

**The Relationship between Learning Style and Level of Sport Performance in Division II
Collegiate Athletes**

by

Megan Marie Brown

A Dissertation submitted to the Graduate Faculty of
Auburn University
in partial fulfillment of the
requirements for the Degree of
Doctor of Philosophy

Auburn, Alabama
December 14, 2013

Keywords: Learning Styles, Collegiate Athletes, Level of Sport Performance

Copyright 2013 by Megan Marie Brown

Approved by

Sheri Brock Committee Chair, Associate Professor, School of Kinesiology
Peter Hastie, Wayne T. Smith Distinguished Professor, School of Kinesiology
Danielle Wadsworth, Associate Professor, School of Kinesiology
Chih-hsuan Wang, Assistant Professor, Educational Foundations, Leadership, and Technology

Abstract

What is the difference between good and great in an athlete? How can a coach teach players to be great? How do athletes learn? These are questions asked every day in the sports world as coaches seek to train their athletes to become great. This teaching and learning of skills are the key premises in athletics and in life. The theories of how people learn have been explored in several areas of sports such as the pedagogy used to teach sports (Williams & Anshel, 2000), the differences in male and female athletes (Miller, Ogilvie, & Branch, 2008), and the differences in level of sport performance (González-Haro, Calleja-González, & Escanero, 2010; Wesch, Law, & Hall 2007).

The current research study sought to answer three questions: (1) What learning styles exist among college athletes across level of performance, gender, and sport? (2) What do college coaches know about learning styles? (3) Do college coaches who have knowledge of learning styles provide instruction that is individualized to their players' learning styles?

Part one of this study included 155 college athletes to determine what similarities exist in learning style preference across gender, sport, level of sport performance, and year of eligibility. The findings showed no significant link between learning styles and gender, sport, level of sport performance, or year of eligibility. The findings supported those of González, González, and Escanero, (2010) who found no relationship to learning styles and level of sport performance. Part two of the study found that college coaches have a general knowledge of learning styles and

do recognize the need to get to know each of their athletes in order to help them perform. The key finding of part two provide a very clear picture from the coaches of what makes athletes at high levels of sport performance different. The responses overwhelmingly pointed to motivation, work ethic, and desire/drive/passion. Part three of the study set a baseline for understanding how often coaches teach to the learning styles of their athletes. In the current study it was found the coach matched the learning styles of their athletes 40% of the time.

Acknowledgments

I would first like to thank my Lord and Savior Jesus Christ. Without Him this would have not been possible. Thank you to my mom and dad for all of their support, patience, and love throughout my life. I would like to thank my family and friends who have supported me through the entire process with encouragement, patience and love. I would like to thank Dr. Sheri Brock for all of her time, commitment, help and guidance through this long and rewarding process. Thank you to my committee Dr. Peter Hastie, Dr. Danielle Wadsworth, and Dr Chihuan Wang for all of your time and guidance.

Table of Contents

Abstract	ii
Acknowledgements	iv
List of Tables	vii
List of Figures	viii
Chapter I Introduction.....	1
Chapter II Literature Review	13
Chapter III Methods	40
Chapter IV Results	68
Chapter V Discussion	90
References	101
Appendix 1 (Demographic Questionnaires)	112
Appendix 2 (Honey and Mumford Learning Styles Questionnaire).....	122
Appendix 3 (Knowledge of Learning Styles Interview Questions).....	129
Appendix 4 (Permission Letters for Research Site).....	131
Appendix 5 (Permission Letters Part One)	135
Appendix 6 (Consent for Athletes Information).....	149
Appendix 7 (Recruitment Script for Part One and Three).....	152
Appendix 8 (Consent Forms Part Two)	155

Appendix 9 (Permission Letter Part Three)	158
Appendix 10 (Consent Form Part Three Athletes)	160
Appendix 11 (Consent Form Part Three Coach)	163
Appendix 12 (Code List for Part Two)	166

List of Tables

Table 1.1. Kolb's Four Learning Styles	3
Table 1.2. Definitions of Kolb and Honey and Mumford Learning Styles	5
Table 2.1. Influences of Learning Styles	13
Table 3.1. Part One Potential Participant Numbers	42
Table 3.2. Levels of Sport Performance	46
Table 3.3. Norms of Honey and Mumford Learning Styles Questionnaire 40-Item	56
Table 3.4. Part Two Potential Participants.....	58
Table 3.5. List of Codes for Part Three	65
Table 4.1. Gender and Sport	70
Table 4.2. Year of Eligibility and Level of Sport Performance.....	71
Table 4.3. The Frequency of Each Learning Style	73
Table 4.4. Learning Styles Frequency	74
Table 4.5. Knowledge of Learning Styles Questionnaire	79
Table 5.1. High Level Characteristics.....	95

List of Figures

Figure 1.1 The Interactions between Kolb and Honey and Mumford	7
--	---

Chapter I

Introduction

What is learning, how does it occur, and when? According to John Dewey, “If we want, then, to find out how education takes place most successfully, let us go to the experiences of children where learning is a necessity” (1959, p.74). Dewey proposed the theory that learning comes from experience (Dewey, 1970). The caveat is that simple experience does not lead to quality learning. In order for experience to be effective as a means to learning, it must produce the opportunity for further growth and learning.

Dewey (1970) supported the following ideals:

What we want and need is education pure and simple, and we shall make surer and faster progress when we devote ourselves to finding out just what education is and what conditions have to be satisfied in order that education may be a reality and not a name or slogan. It is for this reason alone that I have emphasized the need for a sound philosophy of experience. (p.90-91)

Jean Piaget’s theory concurs that experience, or rather how one responds to an experience, is a marvelous teacher. Piaget explained his four stages of development (Piaget 1974). The first stage (sensorimotor period) begins at birth and continues until around the second year of life; during this stage one uses sensorimotor actions and intelligence to learn. The second stage begins around two years of age and continues until age seven or eight. In this stage one adds the ability of symbolic representation of objects; however, one is not yet able to understand that when objects are moved or reorganized, they do not lose their quantitative values, and it is a lengthy process for one to picture an action in one’s mind prior to execution. The third stage, beginning around age seven to eight and continuing until age eleven or twelve, allows one to group objects and form an understanding of associations with objects; however,

one is still not able to understand associations of abstract concepts. The final stage begins around age eleven or twelve. At this stage, one is able to draw conclusions and make assessments of not only objects—but also thoughts, ideas, concepts, and other abstractions. Throughout these stages a person uses the characteristic abilities he or she learns via experience about how the world operates.

In the area of learning via experience, Kurt Lewin proposed the idea of the “Field Theory” (Lewin, 1951), which describes a means to study how humans react to various “fields” or environments:

The use of a constructive rather than classificatory method; an interest in the dynamic aspects of events; a psychological rather than physical approach; an analysis which starts with the situation as a whole; a distinction between systematic and historical problems; a mathematical representation of the field. (p. 60).

Lewin’s (1951) field theory suggests that a person learning via experience learns from the environmental aspects of the field or his/her own personal needs and motivations.

The idea of learning by experience is not one held exclusively by John Dewey, Jean Piaget, and Kurt Lewin. David Kolb, for example, defines learning as “the process whereby knowledge is created through the transformation of experience” (1984, p.41). In 1984 Kolb took the above mentioned theories of Dewey, Piaget, and Lewin and published his work *Experiential Learning: Experience as the Source of Learning and Development* (Kolb, 1984). In his book Kolb formulates the theory of individual learning styles. From experiences people place importance upon either apprehension or comprehension; they then convert these into either extension or intension. These interactions form the modes of learning: concrete experience, reflective observation, abstract conceptualization, and active experimentation. Due to the effects of the environmental factors that are unique to each person, one begins to merge the modes of

learning into a personal learning style: divergence, assimilation, convergence, or accommodation. (See Table 1.1)

Table 1.1

Kolb's Four Learning Styles

Learning style	Dominant learning mode	Personal characteristics
Diverging	Concrete Experience Reflective Observation	<ul style="list-style-type: none"> • Has the ability to see situations from multiple points of view. • Is successful with formulating ideas • Gathers information • Is a people person • Prefers group work • (Kolb, & Kolb, 2005)
Assimilating	Abstract Conceptualization Reflective Observation	<ul style="list-style-type: none"> • Takes information from broad to concise • Focuses around logic • Is suited well for the sciences • Prefers to receive information through written and verbal means • Needs time to process information • (Kolb, & Kolb, 2005)
Converging	Abstract Conceptualization Active Experimentation	<ul style="list-style-type: none"> • Finds solutions to problems based on information received • Prefers technical rather than social subjects • Is suited well for technology and specialization jobs • Prefers laboratory type learning

		environments
		(Kolb, & Kolb, 2005)

Accommodating	Concrete Experience	• Learns by doing
	Active Experimentation	• Acts on instinct
		• Is a people person
		• Is suited for sales and marketing jobs
		• Prefers to work with others
		(Kolb, & Kolb, 2005)

In order to determine the learning styles of individuals, Kolb developed his Learning Styles Inventory. This instrument was based on a four-part design: 1) reaction from the individuals taking the test would be similar to a learning experience 2) the design requires self-reporting 3) the results of the inventory would be consistent with experiential learning theory and 4) the instrument should be succinct. Additionally, Kolb determined norm scores for the instrument via men and women ages 18-60 of varying occupations in a sample size of 1,933 individuals. Thus Kolb became the leader in Learning Styles theory and laid the groundwork for additional learning styles theories and learning style inventories to emerge.

Honey and Mumford developed an additional instrument featuring their own four learning styles (Honey, & Mumford, 2006): Reflexive, Theoretic, Pragmatic, and Active, which coincide with the four learning styles of Kolb (González-Haro, Calleja-González, & Escanero, 2010). There were, as expected, similarities and differences between the two instruments and learning styles proposed. The similarities between the two are shown in Table 1.2 (Swinton, 2006). There are two main differences between Kolb and Honey and Mumford (Honey, & Mumford, 2006). Honey and Mumford use statements instead of words in their instrument; and

their focus is more upon using the results of the instrument to aid an individual in his or her learning, as opposed to only identifying a learning style in the individual. The interactions between Kolb and Honey and Mumford are shown in Figure 1.1

Table 1.2

Definitions of Kolb and Honey and Mumford learning Styles

Honey and Mumford		Kolb	
Learning Style	Definition	Learning Style	Definition
Reflexive:	A person with this learning style views past experiences from various points of view and examines situations before making a decision (González-Haro, Calleja-González, & Escanero, 2010).	Diverging:	A person with this learning style has the ability to see situations from multiple points of view, is successful with formulating ideas, gathers information, is a people person, and prefers group work (Kolb, & Kolb, 2005).
Theoretic:	A person with this learning style is logical and has a dislike for things which are not concrete (González-Haro, Calleja-González, & Escanero, 2010).	Assimilating:	A person with this learning style takes information from broad to concise, thinks logically, is suited well for the sciences, prefers to receive information through written and verbal means, and needs time to process

information (Kolb, & Kolb, 2005).

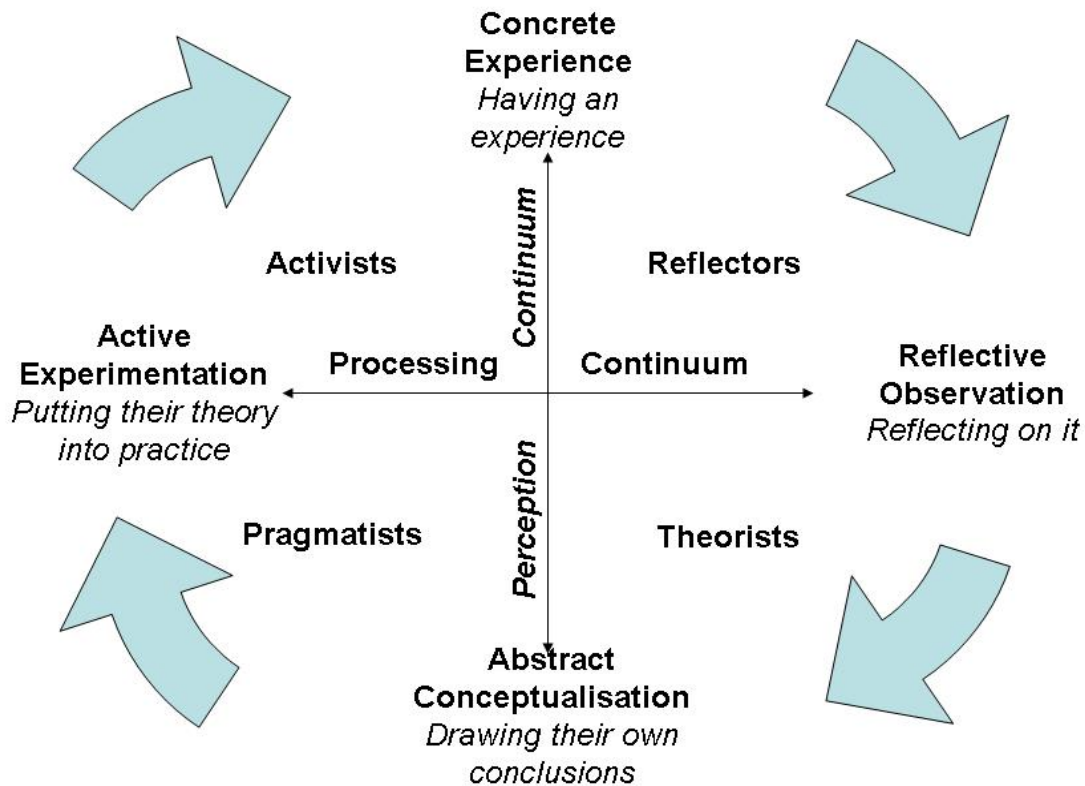
Pragmatic:	A person with this learning style is realistic in use of ideas and is careful in actions (Gonzales-Haro, Calleja-González, & Escanero, 2010).
------------	---

Converging:	A person with this learning style finds solutions to problems based on information received, prefers technical rather than social subjects, is suited well for technology and specialization jobs, and prefers laboratory-type learning environments (Kolb, & Kolb, 2005).
-------------	--

Active:	A person with this learning style likes to try new things and is open to new ideas (González-Haro, Calleja-González, & Escanero, 2010).
---------	---

Accommodating:	A person with this learning style learns by doing, acts on instinct, is a people person, is suited for sales and marketing jobs, and prefers to work with others (Kolb, & Kolb, 2005).
----------------	--

Figure 1.1 The Interactions between Kolb and Honey and Mumford



Clark, D. R. (2008), Honey and Mumford's Model- Learning Styles Questionnaire (LSQ). Retrieved July 10, 2011 from http://www.nwlink.com/~donclark/hrd/styles/honey_mumford.html

As one can see, learning style research with its complexities and discrepancies has lent itself to other definitions of learning styles and assertions of the importance of continuing research in this area. One such idea, according to Peters, Jones, and Peters (2008) is that learning styles are considered by many to be simply personal attributes of the student; Kolb (1984) suggests, to the contrary, that they are a result of the modes one uses to learn. Others feel that continuation of this research is a function of the western culture's view of people as individuals (Scott, 2010) or people's preferences to think of themselves as possessing unique characteristics (Pashler, McDaniel, Rohrer, & Bjork, 2009). Moran, (1991), however, offers

agreement with Kolb by defining learning styles as the way “people differ from each other in the manner in which they process information from the world” (p.239). It is also known that learning styles are not a fixed characteristic of people, but instead have the ability to change in response to environmental factors (Gantasala & Gantasala, 2009; Kolb, 1999; Honey & Mumford, 1992). Due to the important implications of these varying concepts, one can see how these theories could be used in areas outside of purely academic systems.

One such area is athletics. In 2010 González-Haro, Calleja-González, and Escanero sought to use the learning-styles research to determine if professional, amateur, and recreational athletes varied in their learning styles. Their findings of slight differences in the learning-style preferences of professional athletes, as opposed to those of recreational and amateur athletes, provide insight into what could be a determining factor in level of sport performance. However, the study did not include college athletes, females, or the people who coach them. Although this study provided insight into athletes of professional, recreational, and amateur levels, it also left a significant gap in the existing knowledge about a large population of athletes.

According to the National Collegiate Athletic Association (NCAA), in the 2009-2010 academic year, over 430,000 student athletes competed in championship sports in member institutions (NCAA, 2010). This number does not include those student athletes who competed at junior colleges or in the National Association of Intercollegiate Athletics (NAIA). The competitive nature of collegiate athletics and the emphasis placed on performance and training are prevalent in today’s society. In many cases collegiate coaches’ jobs, careers, and livelihoods are determined by the performance of their teams. Due to the severe implications which can result from a lack of desired performance, coaches in the collegiate setting pursue methods to increase performance through clinics, conferences, and sport-specific professional organizations.

An understanding of how individual members of their teams learn is valuable information for coaches desiring to increase the level of sport performance in their athletes.

Research has shown that tailoring instruction to a person's learning style in the educational setting can have positive effects on learning (Boyle and Dunn, 1998; Farkas, 2003). Popescu (2010) suggests that all learning environments should seek to increase student motivation, satisfaction, and positive attitude towards learning and that an essential component of this goal is the use of adapting learning environments to learning styles. By utilizing the theories of learning styles set forth by Kolb, Honey and Mumford, and others, coaches could determine how their athletes learn, as well as how the coaches themselves can tailor instruction to achieve maximal performance, paramount for success in athletics.

Purposes of the Research Study

This study has three primary purposes:

1. To determine learning styles of Division II collegiate athletes across sport, level of sport performance, and gender.
2. To determine what Division II collegiate coaches know about learning styles.
3. To determine how college coaches apply knowledge of learning styles by providing learning experiences and individualized instruction which match the learning styles of the athletes they coach.

Hypotheses

This study has three hypotheses:

1. Athletes will vary in their learning styles across level of sport performance and gender.
2. Athletes will not vary in their learning styles across sport.

3. Coaches who have knowledge of learning styles will teach each player according to his or her learning style.

Research Questions

This study poses three questions:

1. What learning-styles exist among college athletes across level of sport performance, gender, and sport?
2. What do college coaches know about learning styles?
3. Do college coaches who have knowledge of learning styles provide instruction that is individualized to their player's learning style?

Limitations

The setting for the research is a college campus; the researcher will be present to administer the Honey and Mumford Learning Styles Questionnaire, demographic questionnaire, interviews, and the audio-taping of the practice sessions. Limitations for this study include the following: Participants will be limited to the athletes enrolled at the institution. Participants in the study could discuss the study with each other. The results of the Honey and Mumford Learning Styles Questionnaire will be limited by each participant's honesty and diligence in completing the questionnaire. The results for the interview portion are limited by the honesty of the participants. The results from the practice sessions will be limited to an individual sport and only one practice session. The results are also limited as it was not investigated if coaching to learning style elicits a behavioral response in performance.

Delimitations

The delimitations for the study include the following: The study uses only athletes who are competing at the college level in the sports offered for both males and females at the institution. The results are limited to the scores for the Honey and Mumford Learning Styles

Questionnaire and the answers provided by the interviews and type of audio-taped practice session.

Definition of Terms

Cognitive Learning Style – A person with this learning style demonstrates “a stable, relatively permanent disposition that reflects a person’s preferences for receiving, processing, and responding to external input” (Williams & Anshel, 2000).

Converging Learning Style – A person with this learning style finds solutions to problems based on information received, prefers technical rather than social subjects, is suited well for technology and specialization jobs, and prefers laboratory-type learning environments (Kolb, & Kolb, 2005).

Diverging Learning Style – A person with this learning style has the ability to see situations from multiple points of view, is successful with formulating ideas, gathers information, is a people person, and prefers group work (Kolb, & Kolb, 2005).

Learning Style - Specific ways in which “people differ from each other in the manner in which they process information from the world” (Moran, 1991). It can also be defined as the “ability to use all senses in learning new material” (Miller, Ogilvie, & Branch, 2008).

Student Athlete –“Is a student whose enrollment was solicited by a member of the athletics staff or other representative of athletics interests with a view toward the student’s ultimate participation in the intercollegiate athletics program. Any other student becomes a student-athlete when the student reports for an intercollegiate squad that is under the jurisdiction of the athletics department, as specified in Constitution 3.2.4.4. A student is not deemed a student-athlete solely on the basis of prior high school athletics participation” (NCAA Academic and Membership Affairs Staff, 2011 p. 53-54).

Division II Institution – An institution which has undergone the process outlined by the NCAA to become a Division II school and that has met the following criteria: has at least 5 All-Male or 4 Mixed Team sports or 5 All-Female or 6 Mixed Team sports; has a minimum of two All-Male or Mixed Team and two All-Female team sports; has one sport per season of each gender, competing in the minimum number of contest requirements for teams or participants; and provides the minimum amount of financial aid required by the NCAA (NCAA Academic and Membership Affairs Staff, 2011).

Chapter II

Literature Review

Due to the prevalence of college sports in society and the importance placed upon winning, it is essential for college coaches to find the most effective means to provide quality learning experiences and to instruct players individually for the purpose of increasing their performance. Coaches, therefore, must determine how their players learn in order to attain high levels of performance. The majority of research in the area of learning styles is focused in the academic setting. However, there are the multiple similarities between the academic setting and the collegiate athletics setting. Both settings display an exchange of information and a pursuit of increasing performance. Regardless of what skill is being acquired, increasing ability requires an exchange of information. The better equipped the coach or teacher is in conveying the information needed, the better the outcome of the performance. Therefore, the research found in education is very applicable within sports due to the large amount of instruction provided by the coach to the athlete. The research has demonstrated multiple influences upon learning styles (See Table 2.1).

Table 2.1

<i>Influences of learning styles</i>	References
Influences of Learning Styles	
Groups	Burns, Johnson, and Gable 1998; Erton, 2010; Hamade and Artail, 2010; Peters, Jones & Peters, 2008; Harfield, Panko, Davies, & Kenley, 2007; Prajapati, Dunne, Bartlett and Cubbidge, 2011; Coker, 2000;

	Clarke, et al, 2010; Nunn, 1995; Snyder, 1999
Relationship to Achievement	Hlawaty, 2009; Alumran, 2008; Boatman, Courtney, & Lee, 2008; Furnham, Monsen, & Ahmetoglu, 2009; Chiou, 2008; Lister, 2005; Hsin-Tzu and Ansalone, 2008; Wang, Wang, Wang, and Huang, 2006; Collinson, 2000; Mathews, 1996; Burns, Johnson, and Gable, 1998; Al-Balhan, 2007; Terregrossa, Englander, & Zhaobo, 2010; Atkinson, 2006; Woolhouse and Blaire, 2003; Duman, 2010
Relationship to Pedagogy	Bostrom and Lassen, 2006; Yildirim, Acar, Bull, and Sevinc, 2008; Farkas, 2003; Gerdes and Crews, 2010; Tzu-Chien and Graf, 2009; Terregrossa, Englander, and Englander, 2009; Shein and Chiou, 2011; Tatar and Dikici, 2009; Onwuegbuzie and Daley, 1997; Saeed, Yang and Sinnappan, 2009; Engel, 2009; Vaughn and Baker, 2008; Boyle and Dunn, 1998; Choi, Lee, and Kang, 2009;

Learning Environments	Akkoyunlu and Soylu, 2008; Yilmaz-Soylu, and Akkoyunlu, 2009; Rogers and McNeil, 2009; Graf, Liu, and Kinshuk, 2010; Zacharis, 2010; Gantasala and Gantasala, 2009;
Athletes	Wesch, Law, and Hall, 2007; Williams and Anshel, 2000; Williams, Anshel, and Quek, 1997; Miller, Ogilvie, and Branch, 2008; González-Haro, Calleja-González, and Escanero, 2010
Coaching/Leadership	Turman and Schrodt, 2004; Hastie, 1995;

In order to have a better understanding of how research has explored and yet left gaps in the knowledge base of learning styles, studies with similar characteristics are grouped together. While certain studies may cover multiple aspects of learning styles, the information found was categorized as follows: Subject Area Studied, Relationship to Achievement, Pedagogy, Learning Environments, Athletes, and Coaching/Leadership. Studies were placed into the appropriate category based upon primary results or characteristics of the selected populations (*e.g.* athletes).

Groups

In the arena of learning styles research, many populations of people have been examined. This section focuses on research analyzing groups sharing the common characteristics of studying at a specific level of education, subject area (*e.g.* computer science or athletic training), or a specific occupation. It is important to look at the results of this research since the present study seeks to investigate three specific populations within the university setting: male athletes,

female athletes, and coaches. This analysis provides insight into how people who share a common area of study or occupation and, thus, share common experiences will relate in their learning styles.

Grade school populations.

The study of learning styles of specific groups begins as early as 4th grade. Burns, Johnson, and Gable (1998) completed an extension of the Dunn and Price (1980) study to determine if gifted students had similar learning styles to those of the general population. The study utilized the Dunn, Dunn and Price 1975 Learning Style Inventory (the same instrument used in the first study) to analyze 500 fourth- through eighth- grade students in public schools. The results found in both studies that gifted students are persistent and prefer less structure. The study also stressed that learning styles should be used only to gather information about students, but should not be used as a means to label or group students.

Snyder (1999) constructed an instrument to determine what learning styles—Auditory, Global, Visual, Kinesthetic or Analytical—students perceive themselves as having. He validated his results by comparing them to the findings from the National Association of Secondary School Principals Learning Styles Profile. In this study of 128 high school students, Snyder (1999) found that when the total population was considered, high-school students preferred global (64%) over analytical (36%) and tactile/kinesthetic (81.1%) over auditory (7.2%) and visual (11.7%). Findings also indicate that females had higher grade-point averages ($\alpha_2 = .05$) than males. However males showed preferences in working with others ($\alpha_2 = .10$), spatial ($\alpha_2 = .05$), logical ($\alpha_2 = .05$) and in bodily kinesthetic ($\alpha_2 = .002$) characteristics.

University populations.

Those who are taking courses for certain occupations showed relationship to each other. Harfield, Panko, Davies, and Kenley (2007) used the Productivity Environmental Productivity Survey to measure learning styles of 153 construction students. Results and inferences were determined by aggregated data and descriptive statistics. Results showed the two strongest preferences for learning were visual at 21.6%, and tactile, at 19%. The research also found that 42.5% prefer instruction and content to be structured.

The majority of research on specific groups of people has been completed at the college level. Erton (2010) used the Maudsley Personality Inventory and the Jeffery Barsch Learning Styles Inventory to measure the learning styles of 102 freshman male and female students ages 18-23. The study sought to determine if personality traits used in developing learning styles are related to non-native speakers' achievement in learning English. The setting for the study was an English class at Bilkent University. Results of the inventories and inferences were determined by statistical and graphical analysis and *t* test results. Visual-learning-style students comprised the largest proportion and the most successful students (success being measured by grade received in the class), totaling 49% of the population. This group was followed by auditory learners at 43%. Additional findings indicated that different personalities (introvert and extrovert) utilized different learning styles to be successful in learning a foreign language, but there was not a significant difference in the success of either group.

Peters, Jones and Peters (2008) used the Perceptual Learning Style Preference Questionnaire to measure the learning preferences of 116 males and 58 females enrolled in a university-level sports-related program of study. The data instrument was evaluated using the Kaiser–Meyer–Olkin Measure of Sampling Adequacy and the Bartlett's Test of Sphericity. Results from the inventory and inferences were determined by conducting an ANOVA, Chi-

square, Non-parametric Mann–Whitney U, and Non-parametric Kruskal–Wallis test. Data items which were found not to be suitable were removed, and a reliability analysis was performed to ensure the data were suitable for further evaluation. This study found students in these programs were vastly multi-modal (94%); however, auditory-, kinesthetic-, and group-learning styles were also present. It was also determined that females had higher perceptions of grade achievement with a mean grade of C, as opposed to males with a mean grade of C minus.

Hamade and Artail (2010) studied the learning styles and academic achievement of 44 trainees studying computer-aided design. Academic achievement was evaluated based upon performance on tests given throughout the course. The research determined that each of the learning styles, determined by the Honey and Mumford scale, had strengths in specific areas of the computer-aided design field or even multiple areas of the field, but not in every area of the program. This finding indicated that learning style should be considered in placing individuals in areas for computer-aided design.

Marin-Suarec and Alarcon (2010) used the Honey-Alonzo and the Fred-Silverman learning styles questionnaires, along with the Force and Motion Conceptual Evaluation test to determine the amount of conceptual learning in a study of 58 students enrolled in an introductory mechanics class. The study found that 31% of the students' learning could be anticipated in the area of conceptual learning of physics by determining what learning style (Active-Reflective, Visual-Verbal, and Pragmatic styles) a student utilizes.

Clarke, et al, (2010) used the Thinking Styles in Teaching Inventory and the Index of Learning Styles Questionnaire to study 18 male and 77 female graduate students studying education. It was found that the manner in which teachers think and learn affects how they teach. The study also found that masters' students had higher preferences for the sensing and sequential

styles (M=6.21 and M=6.05) than the doctorate students (M=4.0 and M=4.28), thus showing a difference in learning styles when level of degree sought is considered.

Prajapati, Dunne, Bartlett and Cubbidge (2011) studied 270 optometry students (63% female and 33% male) through the use of the Index of Learning Styles and found that the range for a balanced learning style was between 48% and 64% across each learning style. Active-, sensing-, visual-, and sequential-learning styles were also present. Females showed statistically significant preferences ($Z=2.96$, $p < 0.01$) for the reflective and visual styles over males. The study, contrary to other literature, found that academic achievement was not linked to a learning-style preference, but rather to enrollment status (*i.e.* international graduate students, native graduate students).

From the research presented when the population is examined as a group, one can see that various groups do share similar characteristics. These findings are key to the present study as it seeks to determine if groups of athletes have similar learning styles (*e.g.* males and females).

Relationship to Achievement

This section focuses on the relationship of learning styles to achievement. The achievement discussed is primarily based in the academic setting. The findings here are directly applicable in the athletic setting because both require a transfer of knowledge for the participants to be successful.

Grade school populations.

The study of achievement in the academic setting begins with young, grade-school-aged children. Furnham, Mosen, and Ahmetoglu (2009) utilized the Neuroticism-Extroversion-Openness-Five-Factor Inventory, Typical Intellectual Engagement Scale, Study Process Questionnaire, Wonderlick Personnel Test, and the General Knowledge Test to measure 89 male and 123 female grade-school students across multiple variables to determine if predictions could

be made about academic outcomes based upon non-ability and variance-ability test. Results from the inventory and inferences were determined by conducting a correlation analysis. The findings demonstrated that cognitive ability was the largest predictor of success $r = .60-.70$; however, it was also determined for the core subjects that 25% of the variance could be accounted for by personality traits. This study conclusively demonstrated that personality traits and style can significantly influence the outcomes of academic tests.

Collinson (2000) utilized the Learning Styles Inventory developed by Dunn, Dunn, and Price to study 58 male and 52 female third-through fifth-grade students. The study found the students with lower academic achievement showed variation in learning preferences from those with higher achievement. Lower-achieving students preferred a formal environment, learning with peers, and learning in the afternoon –when energy levels are higher for those who prefer to learn during the day. Demonstrating their independence, higher-achieving students preferred to learn alone in an informal environment. The middle-achieving group did not show a preference. The study found that learning styles should be used appropriately for teaching strategies to enhance performance.

Hsin-Tzu and Ansalone (2008) worked with 704 Taiwanese eleven-and twelve-year-olds to determine learning-style and academic-achievement relationships. The study utilized the Learning Style: The Clue and You to determine learning styles in the children. Age was found to be a determining factor. The eleven-year-olds preferred a quiet, formal learning environment with the presence of an authority figure; they wanted to learn alone, were motivated and persistent, and needed mobility and auditory perception. Twelve-year-olds liked cool environments, wanted to eat more, and liked morning for learning. Gender was also a differentiating factor for learning styles. Females preferred a formal environment, and they were

more reflective and analytic. The males liked to eat during learning and preferred kinesthetic learning. When math and reading achievement was discussed, higher achievement was found in those with emotional ($p = .001$, $r = .137$ math and $p = .036$, $r = .084$ reading) and physiological ($p = .016$, $r = .096$ math and $p = .039$, $r = .082$ reading) stimulus. It was also found by comparing the results of this study across cultural lines that the Taiwanese students preferred variety in learning in quiet, less bright, and less structured learning environments.

Wang, Wang, Wang, and Huang (2006) studied the learning styles of 234 male and 221 female seventh-grade students in web-based learning environments. The Kolb Learning Style Inventory was used to determine learning style; using a post-achievement test, it found that in the web-based setting of learning, the diverger ($M = 57.55$) and assimilator ($M = 57.92$) learning styles had the highest achievement, while converger ($M = 51.01$) and accommodator ($M = 50.96$) demonstrated the lowest achievement.

Al-Balhan (2007) studied 159 male and 93 female Kuwaiti middle-school students to see the relationships between learning styles and achievement in math. The Markova's Thinking Patterns Inventory was used to determine learning styles. The participants were broken into control and experimental groups; the experimental group received tutoring focused on specific learning styles. The experimental group ($M = 45.91$) had higher achievement than the control group ($M = 43.80$), and the males in the group had higher achievement in mathematics than the females with a mean difference of 2.15. These findings contribute to the position that tailoring the teaching style to the students' learning styles is beneficial for academic achievement.

Lister (2005) utilized the Dunn, Dunn and Price Learning Styles Inventory to examine the learning styles of 93 sixth- through eighth-grade students. Students were grouped as learning support, regular education, and high achievers. Similarities were found among learning styles

and groups. The students who were regular education students and high achievers were found to be more responsible ($M = 60.42$ and $M = 63.53$ respectively), persistent ($M = 56.00$ and $M = 58.76$ respectively) , and motivated ($M = 59.56$ and $M = 63.47$ respectively) than those students grouped as learning support ($M = 54.39$ responsibility and $M = 42.05$ persistent, and $M = 56.05$ motivation). It was found that learning-support students showed significant improvement when taught with a learning-styles approach as opposed to a traditional teaching method $F= 67.007, p , .05$.

Hlawaty (2009) measured the learning styles of 392 male and 475 female German children ages 13, 15, and 17 from eight German schools in urban, rural, and suburban areas. The Learning Style Inventory was utilized by translating the instrumentation into German and validating the translated version with the English version. Each participant's level of academic achievement was determined by the school attended since German students are assigned to schools based upon academic achievement. Results indicated that gender differences exist among German students. German females showed stronger preferences for five learning styles: responsibility ($M=55.79$), amount of light ($M=51.33$), motivation ($M=49.16$), intake ($M=47.65$), and learning in several ways ($M=46.78$). Results showed the highest-achieving students showed the least preference for parent $F(2, 2,866) = 10.28$ and teacher $F(2, 2,866) = 32.77$ motivation and more preference for mobility $F(2, 2,866) = 7.39$. However, the low-academic achieving students preferred to have an authority figure present $F(2, 2,866) = 6.93$.

Mathews (1996) utilized the Kolb Learning Styles Inventory to study 2,839 male and 2,996 female high-school students to determine what relationships existed between their perceived academic achievement and their learning styles. The study found that students who rate themselves highly in academics tend to have a learning style which emphasizes deductive thinking, not relationships. Students who rate themselves lower were more relationship/people

oriented. The study also showed that the high- and low-perceived achievers demonstrated opposite learning styles. The high-perceived-achievement students preferred the converger, whereas the lower-perceived-achievement learners preferred the diverger learning style. The study showed that even if achievement is based upon self-perception, similarities in learning-style preference exist.

University populations.

The research continued into the college setting. The Index of Learning Styles model was used to measure the learning styles of 265 male and 610 female randomly selected Bahraini University students ages 17-30 (Alumran, 2008). The study utilized the Fielder and Solomon Index of learning styles. Alumran (2008) discovered gender differences in learning-style preferences among students at Bahraini University. The results determined that females demonstrated preferences for the sensing learning styles ($M=3.30$) and males preferred intuitive learning styles ($M=2.26$). These differences could be attributed to culture or biological differences in the genders. According to Alumran (2008), these results demonstrate the need for professors to take learning styles into account when planning lessons. The study determined that the subject area studied also influenced learning styles. Technology students preferred the active/reflective learning style the most ($M=3.21$). Art students preferred the sensing/intuitive learning style the most ($M=3.62$). Education students preferred the visual/verbal and sequential/global learning style most ($M=5.47$ and $M=2.09$, respectively). Grade-point Average was found to be negatively related to visual/verbal learning style ($t = -2.57, p \leq 0.05$) and positively related to sequential/global learning styles ($t = 2.65, p \leq 0.05$). This finding was significant because a visual learning style ($M=5.91$) was preferred by participants; however, most classes were taught contrary to this learning style.

Chiou (2008) utilized the Learning Styles Preference Scale to determine the relationship between learning style and academic achievement in 112 male and 132 female college students taking courses taught by collaborative teaching. The study found the learning style and academic success to be linked to the type of course being taken. Students who showed preference for the theory-driven style of learning had higher achievement in general courses (M=84.26); conversely those who preferred the experience-driven learning style had higher achievement in technical courses (M=78.78). Students who displayed absolute thinking were also found to adopt a single learning style, as opposed to those who displayed a relativistic-thinking approach; also, they tended to have dual-learning styles preferences. Students who are more relativistic and who adopt multiple learning styles tend to perform equally well in technical and general courses.

Atkinson (2006) utilized the Cognitive Style Analysis test to determine the relationships among learning style, achievement, gender, and previous experience in 16 male and 14 female university students studying teaching design and technology education. The study found that when considering the verbalize-imager learning style, the imager learners were the most successful at 61%; however, when all six learning styles were considered, those students who displayed an imager learning style were also the most successful in the classes. This effect was thought to be due to the nature of the activities being presented in the course. However, when gender was considered, males who displayed imager qualities were high achievers in both electronics and design; conversely, females who displayed imager and verbalizer qualities were high achievers in design, but low achievers in electronics.

Terregrossa, Englander, & Zhaobo, (2010) utilized the Productivity Environmental Preferences Survey in conjunction with the restricted-least-square-regression methodology to measure multiple variables and to determine if 125 university students' behaviors, learning

styles and preferences had an effect upon academic performance in an introductory microeconomics class. Results from the inventory and inferences were determined from conducting a factor analysis, multivariate analysis, OLS regression method, and a Joint F-Test for Alternative Clusters of Explanatory Variables. The findings indicated that ability was the most significant determinant for academic success. However, grades received were shown to be an indicator of learning style, as well as lifestyles and academic ability. Also demonstrated were significant correlations among academic success, learning styles, and behavioral choices. Significant levels of correlation were found for learning styles and achievement; global learning styles were negatively related at the .01 level, and indifferent learning styles were positively related at the .05 level.

Boatman, Courtney, and Lee (2008) used the VARK questionnaire to measure the learning-style preferences of 211 college students and 4 faculty members teaching an introductory economics course (110 male and 105 female). Results from the inventory and inferences were determined by conducting a correlation analysis and OLS regression analysis. Results indicated that a student who displayed a strong visual learning-style preference could anticipate a higher final grade by 0.6 of a point. This finding is considered to be linked to the visual manner in which economic information is presented. Students could expect to have a 0.3 of a point higher if they had a preference for textual input.

Woolhouse and Blaire (2003) used the Honey and Mumford Learning Styles Questionnaire in a longitudinal study to determine the relationships among retention, changes in learning styles over a two-year period, and academic achievement. The study included 67 female and 59 male students as well as 37 tutors at a college of further education. The study was dominated by the reflector learning style: (81% of the tutors and 56% of the students). Activists

were more represented in those who did not continue in the program 53%. Academic achievement was demonstrated to have a relationship with the theorist learning style. The theorist style had the highest percentage (37% of their total number in the A/B grade range).

Although much research has found a connection between academic achievement and learning styles, there have been studies that found this connection to be untrue in the populations studied. Duman (2010) found that when experimental (18 male and 16 female) and control (15 male and 19 female) groups of university level students were compared based upon receiving brain-based learning, learning style preference was not an indicator of academic success. However, the main focus of this study was academic achievement and what effects Brain-based learning had upon this type of achievement. The Brain-based method teaches to the individual. This pedagogy was found to be effective. Therefore, the learning style of the individual might not have been a determining factor because all individual learning styles were catered to during the teaching process.

Results from this research show that those who have higher levels of achievement in various areas can have similarities in their learning styles. This is important as this study seeks to investigate learning styles across levels of performance in the athletes being studied.

Relationship to Pedagogy

This group of studies investigates the relationships between learning styles and pedagogy. This information is key when considering how coaches instruct athletes. Regardless of the level, coaches must consider student achievement and motivation. Learning can be enhanced by the use of pedagogy that takes in to account the individual's learning style. However, meta-cognition, "the ability to think about thinking," (Bostrom and Lassen, 2006, p.179) is paramount for the teacher implementing this system (Bostrom and Lassen, 2006).

Grade school populations.

This research begins with young children and continues throughout multiple academic levels. Engel (2009) studied 300 Turkish students grades 4-8 and 12 English language teachers to determine the influences of teaching styles on students' language learning styles. The study utilized two different questionnaires, one for the teachers in the study and the other for the students. The information collected from the questionnaires found that overcrowding, time constraints, and general availability of other resources can affect students' learning; these elements, of course, are inconsistent from school to school, making personalized instruction more difficult at some than at others. However, it is still considered the teachers' responsibility to accommodate the varying learning styles in their classrooms.

Farkas (2003) used a pre- and post-test format to study the difference between 105 seventh-grade students to compare a multisensory instruction (experimental group, $n=51$) to the traditional approach (control group, $n=54$). The findings support that teaching using a multisensory instructional approach, which is a learning-styles-based approach, produced academic gains in the students ($M = 10.9$) as opposed to the control group ($M = 6.4$).

Nunn (1995) studied 59 male and 44 female seventh- and eighth-grade middle-school students. Participants were separated in to three groups (students at risk who received the learning-style and strategy-based intervention, students at risk who did not receive a learning-style and strategy-based intervention, and students who were used as a control group). Results showed that a learning-style and strategy-based intervention program increased the grade-point averages of middle-school children who were labeled as "at risk" from 1.78 to 1.95.

Yildirim, Acar, Bull, and Sevinc, (2008) utilized a pre-post method of analysis to measure learning gains and the Kolb's Learning Styles Inventory to measure learning-style

preferences of 344 male and 402 female eighth-grade students to determine if a student's learning style was indicative of performance in an environment based on the Generative Theory of Multimedia Learning. Results from the inventory and inferences were determined by conducting a one-way ANOVA. The study found the use of multimedia did not affect the learning outcomes of the various learning styles. It was also determined that the use of a teacher-leadership style which was people-oriented was the most influential factor for academic success ($r = .917, p < .01$); there was not a relationship between learning styles and academic success in the population studied. This finding becomes paramount for those coaches who may have a team whose players all possess similar learning styles; the coach, therefore, must focus on his/her methodology.

Tatar and Dikici (2009) examined 58 ninth-grade students in a nonequivalent control group study. The study used the Mathematical Knowledge Test, Mathematical Attitude Scale, and the Binary Operations and its Properties Knowledge Test, to determine if the 4MAT teaching method was effective. The study found it is more efficient to teach mathematics using an approach that takes into consideration learning styles and brain hemispheres.

University populations.

Tzu-Chien and Graf, (2009) used the Felder-Silverman learning-style model to measure the learning preferences of 72 university students encountering an online course that did not match their preferred learning style. A control group was established, and participants were assigned to three groups: students who took a course that matched their learning style, did not match their learning style, or did not take learning styles into consideration (control group). Results from the inventory and inferences were determined from descriptive statistics and from the results of t test and Pearson's r correlation coefficient. Results showed that those who demonstrated strong preferences in learning styles struggled more with courses taught contrary to

their preferences. These students also benefited more from taking courses that matched their learning style or from getting help in strategies to learn in an environment contrary to their preferences than those demonstrating only mild preferences. Learning preferences were also indicative of the students' adaptability. Those with active learning styles struggled more to adapt to reflectively taught courses than reflective to actively taught courses. However, sensing/intuitive and global/sequential learners did not demonstrate this struggle to adapt. The study further investigated the behaviors of students in mismatched courses and found a student's learning style and behaviors related to time spent on the course, the number of log-in times to the course, number of learning objectives used, and additional request for learning objectives to be indicators of learning performance.

Saeed, Yang and Sinnappan (2009) utilized action research to study university students in a web-programming course to determine learning styles of students and then to design the course to meet the learning styles needs of the students. 101 male and 18 female students responded to the Felder-Solomon's learning styles inventory, and the authors designed a technology questionnaire to which 90 male and 15 female students responded. The study found that students in our society are now more able to adapt their learning to the pedagogy being used than previous generations. The study also found that learning style and gender did not play a role in academic achievement.

Terregrossa, Englander, and Englander (2009) conducted a study of microeconomics classes (74 participants) that used pedagogy directed towards analytical learning styles for a portion of the course and then global learning styles for a portion of the course. Findings from the study indicated that global learning styles matched with global teaching were statistically linked at 0.10 level to enhanced performance on exams.

Onwuegbuzie and Daley (1997) utilized the Productivity Environmental Preference Survey to determine how 74 undergraduate students taking research-methods courses learn. The results determined that students varied in their preferences based upon their proficiency in proposal writing; evaluation of research; and understanding of methodology, theory, and purpose. Therefore, for students to be successful in all areas of the course, teachers should use varying pedagogical strategies with their students.

Shein and Chiou (2011) found in a study which consisted of 264 male and 229 female undergraduate students in collaboratively taught technical courses that university students' learning styles resemble those of the faculty they consider role models. Students who evidence concrete-experience and active-experimentation learning style typically chose technical teachers; those who evidenced abstract conceptualization and reflective observation typically chose lecturing teachers.

Gerdes and Crews (2010) developed a course-profiling system based on course workload and learning level as a purposed means to increase student learning and retention at the university level. By surveying 48 male and 52 female college students, then graphing and compiling the information obtained, Gerdes and Crews (2010) were able to provide students with a more complete overview of a course than is typically provided. This information would provide students and advisors with a higher probability of constructing a course schedule that would not only meet graduation requirements, but would also match the students' learning styles and enhance student learning and retention.

In addition to investigations of participants in grade school through undergraduate college students, post-graduate students have also been examined. Choi, Lee, and Kang (2009) measured learning styles, learning outcomes, and learning experience of 70 dental school students. The study utilized the Felder and Soloman Index of Learning Styles, a learning-results

test, and a questionnaire to determine learning experience. The study found that the learning styles did not influence outcomes or experience in relation to learning. It was suggested, however, that the active-reflective learning style could have effects on learning outcomes; however, in the initial phase of the study, these findings led to the suggestion that a more streamlined approach to pedagogy would be to teach students to adapt, as opposed to adapting to the various students' learning styles in learning environments.

Vaughn and Baker (2008) studied 45 Pediatric Preceptor-Residence groups; residents were grouped with Preceptors in a setting of their choice to determine how teaching and learning styles interact in the medical setting. The study found that in the medical learning setting, a medical resident's learning style and a medical preceptor's teaching style should be an area of considerable contemplation when groupings are assigned in order to increase the opportunities for a positive experience. However, it was also suggested by Vaughn and Baker (2001) that teachers provide instruction that both matches and contradicts students' learning styles, creating both accommodation and tension, thus providing students with a vast array of opportunities to be successful.

Boyle and Dunn (1998) studied 76 first-year law students using the Productivity Environmental Preference Survey to determine if the subjects would have a universal learning preference since they had chosen a specific area of study; this was, however, found not to be true in the population studied. The study found that when teaching law students, professors should determine what learning styles are present and then adapt their teaching methodologies.

The results from the research focusing on pedagogy indicate the benefits of tailoring information in a manner which parallels the learning preferences of the intended audience. These findings support the desire of this study to determine if coaches have a knowledge base for

learning styles and if so do they actually incorporate this knowledge into a useful coaching strategy that increases athletic performance.

Learning Environments

This section details studies focused upon the environment in which learning takes place and how learning styles are related to the environment. It is important to determine what environments or what components of an environment are important for learning and meeting the needs of various learning styles.

University populations.

The studies in this section, unlike others, are concentrated in the university setting. Coker (2000) examined the learning styles of 26 university level athletic-training students. The study utilized the Kolb's 1985 Learning Styles Inventory to assess students learning preferences in the classroom and clinical settings. The subjects took the inventory twice, once focusing on acquiring new information in the classroom and the other time focusing on acquiring new information in the clinical setting. The study found that 65.4% of students have a learning-style of assimilator for the classroom setting however; in the clinical setting the dominant learning style is converger 42.3%. This finding indicates that instructors of athletic-training students should adapt their teaching styles to the educational settings (clinical experiences or classroom).

Zacharis (2010) studied 161 (77 online and 84 in person) freshmen using Kolb's Learning Styles Inventory to investigate whether or not there was a difference in the achievement levels of the students in an online versus a traditional learning environment. The study found that learning-style preferences neither hindered nor advanced learners' ability to obtain equal levels of achievement in both courses.

Rogers and McNeil (2009) used the Myers-Briggs personality test to measure the learning styles of 81 male and 112 female undergraduate students enrolled in an online

management course to determine which learning styles demonstrated the highest levels of performance. Results from the inventory and inferences were determined by conducting an ANOVA and subsequent post hoc analysis. Results from the study indicated that learning style does impact ability to perform well in the online course setting and that ST (Sensing-Thinking) (M=76.64 grade in course) and NT (Intuitive-Thinking) (M=79.33 grade in course) learners perform better online. This study suggests that helping students understand their learning styles and their professors' pedagogical methods could allow students to make better-informed decisions about which course and pedagogy offered would allow them to be most successful. Although ST (Sensing-Thinking) and NT (Intuitive-Thinking) learning styles were conducive to success in an online course, it was not determined that other styles cannot be successful. Therefore, it is imperative for instructors to use a multimodal approach in effort to increase the academic success of their students.

Graf, Liu, and Kinshuk (2010) examined 75 undergraduate information systems and computer science students. The authors used the Felder Solomon Index of Learning Styles to find that in an online course the students displayed varying navigational strategies to go through the online information. It was found that this varied based upon learning styles, and that these findings support the use of adaptive learning environments in online courses.

Akkoyunlu and Soylu (2008) found in a study of 34 university students' perceptions of blended-learning environments differed based upon learning style. The study was comprised of assimilator 47% and diverger 53% learning styles. The assimilators (M = 9.13) had significantly different perceptions of the aspects of the learning environment of the blended learning as compared to the divergers (M = 7.83) in the study. Also it was found that assimilators were more active than diverger learners in the online discussion portion of the course for those with high participation (50% and 17% respectively) and medium participation (31% and 22%

respectively); however, for those with low participation, the reverse was true (61% for diverger and 19% for assimilators).

Gantasala and Gantasala (2009) combined the LSQ and the VAK learning-styles inventories to measure the learning styles of 63 Masters of Business graduate students; the goal was to determine whether or not a pedagogical model could be developed based on the learning styles of the students in a MBA program. Results from the inventory and inferences were determined by conducting a Principles Axes Factoring method. The findings indicated that contrary to other studies (Hlawaty, 2009; Alumran, 2008; Miller, Ogilvie, & Branch, 2008; Wesch, Law, & Hall, 2007), there was no difference in learning styles among males and females (Gantasala & Gantasala, 2009). The socio-demographics of the students also had no effect upon learning preferences. Findings also indicated that to improve attitudes and performance, the design of the course and the curriculum used should parallel the learning styles of the students. However, it is also known that learning styles are not a fixed characteristic of people, but instead can change due to environmental factors (Gantasala & Gantasala, 2009; Kolb, 1999; Honey & Mumford, 1992).

Yilmaz-Soylu, and Akkoyunlu, (2009) sought to determine if learning styles were indicative of performance in an environment based on the Generative Theory of Multimedia Learning. The study used a pre-post-test methodology using the Kolb's Learning Style Inventory. The participants for the study were 39 university faculty members. Text -, narrative-, and computer- mediated learning environments were created to test the effects of these environments upon learning styles. The study found that the use of multimedia did not affect the learning outcomes of the various learning styles and that learning environments do not have an effect upon students' achievement. Although contradictory to the previous research listed, it is

important to understand that experiential learning theory places a high importance on the quality of the learning experience and not simply the presence of the experience (Dewey, 1970).

This research furthers pedagogical theory by showing that the environment, as well as instructional method, can affect learning. These findings are important for coaches as they show the need to establish nurturing environments.

Athletes

This section seeks to look at those studies which investigate athletes and their learning styles. Groundwork for what has been studied in relationship to athletics and learning styles is discussed here. The gaps in this literature are discussed later in the chapter.

Grade school populations.

The learning styles of athletes have been analyzed through the lens of possible cultural differences. Williams, Anshel, and Quek (1997) utilized a cognitive-style inventory to study 443 male and 530 female school- or sports-organization athletes ages 11-17 in Singapore, New Zealand, and Australia. The study examined differences in culture and gender. The findings indicate that the similarities among the groups were more prevalent than differences. The groups shared equally in the level of focus upon emotional preparation and the use of behavior and cognitive strategies for the learning and execution of skills. The most prevalent difference was preference for weather between Singapore and New Zealand, 69.8% of dispersion ($R_c = .85$), which could be explained by the varying climates in which the participants live. The study also found some characteristics of the cognitive style (preference for an ordered, planned way of life) were similar to those that are needed to participate in sports.

Athletes were examined based upon a certain style of learning. Williams and Anshel (2000) measured a sample of 278 male and 284 female adolescent (ages 11-17), high-skill level athletes' learning styles using the Cognitive Style in Sport Inventory (CSSI) to determine what

relationship the cognitive-style construct has with athletes playing competitive sports. The Cognitive Style in Sport Inventory consists of internal (affect, perception, and personal dispositions) and external (environmental features, social needs, and behavioral tendencies) groupings. Williams and Anshel (2000) define *cognitive style* as “a stable, relatively permanent disposition that reflects a person’s preferences for receiving, processing, and responding to external input” (p. 70). The results determined that the athletes measured needed social support from the coaches and that this factor could affect sports performance. The pedagogy of the coach was also found to be important in the following areas: the presentation of information verbally or visually, personal interaction, and reactions to and perceptions of external derivatives. Finally, it was determined that performance could be enhanced by providing the athletes with the optimal learning environment for their learning preferences.

Wesch, Law, and Hall, (2007) utilized the Functions of Observational Learning Questionnaire (FOLQ) to measure the differences of 377 male and 265 female high-school athletes in the patterns of observational learning (skill, strategy, and performance) across the following parameters: varsity and recreational athletes, males and females, team and individual sports. Findings indicated that males and females utilized skill and strategy to nearly the same extent. In terms of performance functions, males utilized significantly more than females $F(1,633) = 15.25, p <.02$. Varsity athletes of both genders were found to utilize all three functions of observational learning more than recreational athletes $F(1,631) = 15.93, p <.01$. This finding seems to be indicative of the lack of practice and significantly less time with coaches on the part of recreational athletes, as contrasted with varsity athletes, who would see a coach nearly every day in season. When comparing team and individual sports, the study determined that team-sport participants utilized the function of strategy more than individual-sport athletes $F(1,633) =$

9.86, $p < .02$; conversely, individual-sport athletes utilized the skill function at a higher rate $F(1,633) = 7.38, p < .02$.

University populations.

Miller, Ogilvie, and Branch (2008) utilized the Learning Styles Profile to measure the learning styles of 302 female and 348 male NCAA (National Collegiate Athletic Association) Division I basketball players. The male athletes showed statistically significant differences from women in the areas of frustration tolerance at ($p=.0001$), ability to change and compliance at ($p=.01$) skill rating at ($p=.05$). However, females showed statistical significance in facilitation to change, ability to trust, and feedback—preferences at ($p=.0001$), willingness to change ($p=.05$), and interpersonal control ($p=.01$). It was also determined that the use of tri-modal (visual, trial-and-error, and kinesthetic) learning is effective. Athletes who are not utilizing all three modes of learning demonstrate preferences for less information, a slower rate of change, and an overall less adventurous approach to the game and to learning overall. It was determined that coaches need to adapt their coaching styles to the athletes' needs in game and practice situations.

Multiple levels of performance in male athletes were also examined. González-Haro, Calleja-González, and Escanero (2010) utilized the Honey-Alonso Learning Styles Questionnaire (the Spanish Language version of the Honey and Mumford Learning Styles Questionnaire) to measure the learning styles of 71 male athletes (professional ages 26 ± 4.4 , recreational ages 21.8 ± 4.8 , and amateur ages 19.1 ± 2.6) to determine what differences exist with regard to level and sport. Findings determined that the type of sport was not a predictor of learning style. The preferences found for learning styles among the athletes were accommodator first at 56% and then diverger at 17%--except for cyclists, who preferred assimilator 27% second. When the level of sport performance was considered, only the pragmatic learning style showed a level of significance: professional athletes favored the pragmatic style of learning, the least (11.2 ± 2.8)

of the levels of performance being studied; however, it was not to the point of significance. When taking into consideration the amount of experience in years, the study determined there was no difference in the learning styles among the groups.

Findings from this research support the need to for further research in the area of differences in male and female athletes, as well as the need to look at variations due to level of sport performance.

Leadership/Coaching

This section discusses those studies which focused upon leadership/coaching and how these two are related to learning styles. Although the studies focused upon leadership and coaching, it is important to note that the athletes' perceptions of coaches were the focus of this research.

Grade school populations.

Turman and Schrodtt (2004) used the Leadership Scale for Sports, which measures "autocratic, democratic, social support, training and instruction, and positive feedback" (p.135). The participants of the study included 124 members of wrestling teams from 17 Midwest US high schools. Findings indicated the autocratic model is inversely related to affective learning ($r = .44, p < .0001$); however, all other coaching styles were positively related to affective learning: democratic ($r = .24, p .008$), training and instruction and social support ($r = .44, p < .0001$), and positive feedback ($r = .57, p < .0001$). It was also determined from the results that a use of moderate-and-above positive feedback coupled with an autocratic style would increase the affective learning outcomes of athletes ($t = 1.97, p = .05$).

Hastie (1995) studied 240 high-school-aged volleyball players in Australia using the Chelladurai and Saleh's Leadership Scale for Sports to determine the coaching preferences among athletes. Results demonstrated that the competitive level of the athlete had an impact

upon the coaching-style preference ($F_{3230} = 3.92, p=.004$). High-performing athletes preferred a more direct-execution, winning-oriented feedback than lower-performing athletes, who preferred a coach who fostered a more positive-feedback playing environment.

This research supports the importance of pedagogy for coaches as it can have a profound impact upon learning. It is important to relate the findings of these studies to those conducted in the classroom setting as both areas of instruction share the common theme of transferring information from one person to another.

Gaps in the Current Findings

There are significant gaps in the literature concerning learning styles among collegiate athletes. Miller, Ogilvie, and Branch (2008), for example, failed to examine the athletes' actual levels of performance. Gonzalez-Haro, Calleja-Gonzales, and Escanero (2010) explored varying levels of athletes; however, they did not include females or college athletes. These studies serve to open an area of research which needs further exploration: as noted in the introduction, this new study seeks to examine areas the two previous studies did not—collegiate athletes, gender, and level of sport performance. This study also seeks to add knowledge to the research on coaching methodology and learning-styles knowledge.

Conclusion

The research for learning styles is extensive, though significantly concentrated in the academic setting. Although support and contradictions exist in the research to date, this fact is a demonstration of the need for additional research to determine the scope and applicability of the learning-styles theory. Further research into the learning styles in the field of collegiate athletics will open a door for understanding this highly competitive environment and will help to effectively serve the needs of the people who work and live there.

Chapter III

Methods

Introduction

Today's results-driven society has placed increased importance on college sports but also on learning. Since learning skills is important to success on the athletic field, it is imperative the relationships between performance and learning-styles theory be further examined. Focusing on gender and overall levels of sport performance will open new avenues to continue this kind of research, establish new and more clearly defined parameters for study variables, and foster growth for everyone involved in these dynamic endeavors.

Purposes of the Research Study

This study has three primary purposes:

1. To determine learning styles of Division II collegiate athletes across sport, level of sport performance, and gender.
2. To determine what Division II collegiate coaches know about learning styles.
3. To determine how college coaches apply knowledge of learning styles by providing learning experiences and individualized instruction which match the learning styles of the athletes they coach.

Hypotheses

This study has three hypotheses:

1. Athletes will vary in their learning styles across level of sport performance and gender.
2. Athletes will not vary in their learning styles across sport.
3. Coaches who have knowledge of learning styles will teach each player according to his or her learning style.

Research Questions

This study poses three questions:

1. What learning styles exist among college athletes across level of performance, gender, and sport?
2. What do college coaches know about learning styles?
3. Do college coaches who have knowledge of learning styles provide instruction that is individualized to their players' learning styles?

Methodology

This study employed a mixed-methods design and will consist of three parts. Part one sought to determine the learning styles of collegiate student athletes and how their learning styles relate to gender, the sport played, level of sport performance, and year of eligibility. Part two sought to determine what college coaches know about learning styles. Part three sought to determine how coaches apply knowledge of learning styles to the coaching of athletes and how the college coach interacts with players of various learning styles, gender, year of eligibility and levels of sport performance.

Setting

The setting for the study is an institution located on 100 acres in a suburban area of the southeastern part of the United States ("Fast Facts," 2011). The institution is a private Methodist-Church-affiliated college with a student body of just over 2,300 graduate and undergraduate students. The NCAA Division II institution fields 19 varsity sports. The success of the athletics program boasts 27 team national championships, 20 individual national championships and four relay national championships ("Moccasin success," 2013). The school has also compiled 297 male All-Americans and 166 female All-Americans in the sports this study seeks to investigate ("All-Americans," 2012).

Part One: Survey of the Athletes' Learning Styles and Levels of Sport Performance

The participants for part one of this study will include athletes from the following sports: baseball, softball, men's tennis, women's tennis, men's golf, women's golf, men's cross country/track, women's cross country/track, men's basketball, women's basketball, men's lacrosse, women's lacrosse, men's swimming, women's swimming. (See Table 3.1).

Table 3.1

<i>Part One Potential Participant Numbers</i>			
Male		Female	
Sport	Number of athletes	Sport	Number athletes
Basketball	14	Basketball	12
Baseball	31	Cross Country/ Track	12
Cross Country/ Track	14	Golf	9
Golf	9	Lacrosse	26
Lacrosse	49	Soccer	22
Soccer	27	Softball	18
Swimming	20	Swimming	13
Tennis	15	Tennis	11
Totals	179	Totals	123

These sports were chosen since the NCAA sponsors championships for both men and women in each sport or allows for competition in similar forms (e.g. baseball and softball). This fact is important as it will allow for gender comparisons of learning styles across sports. The sample is

appropriate for the study due to the success of the athletics program and due to the study's intent to determine the learning styles of collegiate student athletes. Any athlete wishing to participate in the study had to be a roster player on one of the teams discussed above, be 18 years of age at the time of the study (18 is the age of consent in the state where the study is being performed), and agree to participate in the study (Appendix 6).

Participant recruitment.

The participants in part one were recruited in the following manner: the Head of Sports Medicine and the Athletic Director were contacted to gain permission to contact athletes for the study (Appendix 4). Per requirements of the Head of Sports Medicine, coaches were contacted to gain permission for each sport (Appendix 5) (For part three Appendix 9). Upon permission being gained from the above individuals, the coaches were contacted to establish the date(s) for the study to be performed. Once permission was gained the coaches were contacted to set up a time to meet with their team. The researcher went at the agreed-upon time and place to inform the athletes of the study. At this meeting the consent and data collection took place for consenting participants.

Data collection.

The data for part one of the study seeking to determine the learning styles of collegiate student athletes was collected in the following manner. Study packets were prepared and labeled by sport to speed the distribution of the material and to ensure that each athlete received the appropriate demographic questionnaire and all of the essential consent forms. Each sport had a different demographic questionnaire since the level of performance was determined by two things. The first was the number of competitions competed in and this varies from sport to sport. The second factor, which was common to all, was whether one has been selected as an all-conference-or-above player. The packets included the following: information about the study;

how to consent to participate and how to decline participation; whom to contact with questions; the demographic information questionnaire specific to each sport (Appendix 1); the Honey and Mumford Learning Styles Questionnaire (Appendix 2); and a pencil to complete the questionnaires. The demographic questionnaire and the Honey and Mumford Questionnaire, and Athletes Consent Form were stapled to each other to ensure the information for each participant was kept together. The women's tennis team members received a different consent form for participation in part three of the study (Appendix 10). Part three of the study will be discussed later in this chapter.

At the determined time(s) and place(s), the researcher explained the first part of the study to the athletes present; depending upon the athletes' schedules, these meetings sometimes included one team or multiple teams. The athletes were given the study packets pertaining to their sports. The researcher explained the criteria for participation and read the study information script which contained information about the study, how to consent to participate or decline participation, and whom to contact with questions (Appendix 7). Each participant received a copy of the Consent for Athletes Information (Appendix 6) in his or her study packets to keep for personal records. The researcher provided an opportunity for the athletes to ask questions. The total time for this phase was approximately 10 minutes.

Once all questions were answered, the researcher left the room/area to allow the athletes who wished to participate to complete the survey packet. The researcher provided a collection box for the survey packets. Those who did not wish to participate could have privately returned their survey packets to the collection box. All of the athletes were asked to keep the consent information documents for their personal records and return the survey packets to the collection box regardless of participation to avoid revealing the identities of actual participants. The projected completion time for those who wish to participate was approximately 20 minutes. To

prevent coercion, the coaches were not present for the meeting with the researcher, and the researcher was not present when the questionnaires were being completed. Once all the athletes had left the room/area, the researcher returned and retrieved the collection box. The questionnaires were given a computer generated randomized number to protect possibility for identification. Only the researcher and dissertation committee have access to the master list. Once questionnaires were coded with randomized numbers the master list was destroyed.

Instrumentation.

For part one, two questionnaires were used. The demographic questionnaire--which determined gender, level of sport performance, and year of eligibility (Appendix 1)—and the Honey and Mumford Learning Styles Questionnaire (Appendix 2), which determined learning styles.

Demographic questionnaire.

The first questionnaire utilized in part one was the demographic questionnaire (Appendix 1). Composed by the researcher, it was used to determine gender, year of eligibility and level of sport performance. Gender was determined by the athlete checking a box for either male or female. Year of eligibility was determined by having the athlete check a box for freshman, sophomore, junior, or senior. The study used year of eligibility for an athlete instead of credit hours to better determine collegiate athletics experience. Due to injury or other reasons, an athlete might differ in credit-hour years than in eligibility years. Also redshirts are not a consideration since the level of sport performance for the study is based upon actual playing experience, not age or number of years in college. Level of sport performance was determined by having the participant check the highest of level (1-5) competed at while in college athletics. The terms of levels 1-5 were utilized to avoid any demeaning language. Levels one and five are the same for each sport: level one is to determine if an athlete has, indeed, completed a year of

athletic competition at the DII level; level five is to determine if the student has been an All-Conference or above player in his or her college career. Since the athlete was to check the highest level competed there was no overlap; though an all-conference player would have met the conditions of a level four, it is irrelevant since the study seeks to determine the highest level each has completed. The level of sport performance for levels two through four was determined on a sport-by-sport basis: various sports have different sized rosters, different numbers of playing positions during competitions, and differing numbers of competitions per season. According to the *NCAA Division II Manual*, sports have either a number of games allowed or number of competition dates allowed (NCAA Academic and Membership Affairs Staff., 2011). This is due to some sports playing multiple games in a day, as opposed to others that have one competition which lasts several days. Also some sports have a ranking system for their players (*e.g.* in tennis the two players ranked number-one for each team play each other). These principles were the foundation for determining levels two through four. Table 3.2 outlines each sport's five levels of sport performance and an explanation of how the levels were determined.

Table 3.2

<i>Level of Sport Performance</i>				
Sport	Level	Description	Number of games/competition dates	Determining factors for level
Baseball	1	You have not played a competitive season at the DII level.	50 Games (NCAA Academic and Membership Affairs Staff., 2011)	The levels were determined by percent of games played. Those who
	2	You have started or played in less than 25		have started or played less than 50% of the games,

		games during the regular season.		started or played in 50%-75% of the games, and
	3	You have played or started in at least 25 games in the regular season.		started or played in at least 75% of the games. The exception for pitchers was made because pitchers in baseball usually pitch in a rotation, so this number was for 25% of the games.
	4	You have started at least 38 games in a regular season. If you are a pitcher you have started or pitched in at least 13 games.		
	5	You have been recognized as an All-Conference player or above at least once while competing.		
Basketball	1	You have not played a competitive season at the DII level.	26 Games (NCAA Academic and Membership Affairs Staff., 2011)	The levels were determined by percent of games played. Those who have started or played less than 50% of the games, started or played in 50%-
	2	You have started or played in less than 13 games during the regular		

		season.		75% of the games, and
	3	You have played or started in at least 13 games in the regular season.		started or played in at least 75% of the games.
	4	You have started at least 20 games in the regular season.		
	5	You have been recognized as an All-Conference player or above at least once while competing.		
Cross Country	1	You have not played a competitive season at the DII level.	7 Dates of Competition (NCAA Academic and Membership Affairs Staff., 2011)	The levels were determined by finishes in competitions as in some events, a team may enter as many participants as appear on the roster. The percentages for those who have finished in the top five were less than 25% of competitions, in at least
	2	You have finished in the top 5 of any event in less than 2 meets during the regular season.		
	3	You have finished in the top 5 in at least 2 meets during the regular		

		season.		25% of competitions, and
	4	You have finished in the top 5 in at least 4 meets during the regular season.		at least 50% of competitions.
	5	You have been recognized as an All-Conference player or above at least once while competing.		
Golf	1	You have not played a competitive season at the DII level.	21 Dates of Competition(NCAA Academic and	The levels were determined by how many times a player plays as the
	2	You have been a top 5 player for your team in less than 5 tournaments during the regular season.	Membership Affairs Staff., 2011)	one of the top 5 for the team in a tournament. Golf teams must have at least five players for a tournament in order to
	3	You have been a top 5 player for your team in at least 5 tournaments during the regular season.		compete (NCAA Academic and Membership Affairs Staff., 2011). The percentages for those in the top five for

	4	You have been a top five player for your team in at least 8 tournaments during the regular season.		their team were less than 50%, more than 50%, and at least 75% of the tournaments. Most tournaments are two days.
	5	You have been recognized as an All-Conference player or above at least once while competing.		
Lacrosse	1	You have not played a competitive season at the DII level.	17 Dates of Competition (NCAA Academic and Membership Affairs Staff., 2011)	The levels were determined by percent of games played: those who have started or played less than 50% of the games, started or played in 50%-75% of the games, and started or played in at least 75% of the games.
	2	You have started or played in less than 9 games during the regular season.		
	3	You have played or started in at least 9 games in the regular season.		
	4	You have started or played at least 13 games		

in the regular season.

5 You have been
recognized as an All-
Conference player or
above at least once
while competing.

Soccer	1	You have not played a competitive season at the DII level.	18 Games (NCAA Academic and Membership Affairs Staff., 2011)	The levels were determined by percent of games played: those who have started or played less than 50% of the games, started or played in 50%- 75% of the games, and started or played in at least 75% of the games.
	2	You have started or played in less than 9 games during the regular season.		
	3	You have started or played as a substitute in at least 9 games during the regular season.		
	4	You have started or played at least 14 games during the regular season.		
	5	You have been recognized as an All-		

		Conference player or above at least once while competing.		
Softball	1	You have not played a competitive season at the DII level	56 games (NCAA Academic and Membership Affairs Staff., 2011)	The levels were determined by percent of games played: those who have started or played less than 50% of the games, started or played in 50%- 75% of the games, and started or played in at least 75% of the games. The exception for pitchers was made because pitchers in softball usually play in a rotation so this number was for 25% of the games.
	2	You have started or played in less than 28 games during the regular season.		
	3	You have started or played in at least 28 games in the regular season.		
	4	You have started or played at least 42 games in a regular season. If you are a pitcher you have started or pitched in at least 14 games.		
	5	You have been recognized as an All- Conference player or		

above at least once
while competing.

Swimming	1	You have not played a competitive season at the DII level.	16 Dates of Competition (NCAA Academic and Membership Affairs Staff., 2011)	The levels were determined by finishes in competitions. The
	2	You have finished in the top 5 in any event in less than 4 meets during the regular season.		percentages for those who have finished in the top five were less than 25% of competitions, in at least
	3	You have finished in the top 5 in any event in at least 4 meets during the regular season.		25% of competitions, and at least 50% of competitions.
	4	You have finished in the top 5 in any event in at least 8 meets during the regular season.		
	5	You have been recognized as an All-Conference player or above at least once while competing.		

Tennis	1	You have not played a	25 Dates of	The levels were
--------	---	-----------------------	-------------	-----------------

		competitive season at the DII level.	Competition (NCAA Academic and Membership Affairs Staff., 2011)	determined by what rank a player played in during 75% of the matches for the season. Tennis teams must have at least five players for a match to be sanctioned by the NCAA (NCAA Academic and Membership Affairs Staff., 2011)
	2	You have been listed as #5 or lower player in at least 19 matches in the regular season.		
	3	You have been listed as a #3 or #4 player in at least 19 matches in the regular season.		
	4	You have been listed as a #1 or #2 player in at least 19 matches in the regular season.		
	5	You have been recognized as an All-Conference player or above at least once while competing.		
Track	1	You have not played a competitive season at the DII level.	18 Dates of Competition (NCAA Academic and Membership	The levels were determined by finishes in competitions. The percentages for those who
	2	You have finished in the	and Membership	

	top 5 of any event in less than 5 meets during the regular season.	Affairs Staff., 2011)	have finished in the top five were less than 25% of competitions, in at least 25% of competitions, and at least 50% of competitions.
3	You have finished in the top 5 in at least 5 meets during the regular season.		
4	You have finished in the top 5 in at least 9 meets during the regular season.		
5	You have been recognized as an All- Conference player or above at least once while competing.		

Honey and Mumford Questionnaire.

The second instrument used will be the Honey and Mumford Questionnaire (Appendix 2). This questionnaire facilitates comparison with the Gonzalez, Gonzalez & Escanero (2010) study. It offers two options a 40-item and an 80-item. This study will use the 40-item to reduce the amount of time required for participation in the study. The survey consists of 40 statements to which the participant checks either agree or disagree (Honey and Mumford, 2006). Each item corresponds to one of the four learning styles presented by Honey and Mumford (Reflexive, Theoretic, Pragmatic, and Active). The items are worth one point each when the Questionnaire

is scored. The participant ends up with a score ranging from 0-10 for each of the learning styles (Honey, 2006). The highest score(s) for each participant would be the learning style for which he or she has the strongest preference. The scores can then be compared across a norm provided by Honey and Mumford from a sample of over 13,000. The norms were determined by the following:

Table 3.3

<i>Norms for Honey and Mumford Learning Styles Questionnaire 40-Item</i>	
Top 10%	Very Strong Preference
Next 20%	Strong Preference
Middle 40%	Moderate Preference
Next 20%	Low Preference
Bottom 10%	Very Low Preference

Note. Table taken from Honey, P. (2006). *Learning styles questionnaire 40-item version*. London: Pearson Assessment.

Limitations and delimitations.

When conducting a survey, the researcher must be aware of multiple considerations in regards to the execution of the study. The first is the response rate of the population. The response rate of the athletes was addressed by providing the student-athletes with copies of the survey, all materials needed, and time to complete the survey without the researcher present. This strategy expedited the amount of personal initiative and minimized criteria for participation on the part of the research subjects. Honesty in response to the Honey and Mumford Learning Styles Questionnaires and Demographic Questionnaire was of some concern: to alleviate this concern the surveys were coded as described above, and school name and other identifying terms

such as specific location or contact person's names will be excluded from any published portion of the study. Information that may contain names or the name of the institution will be available only to the researcher, dissertation committee and IRB officials. The possibility for any repercussions for answers will be eliminated. The amount of usable data can be affected due to incomplete Honey and Mumford Learning Styles Questionnaires and Demographic Questionnaires. Incomplete surveys were destroyed by the researcher and not included in the study. Additionally, the amount of information able to be gathered by survey-based research is limited to what is asked in the Honey and Mumford Learning Styles Questionnaires and Demographic Questionnaire because the type of survey research used in this study does not allow for follow-up questions or interviews with the participants in part one.

Data analysis.

In total, this study seeks to have a minimum of 180 participants for part one. The data for each participant will then be entered into SPSS 19 for analysis. Statistical procedures will consider the following: dependent variable (athletes' preferred learning styles) and independent variables (gender, sports, level of sport performance and current year of eligibility). A one-way MANOVA will be conducted using the following groupings: gender-sport, gender-level of sport performance, and gender-year of eligibility. If statistical significance is reached, the Bonferroni post-hoc test will be conducted to determine how these variables interact. This test was chosen to control for a Type-I error in the analysis. Upon completion of all statistical tests, the results will be analyzed to determine conclusions for this portion of the study. Results from the data analysis will be reviewed and compared to the results from parts two and three.

To prevent a breach in confidentiality, the following precautions were taken with the data: information is available to only the researcher and dissertation committee; Questionnaires were coded (each participant was given a computer randomized number) to protect the identity

of participants from being known based upon information on the consent form. Once the questionnaires were coded, the master sheet was destroyed by the researcher; consent forms will be stored in Department of Kinesiology Room 172 separate from the data for three years to comply with regulations. Once this process is complete, the data was protected by completing statistical analysis on a locked computer; Demographic Questionnaires and Honey and Mumford Learning Style Questionnaires data will be stored in Department of Kinesiology Room 172 . Upon completion of statistical procedures, the researcher will remove all files from the computer and place them on a jump drive, which will be stored with data in Department of Kinesiology Room 172 . Data will be kept until the completion of data analysis; then, data will be destroyed.

Part Two: Coach Interviews Knowledge of Learning Styles

Participants.

The participants for part two will consist of head coaches of the following sports: baseball, softball, men’s tennis, women’s tennis, men’s golf, women’s golf, men’s cross country/track, women’s cross country/track, men’s basketball, women’s basketball, men’s lacrosse, women’s lacrosse, men’s swimming, women’s swimming (Table 3.4)

Table 3.4

<i>Part Two Potential Participants</i>		
Sport	Male sport	Female sport
Basketball	1	1
Baseball	1	
Cross Country/ Track	One for both men and women	
Golf	1	1
Lacrosse	1	1

Soccer	1	1
Softball		1
Swimming	One for both men and women	
Tennis	1	1
Total Number of Coaches	14	

Coaches who wished to participate must have coached (either as a head or assistant) at least one year at the collegiate level, must have signed the consent documents, and must have been available for interviews via phone or in person.

Participant recruitment.

The institution’s athletics website was utilized to obtain the email addresses for the head coaches of the selected sports. Emails introducing the study were sent to the coaches. Those who wished to consent to the study were instructed to respond to the email; they were also provided with contact information for the researcher, as well as the committee chair, if they wish to speak with the researcher in person or have any questions before consenting to the study. The only difference was with the women’s tennis coach. The consent process for her is discussed in part three. Upon receipt of a consenting reply from the coaches, the researcher established a time to conduct each interview either in person or via phone.

Data collection.

Part two consisted of interviewing the college coaches introduced in the participant section. The interviews were conducted either in person or via phone. Once the sample of consenting coaches was determined from the consenting email responses, the researcher established with each coach an agreed upon time and place (i.e. phone call or meeting place) for the interview to be conducted. The researcher sent the consenting coach a reminder email one

week prior to the interview time (some of the interviews were conducted less than a week after consent, but reminder emails were sent) and an additional email one day prior to the interview time to reduce lack of participation because of oversight or misunderstanding of time and arrangements. At the agreed upon time and place, the researcher contacted the coach either in person or via phone to conduct the interview. The researcher proceeded to ask the coach the Knowledge of Learning Styles Interview Questions for part two (Appendix 3). The entire interview was digitally recorded for transcription. Interviews which were conducted via phone were recorded by using a digital voice recorder and a speaker phone. Time was approximately one hour.

Instrumentation.

Part two of the study sought to determine by means of predetermined interview questions (Appendix 3) what college coaches know about learning styles theory and research and how this knowledge is implemented into their coaching. The predetermined questions were developed by the researcher in the following manner: The first three questions were designed to gather demographic information about the coaches' personal educational backgrounds, levels of athletic experience and amount of coaching experience. This was done to determine what differences might exist in these areas for the coaches and to see if education or experience as athletes or a coaches was a factor in their knowledge base of learning styles. The honesty in the answers of the coaches can be verified by the researcher based upon personal information available online via the institution's web site. Questions four and five were designed to determine, without leading the interviewees, what they know about how athletes learn and their familiarity with the terms "learning styles" or "learning preferences." These questions were designed to be general to see if a coach is able to give specific details commonly found in research about the topic of learning styles. As discussed in Chapter Two, research has found links among learning styles

and groups, achievement, pedagogy, environment, and coaching. These findings informed the development of the next questions. Question six and seven ask the coach to describe what similarities and differences he or she observes in how athletes learn. This is done to gather information for how this group of people learn and to see how these answers correspond to the data analysis from part one. Question eight corresponds to the research about learning styles to an instructor's pedagogy. Asking how a coach first interacts with an athlete when he or she begins with the program will help determine if the coach interacts with each player as an individual or if they coach the same way for all players. Questions nine and ten are used as a follow-up to determine if experience has changed the pedagogy used in their coaching and how or if they adapt their pedagogy to the athlete. Question eleven is used to address the type of environment the coach creates with the team to determine what is done to create a positive learning environment. Question twelve was created to determine what type of coach each one personifies. Question thirteen was designed to address level of sport performance and the differences in the ways in which the various levels learn. Question fourteen is to determine what makes an All-Conference player different. This question will be used for comparison with the data from the All-Conference-and-above-level athletes in part one. Question fifteen was added as a matter of good practice to allow the interviewees to add any additional information they feel is relevant to the study. This set of predetermined questions was used by the researcher to conduct interviews with the participants for part two of this study.

Data analysis.

Upon completion of the interviews, the digital recordings were transcribed. From the transcriptions, the data phrases were loaded into atlas ti for analysis. The phrases were analyzed using the codes found in Appendix 12. The list is extensive to provide the most specific feedback from the respondents. Results from the data analysis were reviewed and compared to the

quantitative data from the demographic surveys and Honey and Mumford Learning Style Questionnaire, as well as the qualitative data from part three of the study.

To prevent a breach in confidentiality, the following precautions were taken with the data: Information is available to only the researcher and dissertation committee. Transcriptions have been coded (each transcription will be given a computer randomized number) to protect the each participant's identity from being known by voice, sport, and responses to questions. Once transcribed and coded, the digital recordings of the interviews were erased by the researcher. Transcriptions will be kept as hard copies in Department of Kinesiology Room 172 and data was kept until the completion of data analysis. Only the researcher and dissertation committee have access to the transcriptions and data was destroyed.

Part Three: Women's Tennis Audio-Tape of Practice Sessions

Participants.

The participants were the head coach for the women's tennis team, as well as the players who participated in part one and consented to be audio-recorded during a practice session. Women's tennis was chosen because the ranking system of tennis players: players are ranked on each team for competitions. This ranking system makes comparisons for how the coach interacts with the various levels of sport performance much easier to observe and measure. The coach had to have at least one year of experience at the collegiate level to participate. The players had to be 18 years old (age of consent in the state the study is being conducted), have participated in part one, and have signed the consent forms for both parts of the study (Appendix 10).

Participant recruitment.

The participants for part three are unique as they were the only athletes to complete two parts of the study. The Head Coach for women's tennis team was contacted to gain permission for the study (Appendix 11). As with the other coaches, she was asked to allow her players to

participate in part one. In the same document, she was asked to participate in part two and to provide permission to conduct audio-recordings and video of her coaching during practices with consenting players. Upon receipt of permission from the coach, a time was established to meet with her players for part one of the study. Once the meeting was established, part one was conducted as discussed previously. The women's tennis team members signed documents consenting to allowing themselves to be audio-recorded and videoed at a practice with their coach (Appendix 10). Although the players did not wear microphones, their voices had to potential to be recorded as they interacted with the coach; therefore, they had to offer consent. Once part one was complete, a time or times was established to conduct the audio-recordings and video recording of practice with the consenting players (Appendix 10) and the consenting coach (Appendix 11).

Data collection.

The data collection for part three of the study will used a specific set of procedures. Once consent permission was gained from the head coach, a time was established to conduct part one with the players. The meeting was conducted as discussed in part one. The researcher was then able to identify each athlete based upon the name on the consent document. This allowed the researcher to determine the learning style and level of each of the players to determine if the coach interacted differently with various levels or learning styles. Each player was given a computer generated randomized number to protect privacy. Only the researcher and dissertation committee were allowed access to the master sheet. In addition once the surveys and transcriptions were coded, the master list was destroyed by the researcher. Once part one is complete, the researcher established a time to conduct part three. The practice time was arranged with the coach since in the college setting; the coach sets the practice times for the team. The researcher met with the coach and players at the agreed upon time. The coach wore a

microphone connected to a digital voice recorder. The researcher observed the practice to collect field notes. Once the practice session was over, the researcher took the digital recorder from the coach for analysis along with the video.

Instrumentation.

The only instrumentation for part three is a digital voice recorder, microphone to be worn by the head coach, and a video camera. The use of a digital tape recorder, microphone, and video will provide tangible information about the direct interaction between the coach and players.

Data analysis.

Upon completion of the recordings of the practice sessions, the digital recordings were transcribed and coded (each player will be given a computer randomized number) to protect identity by name, voice, or other means. The recordings were then erased by the researcher. From the transcriptions, the data phrases were loaded into atlas ti for analysis. The phrases were grouped using a coding system developed by the researcher. The researcher, who determined large categories: Praise, Motivation, Correction, Miscellaneous, Athletes, Instructions, Logistics, Focus. Under each of these categories, subcategories were determined. Phrases were placed into the subcategories, and each phrase was labeled as Activist, Theorist, Reflector, Pragmatic, or No Learning Style. There were also certain phrases that will be categorized by two learning styles. See Table 3.5. The phrases were then analyzed using atlas ti. The results from the recordings and the notes made by the researcher during the practice session were then compared to the quantitative data from the demographic surveys, the Honey and Mumford Learning Style Questionnaire, and to the qualitative data from the coaches' interviews for triangulation. To prevent a breach in confidentiality, the following precautions were taken with the data: information was available to only the researcher and dissertation committee; transcriptions were

coded and identifying information destroyed to protect each participant's identity; the digital recordings and video of the practice sessions was erased; coded transcriptions were kept as hard copies in Department of Kinesiology Room 172 ; and data was kept until the completion of data analysis. Then data was destroyed.

Table 3.5

List of Codes for Part Three

Category	Subcategory	Learning style options	Example of code
Praise	Skill	Activist	Praise, Skill, Activist
	Generic	Theorist	
	Personal	Reflector	
	Exertion	Pragmatic	
		No Learning Style	
Motivation	Skill	Activist	Motivation, Generic, Theorist
	Generic	Theorist	
	Direction	Reflector	
	Personal	Pragmatic	
	Exertion	No Learning Style	
Correction	Skill	Activist	Correction, Skill, Pragmatic/Activist
	Strategy	Theorist	
	Personal	Reflector	
	Exertion	Pragmatic	
		No Learning Style	
Miscellaneous	Laughter	Activist	Miscellaneous, Levity, No Learning
	Levity	Theorist	

	Not Related	Reflector	Style
	Filler Words	Pragmatic	
	Weather	No Learning Style	
Athletes	Personal Questions	Activist	Athletes, Personal
	Injury Status	Theorist	Questions, Pragmatic
	Injury Treatment	Reflector	
	Injury Prevention	Pragmatic	
	Hydration/Nutrition	No Learning Style	
	Safety		
Instructions	Drills	Activist	Instructions, Drills,
	Practice	Theorist	Theorist
	Practice Progression	Reflector	
	Equipment	Pragmatic	
	Court Assignment	No Learning Style	
	Skill		
	Strategy		
Logistics	Schedule	Activist	Logistics, Schedule,
	Housing	Theorist	Reflector/Pragmatic
	Practice Times	Reflector	
	Class	Pragmatic	
	Equipment	No Learning Style	
	Hydration/Nutrition		
	Practice		

Focus	Strategy	Activist	Focus,	Strategy,
	Practice	Theorist	Activist	
	Match	Reflector		
	Skill	Pragmatic		
		No Learning Style		

Chapter IV

Results

The current study had three parts with three specific purposes for each. Each part was conducted at the same institution. The setting for the study is an institution located on 100 acres in a suburban area of the southeastern part of the United States (“Fast Facts,” 2011). The institution is a private Methodist-Church-affiliated college with a student body of just over 2,300 graduate and undergraduate students. The NCAA Division II institution fields 19 varsity sports. The success of the athletics program boasts 27 team national championships, 20 individual national championships and four relay national championships (“Moccasin success,” 2013). The school has compiled 297 male All-Americans and 166 female All-Americans in the sports this study seeks to investigate (“All-Americans,” 2012). The institution also competes in the conference which bears the nickname “Conference of National Champions” since it has compiled 84 national titles (“Sunshine State Conference,” 2013). Due to the conference in which the athletes compete, the school they attend, and the school that employs the coaches, the population studied is currently participating in a highly competitive level of collegiate sports. This commonality was important as the three purposes of this study were explored via a three part study.

Part One

The first purpose of this study was to determine learning styles of Division II collegiate athletes across gender sport, level of sport performance, and year of eligibility. Given the highly competitive environment which surrounds collegiate athletics, it is vital for coaches to determine any indicators of high performance in the athletes they coach and, more importantly, the athletes they are recruiting into their program.

Methods.

Part one used the Honey and Mumford Learning Styles Questionnaire and the sport specific Demographic Questionnaire. Upon IRB approval, the coaches were contacted via email to determine times to meet with each team to provide information about the study, answer questions, and for the student athletes to complete the survey if they chose to participate. At the meeting each student athlete was given a packet containing consent information about the study, the Honey and Mumford Learning Styles Questionnaire, the sport specific Demographic Questionnaire, and a pencil. The researcher, without the coach present, presented the study, answered questions, and then left the area while the consenting athletes completed the Honey and Mumford Learning Styles Questionnaire and sport specific Demographic Questionnaire. In total 155 collegiate student athletes from 12 sports participated in part one of this study. Completing both surveys took the athletes about 2 minutes.

Data analysis.

The questionnaires were coded to protect the confidentiality of the athletes, and they were analyzed using the scoring sheet provided by the Honey and Mumford Learning Styles Questionnaire (Honey, 2006). From the scoring sheet a raw score for each of the four learning styles was determined based upon the number of times a student athlete agreed with the statement provided in the survey (Honey, 2006). From the raw score a level of preference was determined for each learning style for each athlete, and the score was compared to a norm provided by the Honey and Mumford Learning Styles Questionnaire. This information along with gender, sport, level of sport performance and year of eligibility were entered into SPSS for further data analysis. A one-way MANOVA was conducted between the dependent variables of degree of preference for Activist, Theorist, Pragmatist and Reflector learning styles and gender, sport, level of sport performance, and year of eligibility. In addition a factorial MANOVA was

conducted for degree of preference for learning styles as the dependent variables and gender and sport, gender and level of sport performance, gender and year of eligibility as independent variables.

Results.

In total 155 Division II collegiate student athletes, 67 females (43.2% of the total sample) and 88 males (56.8% of the total sample) participated in part one of this study. A total of 12 sports participated or had participation at a useable level to be included in the study. Six sports were not included for the following reasons: women’s basketball withdrew from the study; therefore, men’s basketball was dropped from the final analysis of part one due to the lack of a comparable women’s sport. Men’s and women’s cross country and track were withdrawn from the study due to lack of consenting participants. This was due to overall numbers as the consenting participants all competed in both cross country and track but due to only four males and two females these sports were dropped from the study. Men’s Lacrosse had the highest number of participants with 36 (23.2% of total sample) while women’s golf was the lowest participation with only 5 (3.2% of total sample). See Table 4.1.

Table 4.1

<i>Gender and Sport</i>		
Variable	Frequency of participants	Percent of total sample
Gender	155	
Male	88	56.8
Female	67	43.2
Sport:	155	
Baseball	16	10.3
Men’s Golf	6	3.8

Women's Golf	5	3.2
Men's Lacrosse	36	23.2
Women's Lacrosse	18	11.6
Men's Soccer	12	7.7
Women's Soccer	15	9.6
Softball	14	9
Men's Swimming	12	7.7
Women's Swimming	6	3.8
Men's Tennis	6	3.8
Women's Tennis	9	5.8

Of the 155 student athletes, freshman comprised the largest group with 57 participants (36.8% of total sample) and seniors were the smallest group with 12 participants (7.7% of total sample). In between were sophomores with 41 participants (26.5% of total sample) and juniors with 45 participants (29% of total sample). Level four of sport performance had the highest number of participants with 51 (32.2% of total sample) and level one of sport performance was the lowest with 13 (8.4% of total sample). The other three levels of sport performance were as follows: level two had 41 (26.5% of total sample), level three had 16 (10.3% of total sample), and level five had 34 (21.9% of total sample). See Table 4.2.

Table 4.2

Year of Eligibility and Level of Sport Performance

Variable	Frequency of participants	Percent of total sample
Year of Eligibility	155	

1	57	36.8
2	41	26.5
3	45	29
4	12	7.7
<hr/>		
Level of Sport Performance	155	
1	13	8.4
2	41	26.5
3	16	10.3
4	51	32.9
5	34	21.9

Once the demographic information for part one was determined, the learning styles of the athletes were analyzed. Each player's preferred learning style was calculated using their raw scores; the highest was chosen as their preferred learning style (Honey, 2006). When a person had the same high scores for two or more learning styles, he or she were labeled using all learning styles with the same score. The Theorist learning style was the most prevalent with 35 participants (22.6% of the total sample) having it as their highest single learning style preference, while the Activist learning style was the lowest with 21 participants (13.5%). After analyzing multiple learning style preferences the Reflector/Theorist was the highest multiple learning style preference with 17 participants (11%) and the Activist/Reflector learning preference was the lowest with 0 participants. There were six participants who had three preferred learning styles including the Reflector/Theorist/ Pragmatist with three (1.9%), the Activist/Reflector/Pragmatics with two (1.3%) and the Activist/Reflector/Theorist with one (0.6%). The results of each learning style preference can be found in Table 4.3.

Table 4.3

The Frequency of each Learning Style

Variable	Frequency of participants	Percent of total sample
Activist	21	13.5
Reflector	22	14.2
Theorist	35	22.6
Pragmatist	28	18.1
Activist Reflector	0	0
Activist Theorist	1	0.6
Activist Pragmatist	10	6.5
Reflector Theorist	17	11
Reflector Pragmatist	3	1.9
Theorist Pragmatist	12	7.7
Activist Reflector Theorist	1	0.6
Reflector Theorist Pragmatist	3	1.9
Activist Reflector Pragmatist	2	1.3

The results of the learning style surveys were also reported by the degree of preference for each learning style. According to Honey (2006) each learning style has five levels of preference (Very Low, Low, Moderate, Strong, and Very Strong). As discussed the level of preference was determined from each participant's raw score. The highest concentration of learning style for a single level of preference was the Theorist learning style showing a moderate preference (52.3% of total sample). This learning style was followed by Pragmatic showing a moderate preference (49.7%), Reflector showing a low preference (40%) and Activist showing a

strong preference (32.9%). The frequency of participant's degree of preference for each learning style can be found in Table 4.4.

Table 4.4

<i>Learning Styles Frequency</i>		
Variable	Frequency of participants	Percent of total sample
<i>Activist Degree of Preference</i>		
1 (Very Low Preference)	8	5.2
2 (Low Preference)	37	23.9
3 (Moderate Preference)	38	24.5
4 (Strong Preference)	51	32.9
5 (Very Strong Preference)	21	13.5
<i>Reflector Degree of Preference</i>		
1 (Very Low Preference)	33	21.3
2 (Low Preference)	62	40
3 (Moderate Preference)	49	31.6
4 (Strong Preference)	0	0
5 (Very Strong Preference)	21	7.1
<i>Theorist Degree of Preference</i>		
1 (Very Low Preference)	20	12.9
2 (Low Preference)	35	22.6
3 (Moderate Preference)	81	52.3
4 (Strong Preference)	0	0
5 (Very Strong Preference)	19	12.3

Pragmatic Degree of Preference		
1 (Very Low Preference)	16	10.3
2 (Low Preference)	53	34.2
3 (Moderate Preference)	77	49.7
4 (Strong Preference)	0	0
5 (Very Strong Preference)	9	5.8

The results of the one-way MANOVA conducted between the dependent variables of degree of preference for Activist, Theorist, Pragmatist and Reflector learning styles and gender, sport, level of sport performance, and year of eligibility are discussed below. The results will begin with the effect of degree of preference for learning style and gender. The Box's Test of Equality indicated a non-significant result ($p = .134$), indicating the homogeneity assumption was not violated. From this the Wilk's Lambda was consulted and the main effect of degree of preference for learning style and gender displayed an F ratio of $F(4, 150) = 1.009$, $p = .405$ indicating no significant relationship between learning style and gender. However, when the Test between subjects was consulted a relationship was shown ($p = .054$) between the Activist learning style and gender, but not to a level of significance, males ($M = 3.40$, $SD = 1.18$) and females ($M = 3.06$, $SD = 1.01$).

A one-way MANOVA was conducted for the effect of degree of preference for learning style and sport. The Box's Test of Equality indicated a non-significant result ($p = .769$), indicating the homogeneity assumption was not violated. From this the Wilk's Lambda was consulted and the main effect of degree of preference for learning style and sport displayed an F ratio of $F(4, 145) = 1.459$, $p = .075$ indicating no significant relationship between learning style and sport.

A one-way MANOVA was conducted for the effect of degree of preference for learning style and level of sport performance. The Box's Test of Equality indicated a non-significant result ($p = .274$), indicating the homogeneity assumption was not violated. From this the Wilk's Lambda was consulted and the main effect of degree of preference for learning style and level of sport performance displayed an F ratio of $F(16, 150) = .720, p = .775$ indicating no significant relationship between learning style and level of sport performance.

A one-way MANOVA was conducted for the effect of degree of preference for learning style and year of eligibility. The Box's Test of Equality indicated a non-significant result $p = .566$, indicating the homogeneity assumption was not violated. From this the Wilk's Lambda was consulted and the main effect of degree of preference for learning style and year of eligibility displayed an F ratio of $F(4, 148) = 1.358, p = .183$ indicating no significant relationship between learning style and year of eligibility.

Since gender is typically an indicator of differences in learning styles, a factorial MANOVA was conducted for degree of preference for learning style as the dependent variable and gender and sport, gender and level of sport performance, gender and year of eligibility as independent variables. A factorial MANOVA was conducted for the effect of degree of preference for learning styles and gender and sport. The Box's Test of Equality indicated a non-significant result ($p = .183$), indicating the homogeneity assumption was not violated. The interaction effect for each learning style was evaluated. The factorial MANOVA indicated no interaction effect for any of the learning styles: Activist $F(4, 143) = 1.125, p = .347$; Reflector $F(4, 143) = 1.347, p = .256$; Theorist $F(4, 143) = .158, p = .959$; Pragmatist $F(4, 143) = .090, p = .985$. From this the Wilk's Lambda was consulted and the main effect of degree of preference for gender and sport displayed an $F(16, 428) = .753, p = .738$.

A factorial MANOVA was conducted for the effect of degree of preference for learning style and gender and level of sport performance. The Box's Test of Equality indicated a non-significant result ($p = .679$), indicating the homogeneity assumption was not violated. The interaction effect for each learning style was evaluated. The factorial MANOVA indicated no interaction effect for any of the learning styles: Activist $F(4, 145) = .921, p = .454$; Reflector $F(4, 145) = 1.646, p = .166$; Theorist $F(4, 145) = .810, p = .520$; Pragmatist $F(4, 145) = .536, p = .709$. From this the Wilk's Lambda was consulted and the main effect of degree of preference for learning style and gender displayed an F ratio of $F(16, 434) = 1.177, p = .283$ indicating no significant relationship between learning style and gender and level of sport performance.

A factorial MANOVA was conducted for the effect of degree of preference for learning style and gender and year of eligibility. The Box's Test of Equality indicated a significant result ($p = .020$), indicating the homogeneity assumption was not violated. The interaction effect for each learning style was evaluated. The factorial MANOVA indicated no interaction effect for any of the learning styles: Activist $F(3, 147) = 2.242, p = .086$; Reflector $F(3, 147) = .890, p = .448$; Theorist $F(3, 147) = 1.902, p = .132$; Pragmatist $F(3, 147) = .529, p = .663$. From this the Pillai's Trace was consulted and the main effect of degree of preference for learning style and gender displayed an F ratio of $F(12, 438) = 1.201, p = .280$ indicating no significant relationship between learning style and gender and year of eligibility.

Part Two

The second purpose of this study was to determine what Division II collegiate coaches know about learning styles. Using learning styles to aid coaches in determining level of sport performance is only helpful if coaches have knowledge of learning styles and can use this knowledge to help their athletes.

Methods.

Part two studied nine coaches from the following sports: Men's Basketball, Men's and Women's Cross Country and Track, Women's Golf, Men's Tennis, Women's Tennis, Softball, Men's and Women's Swimming, Women's Lacrosse, Women's Soccer. Each coach was contacted by email to determine if they would be interested in participating in the interview portion of the study. Once coaches agreed to participate by responding to the email, a time and place was established to conduct the individual interviews. Coaches were sent reminder emails to confirm meeting times. In total nine coaches agreed to be interviewed. Six coaches were interviewed in their on campus office, one was interviewed in a conference room and two were interviewed over the telephone. Interviews were approximately 10-20 minutes in length. The interview time varied depending upon the length of each coaches' responses. At the prearranged time and location the researcher met with each participant and they were given the consent form to sign. The only exception to this was the two phone interviews which were sent to each of them via email, signed, and returned to the researcher. During the interview the researcher asked a total of 15 questions to determine the knowledge each coach had of learning styles (see Table 4.5). All of the interviews were digitally recorded by the researcher.

Table 4.5

Knowledge of Learning Styles Questions

1. What is your education background? degree, when, where, etc...
 2. What is your experience as an athlete? Sport, level of sport performance, etc...
 3. What is your background in coaching? Sport, level, years, etc...
 4. From your experience as an athlete and coach (or just as a coach) what can you tell me about how athletes learn?
 5. What do you know about or have possibly heard about the terms learning styles or learning preferences?
 6. What similarities have you noticed in how your athletes learn skills or concepts?
 7. What differences have you noticed in how your athletes learn skills or concepts?
 8. How do begin to work with an athlete when they come into your program?
 9. How has this process changed over the course of your coaching career?
 10. If you have a player who is struggling to understand a skill or concept how do you help them understand?
 11. As a coach what type of environment do you try to create in practice, games, conditioning, etc...?
 12. What type of coach would you describe yourself as autocratic, democratic, a mix of both?
 13. When considering the level of sport performance of your athletes *e.g.* an All-Conference vs. a bench player do you notice differences in the ways they learn and if so what are they?
 14. What makes All-Conference or above level athletes different?
 15. Is there any additional information that you think would be helpful or relevant to the study?
-

Data analysis.

Once the interviews were completed each one was transcribed by the researcher and loaded into Atlas ti for coding and analysis. Atlas ti is a qualitative data analysis software that allows the researcher to code and group data based upon the codes used. It also allows for comparisons of data across multiple codes to aid in understanding common themes in qualitative data. The researcher began the coding process by organizing all responses according to question number. From that each response was broken down into phrases that had common themes within the text. These phrases were then coded based upon two things: 1) by emerging themes for each question and 2) quotes from each question. These results were then analyzed using the data analysis tool in Atlas ti which provides the user the ability to see how many times codes occur and cross reference each other. The cross referencing was used primarily in part three of the study. Each question was analyzed to determine how many times each code was used for the response to the question by all participants. These occurrences were then used to determine what similarities the coaches had in their responses to each question. This information then allowed the researcher to determine the scope of coaches' knowledge of learning styles.

Results.

The results will be discussed in the order of the questions and given based upon the number of times the responses were coded with a particular code for that question. Question 1: What is your education background? degree, when, where, etc... All coaches interviewed possessed a Bachelor's degree, and 5 held Master's degrees were in addition to their bachelor's degree. The academics and professional areas included Business (4), Business Sports Management (2), , Finance (2), Higher Education Administration (1), History (1), Human Movement Performance (1), Management (1), Management Information (1), Physical Education (1), Pre-Med (1), and Administration (1). Degrees were reported to be completed as early as

1993 and as recently as 2011 for participants who reported graduation year thus showing a range of educational experience.

Question 2: What is your experience as an athlete? Sport, level of sport performance, etc... All coaches interviewed have past playing experience. The sports they currently coach were played but in addition baseball (2), BMX racing 1 and Motor Cycle Racing (1) were represented. Many of the coaches also participated in sports outside of what they currently coach. The ranges of levels of sport performance were vast. Levels represented were: College (7), National Level (3), High School (2), Pro Level (2), Academic All-American (1), All-American (1), Amateur Sports (1), Club Level (1), Conference Champions (1), Expectations for National Qualifier (1), International Level (1), Junior level (1), Olympic Trails Qualifier (1), Post Season Playing Experience (1), Professional (1), Recreational Level (1), Semi Top 20 Nationally Team (1), Youth Level (1).

Question 3: What is your background in coaching? Sport, level, years, etc... The backgrounds in coaching were varied in that many of the coaches had also coached other sports in addition to the current position they held. Coaches had also spent time at other levels outside of the Division II college realm including club level (1), junior college (1), and private lessons (1). One coach had also had a time away from coaching working in the corporate world. Coaches once in the college sector of sports had also held other positions: Assistant (4), Graduate Assistant (2), and Student Assistant (2) and (1) had taken steps to obtain coaching licenses. The range of experience for coaching ran from 1.5 years of coaching to 32 years.

Question 4: From your experience as an athlete and coach (or just as a coach) what can you tell me about how athletes learn? The coaches concluded that athletes learn differently from each other (5). Examples included Visual (6), Verbal (3), and Kinesthetic (2) learning were voiced, but in addition experience (3), others (2) and negatives (1) were presented as possible

ways of learning. Additionally it was found it is important to learn the learning style of your athletes and that you must use many methods to work with athletes to get concepts or skills across.

Question 5: What do you know about or have possibly heard about the terms learning styles or learning preferences? Coaches had heard of learning styles (2), have used learning styles with athletes (1), thought most learned visual (1) and guessed at learning styles (1).

“well I mean I just know that there's like you know is somebody a visual learner is somebody um, gosh I don't even know there's like three different ways that you can learn it's like visual I forget I'm so far out of college but I know all of that stuff verbal and like actually doing it maybe is that are those the three”

Coaches had knowledge from their educational background (3). Also voiced were verbal (5), visual (5) kinesthetic learning (4), Learning from others (3) and learn from experience (1).

Question 6: What similarities have you noticed in how your athletes learn skills or concepts? The responses were very specific as to the similarities of learning in athletes with learning from others the top response with (4). This was followed by, repetition (2), and visual (2). Other responses were sports IQ (1) being a factor and that higher level athletes tend to have expected outcomes (1). Coaches expressed that they did not know how their athletes learned similarly (2) and continued the remark that athletes learn differently (1).

Question 7: What differences have you noticed in how your athletes learn skills or concepts? For this question only one coach remarked that he or she did not think athletes learn differently. The coaches spoke of the specific things that differentiate how athletes learn.

“differences, uh, I have some kids that literally need a something to read in terms of a workout they can they cannot hear a workout and process it”

The level of engagement the athlete possessed (5) was the main reason given for differences, but motivation (4) and drive/desire/passion (1) which are closely tied with level of engagement were also mentioned as variables. Coaches also expressed the need to get athletes out of their comfort zone and again use many methods to get information across.

Question 8: How do begin to work with an athlete when he or she comes into your program? Knowledge of the personality of an athlete (4) was important to the coaches. The results showed that the motivation of the athlete (2) coaches to knowing whom they can push (1), and what the athlete wants out of their college experience (1) as important to working with an athlete. Some began with more fitness than sports specific skills to learn about their athletes (2).

“So basically the first couple weeks that they are here we do a lot more physical fitness testing than we do on court training, and then I kind of just watch them play see their mannerisms on court, see how they handle stressful situations, see how they handle the stress of the training we put them under, and you kind of find out who is a little soft inside who is a little gritty. You know, does the guy sprint the last quarter-mile of the 5 mile run and then go throw up. Okay this guy, he’s he’s pushing he’s pushing himself, um, but I think a lot of it is I’ll spent probably the first two months kind of just watching. We’ll we’ll go play tournaments and I might not even say a word to them, I might just see how they handle themselves in those situations.”

Also coaches put emphasis upon helping athletes acclimate to the program (4). One coach of a fall sport emphasized the use of more team building focus than skill specific when beginning to work with athletes, again due to the short preparation time before season.

Question 9: How has this process changed over the course of your coaching career? Coaches remarked that the process has not changed or not changed much (3). Also emphasized was the importance of learning about the personalities of athletes (4). The characteristics of

change described were a move to be more positive (1), uplifting to athletes (1) and giving more specific information or feedback (1).

Question 10: If you have a player who is struggling to understand a skill or concept how do you help them understand? The most common means given to help a player was to provide one on one attention (9). This was done either by taking them aside, pulling them out of a drill, or chatting in the office. Once the coach gave the athlete one on one attention the coaches cited having the athlete watch others, use of video, and analysis of skill to help them get better as means to confront the problem.

“I usually try to pull them aside individually and we’ll talk and sometimes its at practice because a lot of our sessions are very group oriented there's not a lot of time to spend with one individual player occasionally I'll pull them out of the session and have them watch other players that are doing it well for the most part the best way to get individual players to understand concepts that they're not getting is through video so we'll video games we'll video some sessions if they're not understanding it and then or bring them into the office and I'll watch it with them and say hey look at this look at your spacing and usually that visual component of them actually seeing what they're doing because sometimes there's a missed correlation with what they think they're doing and what they're actually doing and then the video proof of it that's usually the easiest way some of them we can sit in here and talk do a chalk talk with them and they'll understand it but a lot of them need that visual component to hey I'm messing up and I don't realize it.”

Question 11: As a coach what type of environment do you try to create in practice, games, conditioning, etc...? Most common response was the need to have a competitive environment for their sports (6). The next most common responses were to have a fun (3) and a

positive environment (2). The coaches felt that different things are needed based upon the dynamics of the team (2) and their players needs (1).

Question 12: What type of coach would you describe yourself as autocratic, democratic, a mix of both? The most common was a mix of both styles (5). Second was democratic (3). One coach cited themselves as a “benevolent dictator”. Only one coach self identified as Autocratic yet in further discussion did show that athletes were allowed input in certain areas: uniforms, where to eat, etc... (1), but practices, scheduling, etc were still tightly controlled by the coaches (3).

Question 13: When considering the level of sport performance of your athletes *e.g.* an All-Conference vs. a bench player, do you notice differences in the ways they learn and if so what are they? Responses showed that there was not a difference in the way their athletes learn based upon level of sport performance (4). The coaches did speak of the difference in drive/desire/passion (5), sport IQ (4), motivation (3), and time invested (3), in high-level athletes.

“In my experience here I think the biggest difference is the desire to succeed. Between a roster spot and a all-conference or NCAA qualifier, uh, you know that's I think that's one of the biggest differences across the board here, at least here, um it's just the desire to be successful some kids have a greater desire some are happy with being where they're at and my job as a coach is to try and get them not to be that way but but every every kid is different.”

Question 14: What makes All-Conference or above level athletes different? The coaches explained that athletes would be different based on their drive/desire/passion (10), work ethic (4), talent (3), the time they spend with their skill is more than others (2), they are mentally tough (2), they are engaged in the sport (1), motivation (1), they take advantage of opportunities (1) and they carry themselves with confidence (1).

“I think it's ah, it's a lot of it's their work ethic, um, and if they can, um compete and push themselves more, um, than their, their teammates and um, in every game that they are out there competing... I think it's their their will and determination and and kind of where they want to be as an athlete if they want to push themselves to the fullest versus just being out there to be out there”

“The want the internal drive I honestly”

“I think I say it's just the drive the determination, um, they just the the mental toughness I said just the willingness to do whatever it takes to to compete and win”

“Well again I think it's the I think it's the preparation that you do I think I think people again that are good at their craft like to get there early they like to stay late because they want to get better and they have a real drive and passion for what they do and I I simply think it's the difference of that and the person that you know they say that they're interested but they're not willing to do the work to get better”

“Their desire and their acceptance level of where they're at, you know what I mean, you know if they will be great they're going to take advantage of all the opportunities they have to become great, and they're not afraid of failing you know what a mean, they fail, well okay we will try again they keep going and eventually they get it,”

Question 15: Is there any additional information that you think would be helpful or relevant to the study? Four of the coaches did not have anything to add to the study. The following other topics were added by coaches: How their respective sports have changed, the importance of to getting to know your athletes, differences of coaching methods and the ability of some coaches to turn good to great and the need to answer the question of teaching athletes how to win.

Part Three

The final purpose of the study was to determine how college coaches apply knowledge of learning styles by providing learning experiences and individualized instruction which match the learning styles of the athletes they coach. This portion was important to tie the previous two portions of the study to each other for a complete analysis of learning styles and student athletes and the people who coach them.

Methods.

The women's tennis coach was contacted to gain permission to meet with her athletes as well as video and audio record her during a practice session with the team. Once this permission was gained a time to meet with the team was established. The researcher met with the athletes as described in part one with the exception that the athletes were given consent forms to sign since they would be videotaped and their voices possibly heard on the voice recorder the coach would be wearing during their practice session. The athletes were also given the opportunity to participate in only part one if they so chose. Once consent was gained, the researcher videotaped and voice recorded a practice session. To minimize the intrusion into the practice and to keep the practice as normal as possible the researcher gave the coach the voice recorder and a microphone to be worn on the lapel of her shirt. The digital recorder was placed in her pocket. The researcher videoed the practice from the observation portion of the stands. Atop the stands was a place for filming. The researcher followed the coach's movements during practice with the video camera to capture as much information as possible. Once the practice was over the team and players learning styles were determined. The practice lasted for 2 hours with 9 players and one coach present. The questionnaires from part one were coded to protect the confidentiality of the athletes.

Data analysis.

The learning styles for the athletes were determined using the scoring sheet provided by Honey and Mumford (Honey, 2006). From these results a team Preference for Learning Style was determined. The player's individual learning styles were also determined. Once the practice was over the researcher transcribed the voice recording of the practice. The transcription was then coded to determine the learning style used by the coach for each phrase. This was done by the researcher and an independent reviewer to insure reliability (81.4%) for the coding was in the acceptable range. Next the learning styles of the athletes being addressed were compared to the learning style being used by the coach. It was not possible to always determine to which athlete the coach was speaking.

Results.

It was determined from the study the overall preferred learning style of the team, based upon combined raw scores for the team, was the Pragmatist (7.5). It was closely followed by Reflector (7.3) and Theorist (7.2). Only Activist differed significantly at (5.1). The breakdown of learning styles of the athletes were as follows: Reflector (2 athletes), Theorist (2 athletes), Reflector Theorist (2 athletes), Theorist Pragmatist (1 athlete), Activist Pragmatist (1 athlete), and Activist (1 athlete). The number of times each learning style was addressed by the coach was calculated: Activist 52, Pragmatist 136, Reflector 167, and Theorist 119. This is consistent with the findings of the team's learning styles. The team had a high concentration of learning styles centered on Reflector, Theorist, and Pragmatist and a low emphasis upon Activist. When examining the learning styles the coach used when compared to the learning styles of the players she was coaching it was determined that when addressing the team she utilized the Theorist learning style the most instances (27) compared to Activist (7), Pragmatist (8), and Reflector (5). Indicating the addressing of the team is more suited to those with a theorist learning style

preference. When looking at the learning style presented in coaches interactions with specific players it was found that the learning styles presented by the coach and the learning style of the player matched most often when a Theorist learning style (59% of total) was presented. Reflector (49.6% of total), Pragmatist (26.4% of total), and Activist (11.8% of total) followed in order. Not all interactions with players were able to be linked to a specific player. Therefore, a specific learning style match could not be found for all coaching comments. These findings indicate that when learning style of the athlete being addressed can be determined, the coach matched their learning style 40% of the time. There were cases when the coach was addressing a player but since the player was not able to be identified the learning style of the player was unknown. In these circumstances the coach used learning styles in the following order: Reflector (29) the most, Pragmatist (21) second, Theorist (19) third and Activist (11) the least. Thus indicating that although the match of specific instruction is not 100% the coach does indeed teach to her players most preferred learning styles in that all findings show an emphasis upon Theorist, Reflector and Pragmatist with little focus upon Activist.

Summary of Findings

The current study used a total of 155 athletes and 9 head coaches as participants to determine how athletes learn, how much college coaches know about learning styles and if they use this knowledge when working with their athletes. Overall the study determined that learning style did not have a relationship to level of sport performance, sport or gender; coaches did believe that their athletes learn differently from each other; and coaches believed that differences in athlete's learning should be addressed by getting to know one's athletes. It was also found that although there is not a specific learning style related to achievement, there is a determining factor of motivation that was found to be prevalent in all high level athletes. It was also found that coaches do indeed teach to the learning styles most prevalent on their team.

Chapter V

Discussion

In 1984 Kolb introduced his theory of learning styles to the world. In the decades since, his theory has penetrated many aspects of society. Learning styles have been used to analyze specific groups (those who are studying specific areas of academia, or who are studying at the same level of education) to determine what commonalities they have in the manner in which they learn. Research has shown that various groupings of students do show similarities in the manner in which they learn (Erton, 2010; Hamade & Artail, 2010; Peters, Jones & Peters, 2008; Harfield, Panko, Davies, & Kenley, 2007; Coker, 2000; Clarke, et al, 2010; Nunn, 1995; Snyder, 1999). Learning styles research is also very prevalent in regards to achievement in academics. Numerous studies have found that learning styles do have a connection with academic achievement and there were differences in learning style preferences for higher versus lower achieving students (Furnham, Monsen, & Ahmetoglu, 2009; Collinson, 2000; Wang, Wang, Wang, & Huang, 2006; Hlawaty, 2009; Mathews, 1996; Chiou, 2008; Atkinson, 2006; Terregrossa, Englander, & Zhaobo, 2010; Boatman, Courtney, & Lee, 2008; Woolhouse & Blaire, 2003). Although some learning styles did have relationships to higher or lower achievement, other research in the area of academics has placed a high importance upon instructors using a pedagogy that was tailored to the learning styles of the students in their charge (Alumran, 2008; Engel, 2009; Onwuegbuzie & Daley, 1997; Boyle & Dunn, 1998). Along with tailoring pedagogy it was found that by teaching to students preferred learning styles achievement could indeed be increased (Al-Balhan, 2007; Farkas, 2003; Nunn, 1995; Lister, 2005; Tatar & Dikici, 2009; Terregrossa, Englander, & Englander, 2009). The research into learning styles has also been focused on the environment in which learning occurred. This research found that teachers should use multiple learning styles when teaching (Rogers

&McNeil, 2009), and should match the students learning style (Gantasala & Gantasala, 2009). With all of the focus upon how people learn, and since learning is an essential skill in all aspects of life, it seems like a natural progression for this base of knowledge to be transferred into other areas outside the classroom. One such area of interest to this study was sport. The theories of how people learn has been explored in several areas of sports such as, the culture in which sports occur (Williams, Anshel, & Quek, 1997), the pedagogy used to teach sports (Williams & Anshel, 2000), the differences in male and female athletes (Miller, Ogilvie, & Branch, 2008), and the differences in level of sport performance (Wesch, Law, & Hall 2007; González-Haro, Calleja-González, & Escanero, 2010).

Learning styles research has investigated the arena of sports, but there is a need to further explore the relationships between learning and sport performance (González-Haro, Calleja-González, & Escanero, 2010). Currently in the United States the NCAA (National Collegiate Athletic Association) boast having over 1,000 member institutions within those institutions over 400,000 student athletes compete over three divisions for 89 championships in 23 sports (NCAA, 2013). These numbers do not include the junior colleges and NAIA (National Association of Intercollegiate Athletics) schools that also offer opportunities for student athletes to compete at the college level. For the 2011-2012 fiscal year the NCAA has reported revenue of \$871.6 million (NCAA, 2013). With the large numbers of participants, revenue and high expectations placed upon this segment of society it is paramount for those who are coaching these athletes to find as many means as possible to increase performance with the athletes they currently have but also to find ways to predict the level of sport performance of the athletes they recruit. It was this area with which the current study sought to find answers. How do coaches get high performance out of their athletes and how do they know who will perform at high levels so they can win and retain employment?

The current research study sought to answer three questions: (1) What learning styles exist among college athletes across level of performance, gender, and sport? (2) What do college coaches know about learning styles? (3) Do college coaches who have knowledge of learning styles provide instruction that is individualized to their players' learning styles?

Part One

The first research question asked was what learning styles exist among college athletes across level of sport performance, gender, and sport. As show before there has been extensive research into learning styles, however, there were significant gaps when it came to the learning styles of athletes at the college level. This study sought not only to determine how they learn but to see if there were relationships between learning styles and level sport achievement in the performance driven atmosphere of college sports. This was done by not only determining if they were on a college roster but how much actual measurable playing time they had and how much recognition the received for high level performance. It was proposed that if one could find a learning style that is related to high performance that coaches could tailor their recruiting process to this specific type of learning style.

The results from part one were consistent with the current literature in the realm on learning styles. The study showed the athletes preferred the Theorist Learning style most frequently, followed by Pragmatist, then Reflector and Activist. Honey and Mumford's learning styles parallel Kolb's learning styles. Therefore for comparison purposes across studies these results in Kolb's model of Learning Styles; would be in the following order: Assimilating, Converging, Diverging, and Active (González-Haro, Calleja-González, & Escanero, 2010; Kolb, & Kolb, 2005). This study found no significant relationship between level of sport performance and learning style $F(16, 150) = .720, p = .775$. This finding is consistent with González-Haro, Calleja-González, and Escanero (2010) who were only able to show a relationship to level of

sport performance for one learning style but they were unable to prove this at a level of statistical significance. Gender was also not a predictor of learning style $F(16, 428) = .753, p = .738$. This is contrary to the findings of Miller, Ogilvie, and Branch (2008), Wesch, Law, and Hall, (2007), Snyder (1999), Prajapati, Dunne, Bartlett and Cubbidge (2011) Hsin-Tzu and Ansalone (2008), Hlawaty (2009), Atkinson (2006) who all found differences in the learning preferences across gender. The findings show there was not a statistical significant factor for sport $F(4, 145) = 1.459, p = .075$ indicating no significant relationship between learning styles and sport. This finding was consistent with González-Haro, Calleja-González, and Escanero (2010) who found in their study of male athletes of varying levels of sport performance that sport was not a predictor of learning style. The results of part one of the study confirmed the hypothesis that learning styles would not vary across sport, however, the hypothesis that athletes would vary across gender and level of sport performance was not proven to be true. These findings are very important as coaches who coach mixed gender teams might account for gender differences in some areas but this study found that learning styles is not one that was markedly different. It is also important to note that even though learning styles were not an indicator of performance this information is not useless. A coach could use knowledge of current athletes learning styles as a way to tailor instruction since research has proven that achievement is tied to matching learning and teaching styles (Al-Balhan, 2007; Farkas, 2003; Nunn, 1995; Lister, 2005; Tatar & Dikici, 2009; Terregrossa, Englander, & Englander, 2009) of students and instructors. This could also be used in recruiting as coaches could possibly predict athletes that would work well in the learning environment they create.

Part Two

The second part of the study asked what do college coaches know about learning styles. The findings indicate that college coaches have a very general knowledge of learning styles. They

lacked a very specific knowledge that would allow them to develop a coaching philosophy or recruiting philosophy based upon their knowledge. The interviews also shed light on the findings of part one. While part one found that athletes all learn differently, part two provided insight into what might be the difference in level of sport performance for athletes. The coaches did not feel there was a single learning style that was prevalent for level of sport performance. The coaches also determined that it was very important to learn about each of their athletes. This is consistent with the research done by Williams and Anshel (2000) who found that the athletes need social support from their coaches and that this can have an effect upon sport performance. A coach demonstrating a need to learn about their athletes is important. As the findings of Engel (2009) indicate, it is important for teachers to adapt to the learning styles of their students, it would be difficult to adapt if time had not been invested to learn of students or athletes under ones charge. This was also echoed in the findings of Onwuegbuzie and Daley (1997) who determined that instructors should vary the pedagogical strategies they use for their students. Boyle and Dunn's (1998) findings are supported the findings of this study as they found teachers should determine and adapt to the learning styles present. The coaches were consistent in the environment they chose to create explaining that a competitive environment that prepares their athletes was needed, but also a positive and relaxed tone. Again, as discussed previously it is important for coaches to see the needs of athletes and provide what is needed for success whether it be teaching to learning styles or providing an environment that helps to prepare them for success in competition. The most profound finding of the study was the ability for the coaches to provide a clear description of the differences in higher and lower performing level athletes. See table 5.1. This was a pivotal finding of this study. With learning styles being ruled out as a factor of level of sport performance it was important to find what could be a determinant. Because as described by one of the coaches it is important to find the answer to how you get your athletes to "learn to

win”. By providing a clear definition of what a high performing athlete possesses in the areas of motivation, desire, and time on sport, coaches can be better equipped to recruit these types of athletes and as one coach felt you should recruit the desire and then teach the skill.

Table 5.1

High Level Characteristics

High level athletes

Will Push	Are Not Afraid of Failure	Get Extra Repetitions
Buy In	Have Respect from	Ask for Extra Help
Are Competitive	Competitors	High Sport IQ
Have Confidence	Take Advantage of	To Be Better Than Them You
Have Drive/Desire/Passion	Opportunities	Have to Work More Than
Come Early Stay Late	Have Talent	Them
High Level of Engagement	Put Extra Time into Skill	
Are Mentally Tough	Want the Ball in Big Games	
Are Motivated	Do Whatever it Takes	
	Have Strong Work Ethic	
	Work Hard	

Part Three

Part three of the study asked the question of whether college coaches who know about learning styles will indeed teach to the learning styles of their athletes. As discussed earlier Engel (2009) recommends adapting teaching styles to learning styles. The current study showed that the coach did just this for the team they coached. The teams learning styles in order of preference were Pragmatist (7.5), Reflector (7.3), Theorist (7.2), and Activist (5.1). The manner in which

they are coached follows the preferences of Reflector (167 number of times learning style was used), Pragmatist (136 number of times learning style was used), Theorist (119 number of times learning style was used), and Activist (52 number of times learning style was used). These results show only a slight difference from the pedagogy of the coach to the teams preferred learning styles. Not only did the coach match teaching and learning styles well with the team as a whole but also with individual athletes matching them 40% of the time. It must also be taken into account that this matching of teaching and learning styles does not mean that 60% of the time athletes were not able to learn but only that the teaching style was not a match to their highest preference for learning. It is also important to note that Honey (2006) presents many factors that can affect learning. These can include, obviously, the use of the learner's preferred learning style but also the situation or circumstances in which the learning takes place, the subject matter and the teaching methods employed. Therefore, multiple factors can contribute to learning success, however, this study was key to give a baseline for the primary factor of matching teaching and learning styles. This portion of the study was important as it is the first to look at the frequency of coaches teaching to the learning styles of their athletes. This information is vital to coaches to help them learn the effectiveness of their coaching philosophy. In coaching it is paramount to help athletes "get it" whatever the "it" is, i.e. skill, mental approach, strategy etc... This study could provide a means to evaluate how a coach could close the gap of understanding by determining how often they teach to the learning style of their team. The results of this section confirm the hypothesis that coaches will teach to the learning styles of their athletes.

Relationship of all Three Parts

The findings from the three parts of the study present a very complete picture of not only the college athlete but also how one can effectively coach at this level. The findings indicate that although learning styles do not differ among gender, sport or year of eligibility and are not a

predictor of level of sport performance, that athletes are very different. The coaches for part two were able to provide a clear explanation for the differences in college athletes but more importantly they provided what they see as the difference between good and great in athletes. And finally part three adds a strong conclusion to all the information gathered in that if a coach can identify the learning styles of their athletes, coach to this preference and find ways to motivate them and nurture the drive/desire/passion of each athlete they coach or recruit these types of athletes, that great success can be found.

Gaps Filled in Research

There were significant gaps in the literature concerning learning styles among collegiate athletes. Miller, Ogilvie, and Branch (2008) failed to examine the athletes' actual levels of performance. It was determined in the current study that a link in level of sport performance to learning style is not present. Gonzalez-Haro, Calleja-Gonzales, and Escanero (2010) explored varying levels of athletes; however, they did not include females or college athletes. This gap was filled with part one which included not just college athletes and females but also a wide range of team and individual sports, with corresponding sports for each gender. Part two of this study filled the gap of knowledge of what college coaches know about learning styles. The current study also provided insight into how coaches begin to work with athletes and what similarities coaches see in high performance athletes. Although much research has been done to determine the pedagogy and the matching of pedagogy to learning styles in the classroom (Bostrom & Lassen, 2006; Yildirim, Acar, Bull, & Sevinc, 2008; Farkas, 2003; Gerdes & Crews, 2010; Tzu-Chien & Graf, 2009; Terregrossa, Englander, & Englander, 2009; Shein & Chiou, 2011; Tatar & Dikici, 2009; Onwuegbuzie & Daley, 1997; Saeed, Yang & Sinnappan, 2009; Engel, 2009; Vaughn & Baker, 2008; Boyle & Dunn, 1998; Choi, Lee, & Kang, 2009). However none of these studies looked at matching pedagogy to learning styles in athletes. Part

three of this study filled this gap by giving a baseline of 40% matching of teaching and learning styles between coach and athletes.

Further Research

Although this study filled multiple gaps in the current research in the area of learning styles it also created new avenues for further research. More research is needed to see how coaches can more quickly identify how athletes learn or if it is necessary for them to use a questionnaire. More research is needed to determine if the 40% match of coaching to athletes learning styles is above or below average and what percentage of matching coaching to athletes learning styles is required for optimum performance. Also it is left to be determined if this number is true for a team sport as well as individual sports. Research is also desired in the realm of coaching instruction. As students are studying sport pedagogy it is considered necessary to see if learning styles should be a larger portion of the university curriculum when preparing coaches. And lastly the question, “if coaches recruited to their coaching style would team performance increase?” is yet to be explored.

Implications for Coaches

This study provides great information for coaches who are currently coaching or who wish to coach at the college level. One can find the great importance of learning about each athlete when one begins to work with them. Coaches also see the potential benefits of taking time to help each athlete on a one to one basis when struggles arise, as well as providing a competitive environment that promotes positivity in which if done can only promote achievement in athletics. The study also provides insight into a profile for recruiting. With college athletics being such a high profile competitive arena, it is paramount to get only the best recruits. By providing coaches with a clear picture of what the top level athletes possess, coaches can create a template for recruiting potential athletes, since coaches cannot perform the skills.

However, they are charged to find those athletes who can, and who can perform the skill sets needed at a level that ensures victory. This is vital to coaches as they are hired and fired based upon the ability to win. This study also provides a starting point for future research. Exploring the level of motivation it takes for an athlete to go from good to great was beyond the scope of the present study but would provide great insight into exactly what is needed in athletes at the college level. Also it would be beneficial to see at what percentage other coaches tailor their coaching to the learning styles of their athletes. This study looked at an individual sport but it would be beneficial to see if this trend is carried over to a team sport as the coach would work with groups of players more than individuals.

Implications for Athletes

The information found in this study also has benefits to athletes who are looking to continue their careers in the college setting. As stated before the recruiting of athletes by a college coach is of utmost importance to a program's success. However, the athletes who are being recruited play an important role in this as well since the decision of where to play is ultimately up to them. If athletes are aware of their personal learning style, they can have the potential to increase performance if they are able to match their learning style to the teaching style of the coach at the school they are considering (Al-Balhan, 2007; Farkas, 2003; Nunn, 1995; Lister, 2005; Tatar & Dikici, 2009; Terregrossa, Englander, & Englander, 2009).

Conclusion

Learning styles can be a beneficial tool in aiding coaches, but it is essential that coaches provide their athletes with specific instruction and environments that are conducive to their success. Success at the college level is a multifaceted process that includes coaches who are willing to take time to learn about their athletes, and provide them with the best and most specific instruction and support possible. In addition to the coaches, it takes athletes that are just

as committed to the process. These athletes must be motivated, come early and stay late and buy into the process and the concept of winning.

REFERENCES

- Al-Balhan, E. M. (2007). Learning styles in relation to academic performance in middle school mathematics. *DOMES: Digest Of Middle East Studies*, 16(1), 42-57.
- All-Americans*. (2012). Retrieved from <http://www.fscmocs.com/page.asp?articleID=322>
- Alumran, J. (2008). Learning styles in relation to gender, field of study, and academic achievement for Bahraini university students. *Individual Differences Research*, 6(4), 303-316. Retrieved from Academic Search Premier database.
- Akkoyunlu, B., & Soylu, M. (2008). A study of student's perceptions in a blended learning environment based on different learning styles. *Journal Of Educational Technology & Society*, 11(1), 183-193.
- Atkinson, S. (2006). Factors influencing successful achievement in contrasting design and technology activities in higher education. *International Journal Of Technology & Design Education*, 16(2), 193-213. doi:10.1007/s10798-004-8320-7
- Boatman, K., Courtney, R., & Lee, W. (2008). "See how they learn": the impact of faculty and student learning styles on student performance in introductory economics. *American Economist*, 52(1), 39-48. Retrieved from Business Source Premier database.
- Bostrom, L., & Lassen, L. M. (2006). Unraveling learning, learning styles, learning strategies and meta-cognition. *Education + Training*, 48(2/3), 178-189.
- Boyle, R. A., & Dunn, R. (1998). Teaching law students through individual learning styles. *Albany Law Review*, 62(1), 213.

- Burns, D. E., Johnson, S. E., & Gable, R. K. (1998). Can we generalize about the learning style characteristics. *Roeper Review*, 20(4), 276.
- Chiou, W. (2008). College students' role models, learning style preferences, and academic achievement in collaborative teaching: absolute versus relativistic thinking. *Adolescence*, 43(169), 129-142.
- Choi, I., Lee, S., & Kang, J. (2009). Implementing a case-based e-learning environment in a lecture-oriented anaesthesiology class: do learning styles matter in complex problem solving over time?. *British Journal Of Educational Technology*, 40(5), 933-947.
doi:10.1111/j.1467-8535.2008.00884.x
- Clarke, T. A., Lesh, J. J., Trocchio, J. S., & Wolman, C. (2010). Thinking styles: teaching and learning styles in graduate education students. *Educational Psychology*, 30(7), 837-848.
doi:10.1080/01443410.2010.510794
- Clark, D. R. (2008), Honey and Mumford's model- learning styles questionnaire (LSQ).
Retrieved July 10, 2011 from
http://www.nwlink.com/~donclark/hrd/styles/honey_mumford.html
- Coker, C. A. (2000). Consistency of learning styles of undergraduate athletic training students in the traditional classroom versus the clinical setting. *Journal Of Athletic Training*, 35(4), 441.
- Collinson, E. (2000). A survey of elementary students' learning style preferences and academic success. *Contemporary Education*, 71(4), 42.

- Dewey, J. (1959). *John dewey: Dictionary of education*. New York, New York: Philosophical Library.
- Dewey, J. (1970). *Experience and education*. New York, New York: The Macmillan Company.
- Duman, B. (2010). The effects of brain-based learning on the academic achievement of students with different learning styles. *Educational Sciences: Theory & Practice, 10*(4), 2077-2103.
- Dunn, R., & Price, G. E. (1980). The learning style characteristics of gifted students. *Gifted Child Quarterly, 24*, 33-36.
- Dunn, R., Dunn, K., & Price, G. E. (1996). *Learning style inventory*. Lawrence, KS: Price Systems.
- Engel, I. (2009). English language learning and teaching styles in two Turkish primary schools. *Social Behavior & Personality: An International Journal, 37*(8), 1117-1128.
- Erton, İ. (2010). Relations between personality traits, language learning styles and success in foreign language achievement. *Hacettepe University Journal of Education, (38)*, 115-126. Retrieved from Education Research Complete database.
- Fast Facts: Explore FSC. (2011) Retrieved July, 12 2011, from https://www.flsouthern.edu/about_fsc/quickfacts.htm
- Farkas, R. (2003). Effects of traditional versus learning-styles instructional methods on middle school students. *Journal of Educational Research, 97*(1), 42-51.

- Furnham, A., Mosen, J., & Ahmetoglu, G. (2009). Typical intellectual engagement, big five personality traits, approaches to learning and cognitive ability predictors of academic performance. *British Journal of Educational Psychology*, 79(4), 769-782. Retrieved from Academic Search Premier database.
- Gantasala, P., & Gantasala, S. (2009). Influence of learning styles. *International Journal of Learning*, 16(9), 169-184. Retrieved from Education Research Complete database.
- Gerdes, J., & Crews, T. (2010). Developing course profiles to match course characteristics with student learning styles. *NACADA Journal*, 30(1), 23-33. Retrieved from Education Research Complete database.
- González-Haro, Carlos, Calleja-González, Julio and Escanero, Jesus F. (2010). 'Learning styles favoured by professional, amateur, and recreational athletes in different sports'. *Journal of Sports Sciences*, 28(8), 859-866.
- Graf, S. S., Liu, T. C., & Kinshuk. (2010). Analysis of learners' navigational behaviour and their learning styles in an online course. *Journal of Computer Assisted Learning*, 26(2), 116-131. doi:10.1111/j.1365-2729.2009.00336.x
- Hamade, R. F., & Artail, H. A. (2010). A study of the influence of learning style of beginner computer-aided design users on their performance. *Journal of Engineering Design*, 21(5), 561-577. doi:10.1080/09544820802409289
- Harfield, T., Panko, M., Davies, K., & Kenley, R. (2007). Toward a learning-styles profile of construction students: results from new zealand. *International Journal of Construction Education & Research*, 3(3), 143-158. doi:10.1080/15578770701715060.

- Hastie, P. A. (1995). Factors affecting coaching preferences of secondary school volleyball players. *Perceptual and Motor Skills*, 80, 347-350. Retrieved from <http://www.amsciepub.com.spot.lib.auburn.edu/doi/pdf/10.2466/pms.1995.80.1.347>
- Hlawaty, H. (2009). "Lernen" and learning styles: a comparative analysis of the learning styles of German adolescents by age, gender, and academic achievement level. *European Education*, 40(4), 23-45. Retrieved from ERIC database.
- Honey, P. (2006). *Learning styles questionnaire 40-item version*. London: Pearson Assessment.
- Honey, P., & Mumford, A. (2006). Learning styles questionnaire: an excerpt from the facilitators guide. *Learning Styles Questionnaire Facilitators Guide*, Retrieved from <https://tbi.storesecured.com/images/Theoretical%20Backgrounds/Learning-Styles-Questionnaire-Theory.pdf>.
- Honey, P., & Mumford, A. (2006). Honey and Mumford learning styles questionnaire. Retrieved from www.bbk.ac.uk/.../HoneyandMumfordLearningStylesQuestionnaire.doc.
- Honey, P. & Mumford, A. (1992). *The manual of learning styles*. Maidenhead: Peter Honey Publications.
- Hsin-Tzu, C., & Ansalone, G. (2008). Enhancing excellence and equity in schooling: modality theory, an international perspective. *Educational Research Quarterly*, 32(1), 29-47.
- Kolb, D. A. (1984). *Experiential learning: experience as the source of learning and development*. Englewood Cliffs, New Jersey: PTR Prentice Hall.
- Kolb, D. A. (1999). *The Kolb's learning styles inventory*. Boston: Hay Group.

- Kolb, A.Y., & Kolb, D.A. (2005). The kolb learning style inventory—version 3.1 2005 technical specifications. *Experience Based Learning Systems*, Retrieved from <http://www.whitewater-rescue.com/support/pagepics/lstechmanual.pdf>.
- Lewin, K. (1951). *Field theory in social science: selected theoretical papers*. New York, New York: Harper and Row, Publishers, Incorporated.
- Lister, D. O. (2005). Effects of traditional versus tactual and kinesthetic learning-style responsive instructional strategies on bermudian learning-support sixth-grade students' social studies achievement and attitude-test scores. *Research For Educational Reform*, 10(2), 24-40.
- Marin-Suarez, T., & Alarcon, H. (2010). Influence of learning styles on conceptual learning of physics. *AIP Conference Proceedings*, 1289(1), 217-220. doi:10.1063/1.3515204
- Matthews, D. B. (1996). An investigation of learning styles and perceived academic achievement for high school students. *Clearing House*, 69(4), 249.n
- Miller, T., Ogilvie, B., & Branch, J. (2008). Sport psychology consultation: the influence of gender on learning style. *Consulting Psychology Journal: Practice and Research*, 60(3), 279-285. doi:10.1037/1065-9293.60.3.279.
- Moccasin success*. (2013). Retrieved from <http://www.fscmocs.com/page.asp?articleID=154>
- Moran, A. (1991). What can learning styles research learn from cognitive psychology. *Educational Psychology*, 11(3/4), 239. Retrieved from Academic Search Premier database.

- NCAA, Initials. (2010, December 8). Participation climbs to 430,000 student-athletes. Retrieved from
<http://www.ncaa.org/wps/wcm/connect/public/NCAA/Resources/Latest+News/2010+news+stories/December/Participation+rate+climbs+to+430,000+student-athletes>
- NCAA Academic and Membership Affairs Staff. (2011). *2011-2012 ncaa division ii manual*. Indianapolis, IN: The National Collegiate Athletics Association.
- NCAA. (2013). *Who we are*. Retrieved from
[http://www.ncaa.org/wps/wcm/connect/public/NCAA/About the NCAA/Who We Are landing page](http://www.ncaa.org/wps/wcm/connect/public/NCAA/About+the+NCAA/Who+We+Are+landing+page)
- NCAA. (2013, February). *Revenue*. Retrieved from
<http://www.ncaa.org/wps/wcm/connect/public/NCAA/Finances/Revenue>
- Nunn, G. D. (1995). Effects of a learning styles and strategies intervention upon at-risk middle school students. *Journal Of Instructional Psychology*, 22(1), 34.
- Onwuegbuzie, A. J., & Daley, C. E. (1997). Learning style and achievement in a course on research methods. *Psychological Reports*, 80(2), 496.
- Pashler, H., McDaniel, M., Rohrer, D., & Bjork, R. (2009). Learning styles: concepts and evidence. *Psychological Science in the Public Interest*, 9(3), 105–119.
- Peters, D., Jones, G., & Peters, J. (2008). Preferred 'learning styles' in students studying sports-related programmes in higher education in the United Kingdom. *Studies in Higher Education*, 33(2), 155-166. doi:10.1080/03075070801916005.

- Piaget, J. (1974). *Science of education and psychology of the child*. New York, New York: The Viking Press.
- Popescu, E. E. (2010). Adaptation provisioning with respect to learning styles in a Web-based educational system: an experimental study. *Journal Of Computer Assisted Learning*, 26(4), 243-257. doi:10.1111/j.1365-2729.2010.00364.x
- Prajapati, B., Dunne, M., Bartlett, H., & Cubbidge, R. (2011). The influence of learning styles, enrolment status and gender on academic performance of optometry undergraduates. *Ophthalmic & Physiological Optics*, 31(1), 69-78. doi:10.1111/j.1475-1313.2010.00798.x
- Rogers, P., & McNeil, K. (2009). Student learning styles and online course performance: an empirical examination of student success in web-based management courses. *Business Education Digest*, (18), 1-15. Retrieved from Education Research Complete database.
- Saeed, N., Yun, Y., & Sinnappan, S. (2009). Emerging web technologies in higher education: a case of incorporating blogs, podcasts and social bookmarks in a web programming course based on students' learning styles and technology preferences. *Journal Of Educational Technology & Society*, 12(4), 98-109.
- Scott, C. (2010). The enduring appeal of 'learning styles'. *Australian Journal of Education*, 54(1), 5-17. Retrieved from Academic Search Premier database.
- Shein, P., & Chiou, W. (2011). Teachers as role models for students' learning styles. *Social Behavior & Personality: An International Journal*, 39(8), 1097-1104. doi:org/10.2224/sbp.2011.39.8.1097

- Snyder, R. (1999). The relationship between learning styles/multiple intelligences and academic achievement of high school students. *High School Journal*, 83(2), 11.
- Sunshine State Conference (2013), Retrieved from <http://www.sunshinestateconference.com/>
- Swinton, L. (2006). Kolb's learning style inventory and kolb's learning cycle explained - no fluff, no filler, just facts. *Management for the Rest of Us*, 25. Retrieved from <http://www.mftrou.com/support-files/kolb-learning-style-inventory.pdf>
- Tatar, E., & Dikici, R. (2009). The effect of the 4mat method (learning styles and brain hemispheres) of instruction on achievement in mathematics. *International Journal Of Mathematical Education In Science & Technology*, 40(8), 1027-1036.
doi:10.1080/00207390903121750
- Terregrossa, R., Englander, F., & Englander, V. (2009). The impact of learning styles on achievement in principles of microeconomics: a natural experiment. *College Student Journal*, 43(2), 400-410.
- Terregrossa, R., Englander, F., & Zhaobo, W. (2010). How student achievement in related to student behaviors and leaning styles preferences. *International Journal of Education Research*, 5(2), 94-108. Retrieved from Education Research Complete database.
- Turman, P., & Schrod, P. (2004). New avenues for instructional communication research: relationships among coaches' leadership behaviors and athletes' affective learning. *Communication Research Reports*, 21(2), 130-143. Retrieved from Communication & Mass Media Complete database.

- Tzu-Chien, L., & Graf, S. (2009). Coping with mismatched courses: students' behaviour and performance in courses mismatched to their learning styles. *Educational Technology Research & Development*, 57(6), 739-752. doi:10.1007/s11423-009-9116-y.
- Vaughn, L. M., & Baker, R. C. (2008). Do different pairings of teaching styles and learning styles make a difference? preceptor and resident perceptions. *Teaching & Learning In Medicine*, 20(3), 239-247. doi:10.1080/10401330802199559
- Wang, K. H., Wang, T. H., Wang, W. L., & Huang, S. C. (2006). Learning styles and formative assessment strategy: enhancing student achievement in web-based learning. *Journal Of Computer Assisted Learning*, 22(3), 207-217. doi:10.1111/j.1365-2729.2006.00166.x
- Wesch, N., Law, B., & Hall, C. (2007). The use of observational learning by athletes. *Journal of Sport Behavior*, 30(2), 219. Retrieved from MasterFILE Premier database.
- Williams, L., & Anshel, M. (2000). Cognitive style in adolescent athletes. *Journal of Sport Behavior*, 23(1), 70. Retrieved from Academic Search Premier database.
- Williams, L.R.T., M.H. Anshel, and J.J. Quek. (1997) "Cognitive style in adolescent competitive athletes as a function of culture and gender. / style cognitif chez les athletes adolescents pratiquant le sport en competition, en fonction de la culture et du sexe." *Journal of Sport Behavior* 20.2 (1997): 232-246. *SPORTDiscus*. EBSCO. Web. 8 Dec. 2010.
- Woolhouse, M., & Blaire, T. (2003). Learning styles and retention and achievement on a two-year a-level programme in a further education college. *Journal Of Further & Higher Education*, 27(3), 257.

Yildirim, O., Acar, A., Bull, S., & Sevinc, L. (2008). Relationships between teachers' perceived leadership style, students' learning style, and academic achievement: a study on high school students. *Educational Psychology, 28*(1), 73-81. Retrieved from ERIC database.

Yilmaz-Soylu, M., & Akkoyunlu, B. (2009). The effect of learning styles on achievement in different learning environments. *Turkish Online Journal of Educational Technology - TOJET, 8*(4), 43-50. Retrieved from EBSCOhost.

Zacharis, N. Z. (2010). The impact of learning styles on student achievement in a web-based versus an equivalent face-to-face course. *College Student Journal, 44*(3), 591-597.

Appendix 1
(Demographic Questionnaires)

Demographic Information Questionnaire Basketball

Date: _____

Participant Number (researcher use only): _____

Gender

- Male
- Female

Level of sport performance (Please check only the Highest level you have played at any point while competing)

- Level 1:** You have not played a competitive season at the DII level
- Level 2:** You have started or played in less than 13 games during the regular season
- Level 3:** You have played or started in at least 13 games in the regular season
- Level 4:** You have started at least 20 games in a regular season
- Level 5:** You have been recognized as an All-Conference player or above at least once while competing.

Year of Eligibility

- Freshman
- Sophomore
- Junior
- Senior

Demographic Information Questionnaire Baseball

Date: _____

Participant Number (researcher use only): _____

Gender

- Male
- Female

Level of sport performance (Please check only the Highest level you have played at any point while competing)

- Level 1:** You have not played a competitive season at the DII level
- Level 2:** You have started or played in less than 25 games during the regular season
- Level 3:** You have started or played in at least 25 games in the regular season
- Level 4:** You have started or played at least 38 games in the regular season. If you are a pitcher you have started or pitched in at least 13 games
- Level 5:** You have been recognized as an All-Conference player or above at least once while competing.

Year of Eligibility

- Freshman
- Sophomore
- Junior
- Senior

Demographic Information Questionnaire Cross Country/Track

Date: _____

Participant Number (researcher use only): _____

Gender

- Male
- Female

Sport

- Cross Country
- Track
- Both

Level of sport performance Cross Country (Please check only the Highest level you have played at any point while competing)

- Level 1:** You have not played a competitive season at the DII level
- Level 2:** You have finished in the top 5 of any event in less than 2 meets during the regular season
- Level 3:** You have finished in the top 5 in at least 2 meets during the regular season
- Level 4:** You have finished in the top 5 in at least 4 meets during the regular season
- Level 5:** You have been recognized as an All-Conference player or above at least once while competing.

Level of sport performance Track (Please check only the Highest level you have played at any point while competing)

- Level 1:** You have not played a competitive season at the DII level
- Level 2:** You have finished in the top 5 of any event in less than 5 meets during the regular season
- Level 3:** You have finished in the top 5 of any event in at least 5 meets during the regular season
- Level 4:** You have finished in the top 5 of any event in at least 9 meets during the regular season
- Level 5:** You have been recognized as an All-Conference player or above at least once while competing.

Year of Eligibility

- Freshman
- Sophomore
- Junior
- Senior

Demographic Information Questionnaire Golf

Date: _____

Participant Number (researcher use only): _____

Gender

- Male
- Female

Level of sport performance (Please check only the Highest level you have played at any point while competing)

- Level 1:** You have not played a competitive season at the DII level
- Level 2:** You have been a top 5 player for your team in less than 5 tournaments during the regular season
- Level 3:** You have been a top 5 player for your team in at least 5 tournaments during the regular season
- Level 4:** You have been a top five player for your team in at least 8 tournaments during the regular season
- Level 5:** You have been recognized as an All-Conference player or above at least once while competing.

Year of Eligibility

- Freshman
- Sophomore
- Junior
- Senior

Demographic Information Questionnaire Lacrosse

Date: _____

Participant Number (researcher use only): _____

Gender

- Male
- Female

Level of sport performance (Please check only the Highest level you have played at any point while competing)

- Level 1:** You have not played a competitive season at the DII level
- Level 2:** You have started or played in less than 9 games during the regular season
- Level 3:** You have started or played in at least 9 games in the regular season
- Level 4:** You have started or played at least 13 games in the regular season
- Level 5:** You have been recognized as an All-Conference player or above at least once while competing

Year of Eligibility

- Freshman
- Sophomore
- Junior
- Senior

Demographic Information Questionnaire Soccer

Date: _____

Participant Number (researcher use only): _____

Gender

- Male
- Female

Level of sport performance (Please check only the Highest level you have played at any point while competing)

- Level 1:** You have not played a competitive season at the DII level
- Level 2:** You have started or played in less than 9 games during the regular season
- Level 3:** You have started or played as a substitute in at least 9 games during the regular season
- Level 4:** You have started or played at least 14 games during the regular season
- Level 5:** You have been recognized as an All-Conference player or above at least once while competing.

Year of Eligibility

- Freshman
- Sophomore
- Junior
- Senior

Demographic Information Questionnaire Softball

Date: _____

Participant Number (researcher use only): _____

Gender

- Male
- Female

Level of sport performance (Please check only the Highest level you have played at any point while competing)

- Level 1:** You have not played a competitive season at the DII level
- Level 2:** You have started or played in less than 28 games during the regular season
- Level 3:** You have started or played in at least 28 games in the regular season
- Level 4:** You have started or played at least 42 games in the regular season. If you are a pitcher you have started or pitched in at least 14 games
- Level 5:** You have been recognized as an All-Conference player or above at least once while competing.

Year of Eligibility

- Freshman
- Sophomore
- Junior
- Senior

Demographic Information Questionnaire Swimming

Date: _____

Participant Number (researcher use only): _____

Gender

- Male
- Female

Level of sport performance Cross Country (Please check only the Highest level you have played at any point while competing)

- Level 1:** You have not played a competitive season at the DII level
- Level 2:** You have finished in the top 5 in any event in less than 4 meets during the regular season
- Level 3:** You have finished in the top 5 in any event in at least 4 meets during the regular season
- Level 4:** You have finished in the top 5 in any event in at least 8 meets during the regular season
- Level 5:** You have been recognized as an All-Conference player or above at least once while competing.

Year of Eligibility

- Freshman
- Sophomore
- Junior
- Senior

Demographic Information Questionnaire Tennis

Date: _____

Participant Number (researcher use only): _____

Gender

- Male
- Female

Level of sport performance (Please check only the Highest level you have played at any point while competing)

- Level 1:** You have not played a competitive season at the DII level
- Level 2:** You have been listed as #5 or lower player in at least 19 matches in the regular season
- Level 3:** You have been listed as a #3 or #4 player in at least 19 matches in the regular season
- Level 4:** You have been listed as a #1 or #2 player in at least 19 matches in the regular season
- Level 5:** You have been recognized as an All-Conference player or above at least once while competing.

Year of Eligibility

- Freshman
- Sophomore
- Junior
- Senior

Appendix 2

(Honey and Mumford Learning Styles Questionnaire)

Honey and Mumford Learning Styles Questionnaire

Learning Styles (40-item) Questionnaire

This 40-item questionnaire will help you discover your learning style preferences. We all develop learning 'habits' that make us happier to learn in some ways and less happy to learn in other, less familiar, ways. Most people are only vaguely aware of their learning preferences. This questionnaire will clarify your preferred ways of learning so that you are in a better position to select experiences that suit your style and/or to broaden your scope by strengthening under-utilized styles.

There is no time limit for the completion of this questionnaire. It will probably take you 5 to 10 minutes. The accuracy of the results depends on how honest you are. There is no right or wrong answers. If you agree more than you disagree with a statement select "Agree". If you disagree more than you agree with a statement select "Disagree". Be sure to mark every item.

Take the Questionnaire

Question 1 to 20 of 40

1. I quite like taking risks.

Agree

Disagree

2. Before taking part in a discussion or meeting, I like to read the appropriate papers and prepare carefully.

Agree

Disagree

3. I like to be absolutely correct about things.

Agree

Disagree

4. I like practical, tried and tested techniques.

Agree

Disagree

5. I often do things just because I feel like it, rather than thinking about them first.

Agree

Disagree

6. I make decisions only after weighing up the pros and cons of different possibilities.

Agree

Disagree

7. I prefer to solve problems using a systematic approach that reduces guesswork and uncertainty.

Agree

Disagree

8. What matters most to me is whether something works in practice.

Agree

Disagree

9. I actively look for new things to do.

Agree

Disagree

10. I prefer to establish the facts and think things through before reaching a conclusion.

Agree

Disagree

11. I like to check things out for myself rather than take them for granted.

Agree

Disagree

12. When I hear about a new idea or technique, I immediately start working out how to apply it to my situation/problems.

Agree

Disagree

13. I like the challenge of trying out different ways of doing things.

Agree

Disagree

14. I prefer to have as many bits of information about a subject as possible. The more I have to sift through the better.

Agree

Disagree

15. I am quite keen on sticking to fixed routines, following procedures and keeping to timetables.

Agree

Disagree

16. In discussions, I like to get straight to the point.

Agree

Disagree

17. I prefer to jump in and do things as they come along rather than plan things out beforehand.

Agree

Disagree

18. I prefer to base decisions on hard evidence rather than on hunches or intuition.

Agree

Disagree

19. I like to fit things into some sort of pattern, framework or model.

Agree

Disagree

20. I tend to judge people's ideas on their practical merits.

Agree

Disagree

21. In discussions, I usually come up with lots of spontaneous ideas.

Agree

Disagree

22. I prefer to look at a problem from as many different angles as I can before starting to solve it.

Agree

Disagree

23. I prefer to evaluate the soundness of my ideas before sharing them.

Agree

Disagree

24. In meetings and discussions, I put forward ideas that I know are down-to-earth and realistic.

Agree

Disagree

25. Usually I talk more than I listen.

Agree

Disagree

26. If I have to write a report or a formal letter, I prefer to have several rough drafts before settling on the final version.

Agree

Disagree

27. I am rather fussy about how I do things – a bit of a perfectionist.

Agree

Disagree

28. I find that I can often work out more practical ways of doing things.

Agree

Disagree

29. I find rules and procedures take the fun out of things.

Agree

Disagree

30. I like to consider many options before I make up my mind.

Agree

Disagree

31. I believe that careful, logical thinking is the key to success.

Agree

Disagree

32. I prefer ideas with an obvious relevance to my life and work.

Agree

Disagree

33. I am usually the ‘life and soul’ of the party.

Agree

Disagree

34. I like to think through the consequences before taking action.

Agree

Disagree

35. I like to understand the assumptions, principles and rationale upon which things are based.

Agree

Disagree

36. In my opinion, it doesn’t matter how you do something, as long as it works.

Agree

Disagree

37. I enjoy the excitement of a crisis situation.

Agree

Disagree

38. I usually do more listening than talking.

Agree

Disagree

39. I like meetings and discussions to be structured and orderly.

Agree

Disagree

40. I do whatever I need to, to get the job done.

Agree

Disagree

Appendix 3
(Knowledge of Learning Styles Interview Questions)

Knowledge of Learning Styles Interview

1. What is your education background? degree, when, where, etc...
2. What is your experience as an athlete? Sport, level of sport performance, etc...
3. What is your background in coaching? Sport, level, years, etc...
4. From your experience as an athlete and coach (or just as a coach) what can you tell me about how athletes learn?
5. What do you know about or have possibly heard about the terms learning styles or learning preferences?
6. What similarities have you noticed in how your athletes learn skills or concepts?
7. What differences have you noticed in how your athletes learn skills or concepts?
8. How do begin to work with an athlete when they come into your program?
9. How has this process changed over the course of your coaching career?
10. If you have a player who is struggling to understand a skill or concept how do you help them understand?
11. As a coach what type of environment do you try to create in practice, games, conditioning, etc...?
12. What type of coach would you describe yourself as autocratic, democratic, a mix of both?
13. When considering the level of sport performance of your athletes *e.g.* an All-Conference vs. a bench player do you notice differences in the ways they learn and if so what are they?
14. What makes All-Conference or above level athletes different?
15. Is there any additional information that you think would be helpful or relevant to the study?

Appendix 4

(Permission Letters for Research Site)



Megan Brown
Auburn University
1322 Happy Hill Road
Carrolton, Georgia 30116

February 11, 2013

Dear Ms. Brown,

I am pleased to inform you that the Institutional Review Board of Florida Southern College has reviewed and approved your submission titled "The Relationship between Learning Style and Level of Performance in Division II Collegiate Athletes".

You may begin obtaining consents and collecting data at your earliest convenience. Your project has permission to collect data for one year. If you need more time to finish your project, then the Florida Southern IRB will need an update seeking permission for an extension.

If you decide to change the protocol approved by this committee, a request for modification will need to be submitted before the revised protocol is attempted with human subjects.

Congratulations,

A handwritten signature in cursive script, appearing to read "J Lynch".

James M. Lynch, MD
Chair, Institutional Review Board
Florida Southern College
111 Lake Hollingsworth Drive
Lakeland FL 33801
863-680-6205
jlynch@flsouthern.edu

Institutional Review Board
c/o Office of Human Subjects Research
307 Samford Hall
Auburn University, AL 36849

Dear IRB Members,

After reviewing the proposed study, “The Relationship between Learning Style and Level of sport performance in Division II Collegiate Athletes”, presented by Miss Megan Brown an AU doctoral student, I have granted authorization for students to be *recruited* from the following sports via team meetings establish by Miss Brown and the coaches for the following sports:

Baseball	Men’s Basketball
Softball	Women’s Basketball
Men’s Tennis	Men’s Swimming
Women’s Tennis	Women’s Swimming
Men’s Golf	Men’s Soccer
Women’s Golf	Women’s Soccer
Men’s Cross Country and Track	Men’s Lacrosse
Women’s Cross Country and Track	Women’s Lacrosse

The purpose of the study is first is to determine the learning styles of Division II collegiate athletes across sport, level of sport performance, and gender. The second is to determine what Division II collegiate coaches know about learning styles and how they apply this knowledge to providing learning experiences and individualized instruction to the athletes they coach. Miss Megan Brown will conduct the following activities in the above listed sport(s): recruit the participants during team meetings established by Miss Brown and the coaches, administer a demographic questionnaire and the Honey and Mumford Learning Styles Questionnaire to consenting participants, and audio-tape the women’s tennis practices with consenting athletes. It is understood that this project will end no later than December 31, 2013.

To ensure that the students are protected, Miss Megan Brown has agreed to provide to me a copy of any Auburn University IRB-approved, stamped consent document before she recruits participants in the above-listed sport(s). To eliminate any risk of coercion, I will not be included in any information given to the participants. Miss Megan Brown has agreed to provide a copy of her study results, in aggregate, to our department.

If the IRB has any concerns about the permission being granted by this letter, please contact me at 863-680-4246.

Sincerely,

Al Green - Director of Sports Medicine at Florida Southern College

Institutional Review Board
c/o Office of Human Subjects Research
307 Samford Hall
Auburn University, AL 36849

Dear IRB Members,

After reviewing the proposed study, “The Relationship between Learning Style and Level of sport performance in Division II Collegiate Athletes”, presented by Miss Megan Brown an AU doctoral student, I have granted authorization for students to be *recruited* from the following sports via team meetings establish by Miss Brown and the coaches for the following sports:

Baseball	Men’s Basketball
Softball	Women’s Basketball
Men’s Tennis	Men’s Swimming
Women’s Tennis	Women’s Swimming
Men’s Golf	Men’s Soccer
Women’s Golf	Women’s Soccer
Men’s Cross Country and Track	Men’s Lacrosse
Women’s Cross Country and Track	Women’s Lacrosse

The purpose of the study is first is to determine the learning styles of Division II collegiate athletes across sport, level of sport performance, and gender. The second is to determine what Division II collegiate coaches know about learning styles and how they apply this knowledge to providing learning experiences and individualized instruction to the athletes they coach. Miss Megan Brown will conduct the following activities in the above listed sport(s): recruit the participants during team meetings established by Miss Brown and the coaches, administer a demographic questionnaire and the Honey and Mumford Learning Styles Questionnaire to consenting participants, and audio-tape the women’s tennis practices with consenting athletes. It is understood that this project will end no later than December 31, 2013.

To ensure that the students are protected, Miss Megan Brown has agreed to provide to me a copy of any Auburn University IRB-approved, stamped consent document before she recruits participants in the above-listed sport(s). To eliminate any risk of coercion, I will not be included in any information given to the participants. Miss Megan Brown has agreed to provide a copy of her study results, in aggregate, to our department.

If the IRB has any concerns about the permission being granted by this letter, please contact me at 863-680-4246.

Sincerely,

Pete Myer – Athletic Director at Florida Southern College

Appendix 5
(Permission Letters Part One)

Institutional Review Board
c/o Office of Human Subjects Research
307 Samford Hall
Auburn University, AL 36849

Dear IRB Members,

After reviewing the proposed study, “The Relationship between Learning Style and Level of sport performance in Division II Collegiate Athletes”, presented by Miss Megan Brown an AU doctoral student, I have granted authorization for students to be recruited from the baseball team via team meetings establish by Miss. Brown and myself.

The purpose of the study is first is to determine the learning styles of Division II collegiate athletes across sport, level of sport performance, and gender. The second is to determine what Division II collegiate coaches know about learning styles and how they apply this knowledge to providing learning experiences and individualized instruction to the athletes they coach. Miss Megan Brown will conduct the following activities in the above listed sport(s): recruit the participants during team meetings established by Miss Brown and the coaches, administer a demographic questionnaire and the Honey and Mumford Learning Styles Questionnaire to consenting participants. It is understood that this project will end no later than December 31, 2013.

To ensure that the students are protected, Miss Megan Brown has agreed to provide to me a copy of any Auburn University IRB-approved, stamped consent document before she recruits participants in the above-listed sport. To eliminate any risk of coercion, I will not be included in any information given to the participants or be present at the team meetings where Miss Brown will be recruiting participants. Miss Megan Brown has agreed to provide a copy of her study results, in aggregate, to our department.

If the IRB has any concerns about the permission being granted by this letter, please contact me at 863-680-4246.

Sincerely,

Lance Niekro- Head Coach Baseball at Florida Southern College

Institutional Review Board
c/o Office of Human Subjects Research
307 Samford Hall
Auburn University, AL 36849

Dear IRB Members,

After reviewing the proposed study, “The Relationship between Learning Style and Level of sport performance in Division II Collegiate Athletes”, presented by Miss Megan Brown an AU doctoral student, I have granted authorization for students to be recruited from the men’s basketball team via team meetings establish by Miss. Brown and myself.

The purpose of the study is first is to determine the learning styles of Division II collegiate athletes across sport, level of sport performance, and gender. The second is to determine what Division II collegiate coaches know about learning styles and how they apply this knowledge to providing learning experiences and individualized instruction to the athletes they coach. Miss Megan Brown will conduct the following activities in the above listed sport(s): recruit the participants during team meetings established by Miss Brown and the coaches, administer a demographic questionnaire and the Honey and Mumford Learning Styles Questionnaire to consenting participants. It is understood that this project will end no later than December 31, 2013.

To ensure that the students are protected, Miss Megan Brown has agreed to provide to me a copy of any Auburn University IRB-approved, stamped consent document before she recruits participants in the above-listed sport. To eliminate any risk of coercion, I will not be included in any information given to the participants or be present at the team meetings where Miss Brown will be recruiting participants. Miss Megan Brown has agreed to provide a copy of her study results, in aggregate, to our department.

If the IRB has any concerns about the permission being granted by this letter, please contact me at 863-680-4246.

Sincerely,

Linc Darner - Head Coach Men’s Basketball at Florida Southern College

Institutional Review Board
c/o Office of Human Subjects Research
307 Samford Hall
Auburn University, AL 36849

Dear IRB Members,

After reviewing the proposed study, “The Relationship between Learning Style and Level of sport performance in Division II Collegiate Athletes”, presented by Miss Megan Brown an AU doctoral student, I have granted authorization for students to be recruited from the women’s basketball team via team meetings establish by Miss. Brown and myself.

The purpose of the study is first is to determine the learning styles of Division II collegiate athletes across sport, level of sport performance, and gender. The second is to determine what Division II collegiate coaches know about learning styles and how they apply this knowledge to providing learning experiences and individualized instruction to the athletes they coach. Miss Megan Brown will conduct the following activities in the above listed sport(s): recruit the participants during team meetings established by Miss Brown and the coaches, administer a demographic questionnaire and the Honey and Mumford Learning Styles Questionnaire to consenting participants. It is understood that this project will end no later than December 31, 2013.

To ensure that the students are protected, Miss Megan Brown has agreed to provide to me a copy of any Auburn University IRB-approved, stamped consent document before she recruits participants in the above-listed sport. To eliminate any risk of coercion, I will not be included in any information given to the participants or be present at the team meetings where Miss Brown will be recruiting participants. Miss Megan Brown has agreed to provide a copy of her study results, in aggregate, to our department.

If the IRB has any concerns about the permission being granted by this letter, please contact me at 863-680-4246.

Sincerely,

Holly Borchers- Head Coach Women’s Basketball at Florida Southern College

Institutional Review Board
c/o Office of Human Subjects Research
307 Samford Hall
Auburn University, AL 36849

Dear IRB Members,

After reviewing the proposed study, “The Relationship between Learning Style and Level of sport performance in Division II Collegiate Athletes”, presented by Miss Megan Brown an AU doctoral student, I have granted authorization for students to be recruited from the Cross Country and Track teams via team meetings establish by Miss. Brown and myself.

The purpose of the study is first is to determine the learning styles of Division II collegiate athletes across sport, level of sport performance, and gender. The second is to determine what Division II collegiate coaches know about learning styles and how they apply this knowledge to providing learning experiences and individualized instruction to the athletes they coach. Miss Megan Brown will conduct the following activities in the above listed sport(s): recruit the participants during team meetings established by Miss Brown and the coaches, administer a demographic questionnaire and the Honey and Mumford Learning Styles Questionnaire to consenting participants. It is understood that this project will end no later than December 31, 2013.

To ensure that the students are protected, Miss Megan Brown has agreed to provide to me a copy of any Auburn University IRB-approved, stamped consent document before she recruits participants in the above-listed sport. To eliminate any risk of coercion, I will not be included in any information given to the participants or be present at the team meetings where Miss Brown will be recruiting participants. Miss Megan Brown has agreed to provide a copy of her study results, in aggregate, to our department.

If the IRB has any concerns about the permission being granted by this letter, please contact me at 863-680-4246.

Sincerely,

Rebecca Marsh - Head Coach Men’s and Women’s Cross Country and Track at Florida Southern College

Institutional Review Board
c/o Office of Human Subjects Research
307 Samford Hall
Auburn University, AL 36849

Dear IRB Members,

After reviewing the proposed study, “The Relationship between Learning Style and Level of sport performance in Division II Collegiate Athletes”, presented by Miss Megan Brown an AU doctoral student, I have granted authorization for students to be recruited from the men’s golf team via team meetings establish by Miss. Brown and myself.

The purpose of the study is first is to determine the learning styles of Division II collegiate athletes across sport, level of sport performance, and gender. The second is to determine what Division II collegiate coaches know about learning styles and how they apply this knowledge to providing learning experiences and individualized instruction to the athletes they coach. Miss Megan Brown will conduct the following activities in the above listed sport(s): recruit the participants during team meetings established by Miss Brown and the coaches, administer a demographic questionnaire and the Honey and Mumford Learning Styles Questionnaire to consenting participants. It is understood that this project will end no later than December 31, 2013.

To ensure that the students are protected, Miss Megan Brown has agreed to provide to me a copy of any Auburn University IRB-approved, stamped consent document before she recruits participants in the above-listed sport. To eliminate any risk of coercion, I will not be included in any information given to the participants or be present at the team meetings where Miss Brown will be recruiting participants. Miss Megan Brown has agreed to provide a copy of her study results, in aggregate, to our department.

If the IRB has any concerns about the permission being granted by this letter, please contact me at 863-680-4246.

Sincerely,

Doug Gordin - Head Coach Men’s Golf at Florida Southern College

Institutional Review Board
c/o Office of Human Subjects Research
307 Samford Hall
Auburn University, AL 36849

Dear IRB Members,

After reviewing the proposed study, “The Relationship between Learning Style and Level of sport performance in Division II Collegiate Athletes”, presented by Miss Megan Brown an AU doctoral student, I have granted authorization for students to be recruited from the women’s golf team via team meetings establish by Miss. Brown and myself.

The purpose of the study is first is to determine the learning styles of Division II collegiate athletes across sport, level of sport performance, and gender. The second is to determine what Division II collegiate coaches know about learning styles and how they apply this knowledge to providing learning experiences and individualized instruction to the athletes they coach. Miss Megan Brown will conduct the following activities in the above listed sport(s): recruit the participants during team meetings established by Miss Brown and the coaches, administer a demographic questionnaire and the Honey and Mumford Learning Styles Questionnaire to consenting participants. It is understood that this project will end no later than December 31, 2013.

To ensure that the students are protected, Miss Megan Brown has agreed to provide to me a copy of any Auburn University IRB-approved, stamped consent document before she recruits participants in the above-listed sport. To eliminate any risk of coercion, I will not be included in any information given to the participants or be present at the team meetings where Miss Brown will be recruiting participants. Miss Megan Brown has agreed to provide a copy of her study results, in aggregate, to our department.

If the IRB has any concerns about the permission being granted by this letter, please contact me at 863-680-4246.

Sincerely,

Robbie Davis - Head Coach Women’s Golf at Florida Southern College

Institutional Review Board
c/o Office of Human Subjects Research
307 Samford Hall
Auburn University, AL 36849

Dear IRB Members,

After reviewing the proposed study, “The Relationship between Learning Style and Level of sport performance in Division II Collegiate Athletes”, presented by Miss Megan Brown an AU doctoral student, I have granted authorization for students to be recruited from the men’s lacrosse team via team meetings establish by Miss. Brown and myself.

The purpose of the study is first is to determine the learning styles of Division II collegiate athletes across sport, level of sport performance, and gender. The second is to determine what Division II collegiate coaches know about learning styles and how they apply this knowledge to providing learning experiences and individualized instruction to the athletes they coach. Miss Megan Brown will conduct the following activities in the above listed sport(s): recruit the participants during team meetings established by Miss Brown and the coaches, administer a demographic questionnaire and the Honey and Mumford Learning Styles Questionnaire to consenting participants. It is understood that this project will end no later than December 31, 2013.

To ensure that the students are protected, Miss Megan Brown has agreed to provide to me a copy of any Auburn University IRB-approved, stamped consent document before she recruits participants in the above-listed sport. To eliminate any risk of coercion, I will not be included in any information given to the participants or be present at the team meetings where Miss Brown will be recruiting participants. Miss Megan Brown has agreed to provide a copy of her study results, in aggregate, to our department.

If the IRB has any concerns about the permission being granted by this letter, please contact me at 863-680-4246.

Sincerely,

Marty Ward - Head Coach Men’s Lacrosse at Florida Southern College

Institutional Review Board
c/o Office of Human Subjects Research
307 Samford Hall
Auburn University, AL 36849

Dear IRB Members,

After reviewing the proposed study, “The Relationship between Learning Style and Level of sport performance in Division II Collegiate Athletes”, presented by Miss Megan Brown an AU doctoral student, I have granted authorization for students to be recruited from the women’s lacrosse team via team meetings establish by Miss. Brown and myself.

The purpose of the study is first is to determine the learning styles of Division II collegiate athletes across sport, level of sport performance, and gender. The second is to determine what Division II collegiate coaches know about learning styles and how they apply this knowledge to providing learning experiences and individualized instruction to the athletes they coach. Miss Megan Brown will conduct the following activities in the above listed sport(s): recruit the participants during team meetings established by Miss Brown and the coaches, administer a demographic questionnaire and the Honey and Mumford Learning Styles Questionnaire to consenting participants. It is understood that this project will end no later than December 31, 2013.

To ensure that the students are protected, Miss Megan Brown has agreed to provide to me a copy of any Auburn University IRB-approved, stamped consent document before she recruits participants in the above-listed sport. To eliminate any risk of coercion, I will not be included in any information given to the participants or be present at the team meetings where Miss Brown will be recruiting participants. Miss Megan Brown has agreed to provide a copy of her study results, in aggregate, to our department.

If the IRB has any concerns about the permission being granted by this letter, please contact me at 863-680-4246.

Sincerely,

Kara Reber - Head Coach Men’s Tennis at Florida Southern College

Institutional Review Board
c/o Office of Human Subjects Research
307 Samford Hall
Auburn University, AL 36849

Dear IRB Members,

After reviewing the proposed study, “The Relationship between Learning Style and Level of sport performance in Division II Collegiate Athletes”, presented by Miss Megan Brown an AU doctoral student, I have granted authorization for students to be recruited from the men’s soccer team via team meetings establish by Miss. Brown and myself.

The purpose of the study is first is to determine the learning styles of Division II collegiate athletes across sport, level of sport performance, and gender. The second is to determine what Division II collegiate coaches know about learning styles and how they apply this knowledge to providing learning experiences and individualized instruction to the athletes they coach. Miss Megan Brown will conduct the following activities in the above listed sport(s): recruit the participants during team meetings established by Miss Brown and the coaches, administer a demographic questionnaire and the Honey and Mumford Learning Styles Questionnaire to consenting participants. It is understood that this project will end no later than December 31, 2013.

To ensure that the students are protected, Miss Megan Brown has agreed to provide to me a copy of any Auburn University IRB-approved, stamped consent document before she recruits participants in the above-listed sport. To eliminate any risk of coercion, I will not be included in any information given to the participants or be present at the team meetings where Miss Brown will be recruiting participants. Miss Megan Brown has agreed to provide a copy of her study results, in aggregate, to our department.

If the IRB has any concerns about the permission being granted by this letter, please contact me at 863-680-4246.

Sincerely,

Hugh Seyfarth - Head Coach Men’s Soccer at Florida Southern College

Institutional Review Board
c/o Office of Human Subjects Research
307 Samford Hall
Auburn University, AL 36849

Dear IRB Members,

After reviewing the proposed study, “The Relationship between Learning Style and Level of sport performance in Division II Collegiate Athletes”, presented by Miss Megan Brown an AU doctoral student, I have granted authorization for students to be recruited from the women’s soccer team via team meetings establish by Miss. Brown and myself.

The purpose of the study is first is to determine the learning styles of Division II collegiate athletes across sport, level of sport performance, and gender. The second is to determine what Division II collegiate coaches know about learning styles and how they apply this knowledge to providing learning experiences and individualized instruction to the athletes they coach. Miss Megan Brown will conduct the following activities in the above listed sport(s): recruit the participants during team meetings established by Miss Brown and the coaches, administer a demographic questionnaire and the Honey and Mumford Learning Styles Questionnaire to consenting participants. It is understood that this project will end no later than December 31, 2013.

To ensure that the students are protected, Miss Megan Brown has agreed to provide to me a copy of any Auburn University IRB-approved, stamped consent document before she recruits participants in the above-listed sport. To eliminate any risk of coercion, I will not be included in any information given to the participants or be present at the team meetings where Miss Brown will be recruiting participants. Miss Megan Brown has agreed to provide a copy of her study results, in aggregate, to our department.

If the IRB has any concerns about the permission being granted by this letter, please contact me at 863-680-4246.

Sincerely,

Brittany Jones - Head Coach Women’s Soccer at Florida Southern College

Institutional Review Board
c/o Office of Human Subjects Research
307 Samford Hall
Auburn University, AL 36849

Dear IRB Members,

After reviewing the proposed study, “The Relationship between Learning Style and Level of sport performance in Division II Collegiate Athletes”, presented by Miss Megan Brown an AU doctoral student, I have granted authorization for students to be recruited from the softball team via team meetings establish by Miss. Brown and myself.

The purpose of the study is first is to determine the learning styles of Division II collegiate athletes across sport, level of sport performance, and gender. The second is to determine what Division II collegiate coaches know about learning styles and how they apply this knowledge to providing learning experiences and individualized instruction to the athletes they coach. Miss Megan Brown will conduct the following activities in the above listed sport(s): recruit the participants during team meetings established by Miss Brown and the coaches, administer a demographic questionnaire and the Honey and Mumford Learning Styles Questionnaire to consenting participants. It is understood that this project will end no later than December 31, 2013.

To ensure that the students are protected, Miss Megan Brown has agreed to provide to me a copy of any Auburn University IRB-approved, stamped consent document before she recruits participants in the above-listed sport. To eliminate any risk of coercion, I will not be included in any information given to the participants or be present at the team meetings where Miss Brown will be recruiting participants. Miss Megan Brown has agreed to provide a copy of her study results, in aggregate, to our department.

If the IRB has any concerns about the permission being granted by this letter, please contact me at 863-680-4246.

Sincerely,

Chris Bellotto - Head Coach Softball at Florida Southern College

Institutional Review Board
c/o Office of Human Subjects Research
307 Samford Hall
Auburn University, AL 36849

Dear IRB Members,

After reviewing the proposed study, “The Relationship between Learning Style and Level of sport performance in Division II Collegiate Athletes”, presented by Miss Megan Brown an AU doctoral student, I have granted authorization for students to be recruited from the swimming team via team meetings establish by Miss. Brown and myself.

The purpose of the study is first is to determine the learning styles of Division II collegiate athletes across sport, level of sport performance, and gender. The second is to determine what Division II collegiate coaches know about learning styles and how they apply this knowledge to providing learning experiences and individualized instruction to the athletes they coach. Miss Megan Brown will conduct the following activities in the above listed sport(s): recruit the participants during team meetings established by Miss Brown and the coaches, administer a demographic questionnaire and the Honey and Mumford Learning Styles Questionnaire to consenting participants. It is understood that this project will end no later than December 31, 2013.

To ensure that the students are protected, Miss Megan Brown has agreed to provide to me a copy of any Auburn University IRB-approved, stamped consent document before she recruits participants in the above-listed sport. To eliminate any risk of coercion, I will not be included in any information given to the participants or be present at the team meetings where Miss Brown will be recruiting participants. Miss Megan Brown has agreed to provide a copy of her study results, in aggregate, to our department.

If the IRB has any concerns about the permission being granted by this letter, please contact me at 863-680-4246.

Sincerely,

Duncan Sherrard - Head Coach Men’s and Women’s Swimming at Florida Southern College

Institutional Review Board
c/o Office of Human Subjects Research
307 Samford Hall
Auburn University, AL 36849

Dear IRB Members,

After reviewing the proposed study, “The Relationship between Learning Style and Level of sport performance in Division II Collegiate Athletes”, presented by Miss Megan Brown an AU doctoral student, I have granted authorization for students to be recruited from the men’s tennis team via team meetings establish by Miss. Brown and myself

The purpose of the study is first is to determine the learning styles of Division II collegiate athletes across sport, level of sport performance, and gender. The second is to determine what Division II collegiate coaches know about learning styles and how they apply this knowledge to providing learning experiences and individualized instruction to the athletes they coach. Miss Megan Brown will conduct the following activities in the above listed sport(s): recruit the participants during team meetings established by Miss Brown and the coaches, administer a demographic questionnaire and the Honey and Mumford Learning Styles Questionnaire to consenting participants. It is understood that this project will end no later than December 31, 2013.

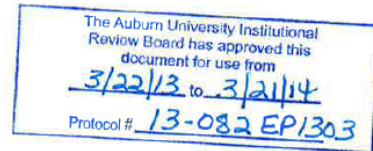
To ensure that the students are protected, Miss Megan Brown has agreed to provide to me a copy of any Auburn University IRB-approved, stamped consent document before she recruits participants in the above-listed sport. To eliminate any risk of coercion, I will not be included in any information given to the participants or be present at the team meetings where Miss Brown will be recruiting participants. Miss Megan Brown has agreed to provide a copy of her study results, in aggregate, to our department.

If the IRB has any concerns about the permission being granted by this letter, please contact me at 863-680-4246.

Sincerely,

Trey Heath - Head Coach Men’s Tennis at Florida Southern College

Appendix 6
(Consent for Athletes Information)



Consent for Athletes Information

(NOTE: DO NOT SIGN THIS DOCUMENT UNLESS AN IRB APPROVAL STAMP WITH CURRENT DATES HAS BEEN APPLIED TO THIS DOCUMENT.)

INFORMED CONSENT

for a Research Study entitled

“The Relationship between Learning Style and Level of sport performance in Division II Collegiate Athletes”

You are invited to participate in a research study to determine if athletes who demonstrate higher levels of performance have different learning styles than lower level performance collegiate athletes and how does level of sport performance effect coaching The study is being conducted by Megan Brown, Doctorial Student under the direction of Dr. Sheri Brock, Committee Chair in the Auburn University Department of Kinesiology. You were selected as a possible participant because you are a Florida Southern College athlete for one of the following sports: Baseball, Softball, Men’s Cross Country and Track, Women’s Country and Track, Men’s Tennis, Women’s Tennis, Men’s Golf, Women’s Golf, Men’s Lacrosse, Women’s Lacrosse, Men’s Soccer, Women’s Soccer, Men’s Basketball, Women’s Basketball, Men’s Swimming, or Women’s Swimming and are willing to take a survey of your personal learning styles. Please do not participate if you are not an athlete of the listed sports, are not willing to be surveyed, and are under eighteen years of age.

What will be involved if you participate? If you decide to participate in this research study, you will be asked to complete a survey to determine your personal learning style and a survey to determine demographic information. Your total time commitment will be approximately fifteen minutes.

Are there any risks or discomforts? The risks associated with participating in this are a breach of confidentiality and coercion. To minimize these risks, we will not require you to place your name on the survey. The questionnaire will be completed in a quiet space without the coaches or researcher present. Results will not be given to your coach or members of Florida Southern College Athletics.

Are there any benefits to yourself or others? The results will be used to understand how athletes learn and how coaches adapt their teaching styles to athletes. The results may help future coaches and athletes understand how learning and performance are related.

Will you receive compensation for participating? You will not receive any compensation for participating in this study.

Are there any costs? There are not costs for participation in this study.

If you change your mind about participating, you can withdraw at any time during the study. Your participation is completely voluntary. If you choose to withdraw, your data can be withdrawn as long as it is identifiable. Your decision about whether or not to participate or to



stop participating will not jeopardize your future relations with Florida Southern College, Florida Southern College Athletics or the Department of Kinesiology at Auburn University. **Your privacy will be protected.** Any information obtained in connection with this study will remain confidential. Information obtained through your participation may be used to fulfill an educational requirement, published in a professional journal, or presented at a professional conference or meeting.

If you have questions about this study, please ask them now or contact Megan Brown at mmb0013@auburn.edu or Dr. Sheri Brock at brocksj@auburn.edu. You may retain this information for your personal records.

If you have questions about your rights as a research participant, you may contact the Auburn University Office of Human Subjects Research or the Institutional Review Board by phone (334)-844-5966 or e-mail at hsubjec@auburn.edu or IRBChair@auburn.edu.

Investigator obtaining consent Date

Printed Name



Appendix 7

(Recruitment Script for Athletes Part One and Three)

Recruitment Scripts for Athletes' Meeting

RECRUITMENT SCRIPT (verbal, in person)

My name is Megan Brown, a Doctoral Student in the Department of Kinesiology at Auburn University. I would like to invite you to participate in my research study to determine the learning styles of collegiate student athletes. You may participate if you are at least 18 years old and are an athlete for one of the following sports: Baseball, Softball, Men's Cross Country and Track, Women's Cross Country and Track, Men's Tennis, Women's Tennis, Men's Golf, Women's Golf, Men's Lacrosse, Women's Lacrosse, Men's Soccer, Women's Soccer, Men's Basketball, Women's Basketball, Men's Swimming, or Women's Swimming at Florida Southern College. Please do not participate if you are under 18 or not an athlete for the previously mentioned sports at Florida Southern College.

At this time if you do not wish to participate or do not meet the previously mentioned requirements you are free to leave. Please know that your departure will not be reported to your coach or any other Florida Southern Athletics Department official.

As a participant, you will be asked to complete a survey to determine your personal learning style and a survey to determine demographic information. Your total time commitment will be approximately fifteen minutes.

The only risks associated with your participation in this study are a possible breach of confidentiality and coercion. To minimize these risks, you are not required to place your name on the survey. The questionnaires will be completed here without your coaches or myself present. Any information obtained in connection with this study will remain confidential. The results will not be given to your coach or members of Florida Southern College Athletics. You will not receive any compensation for participating in this study and there will be no cost for participation.

The results can benefit others to understand how athletes learn and how coaches adapt their teaching styles to athletes. These results may help future coaches and athletes understand how learning and performance are related.

If you would like to participate in this research study, once I leave the room please complete the demographic questionnaire and Honey and Mumford learning styles questionnaire. Once you have completed both, please place them in the collection box by the door.

Do you have any questions now? If you have questions later, please contact me at mmb0013@auburn.edu or you may contact my advisor, Dr. Sheri Brock, at brocksj@auburn.edu.

Recruitment Scripts for Athletes' Meeting (Women's Tennis)

RECRUITMENT SCRIPT (verbal, in person)

My name is Megan Brown, a Doctoral Student in the Department of Kinesiology at Auburn University. I would like to invite you to participate in my research study to determine the learning styles of collegiate student athletes. You may participate if you are at least 18 years old and are an athlete for Women's Tennis at Florida Southern College. Please do not participate if you are under 18 or not an athlete for the previously mentioned sport at Florida Southern College.

At this time if you do not wish to participate or do not meet the previously mentioned requirements you are free to leave. Please know that your departure will not be reported to your coach or any other Florida Southern Athletics Department official.

As a participant, you will be asked to complete a survey to determine your personal learning style and a survey to determine demographic information. Your total time commitment will be approximately fifteen minutes. You will also be audiotaped during a practice session with your coach. Your coach will be wearing a microphone and tape recorder. You will not. The primary reason for the tape recording is to record your coach, however, your voice may be recorded as well.

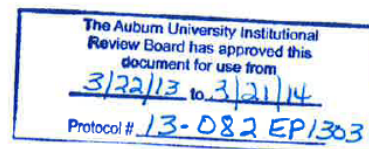
The only risks associated with your participation in this study are a possible breach of confidentiality and coercion. To minimize these risks, you are not required to place your name on the survey. The questionnaires will be completed here without your coaches or myself present. In addition your questionnaire will be coded to protect your identity. Also to minimize these risk your audiotape will be transcribed coded and the audiotape erased by the researcher. The results will not be given to your coach or members of Florida Southern College Athletics. You will not receive any compensation for participating in this study and there will be no cost for participation.

The results can benefit others to understand how athletes learn and how coaches adapt their teaching styles to athletes. These results may help future coaches and athletes understand how learning and performance are related.

If you would like to participate in this research study, once I leave the room please sign the consent document, complete the demographic questionnaire, and Honey and Mumford learning styles questionnaire. Once you have completed these, please place all three in the collection box by the door.

Do you have any questions now? If you have questions later, please contact me at mmb0013@auburn.edu or you may contact my advisor, Dr. Sheri Brock, at brocksj@auburn.edu.

Appendix 8
(Consent Forms Part Two)



Consent for Coaches (Audio Recording of Practice for Women's Tennis)
(NOTE: DO NOT SIGN THIS DOCUMENT UNLESS AN IRB APPROVAL STAMP
WITH CURRENT DATES HAS BEEN APPLIED TO THIS DOCUMENT.)
INFORMED CONSENT
for a Research Study entitled
"The Relationship between Learning Style and Level of sport performance in Division II
Collegiate Athletes"

You are invited to participate in a research study to determine if athletes who demonstrate higher levels of performance have different learning styles than lower level performance collegiate athletes and how does level of sport performance effect coaching The study is being conducted by Megan Brown, Doctorial Student under the direction of Dr. Sheri Brock, Committee Chair in the Auburn University Department of Kinesiology. You were selected as a possible participant because you are a Florida Southern College coach for one of the following sports: Baseball, Softball, Men's Cross Country and Track, Women's Country and Track, Men's Tennis, Women's Tennis, Men's Golf, Women's Golf, Men's lacrosse, Women's Lacrosse, Men's Soccer, Women's Soccer, Men's Basketball, Women's Basketball, Men's Swimming, or Women's Swimming and are willing and available to be interviewed, audio recorded at practice, and are age 18 or older.

What will be involved if you participate? If you decide to participate in this research study, you will be asked to participate in an interview and have practice sessions (with athletes who consent to the study) audio taped, your interview will also be audio recorded. Your total time commitment for the interview will be approximately one hour. Additional time will be determined by the length of practices sessions with consenting players.

Are there any risks or discomforts? The risk associated with participating in this study is a breach of confidentiality. To minimize this risk, your interview and practice sessions recording will not be identified with your name. All identifying information (Sport and sex of athletes coached) will be removed after the data has been analyzed.

Are there any benefits to yourself or others? The results will be used to understand how athletes learn and how coaches adapt their teaching styles to athletes. The results may help future coaches and athletes understand how learning and performance are related.

Will you receive compensation for participating? You will not receive any compensation for participating in this study.

Are there any costs? There are not costs for participation in this study.

If you change your mind about participating, you can withdraw at any time during the study. Your participation is completely voluntary. If you choose to withdraw, your data can be withdrawn as long as it is identifiable. Your decision about whether or not to participate or to stop participating will not jeopardize your future relations with Florida Southern College, Florida Southern College Athletics or the Department of Kinesiology at Auburn University.



Your privacy will be protected. Any information obtained in connection with this study will remain confidential. Information obtained through your participation may be used to fulfill an educational requirement, published in a professional journal, or presented at a professional conference or meeting.

If you have questions about this study, please ask them now or contact Megan Brown at mmb0013@auburn.edu or Dr. Sheri Brock at brocksj@auburn.edu. A copy of this document will be given to you to keep.

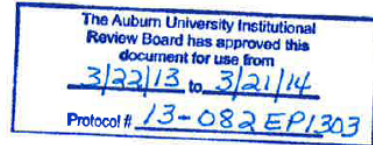
If you have questions about your rights as a research participant, you may contact the Auburn University Office of Human Subjects Research or the Institutional Review Board by phone (334)-844-5966 or e-mail at hsubjec@auburn.edu or IRBChair@auburn.edu.

HAVING READ THE INFORMATION PROVIDED, YOU MUST DECIDE WHETHER OR NOT YOU WISH TO PARTICIPATE IN THIS RESEARCH STUDY. YOUR SIGNATURE INDICATES YOUR WILLINGNESS TO PARTICIPATE.

Participant's signature Date Investigator obtaining consent Date

Printed Name

Printed Name



Appendix 9
(Permission Letter Part Three)

Institutional Review Board
c/o Office of Human Subjects Research
307 Samford Hall
Auburn University, AL 36849

Dear IRB Members,

After reviewing the proposed study, “The Relationship between Learning Style and Level of sport performance in Division II Collegiate Athletes”, presented by Miss Megan Brown an AU doctoral student, I have granted authorization for students to be recruited from the women’s tennis team via team meetings establish by Miss. Brown and myself. I have also granted authorization for Miss Megan Brown to audiotape practice sessions, with consenting players, during the 2012-2013 academic year. The purpose of the study is first is to determine the learning styles of Division II collegiate athletes across sport, level of sport performance, and gender. The second is to determine what Division II collegiate coaches know about learning styles and how they apply this knowledge to providing learning experiences and individualized instruction to the athletes they coach. Miss Megan Brown will conduct the following activities in the above listed sport(s): recruit the participants during team meetings established by Miss Brown and the coaches, administer a demographic questionnaire and the Honey and Mumford Learning Styles Questionnaire to consenting participants, and audio-tape the women’s tennis practices with consenting athletes. It is understood that this project will end no later than December 31, 2013.

To ensure that the students are protected, Miss Megan Brown has agreed to provide to me a copy of any Auburn University IRB-approved, stamped consent document before she recruits participants in the above-listed sport. To eliminate any risk of coercion, I will not be included in any information given to the participants or be present at the team meetings where Miss Brown will be recruiting participants. Miss Megan Brown has agreed to provide a copy of her study results, in aggregate, to our department.

If the IRB has any concerns about the permission being granted by this letter, please contact me at 863-680-4246.

Sincerely,

Trish Riddell- Head Coach Women’s Tennis at Florida Southern College

Appendix 10

(Consent Form Part Three Athletes)



Consent for Athletes (Women's Tennis)

(NOTE: DO NOT SIGN THIS DOCUMENT UNLESS AN IRB APPROVAL STAMP WITH CURRENT DATES HAS BEEN APPLIED TO THIS DOCUMENT.)

INFORMED CONSENT

for a Research Study entitled

"The Relationship between Learning Style and Level of sport performance in Division II Collegiate Athletes"

You are invited to participate in a research study to determine if athletes who demonstrate higher levels of performance have different learning styles than lower level performance collegiate athletes and how does level of sport performance effect coaching The study is being conducted by Megan Brown, a Doctorial Student, under the direction of Dr. Sheri Brock, Committee Chair in the Auburn University Department of Kinesiology. You were selected as a possible participant because you are a Florida Southern College athlete for one of the following sports: Baseball, Softball, Men's Cross Country and Track, Women's Country and Track, Men's Tennis, Women's Tennis, Men's Golf, Women's Golf, Men's Lacrosse, Women's Lacrosse Men's Soccer, Women's Soccer, Men's Basketball, Women's Basketball, Men's Swimming, or Women's Swimming and are willing to take a survey of your personal learning styles and be audio taped during a practice session. Please do not participate if you are not an athlete of the listed sports, are not willing to be surveyed, are not willing to be audio taped, and are under eighteen years of age.

What will be involved if you participate? If you decide to participate in this research study, you will be asked to complete a survey to determine your personal learning style and a survey to determine demographic information. Your total time commitment will be approximately fifteen minutes, you will also be audio taped during a practice session with your coach. Your coach will be wearing a microphone and tape recorder. You will not. The primary reason for the tape recording is to record your coach, however, your voice may be recorded as well.

Are there any risks or discomforts? The risks associated with participating in this are a breach of confidentiality. To minimize these risks your questionnaire will be coded to protect your identity. Also to minimize these risk your audiotape will be transcribed coded and the audiotape erased by the researcher.

Are there any benefits to yourself or others? The results will be used to understand how athletes learn and how coaches adapt their teaching styles to athletes. The results may help future coaches and athletes understand how learning and performance are related.

Will you receive compensation for participating? You will not receive any compensation for participating in this study.

Are there any costs? There are not costs for participation in this study.

If you change your mind about participating, you can withdraw at any time during the study. Your participation is completely voluntary. If you choose to withdraw, your data can be



withdrawn as long as it is identifiable. Your decision about whether or not to participate or to stop participating will not jeopardize your future relations with Florida Southern College, Florida Southern College Athletics or the Department of Kinesiology at Auburn University. **Your privacy will be protected.** Any information obtained in connection with this study will remain confidential. Information obtained through your participation may be used to fulfill an educational requirement, published in a professional journal, or presented at a professional conference or meeting.

If you have questions about this study, please ask them now or contact Megan Brown at mmb0013@auburn.edu or Dr. Sheri Brock at brocksj@auburn.edu. A copy of this document will be given to you to keep.

If you have questions about your rights as a research participant, you may contact the Auburn University Office of Human Subjects Research or the Institutional Review Board by phone (334)-844-5966 or e-mail at hsubjec@auburn.edu or IRBChair@auburn.edu.

HAVING READ THE INFORMATION PROVIDED, YOU MUST DECIDE WHETHER OR NOT YOU WISH TO PARTICIPATE IN THIS RESEARCH STUDY. YOUR SIGNATURE INDICATES YOUR WILLINGNESS TO PARTICIPATE.

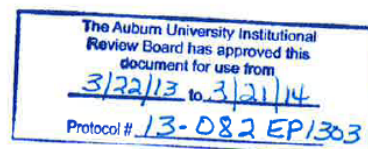
Participant's signature Date Investigator obtaining consent Date

Printed Name Printed Name



Appendix 11

(Consent Form Part Three Coach)



Consent for Coaches (Audio Recording of Practice for Women's Tennis)
(NOTE: DO NOT SIGN THIS DOCUMENT UNLESS AN IRB APPROVAL STAMP
WITH CURRENT DATES HAS BEEN APPLIED TO THIS DOCUMENT.)

INFORMED CONSENT

for a Research Study entitled

"The Relationship between Learning Style and Level of sport performance in Division II Collegiate Athletes"

You are invited to participate in a research study to determine if athletes who demonstrate higher levels of performance have different learning styles than lower level performance collegiate athletes and how does level of sport performance effect coaching The study is being conducted by Megan Brown, Doctorial Student under the direction of Dr. Sheri Brock, Committee Chair in the Auburn University Department of Kinesiology. You were selected as a possible participant because you are a Florida Southern College coach for one of the following sports: Baseball, Softball, Men's Cross Country and Track, Women's Country and Track, Men's Tennis, Women's Tennis, Men's Golf, Women's Golf, Men's lacrosse, Women's Lacrosse, Men's Soccer, Women's Soccer, Men's Basketball, Women's Basketball, Men's Swimming, or Women's Swimming and are willing and available to be interviewed, audio recorded at practice, and are age 18 or older.

What will be involved if you participate? If you decide to participate in this research study, you will be asked to participate in an interview and have practice sessions (with athletes who consent to the study) audio taped, your interview will also be audio recorded. Your total time commitment for the interview will be approximately one hour. Additional time will be determined by the length of practices sessions with consenting players.

Are there any risks or discomforts? The risk associated with participating in this study is a breach of confidentiality. To minimize this risk, your interview and practice sessions recording will not be identified with your name. All identifying information (Sport and sex of athletes coached) will be removed after the data has been analyzed.

Are there any benefits to yourself or others? The results will be used to understand how athletes learn and how coaches adapt their teaching styles to athletes. The results may help future coaches and athletes understand how learning and performance are related.

Will you receive compensation for participating? You will not receive any compensation for participating in this study.

Are there any costs? There are not costs for participation in this study.

If you change your mind about participating, you can withdraw at any time during the study. Your participation is completely voluntary. If you choose to withdraw, your data can be withdrawn as long as it is identifiable. Your decision about whether or not to participate or to stop participating will not jeopardize your future relations with Florida Southern College, Florida Southern College Athletics or the Department of Kinesiology at Auburn University.



Your privacy will be protected. Any information obtained in connection with this study will remain confidential. Information obtained through your participation may be used to fulfill an educational requirement, published in a professional journal, or presented at a professional conference or meeting.

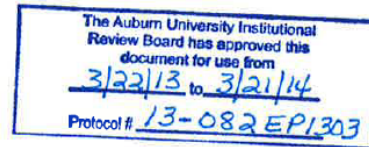
If you have questions about this study, please ask them now or contact Megan Brown at mmb0013@auburn.edu or Dr. Sheri Brock at brocksj@auburn.edu. A copy of this document will be given to you to keep.

If you have questions about your rights as a research participant, you may contact the Auburn University Office of Human Subjects Research or the Institutional Review Board by phone (334)-844-5966 or e-mail at hsubjec@auburn.edu or IRBChair@auburn.edu.

HAVING READ THE INFORMATION PROVIDED, YOU MUST DECIDE WHETHER OR NOT YOU WISH TO PARTICIPATE IN THIS RESEARCH STUDY. YOUR SIGNATURE INDICATES YOUR WILLINGNESS TO PARTICIPATE.

Participant's signature Date Investigator obtaining consent Date

Printed Name Printed Name



Appendix 12
(Code List for Part Two)

Code-Filter: All

HU: Dissertation_Atlasti_Qualitative data

File: [C:\Users\Megan

Marie

Brown\Documents\Dissertation_...\Dissertation_Atlasti_Qualitative data.hpr7]

Edited by: Super

Date/Time: 2013-07-28 18:50:14

10 Years		differently	Player Has It
11 Years		Athletes Like Structure	Coaching
12 years	Coaching	Athletes Struggle with	Coaching Experience
Experience		Communication	Coddled
16Years		Athletes Unable to Make	College
18 Years		Decisions	Come from A
1993		Autocratic	competitive Background
1994		Bachelors	Comfortable to Make
1995		Baseball	Mistakes
1999		Basketball	Compleive Environment
20 Years		Below College Level	Competiveness
2001		Benevolent Dictator	Conference Champion
2002		Biggest Question is How	Confidence
2007		to get Athletes to Believe	Confront Issue Directly
2007-2008		they Can Win	Contentment of Lower
2009		BMX	Level
2010		Break	Continuous Learning
2011		Performance	Corporate Job
2012		Business	Cross Country Track
32 Years		Business	Democratic
Ability to Adapt		Business Administration	Developed own Process
Academic All-American		Buy In	Difference in LS of
Acceptance Level Higher		Can be A Frustrating	Higher and Lower
Level Will Push		Sport	Difference in Upper and
All-American		Can Correct	Lower is Sport IQ
Amateur		Can Push Good Athletes	Different Systems of
Amazing Person who		Can Push Some Athletes	Coaching Work in
enjoys when Not		Clarification of Question	Certain Settings
Successful		Clear Expectations	Direct Approach
Asked for Help		Club Level	Does Not Know
Assistant		Coach Has Final Say	Draw from Experience
At First My Way Only		Coach Must have Rule of	Drive / Desire / Passion
Athlete must Decide To		Certain Areas	Each Athlete is Different
work		Coach ability of Athlete	Education Background
Athletes are Different		Coaches Cannot Play for	for LS
Athletes	Learn	Athletes	Evaluate Each Week
		Coaches Know when a	Evaluate Players Skill

Sets and Enhance in Spring
 Expectations for national Qualifier
 Expected Outcomes by Higher Level Athletes
 Experience Helps Extra Repetition
 Extra Time With Athlete Finance
 Floating Emotion
 Focus is More to Making Players Comfortable
 Formulate a Way to Get Better Together
 Fun
 GA
 General Comment
 Get Athletes Better Each Year
 Getting Through the Uncomfortableness
 Golf
 Good and Bad from Questioning
 Guessing
 Had to Learn about Differences in LS in Athletes
 Have Not Changed Much
 Have Used LS with Athletes
 Head
 Heard of Learning Styles
 Help Athletes get Acclimated
 Help Understand Role
 Help Understand Team Method of Operation
 Here to Mentor not Baby or Discipline
 High Level Come Early Stay Late
 High School
 Higher Ask for Extra Help

Higher Education Administration
 Higher Performance History
 Human Movement Performance
 I Don't Know
 Ice Hockey
 In Off Season Freshman have Settled
 Individual Help
 Individuals Make or Break a Team In golf
 International Level
 Junior College
 Junior Level
 Kinesthetic Learning
 Lacrosse
 Learn By Experience
 Learn By Gaining Confidence in Skill
 Learn From Negatives
 Learn Level of Mentality of Athlete
 Learn New things Every Year
 Learned from Others
 Learning Dependent on Sports Knowledge
 Learning from Experience
 Level of Engagement
 License in Coaching
 Link to LS and IQ
 Lower Level Does not do What is Needed to Succeed
 Lower Level Does Not enjoy Training Because is Shows Shortcomings in Skill
 Lower Level is too Challenged by Looking Within
 Lower Level Lack of Motivation

Lower Level not as Serious
 Management
 Management
 Information
 Marketing
 Masters
 Mental Toughness
 Minor
 Mix of Both
 More Correction
 More Specific Feedback
 Most Learn Visual
 Most want Success But not Work Required
 Motorcycle Racing
 Must Build Competitiveness
 Must Build Relationship with Athlete
 Must get Athlete out of Comfort Zone
 Must Learn from Mistakes
 Must learn LS of Athlete
 Must Learn Personality of Athlete
 Must Learn to Motivate Athletes
 Must use Many Methods to Get Message Across My Way as a Coach
 National Level
 Need of Team Dictates Environment
 Need to Baby Some Athletes
 Need to Be Positive
 Need to see it
 Need to Teach Players to Win
 New Athletes Will Go A Million Miles an Hour
 No
 Not a Conditioning Sport
 Not Afraid of failure

Not Any Differences
Nothing to Add
Olympic Trials Qualifier
On Court Me Off Court
Them
One on One Attention
One year to learn about
LS of Athlete
Parental Influence
Parents were in Coaching
Participant
Patience
Perception
Personal Response
Personality
Physical Education
Pick up Athletes after
Getting onto Them
Player Input
Players Ask more Why
Now
Players have Different
Definitions of fun
Players Must Be
Motivated
Players Need to Know
what to Expect
Positive Environment
Positive Reinforcement
Post College
Post Season Playing
Experience
Practice at Game Speed
Practice is My way
Practice Settings and
Learning
Pre Med
Previous Coaches
Private Lessons
Process Has not Changed
Professional
Question Clarification
Rare to Have Freshman
Come in and Contribute
Reaction to Situations
Recreation Level

Recruit Drive Teach Skill
Recruiting
Relaxed Environment
Repetition
Request for Clarification
of Question
Researcher
Respect
Roles of Motivation
differ with Coaching
Position
Safety
Same LS in Basic Skills
Schedule
Semi Pro Level
Shorter Session
Show them Other Players
Shows Who Will Work
the Hardest
Skill Building in Spring
Soccer
Softball
Some are Motivated but
Cannot Push
Some Coaches Can Turn
Good To Great
Some Democratic
Components
Speed of Understanding
Sport IQ
Sport Management
Sports have Changed
over Time
Sports Teach Life
Lessons
Start with Basics
Start with Fitness
Student Assistant
Swimming
Take Advantage of
Opportunities
Takes Time to be Great
Talent
Taylor Practices to
Individuals
Teach Independence

Teach on the Fly
Teachers Certification
Team Addressed
Team Building
Team Building First
Team Dynamic Dictates
Environment
Team Sports
Tennis
There are Exceptions
Time Put Into Skill
To Be Better than Best
Must Do More
Top 20 Team
Track
Try to Get them To see it
My way
Unique Opportunity with
Athletes
Unlike team Sports it is
Just you and the Ball in
Golf
Upbeat
Use Competitive
Environment to Prepare
for Competition
Use of upperclassmen
Use Qualifying a lot
Used to be My Way as a
Coach
Usually Takes 2 Years to
Be Great
Variety in Training
Verbal
Video
Visual
Want the Ball in Big
Games
Want to Enjoy Practice
Whatever It Takes
Will get Help From
Others
Willing to be
Uncomfortable
Willing to Try New
things

**Work Ethic/ Hard Work
Would Like to See**

**Differences Across Sports
Year of Graduation**

**You Have to Be Softer
Youth Level**