain that the MBTI even measured the characteristics that concerned us— emotional maturity and diligence—let alone the amount of the characteristic.

Selection and admission decisions pose difficulties for specialized programs such as OSI that require both technical skills and transferable skills. Both skill sets are desirable, but while academic ability may be more objective, personal characteristics and professional potential may be difficult to evaluate yet critical to the admission process (Macy, Turner, & Wilson, 2000). To the OSI Development Group, the personal characteristics of emotional maturity and diligence were critical in the admission of students.

Summary of Chapter 2

The MBTI has been used on the Grace College campus for several years and has been routinely administered to our college freshmen. Additionally, several faculty and staff are certified in its administration, including two members of the OSI Team. Because

we were familiar with the MBTI and because it was already administered to our college freshmen, we looked first to this instrument as a tool to determine emotional maturity and diligence in our OSI students.

The MBTI consistently describes equally valuable categories of personality preferences to which individuals already belong. These categories are related to individuals' sources of energy, perception, judgment, and orientation to the outside world. We wanted to determine whether the MBTI categories and descriptors would enable us to identify those students who possessed the characteristics desired by the Development Group: emotional maturity and diligence. We were not attempting to identify the degree to which students possessed these characteristics, merely whether or not the characteristic described the students.

The MBTI vocabulary (see Table 1) used to describe type preferences proved useful to understanding the characteristic of diligence. The concept of diligence is comprised of specific behaviors, many of which were reflected in the MBTI descriptors such as "organized" and "setting goals." While the MBTI literature described behaviors that seemed consistent with diligence, it did not clearly suggest that the MBTI instrument would determine the presence or absence of diligence in students admitted to OSI.

In contrast, the concept of emotional maturity is concerned with the level to which an individual has already developed the opposite preference and can use that opposite depending upon the context. While the MBTI literature provided a theoretical understanding of type, type preference, and the development of opposites, it did not indicate the way in which an individual's actual development or use of the opposite preference could be determined.

It was also necessary to research transferable skills, a concept that the Development Group used in describing the characteristics they desired in new employees and interns. We identified that business and industry commonly used the concept of transferable skills. Further, while the specific terms of "emotional maturity" and "diligence" were not used specifically, they were consistently described in terms that reflected the intent of our two constructs.

There was similarity between the language used about transferable skills and our two constructs of emotional maturity and diligence. This similarity was helpful as we considered how our constructs might be described in a workplace context versus an educational context. As discussed in our conceptual framework, the emphasis in higher education has been on theory, but the emphasis in the workplace has been on practice; employers want employees who can "do" something with the knowledge they have. Regardless of whether higher education is essentialist or perennialist in nature, however, educators must assist students in understanding what employers want in terms of technical skills and transferable skills.

The particular construct reviewed for this research was the "steady, earnest, and energetic effort" (Bernard, 1995, p. 99) of an individual. This action-oriented focus to be persistent and vigilant was labeled diligence and was desired by the orthopaedic industry as a characteristic of students in the OSI Program. Diligent students are the types of students the OSI Team wants to identify through a selection method for admission to the Orthopaedic Scholar Institute. Thus, our focus was narrowed to four action-oriented constructs that were similar to diligence, as defined in this study. The four constructs reviewed were self-efficacy, striving, volition, and conation.

Bernard and Schuttenberg (1995) adapted the original instrument for use with college students, which was the target population in this study. The relationship between the definition of diligence and the MBTI was reviewed. The study of diligence and MBTI raised the question of whether the DI-HE would measure diligence within an individual regardless of MBTI type or whether the DI-HE and MBTI identified similar constructs and would be duplicative tests in the selection and admission process. For a review of the construct emotional maturity, please see Yocum (2007).

A problem arose in trying to determine how to select emotionally mature and diligent students for the OSI Program. The general method of referring students to OSI was subjective and intuitive and produced a cohort of students who were predominantly "ISJs," which did not represent the various MBTI types as we expected. Subsequently, we questioned whether the MBTI alone could identify emotionally mature and diligent students or whether there were other established protocols for admission to a program that we could use. Because the OSI Consultant was familiar with professional education admission requirements, we focused on admission and gatekeeping processes related to professional education programs.

We discovered that while some type of admission process existed in professional degree programs, there was no common procedure among these programs. The only commonality appeared to be their use of multiple tools in their admissions processes including those who were academic and non-academic and those who were standardized and non-standardized. We already used multiple tools in the selection and admission process to OSI (i.e., the MBTI, an interview, faculty referral). The research related to selection and admission of students supported our use of multiple tools in the admission

of students to OSI, including multiple standardized measures.

The literature review informed our methodology because we decided that multiple standardized measures would more likely help us determine the presence of emotional maturity and diligence in OSI students than the MBTI alone. We evaluated whether the ECI-U and the DI-HE provided information that was the same or different from that provided by the MBTI.

CHAPTER THREE

METHODOLOGY

Introduction

Our two studies intend to identify (a) the relationship between student diligence and MBTI type preferences and (b) the relationship between emotional maturity (Yocum, 2007) and MBTI type preferences. The methodology for our research was exactly the same; therefore, chapter 3 presents the setting for our studies, a description of our population and sample, rationale for the use of this group, a description of our research design and data collection procedures, and a summary of the analysis used in these studies. The instruments unique to each study, the ECI-U and the DI-HE, are discussed only in the study in which the data from that instrument were used.

The Setting

The setting for these studies was Grace College, the only undergraduate institution of arts and sciences affiliated with the Fellowship of Grace Brethren Churches. Founded in 1948, the college has experienced a consistent and healthy growth since that time. In 1999, Grace College was re-accredited for 10 years by the North Central Association of Colleges and Schools and will have its next comprehensive visit during the 2008-2009 academic year. Grace College is also accredited by the Association of Christian Schools International.

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The Fellowship of Grace Brethren Churches with which Grace College is affiliated was organized in 1939 with 75 churches and currently represents over 300 congregations. The Fellowship's evangelistic and missionary outreach can be seen worldwide by the work of the Grace Brethren North American Missions and the Grace Brethren International Missions, both located in Winona Lake, Indiana.

Grace College is located in north-central Indiana in the small, rural town of Winona Lake in Kosciusko County. There are no metropolitan areas in Kosciusko County. Winona Lake is located about 40 miles west of Ft. Wayne, 50 miles southeast of South Bend, and 120 miles north of Indianapolis and east of Chicago. Winona Lake has a population of almost 4,000 and is adjacent to Warsaw, the county seat, which has a population of approximately 12,000.

The College serves primarily the needs of students in the Midwest states of Indiana, Michigan, Ohio, Illinois, and Pennsylvania. Those from Grace Brethren churches comprise only 35% of the student population. The College does not limit its recruitment or admissions to students from specific religions, geographical areas, or ethnic, social, and cultural backgrounds.

All campus activities at Grace College are aimed at developing character, competence, and service in students. The goal in Christian living and in Christian teaching is to make Christ preeminent in all things. Students learn to do this by living, studying, working, and worshiping with other young people who share similar Christian ideals. The provisions and programs of the college, as well as its community lifestyle, are designed to encourage serious academic stimulation, wholesome recreation and relaxation, spiritual growth, and development in the social graces. Grace College seeks to

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aid individuals to become competent in intellect, expression, physical development, spiritual understanding, Christian conduct, and social conscience (Grace College, 2003-2005).

Population and Sample

The population for these dissertation studies was the 65 freshman men and 108 freshman women (173 total) at Grace College, a Midwestern, private, Christian liberal arts college, who took the MBTI in the fall of 2004. The sample was the 44 men and 83 women (127 total) who participated in the dissertation research. This sample represents 73% of the total population.

Participants' MBTI types were provided to us by the Student Development Office, which administered and scored the inventory prior to our research. The MBTI types of the participants were labeled as a demographic and are discussed in the description of the sample in chapter 4. Gender was determined by observation and labeled as "male" or "female."

The freshman class entering Grace in the fall of 2004 was chosen for the population because they were the actual group from which OSI would draw its 2007-2008 cohort (juniors). While it was conceivable that a transfer student could enter the population at a later date, the overwhelming majority of the cohort was already on campus. Consequently, identifying the industry-driven criteria of diligence and emotional maturity in this cohort was the first step in a multi-year, invitation-to-apply process for the Orthopaedic Scholar Institute.

The MBTI was used as opposed to other personality indicators because it was the

institutional standard at Grace College and, because of its frequent use in organizational training, it supports the industry-driven nature of OSI.

When the OSI Team began recruiting for OSI, they asked for faculty referrals of students who were diligent and emotionally mature, a reflection of the transferable skills discussed in the literature review and communicated by the orthopaedic representatives in the planning stages of OSI. The result was a group of predominantly "ISJ" (introvert, sensing, judging) students. Consequently, the OSI Team began to question whether diligent and emotionally mature students, as they defined them, were primarily ISJs on the MBTI. My research questions focused on whether the MBTI was a sufficient tool to measure diligence or whether the DI-HE instrument would provide greater accuracy.

Main Research Questions

The four main research questions for my study are:

1. What is the relationship between MBTI type (as measured by "SJ" [sensor and judger] and "NP" [intuitor and perceptor]) and diligence level (as measured by the DI-HE) among freshmen?

2. Are there significant differences in diligence by MBTI type "S" (sensor) and "N" (intuitor)?

3. Are there significant differences in diligence by MBTI type "J" (judger) and "P" (perceptor)?

4. Are there significant differences in diligence by gender?

Main Null Hypotheses

1. There is no significant difference in the diligence level of freshmen by MBTI

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type "SJ" (sensor and judger) and "NP" (intuitor and perceptor).

2. There is no significant difference in diligence level by MBTI type "S" (sensor) and "N" (intuitor).

3. There is no significant difference in diligence level by MBTI type "J" (judger) and "P" (perceptor).

4. There is no significant difference in diligence level by gender.

Instrumentation

Dr. Hinsdale Bernard, principal author, provided permission to use the Diligence Inventory–Higher Education (DI-HE). Bernard (1991) developed the original Diligence Inventory for high-chool students and later developed an inventory specifically designed for higher education (Bernard & Schuttenberg, 1995). The DI-HE is a modified version of the Diligence Inventory–High School (Bernard, 1991). The Bernard and Schuttenberg study (Bernard & Schuttenberg, 1995) found strong validity and reliability scores for the university version.

The Diligence Inventory was used because it would add to the knowledge base of DI-HE. Additionally, it emphasized the effort and striving component that was significant to the definition of diligence used in this dissertation study.

The DI-HE is comprised of five scales that, together, yield a composite diligence score: motivation, concentration and assimilation, conformity and citizenship, discipline, and responsibility. The instrument measures these elements of diligence using 55 statements that correspond to these five scales. The scales and their corresponding characteristics are noted in Table 4.

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Table 4

Diligence Inventory–Higher Education Scales and Characteristics

Scale	Characteristics
1. Motivation	Drive to get started and persist along a certain course of action with an intended result in mind
2. Concentration and assimilation	Focusing attention on a problem, task, or impending situation
3. Conformity and citizenship	Maintaining harmony with the customary behaviors expected in an organized setting by demonstrating maturity and respect for supervisors and peers
4. Discipline	Training of the will
5. Responsibility	Fulfilling assignments and obligations in a timely and thorough manner

Note. From *Diligence Inventory–Higher Education Self-Analysis form*, by H. Bernard and E. M. Schuttenberg, 1994.

Each of the 55 questions on the DI-HE are answered based on the "percent of the time" subjects believe they represent the given statement. The Likert scale includes responses that designate "never/rarely" (0 to 15% of the time), "occasionally" (16 to 35%), "sometimes" (36 to 65%), "usually" (66 to 85%), and "almost always" (86 to 100% of the time). Each declaration receives a score of 1, 2, 3, 4, or 5 depending on the percentage of time the frequency of each statement (1 equals never/rarely and 5 equals almost always).

Factor analysis was conducted to estimate how the composition of the DI-HE and factor loadings of each item on the scales compare with the results of the use of this instrument with the original population. Bernard and Schuttenberg (1995) recommended

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duplication of their original study "in the interest of examining the stability of the factor structure across diverse populations" (p. 99). This provides support for the construct validity of the DI-HE.

Research Design

Both of our studies employed an ex post facto design, also referred to as a causal-comparative study (Patten, 2004). This non-experimental research design occurs after the conditions to be studied have occurred (Vogt, 1993) and involves observing and describing a current condition and trying to identify possible causes of conditions (Patten, 2004).

A causal hypothesis is a bold claim, but difficult to confirm definitively since an apparent cause may be coincidental to the true cause or may even be a result (Patten, 2005; Schloss & Smith, 1999). Although the causal-comparative method has more potential pitfalls than the experimental method, it is often the best researchers can do when attempting to explore causality (Patten, 2004). Additionally, according to Royse (2004), it is possible to put too much importance on statistical significance thereby forgetting about the practical significance, which, in the case of these research studies, is equally important when evaluating the findings.

Procedure

Collection of the data for both dissertations was completed simultaneously; therefore, the discussion about the data collection procedure includes reference to both the DI-HE and the ECI-U.

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Human Subjects Review

Permission was obtained from the administration at Grace College (Appendix A) and from the human subjects review board at Andrews University (Appendix A) to administer the DI-HE and the ECI-U to freshman students. Consent to participate in this dissertation research was also obtained from the subjects (Appendix A). When the MBTI was administered by the institution in the fall of 2004, students provided written consent to permit access to their names and Myers-Briggs Type Indicator types from the Student Development office, which administered the inventory.

Data Collection and Recording

The data collection event was publicized on campus through a chapel announcement, personal invitations through campus mail (Appendix A), email notices, and in a liberal arts course required of all freshmen. The invitations gave students instructions as to the place, time, process, purpose, and use of the dissertation research data. After arriving at the testing site and signing the release statements, students first took the paper-pencil DI-HE followed by the online ECI-U (see Yocum, 2007).

The participants were tracked in order to send follow-up invitations to students who had not yet taken the inventories. An alternate day using the same location was secured for these students.

All participants arrived at a reserved campus computer lab comprised of two rooms: one with tables and chairs and one equipped with computers. They were first given a brief overview of the Informed Consent and asked to read and sign it. Students were assigned a participant number, which was recorded on their DI-HE score sheet and

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also used as their online ECI-U password. The researchers transcribed the MBTI scores obtained from the Student Development office onto the datasheet along with the gender of the student and the participant number.

Participants were then verbally instructed on the nature and purpose of the DI-HE and how to take the inventory. While the participants completed the DI-HE, they were added as participants to the online ECI-U inventory using the instructions provided by Hay Resources Direct. When students completed the DI-HE, they submitted their score sheets and received verbal instructions on how to complete the online ECI-U.

Students accessed the ECI-U online through their email accounts. The researchers had added participants to the ECI-U system by entering their logins and passwords, which subsequently generated an email invitation to participate via their Grace College campus email account.

Students then immediately completed the ECI-U inventory onsite in the computer lab. They received their scores immediately and, because the ECI-U is online and password protected, were instructed on how to access their scores indefinitely and at their convenience. It took most students approximately 20 total minutes to complete both the DI-HE and ECI-U inventories.

We requested permission from the students at the time they took the MBTI (fall 2004) to obtain those scores from the Student Development Office (Appendix A). The release statements communicated that, while the researchers may know some of the students' names, identifying information was not significant to either of the studies and any connection between specific names and data would be destroyed.

Students were provided incentives to participate. They received a coupon of

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minimal value for use at the campus coffee bar or café cart as well as extra credit in a liberal arts course that stressed scholarship and service upon providing verification of participation.

Responses on the ECI-U were recorded on a Likert scale of 1 to 5. Each of the competencies, therefore, was scored on a scale of 1 to 5. The scores describe results as strengths (scores of 4 and higher), areas for growth and development (scores of 3 or less), and competencies that are demonstrated at times (scores of 3-4). If a participant scored 3 or higher, he or she has demonstrated the competency at least some of the time and would find it easier to increase his or her use of it. Strengths are those competencies in which individuals scored 4 or above, and areas for growth and development are those competencies in which they scored below level 3 (Hay Group, 2002).

The online ECI-U scores were available in several reporting formats. The Survey Status Report, used primarily for administrative purposes, indicated the participant's name, login and password, email address, date the email invitation was sent, and when the survey was completed.

The Participant Score Report noted the names of all the participants and their average scores for each of the competencies within each of the four clusters. These scores were highlighted as strengths or areas for development.

The online ECI-U allowed for extraction of participant item scores to a spreadsheet. Because emotional maturity, as defined in this dissertation study, included just the competencies in the first cluster, not all the items were extracted for data entry in statistical software.

Though the ECI-U provides the opportunity for external raters to score the

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participants, the Group Participant Score (a roll-up aggregate of these external raters' scores) was not used. The researchers determined that the participants' self-report was sufficient and more reflective of the current OSI selection and admission process, so did not include this secondary evaluation.

The DI-HE scores were scanned and the resulting data tabulated in statistical software in preparation for analysis.

Statistical Analysis

A one-way analysis of variance (ANOVA) was performed on the variables and a factor analysis on the DI-HE scales. An F test was performed to determine statistical significance. An eta^2 was performed to determine practical significance.

Summary of Chapter 3

Our research was conducted at Grace College because the OSI Program, a new initiative funded by the Lilly Endowment Corporation, required an admissions process. The incoming freshman class of 2004-2005 constituted our population, and 127 of those students chose to participate in our research. Our rationale for the use of this population is because they are the very students who are eligible for selection and admission to OSI.

We chose an ex-post facto design for our method because the OSI Program had already been implemented and two cohorts of students had already been selected to participate in OSI. We collected the data for both of our studies simultaneously because it seemed most efficient to have freshmen take both the DI-HE and ECI-U consecutively since the completion of both inventories required less than 30 minutes of participants' time.

CHAPTER FOUR

FINDINGS

Introduction

The primary purpose of my research was to determine the relationship between participants' MBTI preferences, gender, and diligence. This was accomplished by administering the DI-HE and analyzing the relationship between these variables.

This chapter presents the results of my research. The first section highlights the demographics of the sample. This is followed by the factor analysis of the diligence inventory. The final section analyzes the findings in the relationship between MBTI preferences and gender to diligence. For a review of the findings to determine the relationship between participants' MBTI preferences, gender, and emotional maturity, please see Yocum (2007).

Demographics of Sample

Out of a possible 173 freshmen eligible to participate in the research studies, 127 freshmen (73%) participated. The sample included 83 women and 44 men, which was representative of the actual ratio of women to men on the Grace College campus at that time.

The sample included 53 introverts ("I") and 74 extroverts ("E"), 42 intuitors

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("N") and 85 sensors ("S"), 64 judgers ("J") and 63 perceptors ("P"), 42 intuitor–sensors ("IS"), 31 extrovert–intuitors ("EN"), 53 sensor–judgers ("SJ"), and 31 intuitor–perceptors ("NP").

Table 5 shows the MBTI preferences and the gender of the participants. Some participants had combinations of dichotomies that were not analyzed. These included 54 extroverted–sensors ("ES") or introverted–intuitors ("IN") and 43 sensor–perceptors ("SP") or intuitor–judgers ("NJ").

Factor Analysis of the Diligence Inventory

Initial random correlations of items that the DI-HE (Bernard & Schuttenberg, 1995) stated should be correlated were tested by me to determine whether the data had initial face validity. These random correlations proved to be strong. Additionally, items that should not have correlated because they loaded separately in the five factors in the 1995 study did test with very low correlations in my current study. As in the original DI-HE testing (Bernard & Schuttenberg, 1995) the five-factor model proposed by Bernard appeared to hold true.

An a-priori criterion factor analysis was completed, therefore, using an un-weighted least square Equamax rotation and maximum likelihood extraction. The five factors had eigenvalues of 11.253, 2.572, 1.885, 1.5, and 1.47, which accounted for 34% of the variance. Because all of the resulting eigenvalues were greater than 1, this supported the use of five factors (Heppner & Heppner, 2004; Kaiser, 1958).

Table 5

Description of Study Sample

Gender	N	Percentage
Male	44	35
Female	83	65
Orientation of Energy		
(I)ntrovert	53	42
(E)xtrovert	74	58
Processes of Perception		
I(N)tuitor	42	33
(S)ensor	85	67
Orientation to the Outside World		
(J)udger	64	50
(P)erceptor	63	50
Orientation of Energy and Processes of Perception		
IS	42	33
EN	31	24
Other (ES, IN)	54	43
Processes of Perception/Orientation to Outside World		
SJ	53	42
NP	31	24
Other (SP, NJ)	43	34

For an item to warrant interpretation as a valuable contributor to a factor, the Child's (1979) standard of .30 was used. The previous studies (Bennett, 1994; Bernard, 1991; Bernard, Rak, & Antonini, 1995; Bernard & Schuttenberg, 1995; Bernard et al., 1993) and my initial review provided confidence that within these five factors, the diligence construct was being measured.

Different samples produced different loadings because the source of common variance for a factor was not the same across the samples. The study upon which my replication was based (Bernard & Schuttenberg, 1995) consisted of a sample of college students from freshman to doctoral levels. My dissertation study represented only freshmen.

I compared the factor analysis results of my study with the results of the original study (Bernard & Schuttenberg, 1995). Bernard (1995) had recommended this "replication of [the original] study in the interest of examining the stability of the factor structure across diverse populations" (p. 99). The comparative analysis revealed that common factors were present. Similar items from the original study, five altogether (4, 10, 16, 37, 52), did not load sufficiently into one of the five factors in the current study. Two items (34, 36) did load, minimally, at .302 and .438 respectively in this dissertation study. Items 34 and 36 did not load in the 1995 DI-HE.

After eliminating the items from my current study (4, 10, 16, 18, 30, 37, 43, 45, 50, 51, 52) that did not load sufficiently in one of the five factors based on Child's (1979) criteria of .30, communalities of each factor were obtained by extracting a factor from each of the five factors to determine the communality of each item within the factor. Table 6 notes the rotated factor loadings of the items on the five diligence factors.

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Table 6

Rotated Factor Loadings of the Items on Five Factors in Diligence

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4	FACTOR 5
Q44	.715				
Q48	.632				
Q42	.594				
Q33	.585				
Q35	.557				
Q53	.554				
Q5	.458				
Q8	.396				
Q6	.379				
Q7	.375				
Q24	.359				
Q31	.339				
Q23		.765			
Q1		.617			
Q17		.554			
Q25		.543			
Q55		.498			
Q46		.464			
Q49		.459			
Q47		.429			
Q26		.394			
Q34		.302			
Q44			.639		
Q38			.533		
Q28			.476		
Q2			.433		
Q20			.429		
Q13			.419		
Q32			.414		
Q22			.390		
Q54			.379		
Q14			.349		
Q19				.570	
Q27				.524	
Q9				.503	
Q15				.446	
Q21				.364	
Q41					.767
Q36					.438
Q29					.412
Q12					.394
Q11					.380
Q3					.356
Q39					.303

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Factor I, in both my replicated study and the original Bernard and Schuttenberg

(1995) study, is named Motivation. Twelve items loaded in this factor with a range from

.339 to .715 as noted in Table 7. The current factor remained remarkably true to the

original Motivation factor from the 1995 study in that nine of the original items loaded

showed the items that loaded in the DI-HE study. See Table 8.

Table 7

Factor I (Motivation) Loadings and Communalities for the Items in the DI-HE for the Current Study

Item Number	Item	Factor Loading	Communality
40 [a][b]	I do not find it difficult to complete all my assignments.	.715	.560
48 [a][b]	I do not find it difficult to sustain attention to my academic work.	.632	.573
42 [a][b]	When a course is too difficult I do not settle for a passing grade.	.594	.332
33 [a][b]	I find myself prepared for tests as I would like.	.585	.413
35 [a][b]	I finish projects that I start.	.557	.414
53 [a][b]	I don't have difficulty settling down to my studies outside of class.	.554	.525
5 [b]	I take time to complete all my assignments.	.458	.267
8 [a][b]	I have no problems with taking organized class notes.	.396	.208
6 [a]	I think I get enough rest.	.379	.137
7 [b]	I am able to motivate myself to do my class assignments.	.375	.260
24 [a]	I have regular eating habits.	.359	.188
31 [a]	I do not get upset over the amount of academic work I have to do.	.339	.085

Note. Adapted from "Development of the Diligence Inventory–Higher Education Form," by H. Bernard and E. M. Schuttenberg, 1995, *Journal of Research and Development in Education, 28*, p. 93.
[a] Reversed items. [b] Corresponding item from DI-HE.

Table 8

Factor I (Motivation) Loadings and Communalities for the Items in the DI-HE for Bernard and Schuttenberg (1995) Study

Item Number	Item	Factor Loading	Communality
35[a]	I finish projects that I start.	.562	.420
53[a]	I don't have difficulty settling down to my studies outside of class.	.538	.520
40[a]	I do not find it difficult to complete all my assignments.	.536	.435
42[a]	When a course is too difficult I do not settle for a passing grade.	.531	.414
33[a]	I find myself prepared for tests as I would like.	.527	.426
5	I take time to complete all my assignments.	.503	.503
48[a]	I do not find it difficult to sustain attention to my academic work.	.486	.446
17	I make sure that all my assignments are done correctly.	.461	.551
49	I try to do outstanding work in all my classes.	.450	.586
55	I work very hard to get good grades.	.444	.526
7	I am able to motivate myself to do my assignments.	.392	.458
8[a]	I have no problems with taking organized class notes.	.316	.285
32	My family and friends see me as very organized for college/ university.	.298	.384

Note. From "Development of the Diligence Inventory–Higher Education Form," by H. Bernard and E. M. Schuttenberg, 1995, *Journal of Research and Development in Education, 28,* p. 96.
[a] Reversed item.

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Factor II was named Concentration and Assimilation in the original study. I called

Factor II in my study the same name, Concentration and Assimilation, because the theme

of the factor remained consistent. Four items were the same in this study (23, 1, 25, 26),

and the remaining items that loaded in this factor in this dissertation study still

communicated that focus or concentration was valued by the participants. For instance,

item 46, "Even when I'm tired, I try to complete my assignments," and item 17, "I make

sure that all my assignments are done correctly," demonstrate an extra level of focus

related to the task. Table 9 outlines my current items in Factor II. Table 10 shows the

items that loaded in the DI-HE study

Table 9

Factor II (Concentration and Assimilation) Loadings and Communalities for the Items in the DI-HE for the Current Study

Item Number	Item	Factor Loading	Communality
23 [b]	I strive to do my assignments to the best of my ability.	.765	.763
1 [b]	I want to do the best I can in college/university.	.617	.415
17	I make sure that all my assignments are done correctly.	.554	.570
25 [b]	I set high standards for myself at college/university.	.543	.484
55	I work very hard to get good grades.	.498	.459
46	Even when I'm tired, I try to complete my assignments.	.464	.323
49	I try to do outstanding work in all my classes.	.459	.398
47	I follow a budgeting and accounting system for my finances.	.429	.175
26 [b]	I like my assignments to look neat and tidy.	.394	.385
34	I seek feedback from my professors and/or academic advisors concerning the progress I am making in college/university.	.302	.082

Note. From "Development of the Diligence Inventory–Higher Education Form," by H. Bernard and E. M. Schuttenberg, 1995, *Journal of Research and Development in Education, 28*, p. 97.
[b] Corresponding item from DI-HE.

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Table 10

Factor II (Concentration and Assimilation) Loadings and Communalities for the Items in the DI-HE for Bernard and Schuttenberg (1995) Study

Item Number	Item	Factor Loading	Communality
15	When I am studying a topic, I try to make all the ideas fit logically.	.599	.404
27	I try to see the relationships between what I am studying and what I already know.	.578	.439
26	I like my assignments to look neat and tidy.	.456	.502
25	I set high standards for myself in college/university.	.451	.551
11	I proofread assignments before turning them in.	.404	.420
23	I strive to do my assignments to the best of my ability.	.399	.560
1	I want to do the best I can in college/university.	.334	.351
54	I like to have quiet moments to plan my strategies for academic success.	.311	.343
12	I take time to admire the things of nature.	.308	.243

Note. From "Development of the Diligence Inventory–Higher Education Form," by H. Bernard and E. M. Schuttenberg, 1995, *Journal of Research and Development in Education, 28*, p. 97.

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Factor III was renamed Structured and Disciplined in my current study because it was a blend of Factor III: Conformity and Citizenship and Factor V: Responsibility from the original 1995 study. Clearly, the conformity aspect of the 1995 Factor III was evident with three items carrying over to my dissertation study (44, 28, 22). However, four items were evident from Factor V: Responsibility from the 1995 study, but presented in my dissertation study's Factor III. Items 38, 2, 20, and 14 seem to indicate that my current sample demonstrated respect to supervisors through responsible behavior. Table 11 shows the items loading in Factor III of my current study. Table 12 shows the items that loaded in the DI-HE study under Factor III.

Factor IV was renamed Application and Connection. Three of the five items in my current study loaded in Factor V: Responsibility from the 1995 DI-HE study. When combining the remaining items and excluding the items that loaded in Factor III for my dissertation study, but were from Factor V: Responsibility (Bernard & Schuttenberg, 1995), the general sense of Factor IV in my current study was on the freshmen's desire to use learning in a thorough or applied manner. Table 13 outlines the items loading in Factor IV. While none of the items loaded in the original Factor IV: Discipline, Table 14 shows the items that loaded in the 1995 DI-HE study for information purposes.

Factor V had seven items and was named Commitment and Appreciation. Two of the remaining items from the original study (seven loaded in the current Factors III and IV) loaded in my dissertation study's Factor V. Several items emphasized an action because of the respondent's appreciation for an expected or anticipated outcome. Table 15 displays the items in Factor V. Table 16 shows the items that originally loaded in Factor V: Responsibility in the DI-HE study (Bernard & Schuttenberg, 1995).

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Table 11

Factor III (Structured and Disciplined) Loadings and Communalities for the Items in the DI-HE for the Current Study

Item Number	Item	Factor Loading	Communality
44 [b]	I like to do what my professors tell me to do promptly.	.634	.350
38	I do my assignments as soon as I get them.	.533	.539
28 [a] [b]	Professors don't think I give them a hard time.	.476	.103
2	I make constructive use of my leisure time.	.433	.397
20	I do my academic assignments before spending time with family and friends.	.429	.473
13 [a]	I can find time to extra credit assignments.	.419	.127
32	My family and friends see me as very organized for college/ university.	.414	.462
22 [a] [b]	I think it is necessary to inform my family/superiors about my whereabouts.	.390	.092
54	I like to have quiet moments to plan my strategies for academic success.	.379	.259
14	I review my notes before the next class.	.349	.157

Note. From "Development of the Diligence Inventory–Higher Education Form," by H. Bernard and E. M. Schuttenberg, 1995, *Journal of Research and Development in Education, 28,* p. 94.
[a] Reversed items. [b] Corresponding item from DI-HE.

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Table 12

Factor III (Conformity and Citizenship) Loadings and Communalities for the Items in the DI-HE for Bernard and Schuttenberg (1995) Study

Item Number	Item	Factor Loading	Communality
22[a]	I think it's necessary to inform my family/superiors about my whereabouts.	.465	.256
43	I try to turn in my academic assignments on time.	.419	.423
50	I tend not to have conflicts with my superiors/advisers.	.406	.359
44	I like to do what my professors tell me to do promptly.	.393	.393
28[a]	Professors don't think that I give them a hard time.	.392	.252
39	I owe an explanation to my family/superiors when I am out longer than expected.	.376	.234
41	I enjoy attending religious services (e.g., church, synagogue).	.272	.228
47	I follow a budgeting and accounting system for my finances.	.251	.256

Note. From "Development of the Diligence Inventory–Higher Education Form," by H. Bernard and E. M. Schuttenberg, 1995, *Journal of Research and Development in Education, 28,* p. 97.
[a] Reversed item.

Table 13

Factor IV (Application and Connection) Loadings and Communalities for the Items in the DI-HE for the Current Study

Item Number	Item	Factor Loading	Communality
19	I like to take on challenging academic projects.	.570	.261
27	I try to see the relationship between what I am studying and what I already know.	.524	.486
9	I stop periodically while reading assignments and review the information.	.503	.208
15	When I am studying a topic, I try to make all the ideas fit logically.	.446	.271
21	When preparing for an exam, I create questions that I think might be included and study them.	.364	.096

Table 14

Factor IV (Discipline) Loadings and Communalities for the Item in the DI-HE for Bernard and Schuttenberg (1995) Study

Item Number	Item	Factor Loading	Communality
31[a]	I do not get upset over the amount of academic work I have to do.	.555	.397
51[a]	I do not fall asleep when I'm studying.	.456	.345
30[a]	I remember to drink adequate water.	.435	.254
6[a]	I think I get enough rest.	.400	.241
18[a]	I think I get enough exercise.	.375	.287
24[a]	I have regular eating habits.	.355	.234
13[a]	I can find time to do extra credit assignments.	.237	.203

Note. From "Development of the Diligence Inventory–Higher Education Form," by H. Bernard and E. M. Schuttenberg, 1995, *Journal of Research and Development in Education, 28,* p. 97.
[a] Reversed item.

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Table 15

Factor V (Commitment and Appreciation) Loadings and Communalities for the Items in the DI-HE for the Current Study

Item Number	Item	Factor Loading	Communality
41	I enjoy attending religious services (e.g., church, synagogue).	.767	.307
36	Personally, I like to take a little time out to meditate or pray.	.438	.114
29 [b]	I do not turn in an assignment until I'm sure that it is correct.	.412	.429
12	I take time to admire the things of nature.	.394	.089
11	I proofread assignments before turning them in.	.380	.388
3 [b]	I listen to everything the professor says in class.	.356	.181
39	I owe an explanation to my family/superiors when I'm out longer than expected.	.303	.084

Note. From "Development of the Diligence Inventory–Higher Education Form," by H. Bernard and E. M. Schuttenberg, 1995, *Journal of Research and Development in Education, 28,* p. 95.
[b] Corresponding item from DI-HE.

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Table 16

Factor V (Responsibility) Loadings and Communalities for the Items in the DI-HE for Bernard and Schuttenberg (1995) Study

Item Number	Item	Factor Loading	Communality
20	I do academic assignments before spending time with family and friends.	.560	.505
38	I do my assignments as soon as I get them.	.529	.469
9	I stop periodically while reading assignments and review the information.	.476	.380
14	I review my notes before the next class.	.450	.357
19	I like to take on challenging academic projects.	.393	.434
2	I make constructive use of my leisure time.	.378	.350
21	When preparing for an exam, I create questions that I think might be included and study them.	.376	.300
46	Even when I am tired I try to complete my assignments.	.317	.397
29	I do not turn in an assignment until I am sure that it is correct.	.276	.343
45	I try to keep my weight under control.	.264	.231
3	I listen to everything the professor says in class.	.228	.273

Note. From "Development of the Diligence Inventory–Higher Education Form," by H. Bernard and E. M. Schuttenberg, 1995, *Journal of Research and Development in Education, 28,* p. 98.

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A review of the factors in my current study and DI-HE (Bernard & Schuttenberg, 1995) in Table 17 suggests that the five-factor composition remains reliable. Factors of diligence for traditional-aged college freshmen that my sample represented, and the spectrum of factors for a sample that included students up to the doctoral level (Bernard & Schuttenberg, 1995), are similar and appear to lend support to the proposition that the DI-HE is measuring diligence.

Table 17

Summary of Factor Analyses in Bernard & Schuttenberg's DI-HE and the Current Study

	DI-HE (1995)		Current Study	
Factor	**Scale**	**Coefficient Alpha**	**Scale**	**Coefficient Alpha**
1	Motivation	.858	Motivation	.845
2	Concentration and Assimilation	.776	Concentration and Assimilation	.860
3	Conformity and Citizenship	.587	Responsibility and Conformity	.793
4	Discipline	.615	Application and Connection	.631
5	Responsibility	.762	Commitment and Appreciation	.655

Note. From "Development of the Diligence Inventory–Higher Education Form," by H. Bernard and E. M. Schuttenberg, 1995, *Journal of Research and Development in Education, 28*, pp. 96-98.

Reliability

In order to determine internal consistency of the DI-HE, Cronbach's alpha was used to perform an item analysis on the 44-item DI-HE instrument. An acceptable range for the coefficient is from .70 to .90 (Kuder & Richardson, 1937). The standardized alpha for the 44-item questionnaire was .917, very similar to the 1995 DI-HE study which found .904. The five subscales in the 1995 DI-HE study had Cronbach alphas ranging

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from .587 to .858. My dissertation study produced the following standardized alphas:

Factor I- .845, Factor II- .860, Factor III- .793, Factor IV- .631, Factor V- .655. These

strong results suggest that the DI-HE is internally reliable and tests for similar ideas since

the recommended range for sub-scales is from .46 to .93 (Marcoulides & Hershberger,

1997).

Research Questions and Related Null Hypotheses

The purpose of my dissertation was to determine an accurate and objective

method to identify students who display the characteristic of diligence for application for

admission to the Orthopaedic Scholar Institute.

Main Research Questions

Diligence was determined by using the 44 items that remained after completing a

five-factor analysis of the DI-HE instrument. The dependent variable was tested in

relationship to MBTI types and gender.

Null Hypothesis 1: There is no difference in the diligence level of freshmen by

MBTI type "SJ" (sensor and judger) and "NP" (intuitor and perceptor). See Table 18.

The difference in mean diligence scores between MBTI type "SJ" (sensor and

judger) ($M = 164.62$, $SD = 18.96$) and "NP" (intuitor and perceptor) ($M = 145.90$, $SD = 22.29$) is significant, ($F_{1, 125} = 16.73$, $p = .000$). Additionally, the eta^2 is .1694, meaning

that nearly 17% of the variance is attributed to the relationship.

Null Hypothesis 2: There is no difference in diligence level by MBTI type "S"

(sensor) and "N" (intuitor). See Table 19.

The difference in mean diligence scores between MBTI type "S" (sensor) ($M = $

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12.055, $SD = 1.329$) and "N" (intuitor) ($M = 11.770$, $SD = .930$) and diligence is not

significant at the .05 level. The null hypothesis is supported.

Null Hypothesis 3: There is no difference in diligence level by MBTI type "J"

(judger) and "P" (perceptor). See Table 20.

Table 18

One-way ANOVA Table of Diligence and MBTI Types "SJ" and "NP"

Source	df	SS	MS	F	p
Between Groups	1	6854	6854	16.73	.000
Within Groups (error)	82	33599	410		
TOTAL	83	40453			

Table 19

One-way ANOVA Table of Diligence and MBTI Types "S" and "N"

Source	df	SS	MS	F	p
Between Groups	1	1364	1364	3.23	0.075
Within Groups (error)	125	52732	422		
TOTAL	126	54096			

Table 20

One-way ANOVA Table of Diligence and MBTI Types "J" and "P"

Source	df	SS	MS	F	p
Between Groups	1	10695	10695	30.80	0.000
Within Groups (error)	125	43402	347		
TOTAL	126	54096			

The difference in mean diligence scores between MBTI type "J" (judger) ($M =$ 164.72, $SD = 18.29$) and "P" (perceptor) ($M = 146.37$, $SD = 18.97$) is statistically significant, ($F_{1, 125} = 30.80$, $p = .000$). Additionally, the eta^2 is .1977, meaning that almost 20% of the variance is attributed to the relationship.

Null Hypothesis 4: There is no difference in diligence level by gender. See Table 21.

The difference in mean diligence scores by male ($M = 154.00$, $SD = 18.43$) and female ($M = 156.47$, $SD = 21.90$) participants is not significant at the .05 level. The null hypothesis is supported.

Table 21

One-way ANOVA Table of Diligence and Gender

Source	df	SS	MS	F	p
Between Groups	1	175	175	0.41	0.525
Within Groups (error)	125	53921	431		
TOTAL	126	54096			

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Summary of Chapter 4

Chapter 4 discussed the results of the research for my dissertation study. Because the five factor loadings remained comparable in my replicated study, the construct of diligence as defined in the DI-HE (Bernard & Schuttenberg, 1995) remained intact. Factor analysis reaffirmed the five factors as a viable tool for measuring diligence, though the factors were named to reflect the priorities of this specific sample: motivation, concentration and assimilation, responsibility and conformity, application and connection, and commitment and appreciation.

The hypotheses outlined for my study were also evaluated. The results indicated that diligence had a statistically significant relationship with the "SJ" (sensing and judging) and "J" (judging) preferences on the MBTI. The DI-HE appears to be measuring a preference very similar to the MBTI "J" (judger) and "P" (perceptor) dichotomy. In order to conclude that the DI-HE would be a useful instrument in the selection and admission process to the Orthopaedic Scholar Institute, the findings had to demonstrate that candidates with a high level of diligence would be evenly dispersed across MBTI types. The findings suggest that the DI-HE would be duplicative testing if the MBTI has been administered prior to admission to OSI and the MBTI results are available because the DI-HE appears to identify those individuals who also describe themselves as a judger ("J") on the MBTI.

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CHAPTER FIVE

SUMMARY, DISCUSSION, CONCLUSIONS, AND

RECOMMENDATIONS

This chapter is organized into four major segments. The summary first provides a

framework to discuss the results of my research related to the admission process for the

Orthopaedic Scholar Institute (OSI). It gives background information; communicates the

purpose, rationale, and problem we studied; and reviews the research hypotheses. The

discussion communicates the results of my research about the MBTI, gender, and the DI-

HE. The third segment, conclusions, articulates the significant findings of my research in

regard to their implications for OSI and leads to a number of recommendations.

Summary of the Study

My research evolved from a program initiated at Grace College that was funded

by a Lilly Endowment grant. The grant proposal addressed Lilly's concern about the

brain drain in the state of Indiana and had as its foundation a 2001 study conducted by

Battelle Memorial Institute.

The Indiana Health Industry Forum had commissioned Battelle, one of the

nation's leading nonprofit research and development organizations, to assist in creating a

technology strategy for the health industry in the Kosciusko County, Indiana, region. The

Battelle study noted that the health sector, which is comprised of various industries

including those related to the orthopaedic industry, is one of the fastest growing and most

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active industry segments across the country, and represents the strongest asset of the Kosciusko County region of Indiana (Battelle Memorial Institute, 2001, p. 3).

The major orthopaedic firms in this region, as well as their suppliers, however, suffered from the lack of suitable training programs offered through public schools and local institutions of higher education, including Grace College, which is also located in this region (Battelle Memorial Institute, 2001, p. 14). Links between the local industries and educational institutions for the purposes of establishing internship programs and providing input into technical curricula were intermittent at best.

This awareness caused Grace College to re-evaluate its role in providing graduates who would not only be attractive to industry employers, but also desire to live and work in the region upon graduation. It also required that the college re-examine its traditional model for program development and community involvement. The result of this re-examination was the Orthopaedic Scholar Institute (OSI), a program at Grace College that emphasizes the outcome of higher education on learning and success in employment. Students in OSI experience a pathway of learning that was strategically and collaboratively designed by educators and industry leaders. This initiative represented a program for selected students that has expectations beyond those for a traditional baccalaureate degree by having students participate in training modules outside the classroom.

The Myers-Briggs Type Indicator (MBTI) became a recurring theme through most of the OSI training modules. Its usefulness to OSI students in understanding themselves and others better, combined with the availability of extensive MBTI research related to "type" in various social systems, led us to realize its potential value and use in

OSI. Most of the students in OSI were already familiar with the MBTI, so the training modules focused not only on MBTI types and preferences, but also on the strengths and pitfalls of these types in organizational and group settings. Because it emerged as a theme through the training modules, it became apparent to the OSI Team that the MBTI could be one means to assess students' fit with the OSI Program and ultimately within the orthopaedic industry.

The initial recruiting, selection, and admission to OSI occurred through the hand selection of business students by the OSI Coordinator because he had access to numerous students with intrinsic interest in corporate employment. Upon the OSI Coordinator's appeal, the Grace College faculty referred additional students for consideration; however, aside from a profile consisting primarily of the emotional maturity, diligence, and goodness of industry fit domains, he provided no other specific admission criteria.

Following the realization that the referred candidates did not sufficiently meet the industry-driven criteria, however, the OSI team again educated faculty about the desired characteristics and profile of an OSI candidate. They again requested faculty referrals of prospective students, this time for OSI's second cohort. This time, the referring faculty seemed to equate the OSI profile with particular MBTI types. Specifically, the faculty appeared to have equated the characteristics of the ideal OSI candidate with the "ISJ" (introvert, sensing, and judging) MBTI preference, perhaps without thoroughly understanding the influence of "emotional maturity" regardless of type or perhaps because of the faculty's over-emphasis on the characteristic of "diligence."

It became clear with the second OSI cohort that a more objective means of selection was necessary to determine students' compatibility with and suitability for this

innovative experience based on transferable skills such as emotional maturity and diligence.

Statement of the Problem

While the OSI Team realized its need for a more objective selection and admission process that, as much as possible, quantified the characteristics desired in OSI students rather than relying solely on referral perception, intuition, and an interview, it did not have a clear method or approach to do so. Administering standardized inventories that highlighted these desired characteristics and aided in the selection and admission process seemed to be an objective approach to obtain more quantifiable data. The problem for my study, therefore, was whether the MBTI alone could measure a student's diligence and, subsequently, predict that student's fit in an orthopaedic setting, or whether another objective measure would be necessary to identify this skill.

Purpose of Study

The referral of students for OSI had initially been an intuitive process, but there was no evidence to demonstrate that this accurately identified students with the transferable skills and characteristics the orthopaedic companies desired. The purpose of my study, therefore, was to determine an accurate and objective method to identify students who displayed the characteristics of diligence for application for admission to the Orthopaedic Scholar Institute.

Conceptual Framework

During faculty discussions about ideal OSI candidates, the overriding purpose of education was questioned. Should education be the needs of the student more than the

needs of society? Aristotle (1943) wrestled with similar concerns about the nature of education when he noted that "the existing practice is perplexing; no one knows on what principle we should proceed—should the useful in life, or should virtue, or should the higher knowledge, be the aim of our training; all three opinions have been entertained" (p. 321).

Two commonly held educational philosophies that address the questions Aristotle proposes are perennialism and essentialism. Perennialists believe in a highly academic, rigorous, and intellectual curriculum. Education is crucial because it develops mental discipline and rationality, both needed in preparation for life.

The second commonly held educational philosophy, essentialism, suggests a critical core of information that all people should possess in order to preserve society. Schools adopting this philosophy emphasize basic skills and expect students to master specific academic subjects.

This essentialist approach has considerable significance for our studies because it emphasizes the development of fundamental skills necessary for students to evolve into productive, informed members of the workforce. It was these types of students that OSI was most interested in admitting to its program.

One tool that OSI used with students who were already admitted to OSI was the MBTI. Upon re-evaluating its admission criteria, the OSI Team questioned whether the MBTI would be a valuable tool in the admission and selection process with students. The MBTI was based on the theories of Carl Jung, who believed that all people are born with certain mental and emotional possibilities, which he identified as the capacity to observe and organize. Jung believed that humans need these mental tools to pursue their natural

impulses to relate meaningfully to the world and to people through productive work and significant relationships (Fitzgerald & Kirby, 1997).

Further, Jung believed that, although people have access to all of the mental tools he identified and use each of them to some extent to function effectively, they nevertheless have a natural preference for certain ways of approaching these tools (Myers et al., 2003). Though research suggests that it is virtually impossible for one person to have developed both of the opposites equally well (Fitzgerald & Kirby, 1997, p. 5), type development is seen as a lifelong process of striving for excellence.

Literature Review

Jung's (1926) theory of psychological types provided the assumptions and set the tasks for the initial construction of the Myers-Briggs Type Inventory (MBTI) and for all of the revisions. These assumptions are that true preferences exist and can be more confidently identified in persons with good type development than in persons with inadequate development (Myers et al., 2003). The MBTI, developed in the United States by the mother-and-daughter team Katharine Briggs and Isabel Myers, was intended to make Jung's theories understandable and useful in people's lives by putting the effects of each preference to practical use (Higgs, 2001; Myers et al., 2003). In general, the MBTI provides insights into how others interact with the world, collect data, make decisions, and live their lives based on the assumption that seemingly random behavior is actually orderly and consistent with how people choose to use their perception and judgment (Myers et al., 2003). It was through the use of this personality preference inventory, the MBTI, that the OSI Team combined Grace College students' natural and valuable personality preferences with an essentialist educational philosophy to evaluate their

suitability for selection and admission to OSI.

College students have attracted considerable attention from MBTI researchers. It has been used for leadership and career development with college students. In addition to research related to type and honors programs, athletic status, professional degree programs, leadership position, and other characteristics of students in higher education, the MBTI instrument has also been used for college student career development. "In today's educational settings, this process most often takes the form of administering interest and personality assessments, and 'matching' students' results to suitable career fields and college majors" (Provost & Anchors, 2003, p. 322).

My study focused on MBTI type in college students and its relationship to diligence, another characteristic desired by the orthopaedic industry representatives. Encompassing such attributes as persistence, perseverance, endurance, conscientiousness, and vigilance, the concept of diligence describes an essential characteristic of OSI students requested by the orthopaedic industry and is defined as "steady, earnest, and energetic effort" (Bernard & Schuttenberg, 1995, p. 99). While diligence is not articulated as overtly in the MBTI literature as it is in my study, there is similarity between many of the words used when describing individuals with a judging ("J") preference in MBTI vernacular and those used in describing diligence.

There was limited research related to diligence and students in higher education. Bernard (1991) first ventured into diligence, as defined in this dissertation, when he began investigating how students could be held more responsible for effort in their educational results (Glasser, 1990; Newman, 1989). Bernard and Schuttenberg (1995)

adapted their first version for use in higher education with the Diligence Inventory–

Higher Education (DI-HE).

Because the purpose of my study was to establish an objective selection and

admissions process for OSI, review of the literature to determine how other professional

degree programs selected and admitted students was relevant. The literature did not

describe any purely academic programs in which a formal admissions process was

necessary for selection or continuation in the program. The literature review did support

the premise, however, that various professional degree programs have an admission or

selection process and that academic programs or disciplines do not.

Methodology

In studying the relationship between MBTI preferences and diligence, the

population used was the 65 freshman men and 108 freshman women (173 total) at a

Midwestern, private, Christian liberal arts college who took the MBTI in the fall of 2004.

The sample was the 44 men and 83 women (127 total) who participated in my study. This

sample represented 73% of the total population.

This study focused on several research questions that would help identify whether

the MBTI was a sufficient tool to measure diligence or whether the DI-HE would provide

greater accuracy.

Main Research Questions

1. What is the relationship between MBTI type (as measured by "SJ" [sensor and

judger] and "NP" [intuitor and perceptor]) and diligence level (as measured by the DI-

HE) among freshmen?

2. Are there significant differences in diligence by MBTI type "S" (sensor) and "N" (intuitor)?

3. Are there significant differences in diligence by MBTI type "J" (judger) and "P" (perceptor)?

4. Are there significant differences in diligence by gender?

Factor Analysis

The first step in the data analysis was to complete a factor analysis on the DI-HE (Bernard & Schuttenberg, 1995). Factor analysis of the instrument using data from 127 college freshmen proved the five-factor structure stable. The five factors had eigenvalues of 11.253, 2.572, 1.885, 1.5, and 1.47, which accounted for 34% of the variance. Because all of the resulting eigenvalues were greater than 1, this supported the use of five factors (Heppner & Heppner, 2004; Kaiser, 1958).

The content of some of the scales changed, and labels for these factors were: Motivation, Concentration and Assimilation, Structured and Disciplined, Application and Connection, and Commitment and Appreciation. My factor analysis was remarkably similar to the original DI-HE (Bernard & Schuttenberg, 1995) study. The previous studies (Bennett, 1994; Bernard, 1991; Bernard et al., 1995; Bernard & Schuttenberg, 1995; Bernard et al., 1993) and my review provided confidence that within these five factors the diligence construct was being measured.

Factor I, Motivation, remained the most like the original Motivation factor from the 1995 study. Nine of the original items continued to load in my use of the instrument. Factor II, Concentration and Assimilation, remained the label most describing the characteristics of the items in the second factor of my use of the DI-HE just as it did in

the original study (Bernard & Schuttenberg, 1995).

Cronbach's alpha was used to perform an item analysis on the 44-item DI-HE instrument. The standardized alpha for the 44-item questionnaire was .917, very similar to the 1995 DI-HE (Bernard & Schuttenberg, 1995) study, which found .904.

Findings

Once the factor analysis of the DI-HE instrument was completed, the next step was to investigate the relationship between diligence and other variables. The following findings relate to the testing of the hypotheses.

1. There was a significant difference ($F = 16.73, p < .001$) in the diligence level of freshmen by MBTI type "SJ" (sensor and judger) and "NP" (intuitor and perceptor).

This would suggest that the MBTI and the DI-HE instruments measure similar, "diligent" behaviors; however, the DI-HE attempts to measure actions toward a goal (i.e., "steady, earnest effort") while the MBTI categorizes preferences. These MBTI preferences may be demonstrated as behaviors consistent with the diligence definition.

2. There was no difference in diligence level by MBTI type "S" (sensor) and "N" (intuitor).

3. There was a significant difference ($F = 30.80, p < .001$) in diligence level by MBTI type "J" (judger) and "P" (perceptor).

This finding suggests that diligent behavior is primarily manifested in the "J" (judger) personality preference on the MBTI dichotomies.

4. There was no difference in diligence level by gender.

The implications of the above findings are that the DI-HE appears to be measuring a preference for diligence that is similar to the preference measured by the

judger ("J") and perceptor ("P") dichotomy of the MBTI.

Discussion

The MBTI literature related to college students (Anchors, Gershman, & Robbins, 1987; Anchors & Robinson, 1992; Power & Lundsten, 1994; Erskine, Westerman, & Grandy, 1986) supports my study's findings that judgers ("J") exhibit traits that align with the construct of diligence, which the DI-HE (Bernard & Schuttenberg, 1995) is measuring. While the relationship between sensor-judger ("SJ") and judger ("J") to diligence proved significant, the findings would suggest the significance was based primarily on the presence of the judger ("J") component. This is due to the strong practical significance of the judger ("J") component and an only slightly less practical significance when the sensor ("S") component was added. Further, there was no statistical significance in diligence by MBTI type when the sensor-intuitor (S–N) dichotomy was analyzed.

The literature related to diligence constructs (Atman, 1987; Bernard & Schuttenberg, 1995; Payne, 1997; Ryckman, 1985) tends to be more descriptive of the behaviors observed from someone who is labeled diligent; however, the preferences of judger ("J") personality types to decide, regulate, control, and organize (Bayne 2004; Hirsch & Kummerow; Myers et al., 2003) appear to manifest themselves in behaviors that are consistent with "steady, earnest, and energetic effort" (Bernard & Schuttenberg, 1995).

These findings, therefore, suggest that MBTI preferences can result in behaviors that are desired in OSI candidates and the MBTI should be an objective indicator used in the selection process for admission into the Orthopaedic Scholar Institute. Further, the

use of the DI-HE in the selection process for OSI appears to be repetitive because of the similarity of results. While providing more descriptive indicators of the subsets of diligent behavior (e.g., motivation, concentration), it does not clarify with greater specificity individuals who may be diligent, but have various personality preferences.

Conclusions

In this study, the DI-HE is measuring a construct very similar to the MBTI "J" (judger) and "P" (perceptor) dichotomy. The relationship was quite strong with 20% of the variance in the data attributed to this relationship.

In order to conclude that the DI-HE would be a useful instrument in the selection and admission process to the Orthopaedic Scholar Institute, the findings had to demonstrate that candidates with a high level of diligence would be evenly dispersed across MBTI types. Because of the strong relationship between the DI-HE and the "J" (judger) on the MBTI, however, I concluded that the DI-HE is too similar to the MBTI in measuring diligence and should not be administered as a component of the selection process for OSI.

Recommendations

Based on the results and conclusions of this study, this section offers the following recommendations for future research and practical application.

1. Further research is recommended that would use the same measure (i.e., the DI-HE) on college students other than just freshmen, such as students at all stages of the college career. For example, in this study students took the DI-HE as freshmen and may not have had sufficient opportunity to develop or apply these skills in a college context. Administering this instrument again as a junior might produce different levels of

diligence. Knowing their level of diligence at the time of their admission and selection to OSI may result in a better fit between the student and the OSI Program.

2. Further research related to the DI-HE and students in other contexts, such as the difference between those in small, private colleges and those in public universities, may highlight differences in students who select these types of higher education institutions.

3. Further research focusing on the reliability and validity of the DI-HE with larger samples would strengthen the body of knowledge related to this instrument. Currently, the majority of the research has been conducted by Bernard and his associates (e.g., see Bernard & Schuttenberg, 1995).

4. A study based on the results of the selection criteria into OSI versus the success of students in the completion of the OSI Program should be developed to further determine the predictive validity of these measures. This study could be further strengthened by comparing a group admitted to OSI with a control group of those not admitted to and not referred to OSI.

5. A longitudinal study that measures the success of OSI graduates at various stages of their work lives in the orthopaedic industry would be beneficial to determine if indeed the assumptions made about the ideal future employee are actually occurring because of the Orthopaedic Scholar Institute. For example, OSI believes that the orthopaedic companies will find increased retention, lower training costs, faster promotions, stronger problem-solving skills, and heightened leadership potential in students it selects and places in orthopaedic internships.

6. Research is recommended that would determine a relationship between the DI-HE and other personality measures (e.g., PF16, Big 5) to see whether the DI-HE

measured constructs related to diligence that were as clearly defined as they were in the MBTI.

7. In order to apply the DI-HE to OSI students, further research is recommended that would use the DI-HE as a predictor of orthopaedic job performance. For example, I assume that students with higher scores on the DI-HE will be more successful in an orthopaedic internship where work tasks are expected to be completed on time despite environmental barriers, competing goals, and personality preferences. Determining a student's overall diligence score or score on certain diligence factors could aid in predicting a student's successful performance in an orthopaedic internship.

8. The literature review did not yield any measures of transferable skills. Research is recommended to determine a valid measure or indicator of overall transferable skills and their relationship to the DI-HE and MBTI.

9. The OSI Team should identify other behavioral criteria that indicate the presence of diligence for admission into the OSI Program beyond the MBTI type. The ability to put diligence into practice—or to "get your act in gear"—is the practical application OSI students need rather than just the preference for diligence. This study illuminated the distinction between the preference for and the action of diligence.

10. The OSI Team should create a two-stage entrance process by differentiating between selection and actual admission to OSI. Rather than selection and admission occurring simultaneously (i.e., the beginning of the junior year), selection should occur during the second semester of the freshman year. The OSI Team should provide opportunities for the development and demonstration of diligence during the sophomore year with final admission occurring during the junior year.

11. The OSI Team should identify "P" (perceptor) students during their freshman year. This would enable the OSI Team to observe other actions over time that may indicate the presence of diligence by the "P" (preceptor) students. By having a selection process during the freshman year, with opportunities for development of diligence, more "P" (preceptor) students could gain admission into OSI.

CHAPTER SIX

INTEGRATIVE DISCUSSION

The mission of the Leadership and Educational Administration Department at

Andrews University is to develop a community of scholar-practitioners who transform

the power of knowledge into global service. Its core values include community, service,

integrity, and commitment. The Program describes leadership as:

> A community of learners dedicated to the principles of Christian service. . . .
> Leadership works through a collaborative structure . . . [because] the synergy that
> occurs when participants work together to reach common goals is one of the
> program's most important tools for success. (Andrews University Leadership
> Program, 2002, p. 217)

Further, when formalizing the philosophical foundation of the Leadership

Program, James Tucker described the interdependence of the program's multiple

competencies by emphasizing that they "cannot be segmented in leadership . . . and . . .

they lose their impact as well as leadership relevance if there isn't a constant attempt to

integrate them" (Alaby, 2002, p. 70). One of those integrated competencies is that leaders

are always "collaborating with others in group processes" (Alaby, 2002, p. 70).

Consequently, a defining characteristic of the Leadership Program is the

important bond built among participants in that they "become partners in learning, both

with faculty members and with other participants" (Alaby, 2002, p. 72). Alaby (2002)

uses the term "community-pole" to stress the importance of the collaborative

learning/teaching community that the Leadership Program has been developing (p. 134).

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The community-pole is founded in the assumptions that there are "no isolated scholars [because] . . . knowledge is socially constructed . . . [and] diverse perspectives increase the depth of knowledge gained" (Alaby, 2002, p. 134). As one participant noted, the Leadership Program "'is unique in that it is constructivist education at its best'" (Alaby, 2002, p. 135).

The community-pole and constructivist education are evident in the principles of cooperative learning. According to Johnson, Johnson, and Smith (1991), teaching should promote the discovery of knowledge, active construction of knowledge, development of competencies, interaction between students and with faculty, and learning that maximizes student achievement.

Michaelsen, Knight, and Fink (2002) did extensive research on team-based learning, which demonstrates an increase in the capability to learn and achieve when people work together. They also identified characteristics of an effective team including an individual commitment to the welfare of the group, a high level of trust among the members, time interacting together, resources (especially intellectual), a common goal, and frequent feedback on individual and group performance (Michaelsen et al., 2002, p. 11). They assert the following:

> Team-based learning can be especially helpful to anyone who wants to emphasize the development of . . . thinking skills. . . . In contrast to memorization, thinking is an intellectual activity in which the interaction between people—if properly structured—can be particularly valuable. Whether the skill is critical thinking (judging the value of something), practical thinking (problem solving and decision making), or creative thinking (imagining and creating new ideas or objects), learning how to incorporate the ideas and perspectives of several people and learning how to work through differences can greatly enhance [the] ability to think effectively. The extended application phase of team-based learning supports this kind of learning very well. [Team members] have multiple opportunities to enhance ideas with others, practice thinking, and get feedback on the quality of their thinking. (Michaelsen et al., 2002, pp. 22-23)

As doctoral candidates and educators, we, Michael Harstine and Carrie Yocum, desire to not only carry out the mission and goals of the Leadership Program, but also model effective collaboration for our students.

We comprise a community of scholar-practitioners and exemplify Alaby's (2002) "individuality-community" paradox through our complementary personalities, interpersonal styles, and effective, synergistic, collaborative professional relationship. We value and seek out collaboration, achieve job-embedded competencies in the same organizational context, and believe that our individual efforts have been enhanced by our cooperative efforts, resulting in an outcome far superior to that which we would have produced individually. Our interdependence was solidified by our own unique competencies that were continuously integrated in this collaborative process. Accordingly, then, our studies are the synergistic culmination of our efforts both collectively and individually. While paralleling each other, however, our studies remained distinct.

One study, by Michael Harstine, focuses on the relationship between diligence and personality preferences. The other study, by Carrie Yocum, focuses on the relationship between emotional maturity and personality preferences. Several chapters are either similar or identical because the background to the problem was the same, the populations we studied were the same, our institutional context was the same, and the use of the Myers-Briggs Type Indicator (MBTI) was the same. The research questions, however, are unique to each study.

We did not learn in isolation; rather, we became partners in the learning process associated with writing a dissertation. Our diverse perspectives challenged us each to

gain a greater depth of knowledge as we forged through each of our dissertations, and together we constructed an understanding of not only how to complete the task of research, but perhaps more importantly, how to work together through the process.

For example, in every phase of the dissertation process we spent considerable time interacting with each other through multiple mediums: the phone, email, face-to-face, and with others who served as mentors and mediators. In addition to our frequent interaction, we provided regular feedback to each other about our individual and "group" performance since the work that one did impacted the other. It was at these times, because of the level of our trust in each other and the level of our commitment to the process, that we experienced growth, understanding, greater perspective of the other, and clarity in our mutual goals. This is not to imply that we always agreed with one another and that the feedback was not without conflict. On the contrary, there was typically more disagreement than agreement as we engaged in critical thinking and attempted to understand and integrate our differences.

Our research collaboration was not easy and our differences produced enormous challenges at times—challenges through which other "communities of scholar-practitioners" may not be successful in persevering. Aside from work-style preferences, conflicts abounded in both conceptual and technical areas such as interpretational difference, scope and sequence of the dissertation, and writing style. Because of our individual commitment to the process and trust that the other was equally as committed, however, we were able to negotiate the conflict and value the contributions of the other despite very different work styles, interpersonal styles, decision making, problem solving, and creative thinking. Because of these challenges, we would not necessarily recommend

this same process to others.

Our efforts were successful, however, because of several key and unprecedented contextual factors that other communities of scholar-practitioners may not have. First, our distinct MBTI types (Harstine—ENTP, and Yocum—ISTJ) were significant factors that permitted us both to contribute in unique yet valuable ways to the collaborative dissertation process. Beyond understanding our own type, we also had a very strong understanding of, and appreciation for, the other's type. Because we understood our own strengths and pitfalls, as well as those of the other, we could collaborate effectively. Without understanding each other and that our "style" differences were not personal affronts, it would have been impossible to manage the process effectively. Ultimately, we needed to achieve an outcome to which we were both committed, supportive, and equally invested in helping the other succeed.

For example, Michael Harstine is a clear Intuitor ("N") and Carrie Yocum is a clear Sensor ("S"). These processes of perception, as described using MBTI vocabulary (Hirsh & Kummerow, 1998), meant that Michael pays attention to possibilities, inspirations, theories, and relationships, and Carrie pays attention to the present, facts, and what is real and practical. These differences became apparent as we struggled through the literature review portion of the dissertations. Michael's approach was to review the literature, identify the relationships, and draw a conclusion. Carrie, on the other hand, was more likely to begin with a conclusion and determine whether the research could support it.

A second contextual factor in our successful collaboration was that we began the Leadership Program at the same time. We completed the program's orientation at the

same time and subsequently completed the program's initial projects at the same time. While these were parallel rather than collaborative experiences at the time, they paved the way to greater interdependence as we began to assess and appreciate each other's strengths. A collaborated dissertation became a logical progression following our many, previous collaborated projects.

A third contextual factor in our collaboration was that we were (and remain) employed by the same institution during the time in which we completed the doctoral program. This proximity of employment permitted continuous accessibility to each other, which, while initially of a practical nature, became increasingly supportive and reciprocal as we discovered shared interests in pedagogy and resource development at our institution. Eventually, our collaboration extended beyond the doctoral program to other projects on campus as we experienced considerable administrative support and encouragement for our efforts in the doctoral program, in our respective jobs, and in our collaborative projects on campus. Ultimately, our dissertation topics grew out of shared projects through our employment.

Finally, because of our shared academic and employment interests we enrolled in the same doctoral course work. In developing our educational and employment competencies, our collaboration became increasingly integrated and synthesized as we became more invested in the collaborative process. In many respects, we became a sub-group of our regional group as we processed our experiences, shared resources, questioned decisions, and planned our programs. Shared learning experiences permitted "real time" feedback from each other, and the challenge of providing a clear rationale for our decisions resulted in a stronger product, especially in the dissertation process.

In many respects, collaborative research such as ours may be a more desirable, even a more realistic, approach to research in organizational settings wherein often the work is conducted in teams rather than individually. Quality assurance, grant writing, articulating outcomes, assessment activities, and other research activities such as these are rarely done in isolation. Our collaborative model exemplifies this process.

APPENDIX A

CONSENT FORMS

Grace College
Institutional Research Review

This committee has reviewed the protocol for the administration of the Myers-Briggs Type Inventory to the Freshman Seminar class on September 6, 2004; the instruction of those students upon receiving their MBTI scores; and the attached informed consent.

We understand there is no risk to the students and that the study is being used for institutional research and doctoral research related to student retention and goodness of fit in academic programs.

We endorse the study and the informed consent.

E. Michael Grill, EdD	Tom Edgington, PhD
Department Chair, Behavioral Sciences	Professor, MA Counseling
Certified MBTI Trainer	

James E. Swanson, MA	Brooke Carey, MA
Dean of Students	Instructor, Research Methods
Certified MBTI Trainer	Certified MBTI Trainer

David R. Plaster, ThD.	Date
VP for Academic Affairs	

Grace College, Student Development
Informed Consent

I agree to participate in this research study conducted by Grace College faculty member James E. Swanson, MA, Dean of Students.

I understand that my participation will include two, one-hour class sessions at Grace College during which I will complete the Myers-Briggs Personality Type Inventory and participate in instruction regarding my personality preferences.

I understand that all information obtained through these questionnaires is confidential and that no personally identifying information will be released without my consent. If the study design or the use of the data is to be changed, I will be so informed and my consent re-obtained.

I understand there is no penalty for my refusing to participate, that I am free to withdraw my consent and discontinue participation at any time, and that the investigators may stop the study at any time. I understand that researchers anticipate no physical or emotional risks associated with my participation. This study is to assist the college in identifying methods to determine student diligence and emotional maturity for retention and goodness of fit in academic programs.

Should I choose to participate in additional testing by Michael Harstine, MA, Associate Professor of Business and Carrie A. Yocum, Associate Professor of Social Work, the results of both the MBTI and this additional testing will also be used for dissertation research related to diligence and emotional intelligence.

If you have any questions concerning your rights as a research subject, please contact Dr. David Plaster, Vice President for Academic Affairs, is available to answer any questions about this research. He can be reached at:

Grace College
200 Seminary Drive
Winona Lake, IN 46590
574-372-5100, ext. 6132

I acknowledge that I have received a copy of this form, read the above statement, and understand my rights as they have been outlined. Furthermore, my signature below indicates that I voluntarily agree to participate in this study, and that I am at least 18 years old.

_____	_____
Participant's Printed Name	Phone Number
_____	_____
Participant's Signature	Email Address
_____	_____
Today's Date	James E. Swanson, Principal Investigator

Grace College
Institutional Research Review

This committee has reviewed the protocol for the administration of the Emotional Intelligence Inventory–University Edition and the Diligence Inventory–Higher Education to the freshmen who voluntarily choose to participate in the dissertation research conducted by Michael A. Harstine and Carrie A. Yocum. The testing will occur between 4/5/05 and 12/31/05. We have also reviewed the instructions to those students and the attached informed consent.

We understand there is no risk to the students and that the study is being used for educational and doctoral research related to goodness of fit in academic programs.

We endorse the study and the informed consent.

_____   _____
Tom Edgington, PhD   Date
Professor, MA Counseling

_____   _____
James E. Swanson, MA   Date
Dean of Students

_____   _____
David R. Plaster, ThD.   Date
VP for Academic Affairs

April 20, 2005

Dear Student,

We are currently enrolled in a doctoral program at Andrews University and are requesting your help to complete the research for our dissertations. Our research is related the relationship between MBTI types, diligence, and emotional maturity.

You have been selected to participate in our research because you completed the Myers-Briggs Type Indicator (MBTI) during Freshmen Seminar in the fall of 2004.

Your participation will involve taking two brief inventories: the Emotional Competence Inventory–University edition (ECI-U) and the Diligence Inventory–Higher Education edition (DI-HE). The ECI-U is completed online and the DI-HE is completed using paper and pencil. For most it will take less than 25 minutes total to complete both inventories.

Please help us complete our research by coming to **Philathea 107** on one of the following days:

1. Friday, April 22, 2005 from 9:00 am to 5:00 pm
2. Wednesday, April 27, 2005 from 9:00 am to 5:00 pm
3. Friday, April 29, 2005 from 9:00 am to 5:00 pm

Once you arrive, you will be asked to sign a form consenting to your participation and verifying that you are at least 18 years old.

We know that you are busy at the end of the year, so to show our thanks for giving up your time we would like to offer you a small campus gift certificate for your participation.

Thank you for helping us complete our research. Please contact one of us or the Social Work Office (x6492) if you have any questions.

Michael A. Harstine   Carrie A. Yocum
Assoc. Prof of Business   Social Work Dept. Chair
Grace College   Grace College
372-5100 x6093   372-5100 x6491

Andrews University, Department of Education
Informed Consent

I agree to participate in this research study conducted by Grace College faculty members Michael A. Harstine, MA, Associate Professor of Business and Carrie A. Yocum, MSW, ACSW, LSW, Associate Professor of Social Work.

I understand that my participation will take approximately 30 minutes during which I will complete two standardized questionnaires at Grace College: the Emotional Competence Inventory–University Edition and the Diligence Inventory–Higher Education.

I understand that all information obtained through these questionnaires is confidential and that no personally identifying information will be released without my consent. If the study design or the use of the data is to be changed, I will be so informed and my consent re-obtained.

I understand there is no penalty for my refusing to participate, that I am free to withdraw my consent and discontinue participation at any time, and that the investigators may stop the study at any time. I understand that researchers anticipate no physical or emotional risks associated with my participation. The major benefit of this study is to assist the college in identifying methods to determine student diligence and emotional maturity for retention and goodness of fit in academic programs.

I understand that the co-investigators, Michael A. Harstine and Carrie A. Yocum, are doctoral students at Andrews University, Berrien Springs, MI. They are available to answer questions at any time and can be reached at:

> Grace College
> 200 Seminary Drive
> Winona Lake, IN 46590
> Michael Harstine, 574-372-5100 x6093
> Carrie Yocum, 574-372-5100 x6491

Their Andrews University dissertation chair, Dr. Hinsdale Bernard, is also available to answer questions at (888) 717-6247. If you have any questions concerning your rights as a research subject, please contact Andrews University Institutional Review Board at (269) 471-6361 or irb@andrews.edu

I acknowledge that I have received a copy of this form, read the above statement, and understand my rights as they have been outlined. Furthermore, my signature below indicates that I voluntarily agree to participate in this study, and that I am at least 18 years old.

_____	Michael A. Harstine_____
Participant's Printed Name & Phone Number	Co-Investigator's Printed Name
_____	_____
Participant's Signature and Email Address	Co-Investigator's Signature
	Carrie A. Yocum_____
_____	Co-Investigator's Printed Name
Today's Date	
Hinsdale Bernard_____	_____
Faculty Sponsor's Printed Name	Co-Investigator's Signature
_____	_____
Faculty Sponsor's Signature	Witness Signature

APPENDIX B

MBTI TYPE TABLE

MBTI TYPE TABLE

An individual type is the combination of one preference from each of the four

preference pairs, or dichotomies. When the four dichotomies are combined in all possible

ways, sixteen types result. These sixteen types are displayed on a type table. The type

table is arranged as follows:

1. **Introversion** in the top two rows and **Extroversion** in the bottom two rows

2. **Sensing** in the two left columns and **Intuition** in the two right columns

3. **Thinking** in the two outer columns and **Feeling** in the two inner columns

4. **Judging** in the top and bottom rows and **Perceiving** in the inside rows

Type Table					
	S	**S**	**N**	**N**	
I	**ISTJ**	**ISFJ**	**INFJ**	**INTJ**	**J**
I	**ISTP**	**ISFP**	**INFP**	**INTP**	**P**
E	**ESTP**	**ESFP**	**ENFP**	**ENTP**	**P**
E	**ESTJ**	**ESFJ**	**ENFJ**	**ENTJ**	**J**
	T	**F**	**F**	**T**	

Note. From *Introduction to Type in Organizations* (p. 5), by S. J. Hirsch
and J. M. Kummerow, 1998, Palo Alto, CA: CPP.

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REFERENCE LIST

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Ball State University (1991): M.A. Business Development and Communication

Grace College (1990): B.S. Business Administration, Communications

Grace College, 2003-present
Associate Professor
Responsible for teaching marketing and management classes in the Department of Business.

SYM Financial Corporation, 2000-2002
Partner/Vice President, Marketing
Responsible for the development and implementation of overall marketing strategy of the organization. Focused on specific target marketing to affluent individuals and business owners. Executed research programs to identify ideal customer base. Designed competitive analysis systems to track and understand all significant competitors. Involved in all management decisions for the company.

Kosciusko Community Hospital, 1991-2000
Vice President, Marketing and Physician Services, 1995-2000
Director, KCH Foundation
Accountable for development and implementation of overall marketing strategy of a community hospital that services 70,000 residents in Kosciusko County and surrounding communities. Supervised marketing efforts for physicians affiliated with the hospital. Directed growth of net revenues from $32 million to $58 million despite managed care and government contractual intrusions. Recruited over 20 physicians to medical staff based on research analysis of opportunities for market share growth. Managed all aspects of public relations, image, and advertising. Developed and implemented "Practice-Without-Walls" for primary care physicians to relieve administrative burden.

Division Director, Support Services, 1992-1995
Operational accountability for multimillion-dollar revenue and expense departments. Directed growth and goal fulfillment of Human Resources, Training, Plant Operations, Maintenance, Construction, Biomedical Engineering, Radiology, Laboratory, Cardiopulmonary, Pharmacy, Dietary, Housekeeping, Purchasing, and Materials Management.

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