ABSTRACT

DEWEESE, BRAD HEATH. Defining the Constructs of Expert Coaching: A Q-Methodological Study of Olympic Sport Coaches. (Under the direction of Dr. James E. Bartlett, II, Ph.D.)

The purpose of this study was to enhance the development of coaches for participation at International level competition through the improvement of coaching education programming. Although many studies have alluded to the benefit of various coaching education tactics, no study to date had set out to determine the constructs that define an expert coach. This study utilized Q Methodology in order to unearth the beliefs regarding expert coaching from individuals with experience at the most elite level of competition, namely the Olympic games.

Fifteen current National Team coaches and athletes with previous experience at the Olympic games sorted 34 statements describing expert coaching on a spectrum of "most like an expert coach" (+4) to "least like an expert coach" (-4). These 15 sorts were subsequently analyzed and rotated. As a result of this process, 5 factors representing unique beliefs and perspectives regarding expert coaching were found. In addition to the sorts, post-sort questionnaires provided additional qualitative data that assisted in the understanding of these 5 factors. The factors were categorized as: (a) the Knowledgeable Coach, (b) the Evolving Coach, (c) the Communicating Coach, (d) the Trustworthy Coach, and (e) the Teaching Coach.

The results of this study demonstrate that expert coaching is multi-faceted by nature and is unique to various sporting situations. The findings from this study affirm that expert coaching at the Olympic level is a not only a demonstration of a coach's technical knowledge in the sport, but their ability to transmit this information to the athletes under their direction

through effective communication. In other words, coaches are valued for their ability to teach. Additionally, the individual respondents offered the opinion that expert coaches are trustworthy, which bolsters the coach-athlete relationship. Lastly, a large majority of the participants suggested that expert coaching is not a title that is earned through their involvement within a National Governing Body or National team; however, expertise is gained through the coach's involvement in the sport and resultant growth and development. The knowledge gained through experience in the field and the effective transfer of information to the athletes is what culminates into expert coaching.

The insight gained through this research study can assist in the further development and revision of current coaching education programs within the United States. Understanding the beliefs and attitudes regarding expert coaching of current coaches and athletes with previous Olympic experience can provide a unique perspective of what qualities should be deemed integral in the development of younger coaches.

Defining the Constructs of Expert Coaching: A Q-Methodological Study of Olympic Sport Coaches

by
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DEDICATION

This body of work is dedicated to my two daughters, Addalyn Grace and Brinley Rose. Your love and laughter have provided me with more motivation than you will ever know. Everything I do is for the betterment of your lives.

BIOGRAPHY

Brad Heath DeWeese, a native of Asheville, North Carolina, graduated from T.C. Roberson high school in 1993. With a passion for a career in sports, he entered Western Carolina University later that fall as a Sport Management major with a dual concentration of Exercise Physiology and Athletic Administration, and a minor in coaching. Immediately upon graduation he decided to stay at WCU in order to work towards a Master's Degree in Nutrition and Dietetics so that he could have a more complete understanding of how to impact an athlete's readiness not only through training theory, but also food choices. Following his education, Brad worked in the collegiate setting as a track & field coach as well as a strength & conditioning coach. Through his work and efforts in coaching education, Brad became increasingly interested in improving his knowledge regarding elite sport development. This desire for more knowledge prompted him to begin his doctoral studies at North Carolina State University in the summer of 2006. A majority of his work during this time dealt with improving the United States national sporting system through the understanding and refinement of the coach-athlete relationship, training theory, and coaching education. Brad was able to utilize this information through his involvement in various coaching education capacities, in addition to his professional coaching duties. Specifically, Brad served as a coaching educator for USA Track and Field, USA Weightlifting, and the strength & conditioning coach for the USA Canoe/ Kayak slalom team.

At the time of completing this dissertation, Brad is serving as the Head Sport Physiologist at the United States Olympic Training Center in Lake Placid, New York. In this

capacity he oversees the athlete development of Olympic hopefuls in sports such as bobsled, skeleton, luge, freestyle ski, biathlon, and slalom canoe. In conjunction with these duties, he supervises the athlete-monitoring system, as well as continuing to assist in various coaching education programs. Brad is married to the former Jenny Lind Warfford and has two daughters, Addalyn Grace and Brinley Rose.

ACKNOWLEDGEMENTS

When I started this journey in the summer of 2006, I was unaware of where I would be when I completed my doctorate. At that time, now almost 6 years ago, I was desperately trying to carve my own path in the field of sport science and coaching. In a job that I knew was not going to satisfy my career goals, I decided to take a leap of faith and begin my doctoral studies in hopes of bettering my chances for future opportunities. Fast forward to the year of 2011 and now I am happily married with 2 amazing girls, have found a position that allows me to maximize my knowledge in the construction of meaningful sport science, and still have the support of my loving parents who are at home in the beautiful Blue Ridge Mountains of North Carolina.

Every gift and opportunity that I have been given in this life is a result of the everlasting love of Our Heavenly Father. He is the one that gives me strength and gets me back on the path. I hope that my interactions with others and my body of work provide worthy of the virtues that have been bestowed upon me.

I cannot think of anyone who has been more supportive and nurturing than my parents. For all they have sacrificed, I cannot ever repay. Everything I have accomplished has been a result of their support and guidance. Although I may not say it enough, their voices echo in my thoughts and their love resounds in my heart. They have taught me how to be patient in times of uncertainty, strong in times of fear, grateful in times of joy, and a leader throughout.

Words cannot express the love and gratitude I have for my wife and best friend, Jenny Lind. She will never know how much I have learned about perseverance and determination from her. It has been a joy to watch her transition from an accomplished athlete to an amazing and loving mother. Everything she does in life is to the best of her abilities and I will continue to be her biggest fan.

Addalyn Grace and Brinley Rose, what can I write that expresses the enduring love I have for you both? Each of you has taught me the true meaning of love and life. My fondest memories will forever include you both.

I would be remiss if I did not mention my staff at the United States Olympic Committee who helped me not only transition into a new career path, but also provided support in time of need. Kyle Colavita, Eric Hart, Matt Sams, and Ambrose Serrano have "shared the load" so that I could continue to finish this research endeavor while balancing the responsibilities of our Sport Physiology Department. These gentlemen are the future of sport science and I am thankful that I have them on my side.

Finally, I would like to thank Dr. James Bartlett, II, for his continuous support and guidance during my time as a doctoral student at North Carolina State University. I gained a great deal of admiration and respect for Dr. Bartlett early on in my studies for allowing me to create my own path with regard to study interests. Not only was he there to guide me through my first professional research study, but he mentored me through the challenges of balancing doctoral work with life. I am forever grateful for your leadership.

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Chapter One

Introduction

By definition, participation at the elite level of sport is a rare opportunity that is most often granted to those athletes who display competitive excellence in their sport of expertise. As Allen (2007) reminds us, sport expertise is much more than physical prowess and good genetics. To be considered elite, athletes must perform at a high level on a consistent and long-term basis (Ericsson, Prietula, & Cokely, 2007). To be a fixture at the top of sport, it is commonplace for athletes to acquire the assistance of a coach. In fact, Gould, Greenleaf, Chung, and Guinan (2002) found that a majority of the athletes competing in the Olympic games held in Atlanta and Nagano correlated their success with the positive influences of their coach.

For coaches, the body of work that is typically assessed for advancement in the field is the competitive success of the athletes under their supervision. While consistent winning in sport is a reliable barometer in determining if an athlete is elite, it is not the case within leadership. Cote, Young, North, and Duff (2007) provide insight into the weakness of this measuring system by explaining "if we identify and describe the competencies of coaches who we deem as excellent solely based on athletes' performances, we are mistakenly basing our search on indirect behavioral measures". Ericsson et al., (2007) support this claim by stating that most leadership challenges are highly complex and specific to a given scenario, which makes it hard to compare performance across organizations and situations. Therefore, it is difficult to make a correlation between job advancement and expert status. In addition,

Ericsson et al. furthers this claim by adding current research has revealed many fields of work exist where there is no scientific evidence that supposed expertise leads to superior performance.

Considering the paucity of literature existing on elite sport coaching, the purpose of this research endeavor was to develop a standardized definition for an expert coach. Through the identification of common practices and beliefs regarding expert coaches, the aim of this study was to further the abilities of our National sporting system to sustain competitive success at the International level of competition. An additional priority of this research project was to expand the body of literature that exists on elite sport leadership by unearthing the key constructs of expert coaching status. A clearly articulated definition of expert coaching can lead to further studies regarding the refinement of coaching education curriculum as well as improving the coach-athlete relationship. As a result, these findings are intended for those individuals who have a keen interest in developing programs, initiatives, and agendas tailored to the enhancement of sport through the refinement of coaching education practices. These stakeholders include collegiate faculty in programs of or relating to sport science, administrators overseeing coaching education programs within Olympic sport National Governing Bodies, and coaches themselves.

The theoretical underpinnings of this research endeavor are found in the frameworks of human capital and expert-novice theories. Although these methods of describing human development with regard to a profession or societal standing typically stand alone, it may be

of interest to look at these two frameworks as complimentary with regard to the development of expertise in coaching.

To begin, human capital theory is a method of describing the decision to take part in activities that will influence future real income through the imbedding of resources in people (Becker, 1962). While there are many forms of investment that an individual can take advantage of, these products or opportunities are rarely acquired as final goods. For instance, educational degrees, professional certifications, serving as an apprentice to a mentor, and competing in athletic events require the individual to participate in the creation of their human capital. Therefore, the level of ownership a person takes in the process of self-education and development can determine the amount of human capital that is acquired (Ben-Porath, 1967). When actively taking part in both formal and informal learning opportunities, an individual is making a decision to focus on increasing future market value while at the same time delaying any improvement to their economic status. This decision, whether conscious or unconscious, signifies that the person acknowledges that their current skill level or knowledge base is not yet at a caliber that will demand maximal compensation in the professional marketplace. In other words, the individual understands that they have yet to claim expertise and would prefer to delay immediate earnings until they have graduated from novice status.

Expert-novice theory is a method of understanding the differences between individuals who are considered master technicians of a topic or trade in comparison to their weaker counterparts. Within this framework, experts are considered to demonstrate higher

proficiency through a variety of distinguishing characteristics. "The most obvious difference between an expert and novice is that the expert knows a great many things the novice does not know and can rapidly evoke the particular items relevant to the problem at hand" (Larkin, McDermott, Simon, & Simon, 1980). In order to give a more detailed representation of the dichotomy that exists between an expert and novice, a snapshot of the current literature shows that experts have greater task-specific knowledge, interpret greater meaning from limited information, access stored information easier and more effectively than novices, can better detect and recognize structured patterns of play, and use situational probability data better (Singer & Janelle, 1999). While expert status may be somewhat influenced by intelligence, evidence from perceptual and cognitive sporting scenarios suggest that intensity and quality of training distinguishes experts from novices through improved domain-specific, information-processing abilities. In other words, an individual who has a positive genetic endowment must refine these traits into profession-specific abilities in order to claim the status of expert (Baker, Horton, Robertson-Wilson, & Wall, 2003). This refinement of traits is consistent with human capital theory where an individual who wishes to collect higher dividends on the market must invest in their own development through taking part in educational activities, on the job training, and additional learning opportunities. For this reason, the decision to determine the constructs of expert coaching status is supported by both human-capital and expert-novice theory.

Statement of Problem

The direction provided by a coach continues to play a vital role in the refinement of an athlete's performance capabilities (De Swardt, 2008). As such, the development of coaching knowledge is an essential aspect in the chain of events that ultimately lead to a well-equipped and prepared athlete. Although several opportunities exist for improving coaching knowledge, formalized coaching education programs have become a popular method of disseminating important information to the coaching profession. In Olympic-based sports, many coaching education programs are delivered by National Governing Bodies (NGB's). These independent federations which fall under the jurisdiction of the United States Olympic Committee serve many purposes, but of primary importance is the development of athletes capable of attaining podium worthy performances at International competitions. Initiatives, including coaching education, have been developed within the framework of most of the NGB's in order to equip coaches with the most up-to-date training theories for the athletes under their direction in hopes of bolstering competitive performance.

Through proper development of athletes and coaches alike, the main objective of the USOC and each NGB is to maintain the United States' place at the top of the Olympic medal count. Although a scant amount of information exists on the topic, it is understood that faring well at the Olympic games is an opportunity for a nation to highlight its political, economic, and militaristic position in the world. As illustrated in figures 1.1 and 2.1, the United States has enjoyed consistent success at the Olympic games for more than 2 decades. With that being said, the percentage of total medals won over the last 16 Olympic games

have declined. "Whether this is due to the increasingly well-coordinated sport development systems emerging elsewhere in the world, or is due to stagnation of the American system is unclear" (Sparvero, Chalip, & Green, 2008). It is plausible to infer that creating a stronger body of coaching professionals can assist in maintaining this Nation's position at the top of the overall and gold medal count.

Unfortunately, due to federal legislature and the current environment in higher education within the United States, coaching education programs have been forced to bear most of the responsibility with regard to professional development and fostering expertise of sport coaches. As Sparvero, Chalip, and Green remind us, there are a few, but powerful, federal policies that impact elite sport development in the United States. Along with anti-trust exemption laws, Title IX of the Education Amendments of 1972, the Amateur Sports Act of 1978 has all but separated the development of elite sport from the auspices of the federal government. Specifically, the charge given to the United States Olympic Committee to oversee the rights and responsibilities associated with elite sport development through the actions of the various national governing bodies "was explicitly an effort to prevent federal intrusion into American sport development" (Sparvero, Chalip, & Green, 2008).

Coinciding with the division between the federal government and elite sport development is the lack of true sport science at the academic level of higher education.

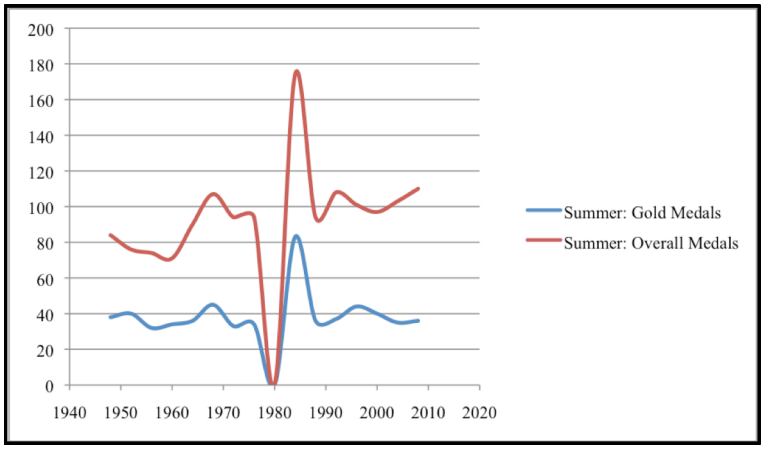

Figure 1.1. United States summer Olympic's medal performance from 1948-2008.

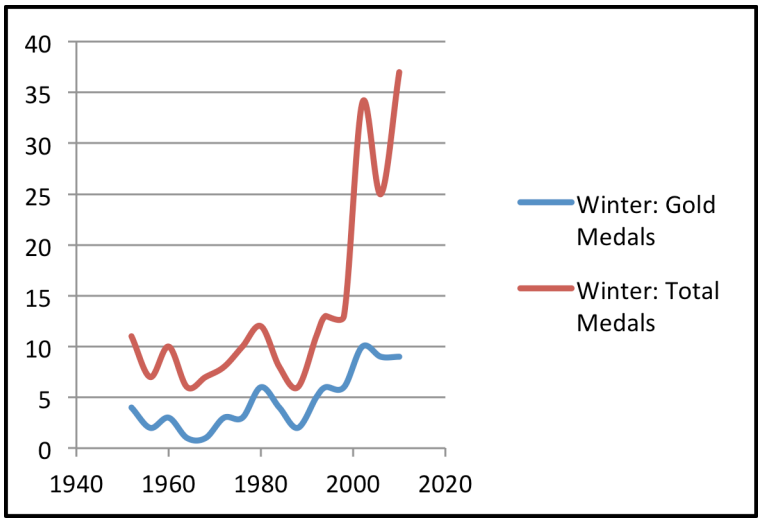

Figure 2.1. United States winter Olympic's medal performance from 1948-2010.

Stone, Stone, and Sands (2005) provide insight into this issue by suggesting that while higher education is perhaps the single largest employer of potential sport scientists, the lack of grants available for true sports research forces potential sport science programs to become more health or fitness oriented. Regrettably, the two subject matters are not cohesive as sport

training can be defined as a scientifically grounded, purposeful activity characterized by the pursuit of performance optimization (Muller, Zallinger, & Ludescher, 1999). Due to the lack of sport study at the academic level, "coaches are often not schooled in science and may even have developed a cynical bias against sport science because of the mistaken application of health-oriented studies to high-performance athletes (Stone, Stone, & Sands, 2005). Sparvero and colleagues expand on the downfall of integrated sport science and coaching development in the United States by saying:

> Although projects by sport scientists at the USOTC's and the individual commitments of some university faculty and students have helped maintain a small stream of development-relevant sport science, there is no prospect for a significant or coordinated stream of sport science work formulated to enhance the foundation upon which American coaching or sport development are built. Given this absence of a coordinated sport development strategy and the lack of any significant sport science funding body, the long-term outlook for American sport science is bleak. (Sparvero et al., p. 260, 2008)

Given the absence of a coordinated sport development strategy at the institutional level of American colleges and universities due to limited funding and research support, individuals with a desire to coach at the elite level are left with few options for proper development. Therefore, National coaching education programs must assist in this endeavor if the United States wishes to remain at the top of international sporting endeavors. With this in mind, the outcomes of this study can possibly play a role in the fine-tuning of National

coaching education programs so that the United States can maintain their position of excellence in world sport.

Purpose of Study

Traditionally, the development of coaching constructs has been limited in study to the scholastic and collegiate levels of participation as they provide larger populations for study and are more accessible. On the other hand, the study of elitism in sport has focused heavily on the performer so that a deeper understanding of improved competitive ability is attained. The emphasis on lower level coaching and elite athletes has resulted in a gap in the literature pertaining to the process of becoming an expert sport coach. Trudel and Gilbert (2004) provide evidence to this dichotomy by stating, an over-representation of studies have been conducted with coaches of school-based sports compared to coaching working in communities, clubs, or professional sport programs. This over-representation of study within the coaching literature is in conflict with the needs of coaching education programmers who have a keen interest in the development of high-performance coaches. Additionally, Cote (2006) reminds us that a unique feature of sport coaching is that significant learning opportunities solely exist in this arena that is hard to match in other settings. Therefore, if this belief is held to be true, then it can be inferred that coaching at the Olympic level of sporting competition provides experiences that are unmatched at lower levels of sport play. With this in mind, the purpose of this study was to enhance the development of coaches for participation at International level competition through the improvement of coaching education programming. Although many studies have alluded to the benefit of various

coaching education tactics, no study to date had set out to determine the constructs that define an expert coach. Therefore, if a goal of coaching educators is to increase the pool of candidates that can be considered elite level coaches, a working definition of expert coaching should be determined in order to tailor curriculum and modes of delivery. Specifically, Larkin, Duffy, and O'Leary (2007) discovered that younger, developing coaches taking part in their study listed the ability to observe elite coaches at work was one of the most valuable tools for increasing their knowledge base. If this is the case, coaching education programs must have a template for defining an elite coach so that lower-ranking coaches have the opportunity to work with an expert in the field. Gilbert, Cote, and Mallett (2006) find it surprising that the lack of conceptual framework to explain coach development is surprising, as this is a requisite for optimal coaching education program construction and delivery. Acknowledging the lack of framework and formal definition of expert coaching, research should be carried out in order to develop a definition that embraces the theoretical underpinnings of expert development through the acquisition of human capital over a career span. In addition, Cote, Young, North, and Duff (2007) recommend a definition of coaching excellence should be multi-faceted so that it is reflective of the highly variable roles that a sport coach assumes, as well as emphasizing the constant personal interactions between coaches and their athletes in the training and competitive environment.

Theoretical Framework

As previously stated, the purpose of this study was to determine the constructs of expert coaching knowledge. The aim of this particular research endeavor was to assist in the

betterment of coaching development in the United States so that we as a nation continue to be a mainstay at the top of international competition for years to come. In order for this to occur, this study was framed in the theoretical foundations of human capital theory and expert-novice theory.

Human capital theory can be described as a framework of understanding the inequalities between the personal incomes of individuals on the open market. This discrepancy in earning power is thought to be the result of individual choices related to the decision to further education or enter the workforce. Mincer (1958) describes the influence of training on income distribution when he describes human capital theory in the following scenario.

> Assume that all individuals have identical abilities and equal opportunities to enter any occupation. Occupations differ, however, in the amount of training they require. Training takes time, and each additional year of it postpones the individual's earnings for another year. If individuals with different amounts of training are to be compensated for the costs of training, the present values of life-earnings must be equalized at the time a choice of occupation is made. (Mincer, p. 284, 1958)

Simply put, if an individual decides to delay immediate earnings in a professional field in order to further their education and skill development, they will forego a lower earning potential with the understanding that once they enter the workforce, they will demand higher pay due to their increased knowledge base. In sport coaching, Cote (2006) alludes to the acquisition of human capital when he states that the sources of coaching

knowledge include studying in a university degree system, a coaching certification program, interactions with peer coaches, self-directed learning, and previous experience as an athlete. This assumption is demonstrated in Figure 3.1, which shows a positive relationship between capital and reimbursement. Mincer summarizes this point by stating that differences in training result in differences in levels of earnings among occupations as well as in differences in slopes of life-paths of earnings among occupations.

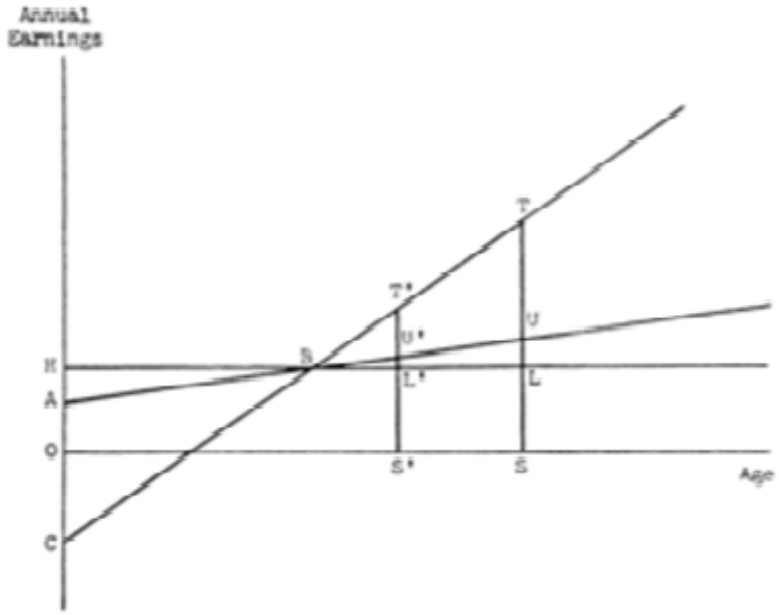

Figure 3.1. Jacob Mincer's Model of Human Capital Theory

Schultz (1961) adds to the theory of human capital by describing the decision of individuals to acquire useful skills and knowledge as a product of deliberate investment, which has possibly influenced the development of our Nation's society. "It has been widely

observed that increases in national output have been large compared with the increases of land, man-hours, and physical reproducible capital. Investment in human capital is probably the major explanation for this difference".

Although on a much smaller scale, the influence of additional human capital is perhaps the difference in success at the International level of sport. If it is assumed that all countries have a dense population of elite athletes to choose from and a similar ability to develop these athletes through advances in technology and knowledge sharing, then a limiting factor may be the ability of coaches to deliver sound training programs and instruction. Therefore, through the adoption of human capital theory, the purpose of this research study was to determine the subtle differences between expert and non-expert coaches so that we ensure proper development of these sport leaders.

In similar fashion to human capital theory, expert-novice theory is a lens through which to view the differences between elite and lower-level performers. Hmelo-Silver and Pfeffer (2004) describe this vantage point as a method of describing how individuals make sense of complex systems through the construction of a network of concepts and principles about some domain that represents key phenomena and their interrelationships. Expert-novice theorists have demonstrated that advanced performers make better decisions in difficult situations by acting more flexibly. Holt and Beilock (2006) support this claim by stating that expertise, which is derived from continued study and exposure to a given subject matter, provided an individual the ability to mentally simulate events offline. Specifically, an

expert's increased knowledge base may free up skilled performers' attentional resources so that they are able to act flexibly when unexpected or difficult circumstances arise.

In the sporting context, expertise between a coach and an athlete are somewhat different, as the athlete must have the physical capabilities to carry out the decisions made by the supervising coach. Likewise, the coach must be familiar with game play at some level in order to make instant and difficult decisions in a dynamic environment. In other words, the potential for competitive success of an athlete is based partly on genetics and partly on situational decision-making. For coaches, genetics may play a role in determining intelligence but the exposure to a variety of learning opportunities may be the limiting factor. Baker and colleagues (2003) support this claim by stating that genes determine the size of the bucket while the environment determines the contents.

These contents are of particular interest in the study of expert coaches' knowledge and status. Through a greater understanding of how expert coaches develop and mature in the world of sport is important in fine-tuning the advancement of the profession. This particular research study set forth to discover the constructs of expert coaching so that educating entities can establish improved methods of filling up the coach's bucket. As demonstrated in figure 4.1, the researcher hypothesized that as an individual takes part in enriching educational activities, he or she will accrue more human capital that can not only increase their earning potential, but improve the Nation's competitive chances in international and Olympic sport play.

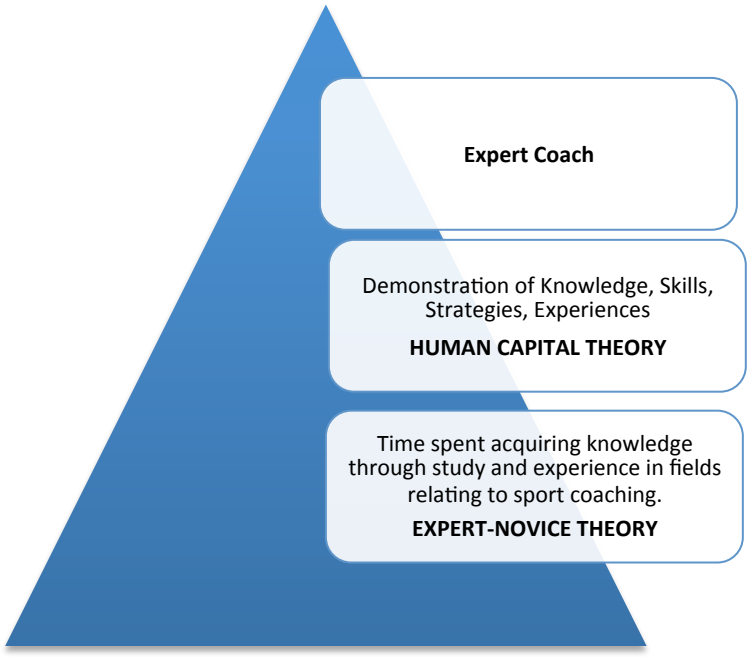

Figure 4.1. Theoretical framework of coaching expertise.

Conceptual Framework

In order to positively influence the development of sport coaches within the United States, this research study aimed to unearth the constructs that define expert coaching. As highlighted in the previous section, the theoretical framework for this study was founded in the principles of human capital theory and expert-novice theory. Although these frameworks are rarely aligned, it is reasonable to infer that an individual who acquires profession-specific human capital will progress from a novice practitioner to an expert in their field of practice. Furthermore, progressive development to expert status may specifically be related to the type of educational strategies and learning opportunities provided to the novice seeking to accrue human capital. Therefore, the research agenda for this study was to assist coaching educators

in refining coaching education practices by focusing on the constructs of expert coaching knowledge.

Reflecting on the theoretical framework, a review of the possible forms of capital was needed in order to assist the researcher in tracing the path from novice to expert coach. To date, no research study has attempted to define the various forms of human capital that expert coaches acquire through professional maturity, therefore a thorough review of the literature was completed to begin a scholarly conversation on the bank of various coaching practices and strategies that have been deemed important in previous investigations. These practices, strategies, and themes have been consolidated into five categories, which were used to develop the Q-cards for participant sorting purposes. The overarching categories include a coach's: knowledge base, athletic experience, relationships, characteristics, and educational practices.

A coach's knowledge base includes potential forms of human capital such as specialized degrees, advanced schooling, and greater abilities to design effective training programs utilizing scientific and biomechanical principles. Athletic experiences are those potential forms of capital that occur from taking part in sport competition at various levels of elitism ranging from grassroots sport to the international level. Coaching relationships is a category that describes the many ways a coach interacts with his or her athletes. This can include leadership styles along with the amount of personal interaction that occurs outside of the sporting environment. On the other hand, coaching characteristics is the category of potential forms of capital that describe a coach's ability to adapt, problem-solving skills,

previous coaching record, and relationship to the National Governing Body. Lastly, the coaching educational practices category reflects the various forms of educational strategies that are used by practicing coaches. Not only are these items means of establishing further human capital, but they can also include additional forms of education that provide certification or credentials outside of the academic setting.

Upon completion of this study, the researcher hoped to determine the constructs of elite coaching by demonstrating the relationship between various forms of human capital that can be acquired by an individual developing from novice to expert status. An example of the possible linkage between forms of capital and expert status can be seen in figure 5.1 below.

Figure 5.1. Example of Conceptual Framework

Research Questions

This study employed Q methodological techniques to determine the differences between elite sport coaches and sub-elite sport coaches as perceived by current National Team coaches as designated by the National Governing Body for their respective sport, and current National team athletes who are training for International competition, namely the Olympic games. The following research questions guided the study:

Research Question 1

What qualities constitute an expert coach?

Research Question 2

Do coaches and athletes share the same definition of expert coaching?

Research Question 3

What are the highest and lowest rated concourse items for each factor?

Research Methods

In order to determine the division between expert coaches from the remainder of the profession, this study utilized Q-Methodology. For this study, current National Team coaches as designated by the National Governing Bodies under the auspices of the United States Olympic Committee were interviewed and surveyed. In addition, current National team member athletes who are presently training for international competition at a designated Olympic Training Center were asked to participate in this study. Data collection occurred through the employment of two instruments, one to rank statements reflective of the coaching practice, as well as a multi-item questionnaire to provide the researcher with demographic

information. Data was collected and analyzed using Q-assessor, a free online software program developed by Stan Kaufman. Inter-correlations among Q-sorts and factor loading were calculated through the software analysis. The results of the analysis were interpreted in a manner that relates to the proposed research questions.

Significance of the Study

Elite sport, especially at the international level of competition, is a rare opportunity provided to a select segment of society who consistently displays high levels of athleticism and technical efficiency. Even more allusive is the chance to participate in the Olympic games, which are held every four years. Acknowledging the scarcity of opportunities an individual has to fulfilling an Olympic dream; much effort is put into the proper development of athletes competing at this level.

An example of the efforts put into elite athlete development at the Olympic level is the "Olympian Survey" which was conducted by the USOC in order to better understand the variables that are required for the successful development of U.S. Olympic athletes. This study, also known as *Reflections on Success & The Pathway to Excellence*, shed light on the beliefs of over 800 Olympic athletes with regard to factors they believed were instrumental in their development and success at the Olympic games. In order to determine these variables, Gibbons, McConnell, Forster, Riewald, and Peterson (2003) asked former Olympians to list the five factors that they believed contributed most to their success. In addition, the athletes were also asked to list the five most significant obstacles they had to overcome in order to achieve success in their given sport. Of the 3178 success factors listed by respondents,

"excellent coaches" was listed as the third most important factor behind "dedication and persistence" and "support of family and friends", respectively with a relative percentage of 49.4%. On the other hand, of the 2653 obstacle factors provided by the respondents, the "lack of coaching expertise and support" was the third most common reply when asked what obstacles had to be overcome in the process of becoming an Olympian, with a relative percentage of 29.4%.

Considering the findings from this study, it is understood that the implication of not having access to an expert coach is a lower rates of success at the Olympic games. Therefore, if a goal of international sport participation is competitive excellence, then a deeper understanding of the constructs behind expert coaching is desired. The investigation on expert coaching constructs will occur through the employment of Q-methodology. This research tool provides a unique vantage point into the population of individuals working at the highest levels of the sporting profession, as Q-methodology is well suited for smaller than usual study samples.

Summary

This chapter began with an introduction of the role an expert coach can play in improving the chances of competitive success in international competition, namely the Olympic games. In conjunction, this chapter discussed the research questions and methodology that guided the current study. Specifically, the research questions for this research endeavor were constructed in such a way that light could be shed on the constructs of expert coaching at the elite level of sport. Once these constructs were identified, a

definition of expert coaching could be used to refine and develop coaching education programs within the United States. In order to determine the constructs of expert coaching in elite sport, Q methodology was used to explore the beliefs, opinions, and perspectives of current National team athletes and National team coaches who have previous competitive experience at the Olympic games. Finally, I discussed the significance that the research outcomes have to the professions of coaching and coaching education. This discussion will continue in chapter 2 with a review of the literature that was used to guide this endeavor. Chapter 3 consists of an overview of the Q methodology and the research design used for this study. Chapter 4 will follow with a discussion on the data and findings. Finally, Chapter 5 summarizes the study with an interpretation of the data followed by a discussion on the implications of the findings for the profession of coaching, and recommendations for future research.

Chapter Two

Review of Literature

The review of literature for this study emphasizes the role coaching has in the sport leadership profession while providing insight into the development and importance of expert knowledge. More specifically, the research reviewed for this study intertwines subject matter from various disciplines in hope to provide direction and support for the acquisition of expert status in elite sporting endeavors.

In order to provide a detailed understanding on the importance of defining coaching expertise various topics were explored through the literature review process. To begin, a thorough investigation of the body of work focusing on sport coaching was reviewed for similarities and support. Through the employment of academic search engines such as SPORT Discus, PubMed, Google Scholar, and EBSCOhost, scholarly articles were found through searching terms such as: elite coach, expert coach, sport coaching, athletic coaching, sport leadership, expert-novice theory, human capital theory, coaching education, sport coach education, Olympic coaching, Olympic development, Olympic sport, leadership theory, performance leadership, performance coaching, coach attributes, role of mentors, coach-athlete relationship, preferred coaching behaviors, coach effectiveness, and desired sport leadership. In addition to performing a search using terms related to sport coaching, further investigation into the literature was completed by searching for work performed by established researchers within the field of coach development. These researchers included Jean Cote, K. Anders Ericsson, Chris Cushion, Michael H. Stone, Pierre Trudel, and Joe

Baker. Through this inclusion of known authors to the search criteria, an exhaustive review of the literature was completed for this project.

Chapter two begins with an introduction to coaching theory as it is defined through leadership theory. This description is followed by a review of literature pertaining to the current understanding of sport coaching. This section leads to a discussion on expert-novice theory, which highlights the development of expert knowledge through deliberate practice and study. Next, human capital theory is described in order to emphasize the value of expert status in the profession of sport coaching. A brief look into organized coaching education will complete the literature review in order to provide reasoning for the need to revise the current coaching education system. Lastly, the chapter will conclude with a summary of the literature review.

Coaching theory. Given the assumption that leadership is essential, and recognizing the persistent difficulties in narrowing the scope of what styles are most successful, a number of scholars have studied people thought to be leaders in order to identify their core characteristics and behaviors. In the quest to provide the best leadership in athletics, many researchers in the field of sport management advocate the use of literature from other fields to inform sport management research (Kellett, 1999). For this reason, a review of theories relating to human resource development and adult education will be explored.

Northouse (2004) reminds us that leadership is a process whereby an individual influences a group of individuals to achieve a common goal. Leadership is not a linear, one-

way event but rather an interactive event encompassing three important constructs: influence, people, and goals. Leadership is reciprocal and dynamic, involving the use of power.

Within leadership theory, coaching is a style found in the Situational Leadership II Model, developed by Blanchard et al. (as cited in Northouse, 2004). As defined by the developers, coaching is a high-directive and high-supportive approach style. Directive behaviors are those that assist group members in goal accomplishment through giving directions, establishing goals and methods of evaluation, setting time lines, defining roles, and showing how the goals are to be achieved. Directive behaviors clarify, often with one-way communication, what is to be done, how it is to be done, and who is responsible for doing it. Supportive behaviors help team members feel comfortable about themselves, their teammates, and the situation. Supportive behaviors involve two-way communication and responses that show social and emotional support to others. In this approach, the leader focuses communication on both goal achievement and maintenance of subordinates' socioemotional needs. The coaching style requires that the leader involve themselves with subordinates through giving encouragement and soliciting subordinate input. However, coaching is an extension of directing in that the leader is required to make the final decision on the "what and how" of goal accomplishment (Northouse, 2004, p. 89). Coaching, as a subdivision of athletic management, is closely related to this approach, but also encompasses other theories found within the field of leadership study. A representation of this style of leadership is found within figure 1.2 found below.

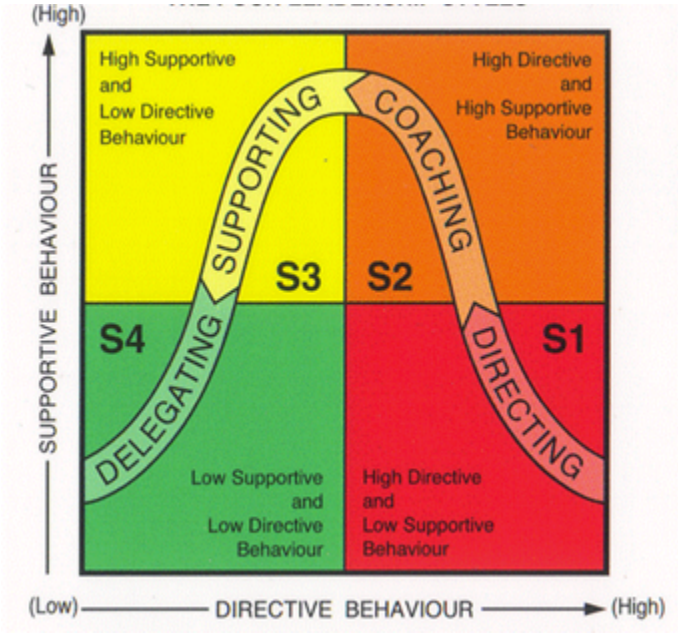

Figure 1.2. Model of Situational Leadership Styles II (Hersey & Blanchard, 1982).

Sport coaching. In competitive sport, effective leadership is considered one of the most important variables for athletic success. The direction of a coach provides expert insight on team dynamics, team cohesion, motivation, game strategy, and training theory (Laios, Theodorakis, & Gargalianos, 2003). Although many factors impact an athlete's development, the coach-athlete relationship is one of the greatest influences on motivation and subsequent performance. Several researchers affirm the importance of a coach by claiming that no other quality is more important in the world of sports than leadership, which the lack thereof might create problems regarding discipline, communication, and psychological preparation, thereby reducing individual and team performance (Laois, Theodorakis, & Gargalianos, 2003; Mageau & Vallerand, 2003; Saury & Durand, 1998).

In order to properly prepare an athlete, a coach must not only create a sophisticated training program founded in scientific principle, but also deliver the training program in a manner that is preferred by the athlete. Within the context of sport coaching, Chelladurai's (1980) multidimensional model of leadership behavior provides a theoretical concept of the relationship between the coach's method of leadership and athlete responsiveness. A concept that is similar to Natale and Diamante's (2005) model of the executive coaching process, this model suggests that actual coaching behavior is influenced by not only the characteristics of the coach (e.g., personality, experience, and attitude), but also by the coaching behavior (required and preferred) that is directly influenced by situational characteristics (e.g. home or away competition location), and member characteristics such as gender and the skill level of the athletes (Hoigaard, Jones, & Peters, 2008). Thus, in order to maximize performance and satisfaction of the athlete, the coach must maintain congruence between actual coaching behaviors, preferred group behaviors and situational requirements (Maby & Grady, 1996).

Terry and Howe (1984) improve upon Chelladurai's findings by demonstrating that athletes desire specific leadership styles based on the type of sporting event. Specifically, athletes participating in independent sports such as track & field, weightlifting, and kayaking prefer more democratic behaviors than athletes in team sports. Conversely, team sport athletes prefer more autocratic behaviors than athletes who compete independently of teammates. In other words, independent athletes desire a coach who will allow them to take part in the decision making process, while team sport athletes prefer a coach to take full responsibility for the direction of the team. Therefore, coaches in both capacities need to

adopt preferred leadership qualities in order to improve the probability of coach-athlete cohesion and ultimately, goal attainment.

Levels of coaching. Sport coaches are categorized by the level of athletes under their scope of supervision (Lyle, 2002; Trudel & Gilbert, 2004). Specifically, a sport coach is either employed at the participatory or high performance level of competition. Although both forms of coaching are important in the world of sport, the focus and responsibility of each type of coach is significantly different. Additionally, while all forms of coaching should be equally valued, the roles and foci of performance coaches differ from that of participation coaches (Mallett & Cote, 2006). Affirming this opinion, Cote et al. (2007) found that coaches who spend many years of development in a recreational sport participation context will be ill equipped to function successfully in a competitive context, and vice versa. Thus, knowledge and competent coaches excel mainly in particular contexts. Therefore, coach training and education should differ according to the context in which the coaches work (Trudel & Gilbert, 2004).

Participation coaches are employed at the recreational and scholastic level of competition. Regardless of the sport being supervised, the main responsibility of a coach in this role is to promote the positive aspects of sport involvement to youth and adolescents. Participation coaching is therefore distinctive because competition is not emphasized (Lyle, 2002). For example, a coach in the participatory realm should emphasize good sportsmanship, encourage participation, promote teamwork, and introduce the athlete to game strategy and skills. Even though the participatory coach should foster a winning

attitude and competitive spirit, the emphasis is placed on developing well-rounded athletes that will continue to take part in sporting activities at the next level.

In contrast, high performance coaching is success driven. Coaches at the high performance level are employed at the collegiate, national, and international level of competition with the primary objective to win. Performance coaching entails a more intensive commitment to a preparation program for competition and a planned attempt to influence performance variables (Lyle, 2002). The high performance coach is expected to refine, prepare, and perfect an athlete or team's readiness in order to successfully overcome the rigors of elite competition. Unlike the participation coach, the high performance coach is held responsible for his or her team's results in game play. A fundamental difference in the measurement of coach effectiveness, the requirement to win, may influence the decision making process that occur in athlete development (Mallett & Cote, 2006).

Expert coaching. At the highest level of performance coaching is the expert coach connotation. Within the sport coaching literature, common synonyms include elite coach, excellent coach, high performance coach, and master coach. Although it is generally accepted that such a distinction exists, there is little agreement on how this status is gained or what factors underpin the existence of this qualification. In fact, only a few studies have attempted to quantify the specific developmental sport experiences of high-performance coaches despite suggestions that there are a number of experiential factors that might be consistent in most high-performance coaches' development (Erickson, Cote, & Fraser-Thomas, 2007). Of the current literature that exists on the subject of expert coaching, most

scholars have managed to either be too wide in their definition of an expert coach or too narrow in the variables chosen in the sample selection process. In an attempt to understand the development of expert coaching knowledge, Erickson and colleagues loosely defined a high-performance coach as someone coaching highly skilled athletes in an environment that focused primarily on performance, as opposed to fun or athlete development. In order to assist the USOC in determining the most important factors in the development of Olympic athletes, Gibbons and colleagues (2003) vaguely defined an excellent coach as someone who provides sport expertise, skills, and motivation to Olympians. When looking at the behaviors of successful coaches, Horton and colleagues (2005) chose to only consider coaches employed as National Team coaches, which did not take into consideration other important factors such as talent developed, educational status, or personality traits. Taking it a step further, in a study of expert rowing coaches, Cote and Sedgwick (2003) deemed participants worthy of inclusion if they had a minimum of 10 years coaching experience in the sport, supervised the training of athletes competing at the international stage of competition, and were recognized as experts by their peers. Unfortunately, a lack of continuity is present between studies performed on expert coaching to date. Abraham, Collins, and Martindale (2006) affirm this disarray when they acknowledge that a gold standard for determining expert status is not only a "thorny issue" but has yet to be tackled.

For this reason, the current study attempted to determine the constructs of expert coaching status by including both individuals that were currently employed by the National Governing Body of their respective sporting discipline. Utilizing this selection criterion,

coaches of National teams who were supervising the training of elite athletes competing for success in International competitions, namely the Olympic games, were chosen for this study. In addition, the study incorporated the thoughts of current National team athletes who have had competitive experience at the Olympic games. Although these individuals are not coaches themselves, they had rare insight into the abilities and characteristics of expert coaches.

The theoretical underpinnings of the coaching process reinforce the need to carry out future research that focuses on sport coaching. Even though a sufficient body of literature exists for generalized coaching theory, there is a limited amount of information with regard to the profession of elite sport coaching. Within the framework of high performance coaching, the elite connotation is conferred only to those coaches who serve at the National and International levels of competition. Due to the rarity of such employment, researchers have found it difficult to assess the differences that exist between coaching at the highest level of game play to lesser coaching categories. With this in mind, my objective was to lead a research study with the intent to define the elite coaching process through the study of current National Team coaches and athletes. Recognizing that winning is the lone barometer of success at the elite level of sport, determining how a coach can nurture athletic development, improve an athlete's ability to self-regulate, and satisfy stated goals in a stressful environment can be of benefit to future coaches.

Expert-Novice Theory

Developing expertise is important for every dimension of commerce and industry as a more skilled laborer is the means by which a market or community progresses. In a given field, expertise comes to be recognized by the reasonably skilled peers with whom they work, generally over extended periods of time involving significant, complex, individual, feats or over many instances involving performance on different problems (Conford & Athanasou, 1995). Further, Ericsson et al., (2007) define an expert as someone who performs are superior in comparison to that of their peers, produces concrete results, and who replicates their performances. From an occupational perspective, experts demonstrate a set of similar patterns and abilities that are identifiable across many sectors of employment. Various researchers have concluded that experts:

- have their own specialized area of knowledge;
- recognize patterns faster than novices;
- take deeper meanings from cues than novices;
- are more flexible and more able to adapt to situations;
- develop routines to allow processing capacity to be focused on ongoing environments;
- are quicker in their ability to solve problems successfully;
- understand the structure of their field and how individual pieces of information interrelate;

- have specific occupational memories with ability to recall complex details from past instances, especially the atypical or error situations;
- understand the complexities of a situation; and
- are able to apply specific judgment rules to each case.

(Berliner, 2004; Conford & Athanasou, 1995; Guest et al., 2001)

In contrast, a novice is defined as a beginner who seeks all-purpose rules to guide his or her behavior. These rules are logical, fairly consistent and the beginner typically is locked into these and unable to deal with situations, which require more than the application of rules (Conford & Athanasou, 1995). The differences between expert and novice performers are displayed below.

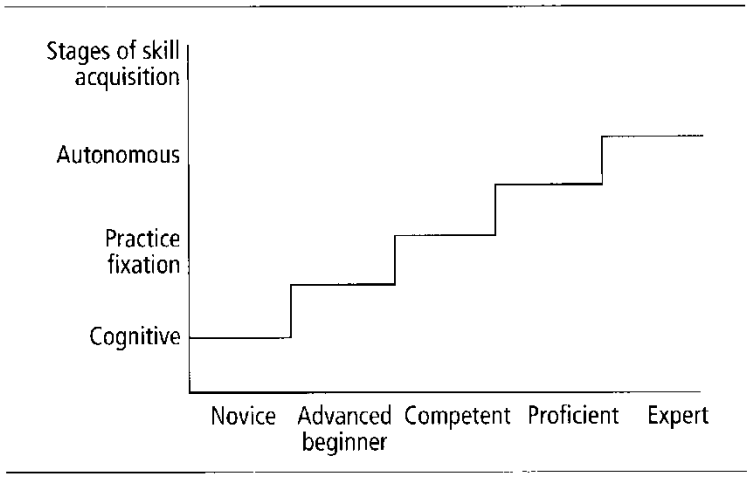

Figure 2.2. Stages of Skill Acquisition and Levels of Expertise, (Cornford & Athanasou, 1995)

In order to develop the necessary skills and knowledge deemed appropriate for expert status, an individual of novice designation must take part in meaningful and structured practice in one's field of specialization. This purposeful study of subject matter has been termed deliberate practice by Ericsson, Krampe, and Tesch-Romer (1993). Specifically, "deliberate practice refers to the training activities designed to enhance an individual's performance, with explicitly defined parameters including (1) a well-defined task with appropriate difficulty level, (2) high effort, and (3) opportunities for repetition and error correction. Furthermore, deliberate practice is designed to optimize the performer's training regimens, and is not inherently enjoyable due to its rigorous nature" (Johnson, Tenenbaum, & Edmonds, 2006). In many fields, knowledge of effective training procedures accumulates over many years. Experts in these domains attain their highest level of performance at least a decade or more after introduction to the topic. This finding is considered the "10-year rule", which was developed following the study of master chess players by researchers such as de Groot in 1946 and Simon & Chase in 1973. This rule contends that not even the most talented individual can attain international performance without approximately 10 years or 10,000 hours of preparation (Ericsson & Lehmann, 1996).

As coaches mature and continue to take part in deliberate practice in an effort to develop knowledge and meaning, an analysis of how expert and novice performers differ in their abilities to evaluate complex systems is warranted. Understanding how experts can repeatedly outperform novices in understanding and solving complex systems can allow

those involved in the development of coaching education curriculums to understand what segments should be highlighted during developmental sessions and stages.

Considering research done outside of the sporting arena, Hmelo-Silver and Pfeffer's (2004) work provides insight on how experts and novices represent their knowledge of complex structures when faced with adverse and dynamic systems. When dealing with complexity, a person must construct a network of concepts and principles about some domain that represents key phenomena and the interrelationships between different levels of the system, whether it is macro or micro or structure to function. The authors believe that Structure-Behavior-Function theory may provide a deep principle that is useful for thinking about complex systems in a way that takes into consideration the interrelated levels and dynamic nature. Within this framework, structures refer to elements of the system, behaviors refer to how the structures of a system achieve their purpose, and functions refer to why an element exists within a given system. With this theoretical framework, the researchers compared the knowledge base of experts and novices as it relates to aquatic systems. As expected, their analysis showed that experts identified more concepts across the SBF framework than the novice groups. Although there was no difference among the groups for the numbers of structures mentioned, there were key differences for behaviors and functions. Results indicated that experts knew more about both functions and behaviors than the novices. These findings indicate that experts have more functional, behavioral, and abstract understandings of this complex system whereas novices have a more structural, concrete representation. In other words, where novices focus on the most salient of structures when

dealing with a complex system, experts use a more elaborate network of concepts and principles that allow them to understand behavioral mechanisms which are often invisible processes and difficult to represent.

This finding suggests that in order to build an elaborate network of concepts that will assist in understanding complex systems, an individual who desires to attain expertise in a specific domain of sport should take part in formal educational and field-based learning opportunities that will allow for problem-solving and experiential knowledge development to occur. These educational opportunities, both formal and informal, provide the individual with a chance to gather a set of skills that will improve their likelihood of greater success and earnings in the future. This known and accepted delay of compensation can be described with human capital theory.

Stages of development in the coaching career. In the sporting environment most individuals who enter into the workforce as a coach have been athletes at some level of competition. Through early game play, positive experiences may lead an individual to ponder the possibilities of one day serving as a coach. Various researchers have attempted to determine if a pattern exists in the development of experts in a variety of professions, but few have considered the profession of coaching. One research team that has looked into coaching is that of Schinke, Bloom, and Salmela (1995), who set out to identify the chronological career advancement of expert basketball coaches. From their qualitative assessment of six expert coaches aligned with the National team of Basketball Canada, the researchers constructed a model of chronological development encompassing seven distinct phases. The

phases of development reflect an individual's process of acquiring human capital ranging from the initial experiences in sport as a competitor to later serving as a coach in various capacities. Each stage of chronological development can be illustrated by a gradual increase in competition, an affinity to the sport, an improved sense of task knowledge, as well as by the type of human capital acquired. The stages are described as follows:

1. Early Sport Participation: This category represents the first experiences in sport at the community level of competition. Here, the focus is on skill development and participation. At this point in the maturation process, coaches can expect to gain capital in the form of learning how to take part in organized practice and comprehension of the rules of game play. Additionally, the individual learns the importance of hardship, teamwork, sacrifice, and how to deal with winning and losing.
2. Elite Sport Participation: Individuals in this category are competing at the university or regional level in national level competitions. This represents a turning point in a person's career, as the sport becomes an obsession as opposed to a recreational activity. An individual in this stage can expect to gain a deeper understanding of game strategy, and the importance of commitment. The athlete may also be looking to their coach for examples of how to lead in various situations.

3. International Elite Sport Participation: This represents the final stage of athletic participation and is reserved only for those who are talented enough to perform at the highest level of competition. Although this stage exists, it is not known whether or not this stage is required to coach at this level. With regard to human capital, future coaches can improve their knowledge of game strategy, skill development, and non-training factors such as dealing with travel, media, and greater expectations of winning.
4. Novice Coaching: At this stage, individuals enter into the workforce as entry-level coaches working with primary or secondary school students. This phase will last long enough for the coach to acquire sufficient knowledge to specialize in one sport. In addition, they will gain an understanding of group supervision and administrative duties.
5. Developmental Coaching: This phase is represented by the transition into a coaching position that is at the high school or small college level of competition. In this setting, a coach will begin to develop more complex training and competition strategies. With an understanding that their knowledge is not exhaustive or complete, the coach may return to school for an advanced degree in a field of study pertaining to sport in order to improve their human capital. This step in knowledge consumption is typically coupled with the interactions with a master coach who serves as a mentor to the individual.

6. National Elite Coaching: Coaching at this level differs from previous stages as the individual is now working with a more successful university team. Initial appointments at this stage are often a shared responsibility, which serves to gradually introduce the coach to more responsibility and advanced knowledge of game play. During this time, the coach gains additional human capital in the form of improved and complete knowledge as it pertains to team development and game strategy.
7. International Elite Coaching: This stage signifies expert status, as it represents the moment in one's career when they have proven themselves worthy of serving on a national team staff. Specifically, a national team is one that is created to compete on the world stage, namely the Olympic games. At this point, a coach utilizes his or her human capital in order to successfully deal with ambiguous situations in a highly outcome-centered environment. Human capital continues to be enhanced by the exposure to international competition, and the title of national team coach improves what the coach can demand on the open market.

These chronological stages of development are similar to findings from previous research done on performers outside of the sporting arena. Through the study of expert teachers, Berliner (1988) discovered a common theme in the development of teaching professionals. These stages demonstrate a similar path of maturation and growth through the acquisition of knowledge and experiences in classroom instruction. Berliner postulates that

"novice teachers" base their teaching on theoretical principles that were learned from their studies in the university setting. Over a period of two to three years, these individuals become "advanced beginners" that now have the ability to develop teaching strategies based on theory as well as personal experience. In the third stage, the teachers become "competent" relying more on experience and streamlining their teaching strategies. Even though they have yet to automate their teaching schedule, the teachers have learned through experience what to attend to and what to ignore. With regard to the final two stages, the teachers progress from a cognitive state to a more intuitive, automated state of classroom instruction. A teacher is considered an "expert instructor" when they demonstrate a fluid performance and do not consciously decide what to attend to (Berliner, 1988).

Sufficient evidence exists that demonstrates a logical and progressive path of development for individuals who desire to become expert performers in their given career. The chronological development for coaches is different in that the first steps are highlighted by participation in the sport as an athlete. This participatory role may allow the individual to gain a unique perspective on the coaching process that can help guide them through their own growth in the profession.

Human Capital Theory

Human capital theory is defined as the process of an individual acquiring skills and knowledge in order to improve earnings consumption at a later date. This theory argues that individuals invest in personal capital to achieve greater labor market outcomes. Investing in human capital is not limited to schooling and job training, but can also be used to describe

traits that are deemed influential on future endeavors (Heidbreder, 2007). The many ways to invest include schooling, on-the-job training, medical care, sport training, and acquiring information about the specific system they are employed in. The types of investment may differ in the relative effects on earnings, but all improve the physical and mental abilities of the persons involved (Becker, 1962). In an athletic context, human capital theory can help to understand, and empirically assess, how the sports labor market rewards performance attributes of athletes and coaches (Antonietti, 2006).

When considering the acquisition of knowledge to move from novice to expert, the plausibility to propose that the honing of skills over many years in order to gain mastery can be considered an attempt to improve one's human capital. Once an individual determines that a career in coaching is desired, he or she may become actively involved in the consumption of knowledge and experiences that can provide them with a deeper understanding of the sport they wish to supervise.

Recall that expert-novice theory proposes that an individual must take part in at least 10 years of disciplined practice before enjoying success as an expert. With this in mind, a novice coach should begin formalized training and study at an early age so that the benefits of expert status can be available for a longer period of time (Baker, Horton, Robertson-Wilson, & Wall, 2003). These benefits that can include compensation, professional title, competitive level of athletes, and win-loss record are the result of the collected skills and know-how that the labor market considers human capital. Theoretically, the earlier an individual begins to collect human capital, the more likely he or she will acquire a greater

sum than their counterparts over a career. Therefore, the lack of time that is available for young professionals to accrue enough skills and knowledge could hypothetically explain why only a few coaches matriculate into the elite coaching ranks.

With respect to the idea of developing an expert through the careful selection of learning strategies that fosters human capital, a definition of the stages of maturation for individuals in the coaching profession is warranted. Although unrelated to the profession of sport coaching, Law's figure below provides detail on the development and advantages of human capital.

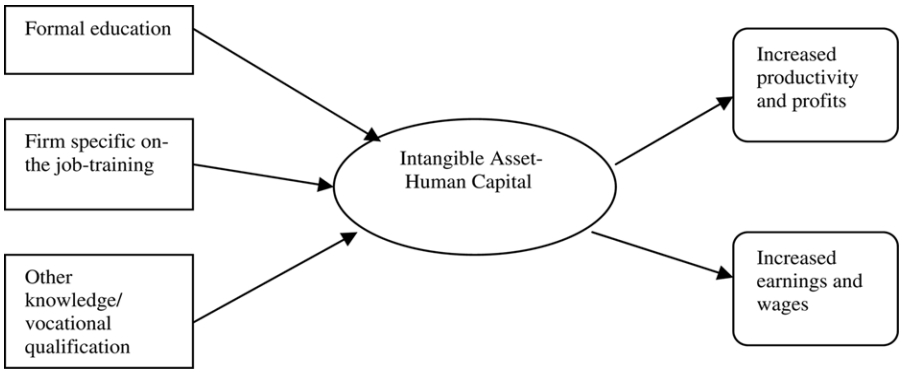

Figure 3.2. Law's Interpretation of Human Capital, (Law, 2010)

Coaching Education

The development of coaching knowledge can be attributed to the exposure of a coach to a variety of factors. Previous researchers remind us that the sources of coaching knowledge have

been identified to include the coach's previous experience as an athlete, serving under a mentor, formal education, experiential learning, and taking part in continuing education

(Gilbert & Trudel, 1999; Lynch & Mallett, 2006). Interestingly, most of these activities occur when a person has already identified himself or herself as a coach and has entered into the workforce as such. Accepting this fact, many sport organizations have begun offering coaching education programs as a means to continue the development of the individuals in these capacities. As a result of the increased international popularity of competitive sport, "comprehensive coach education programs have been developed in many countries around the world. These formal programs have many similarities in content and are typically structured around courses for general coaching theory, sport specific techniques and tactics, and supervised coaching practice" (Cote, 2006).

Within the United States of America (USA), a majority of coaching education programs are supervised by the National Governing Body (NGB) for each sport that is under the scope of the United States Olympic Committee (USOC). The intention of the USOC is to field a team that is consistently successful at the international level of competition. "This intention, set forth by the USOC, then flows through the organizational structure to each NGB and to the athletes themselves. It is at the NGB level where the foundation of sustained competitive excellence lies and where the creation of an athlete development system truly takes shape" (Stotlar & Wonders, 2006). A strong segment of athletic development is the inclusion of qualified coaches to oversee the training and competitive scenarios of USA athletes. Therefore, most NGB's have implemented coaching education programs in order to promote forward thinking in the profession of sport coaching. Although most of the educational programs provided by the NGBs share commonalities in curriculum, they do include specialized material for the specific sports under their jurisdiction. For instance,

although USA Weightlifting and USA Swimming may share the same educational material regarding physiology and nutrition, they will focus on delivering this content to coaches in a way that is specific to the sport in which they supervise.

Additionally, the coaching education programs offered by each National Governing Body are commonly scheduled during the off-season for each sport in order to promote maximum attendance. Once scheduled, these courses last for a weekend to as long as a week. Although attendance is voluntary, prerequisites often exist for many of the coaching education programs. These prerequisites can include full-time coaching status at the scholastic or collegiate level, a pre-determined minimum number of years coaching, and the completion of an undergraduate degree. These requirements indicate that many coaches take part in these career enrichment programs in adulthood, and as part of a continuing education activity. Coaching education can therefore be considered an aspect of continuing adult education (Showers, 1985).

More often than not, all coaching education programs adhere to a similar structure with regard to curriculum delivery. Typically, content is provided to a group of coaches in the form of slides, lectures, and video. In order to maintain a reasonable learning sequence, discussion is limited to the end of the seminar. In addition, if time permits, program coordinators and lecturers often lead demonstrations and practicum once the subject matter has been taught. This system of education reflects very closely pedagogical principles, which focus on the transmission of information and skills. For example, Holmes & Abington-Cooper (2000) state that in a typical pedagogic course design, the teacher decides

in advance what knowledge or skill needs to be transmitted, arranges this body of content into logical units, selects the most efficient means for transmitting this content, and then develops a plan for presenting these units in some sequence by using lectures, films, tapes, or lab exercises.

Regardless of design, the results of a continuing education program for the coaching discipline should optimally allow for the following:

- coaches to practice new strategies more frequently, and develop greater skill in the actual moves of a new teaching strategy,
- coaches to use these new strategies more appropriately in terms of their own instructional objectives,
- coaches to exhibit greater long-term retention of knowledge about and skill with new strategies,
- coaches to pass on the new strategies and knowledge to understudies (Gilbert & Trudel, 1999; Showers, 1985).

However, it is unknown whether or not a coaching education program does indeed improve a coach's ability to improve domain-specific knowledge due to a lack of follow-up. In addition, the current design of coaching education programs offered by various National Governing Bodies does not subscribe to a singular and accepted definition of elite coaching, therefore, the ultimate goal of coaching education is difficult to measure.

In summary, success in sport is highly dependent on the leadership provided by a coach. Within leadership theory, coaching is a dynamic method of group and individual

supervision that exemplifies both a high-directive and high-supportive approach. For instance, sport coaches must not only plan appropriate practice and competition schedules based on their athletes' level of capabilities, but also be in tune with the athletes' psychological and emotional needs. In order to become an expert coach, it is suggested that an individual take part in discernable practice and study in order to collect the minimum 10,000 hours that is generally accepted to graduate from novice to expert status. An individual, who elects to take part in proper developmental strategies, including both formal and informal educational opportunities, will have acquired human capital in the form of advanced skills and knowledge that can better serve them and their employing organization in the competitive arena.

Chapter Three

Methods

This chapter discusses the implementation of Q methodology for the purpose of answering the aforementioned research questions regarding expert coaching in the United States Olympic movement. The chapter begins with a review of the research questions and a brief review of the Q method as it relates to the research agenda. The discussion on Q methodology will be followed by a description of the research design and analysis.

This study was guided by the creation of three research questions regarding expert coaching within the United States' Olympic movement. The aim of these questions were to construct a working definition of expert coaching so that coaching education programs within the United States can continue to produce high-level professionals capable of sustaining international competitive excellence within Olympic sport. This examination of expert coaching at the Olympic level of sport attempted to address the following research questions. First, the researcher wanted to determine the defining qualities of an expert coach. This question was of primary importance since no research to date had set out to uncover the unique qualities of this segment of the coaching profession. Secondly, the researcher wanted to determine if a difference in how coaching expertise is defined exists between National team coaches and National team athletes. Finally, the researcher wanted to understand what statements or commonly-held thoughts defined the various opinions regarding expert coaching. Each of these questions were exploratory in nature and required a methodology

that provided an avenue to measure a unique population's subjective beliefs and experiences regarding expert coaching. As a result, Q methodology was chosen as a superior method.

Q methodology is a process that was created in 1935 by William Stephenson in order to provide a way to reveal the subjectivity involved in any situation. The development of this methodology was in direct opposition to the positivist assumptions underpinning traditional correlational research, as the life as lived from the standpoint of the person living is typically passed over by quantitative procedures (Brown, 1996; Shemmings, 2006). In other words, the primary goal of Q methodology is to uncover *how* and *why* people think the way they do (Brown, 1994). Shemmings (2006) reminds us that at its simplest level,

> Q methodology is a research tool capable of augmenting existing qualitative analytical techniques aimed at identifying patterns and themes in interview transcripts, field notes, or naturalistic observation. Although Q methodology deploys factor analysis, the mathematics of which is complex, it is a remarkably user-friendly method and requires no knowledge of mathematics to interpret the data obtained. (Shemmings, p. 2, 2006)

Thus, a benefit of Q methodology lies in the fact that it helps in identifying the similarities and differences in the subjective perceptions across a sample group. A considerable difference between Q methodology and correlation coefficients is that "Q does not need large numbers of subjects as does correlational research, for it can reveal a characteristic independently of the distribution of that characteristic relative to other characteristics" (Smith 2001; as cited by Brown, 1994). Simply put, instead

of a large number of people receiving a small number of test items, now a small number of people are receiving a large number of tests. For this reason, Q-methodology is a good choice for the current research endeavor as National team coaches and athletes, especially those with competitive experience at the Olympic games, are rare and very difficult to study in large quantities due to the intense nature of their work. This inversion of traditional quantitative research tactics allows the investigator to correlate persons instead of tests. Traditionally, qualitative studies are carried out by the use of exhaustive textual analytical techniques and procedures that assist in developing conceptual constructs from interview transcripts (Shemmings, 2006). On the other hand, by correlating people, Q factor analysis provides information about similarities, preferences, and viewpoints on a particular subject (Brown, 1993). Within qualitative research, Q methodology is a useful tool that provides the researcher with a variety of options. Steelman & Maguire (2004) state that Q methodology can often:

- identify important internal and external constituencies;
- define participant viewpoints and perceptions;
- provide sharper insight into preferred management directions;
- identify criteria that are important to clusters of individuals;
- examine areas of friction, consensus, and conflict;
- and isolate gaps in shared understanding

(as cited in Baker, 2004).

Q Methodology

In Q methodological research, intra-subjective studies gather data from an individual on multiple issues of interest. These points of view are then clustered together based on similarity of opinion. The overall purpose is to determine whether or not these opinions demonstrate a theme that will assist in the understanding of the subject matter (Brown, 1993). In order to generate these thematic results, a Q-methodology must be performed using specific guidelines. These guidelines or steps include establishing the sample, administering the test, and analyzing the results. They are explained below.

Step 1: Define the concourse. When developing the concourse, the researcher attempts to create an exhaustive collection of all the possible statements that can be made about a given subject matter. This information can be gathered from a variety of resources, including participant observation, drawing from the cultural experiences of the researchers, literature reviews, interviews, popular media, and opinion. Next, the statements are compiled into categories based on overall themes. Although these statements of belief come from a variety of sources, the scale on which participant's sort the items remain fixed. In the current study, the researcher elected to collect statements regarding expert sport coaching through an exhaustive review of the scholarly literature regarding sport and professional coaching.

Once the concourse is determined, a common method of assessing the list of statements is to rate them on a scale of -4 to +4, which reflects the participant's level of agreement with the statement (Brown, 1993). The collected material should represent the

existing thoughts and opinions that people in the field of study would have to say on the subject matter (Van Exel & de Graaf, 2005).

Step 2: Develop the Q-Set. The next step in Q methodological development can simply be described as the refinement of the concourse. Here, the final Q-set was determined by deleting statements that were repetitive or ambiguous. In order to maintain coherency and ease of use, the initial concourse was viewed by a group of individuals familiar with the Olympic movement. This method is supported by current literature as Brown (1993) suggests that this editing process can be completed by allowing domain experts to review the statements, performing a pilot study, or through a random sample of statements. The group chosen to assist in the refinement of the current concourse included a current National team assistant coach, an assistant Sport Physiologist with the USOC, a National team athlete in the sport of Canoe/ Kayak, two National team athletes in the sport of Bobsled, a National team athlete in the sport of Luge, and a former Olympic trials qualifier in the marathon. Along with the feedback from the pilot group, the researcher narrowed the initial collection of statements to a final set of 34 concourse items. Various experts in Q-methodological assessment recommend a finalized set of 30 to 60 sample items to be determined before beginning the Q-sort (Brown, 1996; Cross, 2005; Thomas & Watson, 2002).

Step 3: Select the P-Set. In order to administer the Q-Set, current literature recommends that the researcher must select a P-Set, which is comprised of individuals that are familiar with, and have an opinion of the subject matter being studied. Van Exel & de Graaf (2005) state that "this P-Set is not random, rather it is a structured sample of

respondents who are theoretically relevant to the problem under consideration". With this in mind, the P-Set in this study was comprised of individuals who are currently serving the USOC and its associated NGB's as National team coaches. Additionally, individuals who are current members of a National team roster were asked to take part in the study as their training and competitive conditions require constant communication with National team coaching staffs. Due to the rarity of serving at the Olympic level of sport, a limited pool from which to draw participants was afforded to the researcher. Scholarly research on the topic of Q methodology suggests that this was not an issue as in comparison to correlational analysis, Q methodology does not require large samples to develop themes of subjectivity. The number of persons associated with a factor is of less importance than who they are; in the total population the prevalence may be much higher (Brown 1978, as cited in Van Exel & de Graaf, 2005).

Step 4: Q-Sorting. Once the Q-sample was established, the next stage in the process was to administer the Q-sort. This research technique was developed by Stevenson to more fully explore participant subjectivity (Semmings, 2006). "When administering the Q-sort, participants are often given a sheet with specific sorting instructions called a *condition of instruction* and an answer sheet to record the rank ordering" (Brown, 1993). In this particular study, each participant was given a "Q-Sort Guideline" that thoroughly explained the process of online statement sorting as it relates to determining the constructs of expert coaching. During this self-directed process, the participant ranked important aspects of a phenomenon based on a gradated numeric scale, from -4 to +4, which was anchored by polarized

comments such as “strongly disagree” and “strongly agree". Once the sorters opened the emailed link to the study’s webpage hosted by Q-Assessor, they began reading through the comments, comparing the statements, and reflecting on their own experiences with the subject matter. Based on the Q-sort guidelines, the respondents divided the items into three virtual piles: Category 1 which represented statements that the participant believes define an expert coach; Category 2 which represented statements that the participant believes does not define an expert coach; and Category 3 which was recommended for statements that the respondents were not sure about. Upon completion of the initial sort of statements into three piles, the sorter was automatically sent to the next webpage where they were asked to further the statement sort. In the following iterative process, each pile would be examined carefully and distinctions made within the pile, eventually leading to each space in the distribution being filled" (Thomas & Watson, 2002). This process allowed the sorters to compare each statement to one another and use their own experiences and opinion in placing the items on the virtual grid sheet as they saw fit. Thomas & Watson (2002) postulate this self-referent process may then be termed accurate from the respondent's perspective regardless of whether the universal pool of Q-samples was represented.

During the Q-sort process, the researcher needed to make certain that no outside source guided the participant in the scoring of items. This outside assistance would result in a loss of authenticity as it relates to understanding the respondent's opinion about the subject matter. In addition, the Q-samples had to remain accessible until the sorter was satisfied with their decisions (Thomas & Watson, 2002).

Step 5: Analysis and interpretation. Measuring the attitudinal patterns related to a subject matter or phenomenon requires factor analysis, the final step in Q-methodological assessment. Brown (1993) suggests the analysis of the Q-sorts is a purely technical, objective procedure and is therefore sometimes referred to as the scientific basis for Q. The first step in analysis is to calculate the correlation matrix of Q which represents the degree of dis (similarity) in points of view between the individual Q sorters" (Van Exel & de Graaf, 2005). Performing factor analysis, which will unearth the relationships that exist between the individual sorters, follows this. Here, the primary goal is to determine how many different Q-sorts are in evidence. Van Exel & de Graaf (2005) explain, "people with similar views on the topic will share the same factor. A factor loading is determined for each Q-sort, expressing the extent to which each Q-sort is associated with each factor. The number of factors in the final set depends on the variability in the elicited Q-sorts". With the Q-sorts as variables, "the factors produced represent groupings of people with similar patterns of response during the sorting, and the loading of a particular respondent on a given factor indicates the level of agreement or disagreement" (Thomas & Watson, 2002).

The final two stages of analysis are referred to as *factor rotation* and *factor score.* A factor rotation is performed to maintain as much of the variance as possible. This process, which is a rotation of the original set of factors, can be done either objectively or theoretically. Objective rotation is done according to some statistical principal while theoretical rotation is performed based on the researcher's prior knowledge or preconceived idea about the topic. Through rotation of factors, the investigator examines the respondents'

opinions and views answers from different angles. Rotation is only performed to shift the perspective from which the factors are viewed and analyzed. Upon completion of the rotation, factor scores and differential scores are calculated. These calculations, otherwise known as Z-scores, define a given factor. Once attained, a Z-score can be added back to the distribution resulting in a composite Q-sort for each factor. Once interpretation begins, statements need to be considered within the context of the portion of the conversation from which they were taken. The particular configuration of statements together creates the nuanced meaning for each factor.

Participants

In order to determine the constructs of expert coaching, individuals who serve to improve the USOC's system of athletic development and competitive success were utilized for this study. This group of individuals had titles such as National Team coach, National Team staff, Olympic coach, National Team athlete, Olympic athlete, and Olympic medalist. Although coaches may be able to provide rare insight into the needs of the profession, it was important to understand the beliefs of current National team athletes as they could provide clarity on the subject as these individuals work in close proximity to coaches.

Sample

Recall that Q methodology is a process that can unearth the subjectivity concerning a given subject. Further, this type of study does not require a large sample group, as the underlying assumption is that there is a limited amount of opinions and beliefs for a given subject and that a carefully structured sample population can provide the researcher with the

predominant thoughts that exist. Acceding that competing at the Olympic level of sport is an elite endeavor, it is safe to presume that coaching at the Olympic level is also a rare opportunity. Building on the understanding that Olympic participation at any level is an exclusive and rare event; small populations of possible subjects are afforded to researchers interested in pursuing study on this segment of athletic play. With a limited pool of participants to draw from, Q-methodology is a good choice for assessment as it works well with small samplings. Once the respondents have been identified, they should provide the research team with themes or tendencies of belief that can be generalized to others in the population that the sample represents.

In order to acquire participants for this study, the researcher contacted a select group of current coaches and athletes with previous competitive experience in the Olympic games who were working and training out of the Olympic Training Center located in Lake Placid, New York. The initial contact with potential participants was made through electronic mail, utilizing a mailing list that is available through the organization's network and through each sport's administrative office. As an employee of the United States Olympic Committee and a former coaching educator for three different sports, the researcher had access to current National team coaches and athletes working and residing at the Olympic Training Centers. At the time of study, the researcher was serving as the Sport Physiologist for the United States Olympic Training Center in Lake Placid, NY where he oversaw the development of athletes representing NGB's including: USA Bobsled & Skeleton, USA Luge, USA Canoe/ Kayak, USA Biathlon, and USA Ski & Snowboard. In addition to this work, the lead

investigator served as a coaching educator for USA Weightlifting, USA Canoe/ Kayak, and USA Track and Field. This existing line of communication played a role in the level of assistance and openness that was afforded during this research endeavor.

Once a group of coaches and athletes electronically agreed to take part in the study, email addresses were entered into the Q-Assessor website in order to formally invite the subjects to participate in the research endeavor. Each introductory email provided an overview of the study as well as emphasizing the individual's right to remove themselves from the study without any complications or personal harm. Coaches and athletes were made aware that by clicking the link to participate in the study they were providing their electronic signature agreeing to participate in the study process.

Instrumentation

In order to measure the participants' beliefs regarding the constructs of expert coaching, a 34-item concourse was developed. The process of creating the concourse began with a thorough literature review of studies addressing the practices and patterns of elite coaches. As a result of the literature review, 59 statements were initially collected. As seen in Appendix E, the beginning 59 statements were grouped together by larger themes that emerged through the development process. These items were categorized under the themes: knowledge base, athletic experience, coaching relationships, coaching experience, coaching characteristics, acquisition of expertise, and educational resources.

Upon completion of the categorization, elimination of items began. To start, any statement that was ambiguous or lacked scholarly support was removed from the sort. In

addition, statements that were similar or redundant were merged together. This resulted in a final list of 34 sort items. These 34 sort items were then placed in revised thematic categories based on the elimination of statements and relevancy to the topic. Once the final statements were categorized, the items were provided to a pilot group to ensure statements were easily understood and represented their initial thoughts on the matter.

As mentioned earlier, the final 34 statements were placed into larger categories based on thematic similarities. The final themes emerging from the revision of statements include: knowledge base, athletic experience, coaching relationships, coaching characteristics, and educational practices. A brief description of each category is listed below.

- Knowledge base: This collection of statements represents the various beliefs regarding a coach's knowledge on a component of knowledge that relates to the sporting discipline or an overarching subject matter related to the profession.
- Athletic experience: The purpose of this grouping of statements is to determine what level of personal competitive experience is required to become an expert coach.
- Coaching relationships: This segment of sort items represents a variety of statements that reflect the role a coach plays in the development of an athlete outside of physical conditioning.
- Coaching characteristics: The sort items comprising this theme provide insight into the abilities of a coach to make accurate decisions, understand their role in the practice or competitive setting, and ability to adapt to their setting.

- Educational practices: This component of the concourse represents the various methods used by coaches to acquire sport-related knowledge.

Data Collection

In order to determine the constructs of expert coaching knowledge and status, data was collected once the Institutional Review Board (IRB) of North Carolina State University granted approval for the study. As mentioned earlier, this particular study utilized the Q-methodological approach, which promotes the employment of a smaller collection of well-informed participants to provide their beliefs and opinions on a specific subject matter through the ranking of a collection of statements regarding a topic.

To begin data collection, the researcher emailed a link to the online statement sort and questionnaire to potential candidates. In conjunction, detailed instructions on how to carry out the Q-sort were listed on the introductory webpage. The researcher made sure to provide the minimal amount of additional instruction so that coaching or persuasion does not compromise the study. Once the participant was confident in their abilities to complete the card sort, the participant began the online statement sort in privacy. Upon completion of the card sort, the researcher asked each participant to complete each sampling event with a series of open-ended questions in order to provide additional meaning to the final sort. These questions provided the researcher with greater understanding of what series of events or thoughts prompted the participant to sort the statements in the manner that they did. After each participant had the opportunity to complete the Q-sort, a randomized identification number was provided to each participant by the Q-Assessor program and saved online until

data analysis began. All data was kept online and maintained under a password-protected account at all times.

Data Analysis

Once all card sorts were complete, data analysis began. In order to complete this section of the research study, the completed sorts were analyzed using Q-assessor online, which is a statistical software program that allows Q sorts to be entered as piles of statement numbers. This online application designed by Stan Kaufmann, computed for inter-correlations among Q sorts, which were then factor-analyzed with the Centroid, or PCA method.

Summary

The purpose of this chapter was to describe the methodology that was employed in the current study. As previously mentioned, the purpose of this study was to determine the defining constructs of expert coaching. Specifically, this study set out to measure the beliefs and attitudes regarding expert coaching through the participation of current National team coaches and athletes with previous experience at the Olympic games. Recall that competitive experience at the Olympic games is a rare experience, and as a result, a small population of individuals with this requirement exists in the normal population. Acknowledging this fact, Q Methodology was chosen as the method of data collection and assessment in this research endeavor. Specifically, Q Methodology does not require a large sample group, as the underlying assumption is that there is a limited amount of opinions and beliefs for a given

subject and that a carefully structured sample population can provide the researcher with the predominant thoughts that exist.

Chapter Four

Results

This chapter presents the results from the data analysis of the Q sorts, which were completed by 15 current National team coaches, and athletes who were given the task of determining the constructs of expert coaches at the Olympic level of competition within the United States. This follows the introduction to Q-methodology that was provided in Chapter 3.

Recall that Q methodology is a resource that allows the researcher to determine relationships between commonly held opinions on a specific topic through the study of individuals that are fluent on the given subject matter. Specifically, Q methodology correlates the personal profiles that are elucidated through the statement sort in order to determine common viewpoints or segments of subjectivity (Brown, 1993). This process of determining themes from individual statement sorting is a technical and objective procedure that is referred to as the scientific basis of Q (Van Exel & de Graaf, 2005). The results section includes the demographics of the sampled population, the correlation between the sorts, descriptions of the factor analysis, factor rotation, factor arrays, defining statements, and the factor interpretations. In addition, this chapter describes each factor utilizing the information gathered from the data analysis.

P Set Demographics

Fifteen participants completed the Q sort, which had the aim of determining the constructs of expert coaching within the United States' Olympic movement. Of the 15

participants, 7 were National team coaches and 8 were National team athletes. As seen in table 1.4, most of the participants completing this study were male (10). Interestingly, most of the athletes choosing to take part in this study were female (5).

Coach Demographics

Of the 10 coaches approached for this study, 7 completed the online Q sort. As noted in table 2.4, of the participating group, USA Canoe/ Kayak employed 3, while 1 coach each represented the federations of USA Bobsled, USA Skeleton, USA Ski Jump, and USA Biathlon.

Table 1.4

Breakdown of gender for sampled population

Subjects	Number	Male	Female
Coaches	7	7 (100%)	0 (0%)
Athletes	8	3 (37.5%)	5 (62.5%)

Table 2.4

Breakdown of sporting discipline for coach's sampled

Sporting Discipline	Participants	Percentage
Bobsled	1	14.29%
Skeleton	1	14.29%
Ski Jump	1	14.29%
Canoe/ Kayak	3	42.85%
Biathlon	1	14.29%

As seen in table 3.4, the average amount of coaching experience at the National level for this group was 10 years. Interestingly, table 4.4 demonstrates that all of the coaches taking part in this study had previous coaching experience at the Olympic games. In addition, over half of these individuals had coached an athlete to an Olympic medal. On a similar note, only one coach participating in this study had won an Olympic medal as an athlete before entering into the coaching profession.

Athlete Demographics

Out of the 10 athletes approached for this study, a large majority (8) completed the online Q sort. Table 5.4 shows that of the participating athletes, 4 were current National team members

of the USA Bobsled team, followed by 2 representing USA Biathlon, and 1 each from USA Luge and USA Ski/ Snowboard. As seen in table 6.4, these athletes had an average of almost 8 years of competitive experience representing the United States through their respective National Teams. As a member of their federation's respective National Team, each athlete taking part in this study had enjoyed previous competitive experience at the Olympic games. Table 7.4 shows that of these 8 athletes, 2 were gold medalists, and 1 received a bronze

Table 3.4

Years of coaching experience at National Team level

Coach	Sport	Years of Experience
1	Bobsled	2
2	Biathlon	3
3	Canoe/ Kayak	25
4	Canoe/ Kayak	22
5	Canoe/ Kayak	9
6	Skeleton	13
7	Ski Jump	8
	Mean	10.14
	Std. Dev.	7.67

Table 4.4

Highest competitive level of athletes under coach supervision

Coach	Sport	Highest Level of Competition	Olympic Medal Earned Under Coach's Supervision
1	Bobsled	Olympian	No
2	Biathlon	Olympian	No
3	Canoe/ Kayak	Olympian	Yes
4	Canoe/ Kayak	Olympian	Yes
5	Canoe/ Kayak	Olympian	Yes
6	Skeleton	Olympian	Yes
7	Ski Jump	Olympian	No

Table 5.4

Breakdown of sporting discipline for athlete's sampled

Sporting Discipline	Participants	Percentage
Bobsled	4	50%
Freestyle Ski	1	12.50%
Luge	1	12.50%
Biathlon	2	25%

Table 6.4

Years of athletic experience at National Team level

Athlete	Sport	Years of Experience
1	Bobsled	4
2	Bobsled	8
3	Bobsled	14
4	Freestyle Ski	3
5	Luge	12
6	Biathlon	12
7	Biathlon	4
8	Bobsled	5
	Mean	7.75
	Std. Dev.	4.37

Table 7.4

Highest level of competitive success for sampled athlete population

Athlete	Sport	Highest Level of Competition	Olympic Medal
1	Bobsled	Olympian	Bronze
2	Bobsled	Olympian	Gold
3	Bobsled	Olympian	Gold
4	Freestyle Ski	Olympian	No
5	Luge	Olympian	No
6	Biathlon	Olympian	No
7	Biathlon	Olympian	No
8	Bobsled	Olympian	No

medal while participating in the 2010 Olympic games in Vancouver. Complete demographic information for the participants can be found in the Appendices.

Correlation Between Sorts

The calculation of the correlation matrix is the first primary step in analyzing the Q sorts. This process represents the level of (dis)agreement between the individual sorts, otherwise known as the points of view that are demonstrated by each participant. (Van Exel & de Graaf, 2005). As previously mentioned, the purpose of this study was to determine the constructs of expert coaching through the analysis of coaches and athletes participating at the Olympic level of sport within the United States. In order to measure these constructs, a 34-item concourse was provided to 15 current National team athletes and coaches with previous experience at the Olympic games. Through an online statement sort, individual perceptions regarding expert coaching were identified and clustered together around resultant factors. These clusters of concourse items represent the different perspectives regarding expert coaching at the Olympic level of sport within the United States. Q-Assessor, an online Q methodology program, generated the correlation matrix of the 15 individual Q sorts. As supported by Brown (1993), the usefulness of Q technique software packages convert into ease what was before drudgery, and thereby redirects the researcher's attention back to the phenomenon and away from the means of its measurement. The resultant correlation matrix provided by the Q-Assessor program demonstrated how each individual Q sort compared or correlated with each of the sorts completed by the other participants. The goal of this process was to determine the variability of the 15 Q sorts in order to determine how many shared factors are in evidence. Brown (1993) asserts that two or more sorts with a correlation of 1.00 would demonstrate a perfect agreement between the sampled populations, while a

correlation of -1.00 would suggest a perfect negative relationship. Acknowledging that a correlation of 1.00 is rare, Q sorts that are closer to 1.00 are more likely to display common themes in individual beliefs regarding expert coaching.

Factor Analysis

Recall that Q methodology utilizes factor analysis in order to study the relationships among variables. Brown (1993) reminds us that factor analysis determines how many different Q sorts are in evidence, with sorts of similar scoring considered to having a family resemblance. In short, factor analysis tells the researcher how many different families exist. With regard to the present study, factor analysis was performed using the Q-Assessor online software application. Although the generation of un-rotated factors can be performed using the Principal Component Analysis, Stan Kaufman, creator of the Q-Assessor program chose to utilize the Centroid method due to the theoretical argument that Steven R. Brown makes on the superiority of this approach.

Before attempting to determine how large a correlation must be before considering it significant, standard error must be calculated. Standard error is determined by the following equation: SE= $1/\sqrt{N}$, where *N* is the number of statements in the concourse. In particular to this study, SE = $1/\sqrt{34}$ = 1/ 5.83= .17 displays the standard error for the 34 statement concourse. Brown asserts that correlations are generally considered to be statistically significant if they are approximately 2 to 2.5 times the standard error. Specifically, statistical significance falls somewhere between 2(.17) = .34 and 2.5(.17) = .85 for this study.

Factor Rotation

Within Q Methodology, the next recommended step following factor analysis is factor rotation. Rotation may be either objective, according to some statistical principle, or theoretical, driven by some prior knowledge or idea of the investigator (van Exel & de Graaf, 2005). Regardless of method, each resulting final factor continues to represent a group of individuals who are (dis)similar to others with regard to a specific topic. Q-Assessor utilizes varimax factor rotation in order to preserve as much of the variance as possible.

The Q-Assessor online data analysis originally provided 7 factor rotations, although 5 were ultimately chosen to interpret the data. The 5 rotated factors explained the variance in all 15 of the participants within the current study, with only 9 displaying significant loading by the Fuerntratt criterion. Specifically, 4 subjects (sorts 5, 8, 14, and 15) significantly loaded onto factor 1; two subjects (sorts 6 and 10) significantly loaded onto factor 2; one subject (sort 13) significantly loaded onto factor 3; one subject (sort 3) significantly loaded onto factor 4; and one subject (sort 2) significantly loaded onto factor 5. The factor loadings for the entire factor rotation are included in Table 8.4.

Factor Arrays

Moving forward in the Q methodology process requires an interpretation of factor scores. Within Q analysis, factor scores are another term for a z-score of a given Q statement and is comprised of all the scores given to that specific statement by each participant taking part in the study. Recall that individual sorts can load more significantly onto a given factor

than another; therefore the factor scores are weighted based on how strongly they correlate to that factor.

These factor scores are represented by whole numbers that are similar to those that were used by participants in the sorting process, which in this case was a range of -4 to +4. The usage of whole numbers is advantageous, as it allows for easier comparisons between factor arrays. In general, factor arrays provide the researcher an opportunity to see how the 34 statements rank in each of the factors. In this case, the factors are made distinguishable from one another by the score of individual statements. Factor arrays allow the researcher to begin the process of data interpretation and theme development. Table 9.4 displays how each statement was ranked within each of the 5 factors.

Table 8.4

Factor Loading of Subject Responses to Constructs of Expert Coaching

Respondent	Respondent Descriptive	Respondent Gender	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
15	Biathlon Athlete	Female	.7449				
14	Ski Jump Coach	Male	.6946				
5	Bobsled Coach	Male	.6641				
11	Luge Athlete	Female	.5608				

Table 8.4 Continued

8	Canoe/ Kayak Coach	Male	.5425					
7	Freestyle Ski Athlete	Female	.4950					
6	Biathlon Coach	Male		.6944				
10	Canoe/ Kayak Coach	Male		.6357				
12	Biathlon Athlete	Male		.5911				
9	Canoe/ Kayak Coach	Male		.3936				
1	Bobsled Athlete	Female		.3472				
13	Skeleton Coach	Male			.7259			
4	Bobsled Athlete	Female			.4455			
3	Bobsled Athlete	Male				.7976		
2	Bobsled Athlete	Male						.6017

Factor Characteristics

Table 10.4 provides insight into the factor characteristics, including the number of defining variables for each factor, the composite reliability, and the standard error for each factor. To clarify, the number of defining variables is the number of subjects who significantly identified themselves with one of the 5 factors.

Composite reliability demonstrates the likelihood that participants will perform the statement sort in a similar way if given the opportunity again. Practically speaking, higher reliability scores provide security in the replication of Q-sorts if they are performed again.

Defining Statements

In addition to factor characteristics, the researcher looked to understand what items from the Q-sorts are unique to each factor. First, distinguishing statements were used to determine what items from the concourse were unique to each of the five factors. Specifically, distinguishing statements provide insight into what statements assist in the delineation of one factor from another, while maintaining statistical significance. The distinguishing statements and related z-scores are located in table 11.4. Secondly, the researcher continued to differentiate the factors by comparing the highest and lowest rated statements. While these concourse items may or may not have been distinguishing statements, they did provide additional insight into interpreting the factors. Tables 12.4 and 13.4 list the highest and lowest rated statements for each factor, respectively.

Factor Interpretation

As previously stated, Brown (1993) recommends that factors be considered familial since an individual factor is a collection of individuals that share a common thought process or belief system regarding a specific topic. Through the analysis of data, a collection of five factors regarding the constructs of expert coaching where discovered. These factors were defined and understood through a variety of statistical measures. The statistical measures employed in the examination of factors included factor arrays, distinguishing statements, anchor statements, and subject responses from the post-sort questionnaires.

Table 9.4

Factor Arrays

Number	Statement	Factor A	Factor B	Factor C	Factor D	Factor E
1	Expert coaches have an advanced level of technical knowledge of their sport.	4	3	3	-1	-1
2	Expert coaches have an advanced level of tactical knowledge of their sport.	2	1	-2	0	2
3	Expert coaches have an advanced ability to design training programs.	1	1	-3	-3	-2
4	Expert coaches have an advanced level of knowledge regarding sport sciences.	-2	-2	-1	-1	2
5	Expert coaches have a bachelor's degree or higher in a discipline of or relating to sport science, exercise physiology, or physical education.	-4	-3	-1	-3	1
6	Expert coaches were exposed to early leadership opportunities as a youth through sport play.	-2	-2	-4	-2	-4
7	Expert coaches have competitive experience as an athlete in the sport they coach.	3	-3	4	2	1
8	Expert coaches have competitive experience at the most elite level of competition in the sport they coach.	-1	-4	1	-1	0
9	Expert coaches can effectively communicate with others.	3	-2	4	0	0
10	Expert coaches are knowledgeable and understanding of personal issues facing the athletes under their supervision.	0	-1	-4	2	-3
11	Expert coaches have the ability to identify the needs of the athletes under their supervision.	4	1	2	0	-1
12	Expert coaches have reasonable expectations of their athlete.	-1	-1	0	1	1
13	Expert coaches are good teachers.	2	2	0	4	4
14	Expert coaches know how to motivate and encourage their athletes.	3	1	2	3	3
15	Expert coaches are trustworthy.	1	0	2	4	3
16	Expert coaches facilitate their athlete's goal setting.	0	-1	1	3	-3

Table 9.4 Continued

17	Expert coaches create a positive training environment.	2	0	3	2	0
18	Expert coaches have a clearly defined role at athletic competitions.	0	1	-3	0	3
19	Expert coaches are able to keep things simple for the athlete.	1	3	-2	-2	-2
20	Expert coaches do not “over-coach”. In other words, expert coaches know when to say when.	0	3	-1	3	-1
21	Expert coaches are able to make decisive but fair decisions.	-1	-2	1	2	1
22	Expert coaches are those that are assigned to the National Team or National Governing Body.	-4	-4	-1	-4	-4
23	Expert coaches make decisions based on instinct and experience rather than theoretical principles.	-2	0	-3	1	1
24	Expert coaches are quicker in their ability to solve problems successfully.	-1	-1	-2	-2	-2
25	Expert coaches are flexible.	1	2	-2	1	0
26	Expert coaches demonstrate a high commitment level to their profession.	1	4	3	1	2
27	Expert coaches display constant adaptations to their own coaching experiences.	0	0	0	0	4
28	Expert coaches consistently produce successful athletes and/or teams.	-2	0	1	1	-3
29	Expert coaches take part in self-directed learning such as reading books, journals, and watching videos.	-1	2	1	-1	-1
30	Expert coaches regularly consult and learn from other expert coaches.	2	4	0	-1	-2
31	Expert coaches practice critical reflection.	0	2	2	0	2
32	Expert coaches have an official coaching qualification or certification.	-3	-3	0	-4	-1
33	Expert coaches worked under a mentor or master coach early in their career.	-3	0	-1	-3	0
34	Expert coaches consistently attend coaching conferences.	-3	-1	0	-2	0

Table 10.4

Factor Characteristics

Characteristics	A	B	C	D	E
Number of Defining Variables	4	2	1	1	1
Composite Reliability	0.941	0.889	0.8	0.8	0.8
Standard Error of Factor Scores	0.243	0.333	0.447	0.447	0.447

As mentioned earlier, factor arrays provide the researcher with a general understanding of how each of the 34 statements loaded on each of the 5 factors. In short, factor arrays allow the researcher to see how each factor differs from one another. Next, the distinguishing statements demonstrate the statistically significant statements for each factor. These significant statements are compiled so that a factor's unique properties become more apparent. Thirdly, the anchor statements were used to highlight how each respondent viewed expert coaching at the Olympic level of competition. Specifically, the anchor statements are those that are found at the *+4* and *-4* positions of each array. As a result of their position, anchor statements are evidence of what is believed to be the most important and least important characteristics of expert coaching for each factor. Lastly, the data collected from the post-sort questionnaires were used to elucidate the details regarding each respondent's sort.

Table 11.4

Distinguishing Statements for Factors

		A		B		C		D		E	
		Z-Score	Rank	Z-Score	Rank	Z-Score	Rank	Z-Score	Rank	Z-Score	Rank
Factor A											
19	Expert coaches are able to keep things simple for the athlete	0.271	1	1.337	3	-0.908	-2	-0.908	-2	-0.908	-2
Factor B											
7	Expert coaches have competitive experience as an athlete in the sport they coach	1.116	3	-1.642	-3	1.817	4	0.908	2	0.454	1
19	Expert coaches are able to keep things simple for the athlete	0.271	1	1.337	3	-0.908	-2	-0.908	-2	-0.908	-2
8	Expert coaches have competitive experience at the most elite level of competition in the sport they coach	-0.419	-1	-2.189	-4	0.454	1	-0.454	-1	-0.0	0
Factor C											
18	Expert coaches have a clearly defined role at athletic competitions	0.114	0	0.423	1	-1.362	-3	-0.0	0	1.362	3
22	Expert coaches are those that are assigned to National Team	-1.988	-4	-1.642	-4	-0.454	-1	-1.817	-4	-1.817	-4

Table 11.4 Continued

Factor D											
There Were NO Distinguishing Statements for Factor D											
Factor E											
27	Expert coaches display constant adaptations to their own coaching experiences	0.148	0	0.062	0	0.0	0	-0.0	0	1.817	4
4	Expert coaches have an advanced level of knowledge regarding sport sciences.	-0.747	-2	-1.095	-2	-0.454	-1	-0.454	-1	0.908	2

This qualitative data provided further insight into reasoning for statement sorts and previous experiences regarding coaching at the elite level of sport.

This research endeavor uncovered five emerging factors regarding the constructs of expert coaching. These factors have been identified as: (a) The Knowledgeable Coach, (b) The Evolving Coach, (c) The Communicating Coach, (d) The Trustworthy Coach, and (e) The Teaching Coach. Descriptions of the five factors are provided below. Along with these descriptions, the demographics of the participants who loaded on the factors are also provided. Lastly, the anchor statements and excerpts from the post-sort questionnaires further detail the constructs of expert coaching within these five factors.

Table 12.4

Highest Rated Statements for Each Factor

Factor	Highest Rated	2nd Highest Rated	3rd Highest Rated
1	Advanced Technical Knowledge	Identify Athlete Needs	Effectively Communicate
2	Commitment to Profession	Consult Other Expert Coaches	Keep Things Simple
3	Effectively Communicate	Competitive Experience in Sport	Commitment to Profession
4	Trustworthy	Good Teacher	Do Not Over-coach
5	Adapt	Good Teacher	Clearly Defined Role

Table 13.4

Lowest Rated Statements for Each Factor

Factor	Lowest Rated	2nd Lowest Rated	3rd Lowest Rated
1	Assigned by NGB	Degree in Sport Science	Coaching Certification
2	Competitive Experience at Elite Level of Sport	Competitive Experience in Sport	Assigned by NGB
3	Exposed to Early Leadership Opportunity	Understanding of Athlete's Personal Issues	Advanced Ability in Program Design
4	Assigned by NGB	Coaching Certification	Advanced Ability in Program Design
5	Exposed to Early Leadership Opportunity	Assigned by NGB	Understanding of Athlete's Personal Issues

Factor A: The knowledgeable coach. Factor A was responsible for most of the variance unearthed in this study with 40% (6) of the respondents loading onto this factor. An equal amount of men (3) and women (3) loaded onto this factor. Interestingly, all of the

males attributed to this factor were coaches while all the females loading onto this factor were athletes. At the time of study, each of the coaches loading on Factor A supervised both male and female athletes. Concurrently, the female athletes loading on Factor A were coached exclusively by men. Regardless of the similarities in male respondents being coaches and female respondents being athletes, no sport saw duplication in loading. Specifically, the male coaches represented Bobsled, Canoe/ Kayak, and Ski Jumping respectively. In contrast, the female athletes represented the sports of Biathlon, Freestyle Ski, and Luge. While in their current capacity as either a National team coach or athlete, the respondent's years of experience was varied. The coaches ranged in years of experience at the Olympic level of competition from 2 to 25 years. The athletes displayed somewhat smaller levels of variations in experience with two athletes having an average of 3.5 years, while one had over 10 years experience competing at the international level. All coaches and athletes loading onto Factor A had previous experience at the Olympic games. The demographic information for this group of participants is found in table 14.4.

When considering the factor arrays, distinguishing statements, anchor statements, and post-sort interview data, the coaches and athletes loading onto Factor A considered an expert coach to be knowledgeable. In other words, the individuals relating to this factor believe that an expert coach must have technical knowledge in order to better equip an athlete for Olympic or international competition. In addition, the respondents also describe a knowledgeable coach as someone who can identify an athlete's needs.

As previously stated, the participants who comprised Factor A believe that an expert coach is knowledgeable. Confirmation of this belief is found in the factor array, which describes an expert coach as someone who is knowledgeable about their sport and the athletes under their direction. This opinion is initially seen in statement #1, "Expert coaches

Table 14.4

Demographic Characteristics for Factor A

Sort ID	Gender	Sport	Current Position	Years of Experience in Current Capacity	Highest Level of Success
5	Male	USA Bobsled	Coach	2	Coached Olympic Medalist
8	Male	USA Canoe/ Kayak	Coach	25	Coached Olympic Medalist
14	Male	USA Ski Jumping	Coach	8	Coached Olympian
15	Female	Biathlon	Athlete	4	Olympian
7	Female	Freestyle Ski	Athlete	3	Olympian
11	Female	Luge	Athlete	12	Olympian

have an advanced level of technical knowledge of their sport". This statement not only held the top position in the factor array, but it had the highest z-score (1.808) for the factor.

Most of the highest loading participants (respondents 5, 8, 14, and 15) in Factor A alluded to the importance of this statement in their post-sorting analysis. Participant 5, who had the third highest factor loading (.6641), was a male Bobsled coach who had only 2 years experience coaching the national team. However, this individual had not only coached athletes at the Olympic games but had earned a silver medal as a previous competitor. In his analysis of statement #1, he wrote, "It is very important for coaches to know strategies to put athletes in a position to win at the highest level". Further support for this statement came from respondent 8 who had the fifth highest factor loading (.5425). This participant was a male coach from the USA Canoe/ Kayak federation had 25 years of coaching experience at the time of study and had coached several Olympians and an Olympic medalist. When discussing technical knowledge he stated, "I do not believe in instinctual coaching. Knowledge of theoretical principles and competitive experience allow a coach to make better decisions in the competitive setting". As someone who has tasted competition at the Olympic games as an athlete and coach, respondent 5 valued the need for a coach to understand the technical strategies of his or her respective sport in order to improve the chances for competitive success. Concurrently, respondent 8 utilized his experiences gained over two decades in the sport to explain the benefit of technical knowledge in competition. Participant 15, who had the highest factor loading (.7449), had 4 years of competitive experience as a female athlete in the sport of Biathlon. She extends the value placed on technical knowledge with the remark, "Most athletes need to know certain things to improve;

they need knowledge". Here she underscores the elite athlete's desire for expertise and technical leadership when entering into competition.

Factor A was also distinguished by statement #11, "Expert coaches have the ability to identify the needs of the athletes under their supervision". This statement also occupied the +4 spot in the factor array, indicating that this was representative of the respondents beliefs relating to Factor A. Respondent 8, the previously mentioned Canoe/ Kayak coach, provided insight into the need for an individualized approach by adding, "At the highest level of competition, when the difference between the athletes is small, the coach needs to be able to identify the exact weaknesses of the athlete and be able to make improvements in this area". Other participants provided additional evidence for the importance of a coach to be able to decipher an individual athlete's need. Participant 11, a female luge athlete with the fourth highest factor loading (.5608), exclaimed, that "It is very important for coaches to be able to see what individual athletes need from them. Every athlete is different not only in how they physically respond to training, but in how they are motivated. Participant 7, who had the sixth highest factor loading for Factor A (.4950), was a female freestyle ski athlete with competitive experience at the Olympic games. She supported the previous statement regarding a coach's ability to be in tune with an athlete's need and motivation by writing, "Coaches need to know what each athlete wants in order to motivate them. If they do not know this information, the athletes may not listen to what the coach is saying".

Together, statements #1 and #11 imply that an expert coach should have the technical knowledge to outwit their opponent while at the same time having the ability to identify and

act upon the individualized needs of the athletes under his or her supervision. Through interpretation of the post-sort answers, individuals who related to this factor provided insight into the level of technical knowledge needed for success at the Olympic games. In addition, coaches who are unwilling to pay attention to the individual needs of the athletes competing at this level may be less likely to keep athletes motivated. Statement loading and respective z-scores for Factor A are found in table 15.4.

Table 15.4

Statement Rank and Z-Scores for Factor A

Statement ID	Statements	Rank	Z-Score
1	Expert coaches have an advanced level of technical knowledge of their sport.	4	1.808
11	Expert coaches have the ability to identify the needs of the athletes under their supervision	4	1.576
9	Expert coaches can effectively communicate with others	3	1.52
7	Expert coaches have competitive experience as an athlete in the sport they coach	3	1.116
14	Expert coaches know how to motivate and encourage their athletes	3	1.036
13	Expert coaches are good teachers	2	1.026
30	Expert coaches regularly consult and learn from other expert coaches	2	0.992
17	Expert coaches create a positive training environment	2	0.956
2	Expert coaches have an advanced level of tactical knowledge of their sport	2	0.75

Table 15.4 Continued

25	Expert coaches are flexible. In other words, they know how to align their own competencies such that they are congruent with the needs of their athletes and the context of the competitive setting	1	0.706
15	Expert coaches are trustworthy	1	0.521
26	Expert coaches demonstrate a high commitment level to their profession	1	0.388
3	Expert coaches have an advanced ability to design training programs	1	0.297
19	Expert coaches are able to keep things simple for the athlete	1	0.271
16	Expert coaches facilitate their athlete's goal setting	0	0.217
10	Expert coaches are knowledgeable and understanding of personal issues facing the athletes under their supervision	0	0.211
20	Expert coaches do not "over-coach". In other words, expert coaches know when to say when	0	0.178
27	Expert coaches display constant adaptations to their own coaching experiences	0	0.148
18	Expert coaches have a clearly defined role at athletic competitions	0	0.114
31	Expert coaches practice critical reflection	0	-0.067
12	Expert coaches have reasonable expectations of their athlete	-1	-0.306
8	Expert coaches have competitive experience at the most elite level of competition in the sport they coach	-1	-0.419
24	Expert coaches are quicker in their ability to solve problems successfully	-1	-0.437
21	Expert coaches are able to make decisive but fair decisions	-1	-0.447
29	Expert coaches take part in self-directed learning such as reading books, journals.	-1	-0.543
23	Expert coaches make decisions based on instinct & experience rather than theoretical principles	-2	-0.559

Table 15.4 Continued

4	Expert coaches have an advanced level of knowledge regarding sport sciences.	-2	-0.747
6	Expert coaches were exposed to early leadership opportunities as a youth through sport play.	-2	-0.94
28	Expert coaches consistently produce successful athletes and/or teams	-2	-1.204
34	Expert coaches consistently attend coaching conferences	-3	-1.214
33	Expert coaches worked under a mentor or master coach early in their career	-3	-1.443
32	Expert coaches have an official coaching qualification or certification	-3	-1.747
5	Expert coaches have a bachelor's degree or higher in a discipline of or relating to sport science, exercise physiology, or physical education.	-4	-1.773
22	Expert coaches are those that are assigned to the National Team or National Governing Body	-4	-1.988

In comparison to the factor statements that occupied the *+4* position, statements that were deemed as unfitting of an expert coach provided additional detail in the development of Factor A. The first anchor statement in the *-4* position was #22, which had the largest z-score among the negative statements (-1.988). This statement implies that, "Expert coaches are those that are assigned to the National Team or National Governing Body". Respondent 15 dismissed the assertion that National Team coaches are experts when she said, "I do not think that being a National team coach makes you an elite coach. NGB's can make mistakes in hiring, or coaches can get lazy once they get their dream job". Looking at the statement from another angle, respondent 11 highlighted the political nature of elite sport by suggesting that, "Coaches are often chosen by the federation for political reasons, not for what they can

do for the sport". In addition, statement #5, which had the second largest z-score among negative statements (-1.773) states, "Expert coaches have a bachelor's degree or higher in a discipline of or relating to sport science, exercise physiology, or physical education". Respondent 7 provides insight into this belief with her reply, "Coaches don't need official degrees or certifications to prove that they are a good coach. Some coaches are good just based on their field experience". Respondent 8 furthers this discussion by adding, "Coaching as many athletes as possible from beginner to expert gives the most valuable knowledge to the coach and makes the coach the most effective, not formalized education". Lastly, respondent 11 stated, "Having an education does not make you an expert coach. If you don't have sport knowledge and personality it does not matter how many classes you have taken".

Based on factor analysis and the data collected from the post-sort questionnaire, coaches and athletes who loaded on Factor A believe that an expert coach at the Olympic level of competition has an advanced level of technical knowledge regarding their sporting discipline, as well as having a strong ability to interpret the needs of the individual athletes under their direction. Also as important as the statements that highlight the strengths of an expert coach are the statements that do not associate with this factor. Specifically, individuals who loaded onto Factor A suggest that a coach does not need a formal education in sport science or a related discipline to attain expertise. In addition, the confirmation of National Team coach does not automatically entitle a coach to become deemed an expert. These individuals believe that an expert coach develops knowledge through experiential learning opportunities and communicating with their athletes.

Factor B: The evolving coach. Factor B accounted for 33% of the variance explained in this study with 5 of the 15 respondents loading on this factor. As noted in table 16.4, an overwhelming majority of the participants relating to this factor where male (83%). Within this group, 3 were coaches while 2 were athletes. Specifically, the sport of Canoe/ Kayak had 2 coaches load onto Factor B, while Biathlon was also represented. The 2 athletes loading onto this factor were from the sports of Bobsled and Biathlon. Interestingly, this was the only grouping that had a coach and athlete load from the same sport load onto the same factor. Within the group of coaches, the Canoe/ Kayak staff members had the most experience with an average of 10 years, whereas the Biathlon coach had been with the National team for 3 years. The athletes loading onto Factor B showed a similar variance in experience with the Biathlete competing at the National level for 12 years, while the Bobsled athlete had only been competing internationally for 4 years. However, the Bobsled athlete had won an Olympic medal within this relatively short time span.

Evidence from the factor arrays, distinguishing statements, anchor statements, and post-sort responses indicates that individuals loading onto Factor B consider an expert coach someone who evolves throughout their career. In other words, the belief presented in Factor B suggests that expert coaches continue to consult and learn from other expert coaches through their active and high involvement in the profession. Concurrently, the coaches and athletes who loaded onto this factor argue that an expert coach is also able to keep things simple for the athlete under their supervision. That is, the coach is cognizant of an athlete's threshold with regard to information overload in the practice and competitive setting.

Table 16.4

Demographic Characteristics for Factor B

Sort ID	Gender	Sport	Current Position	Years of Experience in Current Capacity	Highest Level of Success
6	Male	Biathlon	Coach	3	Coached Olympian
10	Male	Canoe/ Kayak	Coach	9	Coached Olympian
12	Male	Biathlon	Athlete	12	Olympian
9	Male	Canoe/ Kayak	Coach	11	Coached Medalist
1	Female	Bobsled	Athlete	4	Olympic Medalist

As previously mentioned, Factor B asserts that an expert coach is one understands the need for continued personal development. This proposition is supported by the factor array, which demonstrates that statement #26, "Expert coaches demonstrate a high commitment level to their profession" has the highest z-score for all 34 statements (1.462). In conjunction, statement #30, "Expert coaches regularly consult and learn from other expert coaches" follows with the second highest z-score (1.337). Although sharing the same z-score (1.337), statement 19, "Expert coaches are able to keep things simple for the athlete" deviates from the coach's professional development and supports the notion that expert coaches have

the ability to pass along important information to the athlete in a palatable manner. Statement 19 is also the only positively correlating distinguishing statement for this factor, which suggests that keeping things simple is a strong component of expert coaching. The complete breakdown of statement rank and z-scores are found in table 17.4.

Data collected from the post-statement sorts elucidate the beliefs regarding the evolving expert coach from the respondents loading onto this factor. Initial support for the proposition that expert coaches are regularly consulting other expert coaches came from respondent 6, who had the highest factor loading for Factor B (.6944). This respondent was a male Biathlon coach with 3 years of experience at the National team level. He wrote,

> Educational degrees in sport science are not a necessity. There are other ways to learn coaching such as mentoring, job experience, and coaching conferences. Mine, for example, is a non-traditional background. I have a high school degree and no high-level competitive experience. I developed through passion for the sport, direct mentoring, and learning on the job.

Table 17.4

Statement Rank and Z-Scores for Factor B

Statement ID	Statement	Rank	Z-Score
26	Expert coaches demonstrate a high commitment level to their profession	4	1.462
30	Expert coaches regularly consult and learn from other expert coaches	4	1.337
19	Expert coaches are able to keep things simple for the athlete	3	1.337

Table 17.4 Continued

1	Expert coaches have an advanced level of technical knowledge of sport.	3	1.275
20	Expert coaches do not “over-coach”. In other words, expert coaches know when to say when	3	1.157
13	Expert coaches are good teachers	2	0.977
29	Expert coaches take part in self-directed learning such as reading books, journals.	2	0.97
31	Expert coaches practice critical reflection	2	0.915
25	Expert coaches are flexible. In other words, they know how to align their own competencies such that they are congruent with the needs of their athletes and the context of the competitive setting	2	0.915
14	Expert coaches know how to motivate and encourage their athletes	1	0.852
3	Expert coaches have an advanced ability to design training programs	1	0.79
2	Expert coaches have an advanced level of tactical knowledge of sport	1	0.79
11	Expert coaches have the ability to identify the needs of the athletes under their supervision	1	0.485
18	Expert coaches have a clearly defined role at athletic competitions	1	0.423
23	Expert coaches make decisions based on instinct and experience rather than theoretical principles	0	0.18
15	Expert coaches are trustworthy	0	0.125
27	Expert coaches display constant adaptations to their own coaching experiences	0	0.062

Table 17.4 Continued

33	Expert coaches worked under a mentor or master coach early in career	0	0
17	Expert coaches create a positive training environment	0	0
28	Expert coaches consistently produce successful athletes and/or teams	0	-0.062
24	Expert coaches are quicker in their ability to solve problems successfully	-1	-0.18
10	Expert coaches are knowledgeable and understanding of personal issues facing the athletes under their supervision	-1	-0.242
16	Expert coaches facilitate their athlete's goal setting	-1	-0.367
12	Expert coaches have reasonable expectations of their athlete	-1	-0.547
34	Expert coaches consistently attend coaching conferences	-1	-0.61
9	Expert coaches can effectively communicate with others	-2	-0.97
6	Expert coaches were exposed to early leadership opportunities as a youth through sport play.	-2	-1.032
21	Expert coaches are able to make decisive but fair decisions	-2	-1.095
4	Expert coaches have an advanced level of knowledge regarding sport sciences.	-2	-1.095
32	Expert coaches have an official coaching qualification or certification	-3	-1.157
5	Expert coaches have a bachelor's degree or higher in a discipline of or relating to sport science, exercise physiology, or physical education.	-3	-1.219
22	Expert coaches are those that are assigned to the National Team	-3	-1.642

Table 17.4 Continued

7	Expert coaches have competitive experience as an athlete in the sport they coach	-4	-1.642
8	Expert coaches have competitive experience at the most elite level of competition in the sport they coach	-4	-2.189

Respondent 10, who had the second highest factor loading (.6357), further supported the belief that expert coaching is linked to a commitment to the profession through educational activities and knowledge sharing. At the time of the study this male coach had been on the Canoe/ Kayak National Team coaching staff for 9 years, which accounted for his coaching of an Olympic medalist. He added, "Typically I have found that expert coaches are not afraid to consult with other coaches for training advice. Expert coaches are students of the game. They are constantly learning". Respondent 9, a male Canoe/ Kayak coach who also supervised an athlete to the Olympic medal podium in his 11 years of experience, stated, "I believe that a good coach is motivated to keep learning so they can provide their athletes with competitive advantages", demonstrating a consensus in beliefs within the Canoe/ Kayak federation. Respondent 12, a Biathlon athlete with over a decade of experience as a competitor on the National team, continued the trend of emphasizing the belief that expert coaches were dedicated to learning and enrichment. As the third highest loading respondent for Factor B (.5944), he added, "I don't think coaches need an elite level of sport science knowledge. They do however need to be able to know where to find that information when they need it". Interestingly, this statement was similar to the previously mentioned quote

provided by respondent 6, a Biathlon coach, who also suggested that formal education in sport science was not a requisite for expert coaching. The similarity of responses could highlight a belief system that is in place within the culture of Biathlon within the United States.

As stated earlier, the third highest statement for Factor B was #19, which suggests that, "expert coaches are able to keep things simple for the athlete". In conjunction to being a highly ranked statement, it was the only distinguishing statement for this factor. These analysis-derived indicators suggest that the ability to simplify complex material for the athletes was a major characteristic demonstrated by expert coaches. Surprisingly, only one respondent in the post-sort data collection suggested this ability. Respondent 1, a female bobsled athlete and Olympic medalist, suggested that, "It doesn't matter if a coach knows everything in the world, if they cannot easily explain and break it down to the athlete then their knowledge is useless".

In comparison to the anchor and distinguishing statements that occupied the *+4* and *+3* positions respectively, statements that were deemed as unfitting of an expert coach provided additional detail in the development of Factor B. Based on the factor array for Factor B, the first anchor statement in the *-4* position was statement #8, which had the most negative z-score among the distinguishing statements (-2.189). This statement reads, "Expert coaches have competitive experience at the most elite level of competition in the sport they coach". This was closely followed by statement #7, which also had a negatively correlated z-score (-1.642). Although statement #7 ranked on the *-3* slot in the factor array, it

suggests that, “Expert coaches have competitive experience as an athlete in the sport they coach”. Together, these imply that neither coaches nor athletes loading onto Factor B believe that a coach must have participated in the sport to be an effective leader in high-level competition. Respondent 10, a Canoe/ Kayak coach with 9 years of experience at the National level, was the only participant to discuss this topic in their post-sort assessment. He wrote, “A good coach does not need to have played at a high level to coach at a high level. It is what you know that matters, not what you can do”. Interestingly, statement #22 ranked as an anchor statement in the factor array for Factor B, just as it did in the previously described Factor A. Statement #22 states that, “Expert coaches are those that are assigned to the National Team or National Governing Body”. From these findings, an assertion can be made that expert coaches are not deemed expert based on their previous athletic ability or their status within or relating to a National Governing Body.

Together, the anchor statements and distinguishing statements for Factor B provide initial insight into the coaches and athletes who believe that an expert coach is constantly evolving through a commitment to their profession. The underlying thoughts and presumptions of Factor B were further unearthed by the addition of post-sort data collected through the online questionnaires provided to each respondent. Through analysis of the positively ranked statements, Factor B defines an expert coach who continues to refine their knowledge through interactions with other expert coaches or informal, self-directed educational opportunities. These coaches are motivated to maintain their education as a result of a desire to provide their athletes with competitive advantages. In addition, the data

suggests that once a coach has the requisite information for improving competitive abilities, they must be able to transfer this knowledge to each athlete in a simple, yet effective manner.

Factor C: The communicating coach. Factor C accounted for 13% of the variance explained in this study with 2 of the 15 respondents loading on this factor. As noted in table 18.4, this smaller group of respondents was comprised equally of one male and one female. Respondent 13, who significantly loaded onto this factor by the Fuerntratt Criterion (.7259), was a male Skeleton National team coach who had 13 years of experience in coaching at the International level of competition. Within this time, he had coached an Olympic gold medalist. In contrast, Respondent 4, who non-significantly loaded onto Factor B (.4455), was a female Bobsled athlete who had previous experience as a competitor at the Olympic games within her almost-decade long career.

Evidence from the factor arrays, distinguishing statements, positive anchor statements, and post-sort responses indicates that the two individuals loading onto Factor C consider an expert coach as someone who is an effective communicator. In other words, the belief presented in Factor C is that coaches at the highest level of competition are able to maintain clear lines of communication with their athletes. This proposition is supported by the factor array, which demonstrates that statement #9, "Expert coaches can effectively communicate with others" is tied for the highest z-score for all 34 statements (1.817). In addition to being an effective communicator, the second anchor statement in the *+4* position was statement #7 which read, "Expert coaches have competitive experience as an athlete in the sport they coach". This statement was tied with statement #9 for the highest z-score in

Factor C (1.817). The complete breakdown of statement rank and z-scores are found in table 19.4.

Table 18.4

Demographic Characteristics for Factor C

Sort ID	Gender	Sport	Current Position	Years of Experience in Current Capacity	Highest Level of Success
13	Male	Skeleton	Coach	13	Coached Olympic Medalist
4	Female	Bobsled	Athlete	9	Olympian

Table 19.4

Statement Rank and Z-Scores for Factor C

Statement ID	Statement	Rank	Z-Score
9	Expert coaches can effectively communicate with others	4	1.817
7	Expert coaches have competitive experience as an athlete in the sport they coach	4	1.817
26	Expert coaches demonstrate a high commitment level to their profession	3	1.362
17	Expert coaches create a positive training environment	3	1.362
1	Expert coaches have an advanced level of technical knowledge of their sport.	3	1.362
31	Expert coaches practice critical reflection	2	0.908
15	Expert coaches are trustworthy	2	0.908
14	Expert coaches know how to motivate and encourage their athletes	2	0.908

Table 19.4 Continued

11	Expert coaches have the ability to identify the needs of the athletes under their supervision	2	0.908
29	Expert coaches take part in self-directed learning such as reading books, journals, and watching videos	1	0.454
28	Expert coaches consistently produce successful athletes and/or teams	1	0.454
21	Expert coaches are able to make decisive but fair decisions	1	0.454
16	Expert coaches facilitate their athlete's goal setting	1	0.454
8	Expert coaches have competitive experience at the most elite level of competition in the sport they coach	1	0.454
34	Expert coaches consistently attend coaching conferences	0	0
32	Expert coaches have an official coaching qualification or certification	0	0
30	Expert coaches regularly consult and learn from other expert coaches	0	0
27	Expert coaches display constant adaptations to their own coaching experiences	0	0
13	Expert coaches are good teachers	0	0
12	Expert coaches have reasonable expectations of their athlete	0	0
33	Expert coaches worked under a mentor or master coach early in their career	-1	-0.454
22	Expert coaches are those that are assigned to the National Team or National Governing Body	-1	-0.454
20	Expert coaches do not "over-coach". In other words, expert coaches know when to say when	-1	-0.454
5	Expert coaches have a bachelor's degree or higher in a discipline of or relating to sport science, exercise physiology, or physical education.	-1	-0.454

Table 19.4 Continued

4	Expert coaches have an advanced level of knowledge regarding sport sciences.	-1	-0.454
25	Expert coaches are flexible. In other words, they know how to align their own competencies such that they are congruent with the needs of their athletes and the context of the competitive setting	-2	-0.908
24	Expert coaches are quicker in their ability to solve problems successfully	-2	-0.908
19	Expert coaches are able to keep things simple for the athlete	-2	-0.908
2	Expert coaches have an advanced level of tactical knowledge of their sport	-2	-0.908
23	Expert coaches make decisions based on instinct and experience rather than theoretical principles	-3	-1.362
18	Expert coaches have a clearly defined role at athletic competitions	-3	-1.362
3	Expert coaches have an advanced ability to design training programs	-3	-1.362
10	Expert coaches are knowledgeable and understanding of personal issues facing the athletes under their supervision	-4	-1.817
6	Expert coaches were exposed to early leadership opportunities as a youth through sport play.	-4	-1.817

Analysis of the post-sort data suggests that both individuals loading onto Factor C strongly believed in the proposition that expert coaches are effective communicators. Respondent 13, the male Skeleton coach, started off by writing, “As a head coach, communication is the one key to running a successful high performance program. Without

effective communication, there is very little understanding of what a coach is trying to accomplish". Respondent 4 agreed with this statement by adding, "Expert coaches must be good communicators and teachers. Trust seems to be built on the ability to communicate". Combined, this data suggests that a coach cannot orchestrate organizational or competitive success without the ability to communicate. Further, it can be surmised that a coach who is an effective communicator will have increased buy-in and trust from the athletes under their supervision. In short, respondent 13 ties up this sentiment with, "Unless a coach possesses the ability to communicate their thoughts, all of their knowledge and usefulness may be lost". Interestingly, no respondent loading onto Factor C discussed the importance of a coach to have competitive experience as an athlete in the sport they currently supervise. However, respondent 13 did allude to statement #1, "Expert coaches have an advanced level of technical knowledge of their sport", which loaded onto the *+3* slot in the factor array with a moderately high z-score (1.362). He referred to the importance of technical knowledge when he stated, "A coach has to have a great deal of qualities in his arsenal which comes from educational experiences". Although not clearly articulated in this quote, it can be proposed that previous competitive experience in the sport can provide the coach with a base of technical knowledge, which can be built upon throughout the coaching career. Respondent # 13 continues his thoughts by providing insight into how Factor C obviates from Factor B.

Recall that respondents on Factor B believed that an expert coach is someone who not only continues to place a premium on personal development, but also has the ability to simplify information for the athletes under their supervision. He separates himself from

individuals loaded onto Factor B with the statement, “Even though it is probably important, it is hard to keep things simple since there are so many variables at play in high-level competitions. My main concern is communicating to the athlete that I have their best interest at heart when I make a logistical decision”.

In comparison to the positively associated anchor statements and factor array, the statements that negatively correlated with Factor C continued to highlight the differences in perspectives regarding expertise in sport coaching. Specifically, Factor C had two statements that loaded onto the *-4* anchor slot with the same z-scores (-1.817). The first anchor statement to negatively associate with Factor C was #7, “Expert coaches were exposed to early leadership opportunities as youth through sport play”. The disagreement with this statement suggests that respondents loading onto this factor believe that expertise is developed through on-going education and learning in the sporting environment, not early exposure to leadership positions. This may also provide evidence of the expert-novice theory, which suggests that it takes a minimum of 10 years of 10,000 hours of deliberate practice to develop expertise in a given field. This statement was not discussed in the post-sort answers, therefore further insight regarding the placement of this statement cannot be provided. The second statement that negatively associated with Factor C was # 10, which states, “Expert coaches are knowledgeable and understanding of personal issues facing the athletes under their supervision”. Just as in the case with statement # 7, the respondents loading onto this factor did not further elaborate on the placement of this statement. However, based on the factor arrays and anchor statements that positively associated with

Factor C, it can be surmised that respondents who loaded onto this factor believe that expert coaches are effective communicators with regard to information regarding the sport. In addition, the previously listed response from participant # 13 may suggest that additional information in the form of an athlete's personal issues may not be at the forefront of what a coach deems important with regard to high performance planning. Recall that respondent #13 stated, "It is hard to keep things simple since there are so many variables at play in high-level competitions. My main concern is communicating to the athlete that I have their best interest at heart when I make a logistical decision". Therefore a proposition can be made that asserts an expert coach makes strong attempts to communicate technical and tactical information to the athlete, but foregoes getting involved in discussing personal matters due to the complexities of the coaching position and level of competition.

In summary, Factor C describes an expert coach as someone who is an effective communicator who has previous experience as an athlete in the sport they supervise. Based on the factor arrays, anchor statements, and post-sort data, the respondents who loaded onto this factor assert that an expert coach effectively communicates logistical and high-performance related information to the athlete on a regular basis. This open line of communication builds the trust between the coach and athlete, which may improve the competitive chances of the athletes under their supervision. In addition, the coach's previous experience as an athlete in the sport may provide them with technical knowledge that can be used in the development of their athletes. Lastly, respondents loading onto Factor C do not believe that an expert coach has to be involved in the personal matters regarding their

athletes. According to this factor it can be suggested that athletes at the Olympic level of competition prefer a coach to communicate technical knowledge rather than providing insight into personal information.

Factor D: The trustworthy coach. Factor D accounted for 7% of the variance explained in this study with 1 of the 15 respondents loading on this factor. As detailed in table 20.4, this lone respondent was a male Bobsled athlete with 14 years of competitive experience on the National team. Within this time, this respondent had also won an Olympic medal. Respondent 3 significantly loaded onto Factor D by the Fuerntratt Criterion (.7976).

Table 20.4

Demographic Characteristics for Factor D

Sort ID	Gender	Sport	Current Position	Years of Experience in Current Capacity	Highest Level of Success
3	Male	Bobsled	Athlete	14	Olympic Medalist

Evidence from the factor arrays, distinguishing statements, positive anchor statements, and post-sort responses indicates that the individual loading onto Factor D considers an expert coach as someone who is trustworthy. In other words, the belief presented in Factor D is that coaches at the highest level of competition are able to build and maintain trust with the athletes under their direction. This proposition is supported by the factor array, which demonstrates that statement #15, "Expert coaches are trustworthy" was

not only tied as having the highest z-score for all 34 statements (1.817), but also serves as one of the anchor statements in the *+4* position. This belief is supported by data collected from the post-sort questionnaire, where respondent #3 clearly states, "Trustworthiness is the most important aspect of coaching. It is no different than any other relationship. If I cannot trust my coach, I will not listen to them". This one statement provides great insight into the perspective of this Olympic medalist. In addition, this respondent believed that an expert coach is a good teacher. This fact was demonstrated with his ranking of statement #13, "Expert coaches are good teachers", which attained an anchor ranking of *+4* with the highest z-score tied to statement #3 (1.817). Unfortunately, this respondent did not elaborate on his decision to rank this statement as an anchor statement. Details regarding all statement ranks and z-scores for Factor D can be found in table 21.4.

Table 21.4

Statement Rank and Z-Scores for Factor D

Statement ID	Statement	Rank	Z-Score
15	Expert coaches are trustworthy	4	1.817
13	Expert coaches are good teachers	4	1.817
20	Expert coaches do not "over-coach". In other words, expert coaches know when to say when	3	1.362
16	Expert coaches facilitate their athlete's goal setting	3	1.362
14	Expert coaches know how to motivate and encourage their athletes	3	1.362
21	Expert coaches are able to make decisive but fair decisions	2	0.908

Table 21.4 Continued

17	Expert coaches create a positive training environment	2	0.908
10	Expert coaches are knowledgeable and understanding of personal issues facing the athletes under their supervision	2	0.908
7	Expert coaches have competitive experience as an athlete in the sport they coach	2	0.908
28	Expert coaches consistently produce successful athletes and/or teams	1	0.454
26	Expert coaches demonstrate a high commitment level to their profession	1	0.454
25	Expert coaches are flexible. In other words, they know how to align their own competencies such that they are congruent with the needs of their athletes and the context of the competitive setting	1	0.454
23	Expert coaches make decisions based on instinct and experience rather than theoretical principles	1	0.454
12	Expert coaches have reasonable expectations of their athlete	1	0.454
31	Expert coaches practice critical reflection	0	0
27	Expert coaches display constant adaptations to their own coaching experiences	0	0
18	Expert coaches have a clearly defined role at athletic competitions	0	0

Table 21.4 Continued

11	Expert coaches have the ability to identify the needs of the athletes under their supervision	0	0
9	Expert coaches can effectively communicate with others	0	0
2	Expert coaches have an advanced level of tactical knowledge of their sport	0	0
30	Expert coaches regularly consult and learn from other expert coaches	-1	-0.454
29	Expert coaches take part in self-directed learning such as reading books, journals, and watching videos	-1	-0.454
8	Expert coaches have competitive experience at the most elite level of competition in the sport they coach	-1	-0.454
4	Expert coaches have an advanced level of knowledge regarding sport sciences.	-1	-0.454
1	Expert coaches have an advanced level of technical knowledge of their sport.	-1	-0.454
34	Expert coaches consistently attend coaching conferences	-2	-0.908
24	Expert coaches are quicker in their ability to solve problems successfully	-2	-0.908
19	Expert coaches are able to keep things simple for the athlete	-2	-0.908
6	Expert coaches were exposed to early leadership opportunities as a youth through sport play.	-2	-0.908
33	Expert coaches worked under a mentor or master coach early in their career	-3	-1.362
5	Expert coaches have a bachelor's degree or higher in a discipline of or relating to sport science, exercise physiology, or physical education.	-3	-1.362

Table 21.4 Continued

3	Expert coaches have an advanced ability to design training programs	-3	-1.362
32	Expert coaches have an official coaching qualification or certification	-4	-1.817
22	Expert coaches are those that are assigned to the National Team or National Governing Body	-4	-1.817

In contrast to the statements and data that positively associated with Factor D, respondent #3 provided additional insight into the statements and constructs that negatively correlate to expert coaching. Specifically, this male bobsled athlete ranked statement #22, "Expert coaches are those that are assigned to the National Team or National Governing Body" with as an anchor statement in the *-4* slot with a very low associating z-score (-1.817). He bolsters the argument against a coach's expertise being affiliated with his or her standing with the National Team with the following statement, "Being a National Team coach has absolutely no relation to being an

expert". Although he does not pinpoint an exact reason for his opinion, the absolute and direct delivery of this statement connotes his feelings and possibly sheds light on previous experiences with various coaches over his 14-year career. In addition, he also placed statement #32 in the *-4* anchor statement slot. This statement reads, "Expert coaches have an official coaching qualification or certification". He highlights his disagreement with this statement by writing, "I don't even know what happens at a coaching conference, and I don't

think my coaches even go. My sport is unique because the coaches can only be former athletes, and there is a very small pool of athletes to choose from". Based on this data, it can be suggested that respondent #3 understands that his sport relies upon coaches to be developed within. In other words, coaches in the sport of Bobsled are typically former athletes due to the nature of the sport. For this reason, attendance at coaching education conferences may not be a part of the sport's culture.

In summary, Factor D references an expert coach as someone who is trustworthy. More specifically, the level of trust between the coach and athlete may play a significant role in competitive outcomes. In addition, the expert coach described in Factor D is a good teacher who is astute on sporting principles from their previous experience as an athlete in the sport, not their involvement in coaching education programs. Further, the respondent loading onto Factor D presents additional evidence that a coach is not deemed an expert by their confirmation as a National Team coach. Regardless of title, the coach must work to gain the trust of the athletes under their supervision.

Factor E: The teaching coach. Factor E accounted for 7% of the variance explained in this study with 1 of the 15 respondents loading on this factor. As noted in table 22.4, this individual respondent was a male Bobsled athlete with 8 years of competitive experience on the National team. Within this time, this respondent had also won an Olympic medal. Respondent #2 significantly loaded onto this factor by the Fuerntratt Criterion (.6017). Evidence from the factor arrays, distinguishing statements, positive anchor statements, and post-sort responses indicates that the individual loading onto Factor E considers an expert

coach as someone who is a good teacher. In other words, the individuals relating to this factor believes that an expert coach must have the ability to pass along important information to the athlete in order to equip them for Olympic or international competition. In addition, the respondent also

Table 22.4

Demographic Characteristics for Factor E

Sort ID	Gender	Sport	Current Position	Years of Experience in Current Capacity	Highest Level of Success
2	Male	Bobsled	Athlete	8	Olympic Medalist

described an expert coach as someone who adapts to his or her own coaching experiences. The respondent may have believed that an expert coach is someone who learns from and adapts to experiences in the field, and in return would share these findings through effective teaching strategies.

As previously stated, the participant who comprised Factor E believed that an expert coach is a good teacher. The factor array provides initial confirmation of this belief as seen in statement #13, "Expert coaches are good teachers". This statement not only held the top position in the factor array, but it was also tied for the highest z-score (1.817) for the factor. In support of his placement of statement #13, this male Bobsled athlete wrote, "Coaches are good teachers. That is what coaching is, teaching". In addition, statement #27, "Expert coaches display constant adaptations to their own coaching experiences", placed as an anchor

statement with the same z-score as statement #13 (1.817). While this respondent does not elaborate specifically on the ability of an expert coach to adapt to experiential learning opportunities, it can be inferred from his quote, "experience can go much further than a formal education", that this Bobsled athlete believes that the knowledge gained through continuous exposure to sport competition provides the coach with enough information to improve an athlete's chances of success in the Olympic games.

In contrast to the statements and data that positively associated with Factor E, respondent #2 provided additional insight into the statements and constructs that negatively correlate to expert coaching. Specifically, this male bobsled athlete ranked statement #22, "Expert coaches are those that are assigned to the National Team or National Governing Body" with as an anchor statement in the *-4* slot with a very low associating z-score (-1.817). This respondent evidenced his feelings regarding a coach's designation to a National Team and expertise by stating, "What a coach has done for the sport and the respect they have from other coaches, means more than their title". Here, he describes an expert coach as someone who has garners respect from fellow peers in the sport as a result of their work. In short, this athlete is saying that an individual earns the designation of expert coach. Lastly, respondent 2 placed statement #6 as a negatively correlating anchor statement, which also had a low associating z-score (-1.817). This statement read, Expert coaches were exposed to early leadership opportunities as a youth through sport play".

This athlete displays his disagreement with this statement by adding, "Coaches do not need to be exposed to leadership at a young age. My sport doesn't even have youth

competitions". Here, the respondent provides insight into the development of coaches within the sport of Bobsled by demonstrating that the sport is not accessible for younger participants within the United States. As a result, he does not believe that success in coaching is associated with early leadership opportunities. Details regarding all statement ranks and z-scores for Factor E can be found in table 23.4.

In summary, Factor E describes an expert coach as someone who is a good teacher. The ability to teach may come from their adaptations to specific occurrences in their sporting careers. In addition, respondent #2 described an expert coach who not only teaches well, but also has garnered respect from other coaches in the profession. This factor continued to demonstrate the belief that expert coaching is not related to an individual's standing within the National Governing Body or employment as a National Team coach.

Summary

This chapter presented the results of this study, which sat out to determine the constructs of expert coaching within the Olympic movement in the United States. Results included the correlation of individual statement sorts, factor correlations, and the resultant factor analysis. Using the online software tool, Q-Assessor, five factors were identified as possible scenarios or belief systems of how to define expert coaching. These five factors were identified as: (a) the Knowledgeable Coach, (b) the Evolving Coach, (c) the Communicating Coach, (d) the

Table 23.4

Statement Rank and Z-Scores for Factor E

Statement ID	Statement	Rank	Z-Score
27	Expert coaches display constant adaptations to their own coaching experiences	4	1.817
13	Expert coaches are good teachers	4	1.817
18	Expert coaches have a clearly defined role at athletic competitions	3	1.362
15	Expert coaches are trustworthy	3	1.362
14	Expert coaches know how to motivate and encourage their athletes	3	1.362
31	Expert coaches practice critical reflection	2	0.908
26	Expert coaches demonstrate a high commitment level to their profession	2	0.908
4	Expert coaches have an advanced level of knowledge regarding sport sciences.	2	0.908
2	Expert coaches have an advanced level of tactical knowledge of their sport	2	0.908
23	Expert coaches make decisions based on instinct and experience rather than theoretical principles	1	0.454
21	Expert coaches are able to make decisive but fair decisions	1	0.454
12	Expert coaches have reasonable expectations of their athlete	1	0.454

Table 23.4 Continued

7	Expert coaches have competitive experience as an athlete in the sport they coach	1	0.454
5	Expert coaches have a bachelor's degree or higher in a discipline of or relating to sport science, exercise physiology, or physical education.	1	0.454
34	Expert coaches consistently attend coaching conferences	0	0
33	Expert coaches worked under a mentor or master coach early in their career	0	0
25	Expert coaches are flexible. In other words, they know how to align their own competencies such that they are congruent with the needs of their athletes and the context of the competitive setting	0	0
17	Expert coaches create a positive training environment	0	0
9	Expert coaches can effectively communicate with others	0	0
8	Expert coaches have competitive experience at the most elite level of competition in the sport they coach	0	0
32	Expert coaches have an official coaching qualification or certification	-1	-0.454
29	Expert coaches take part in self-directed learning such as reading books, journals, and watching videos	-1	-0.454
20	Expert coaches do not "over-coach". In other words, expert coaches know when to say when	-1	-0.454
11	Expert coaches have the ability to identify the needs of the athletes under their supervision	-1	-0.454
1	Expert coaches have an advanced level of technical knowledge of their sport.	-1	-0.454

Table 23.4 Continued

30	Expert coaches regularly consult and learn from other expert coaches	-2	-0.908
24	Expert coaches are quicker in their ability to solve problems successfully	-2	-0.908
19	Expert coaches are able to keep things simple for the athlete	-2	-0.908
3	Expert coaches have an advanced ability to design training programs	-2	-0.908
28	Expert coaches consistently produce successful athletes and/or teams	-3	-1.362
16	Expert coaches facilitate their athlete's goal setting	-3	-1.362
10	Expert coaches are knowledgeable and understanding of personal issues facing the athletes under their supervision	-3	-1.362
22	Expert coaches are those that are assigned to the National Team or National Governing Body	-4	-1.817
6	Expert coaches were exposed to early leadership opportunities as a youth through sport play.	-4	-1.817

Trustworthy Coach, and (e) the Teaching Coach. The five factors were introduced and described by utilizing subject demographics, distinguishing statements, anchor statements, and data collected from the post-sort questionnaires. The following chapter will discuss the implications of the findings of this study.

Chapter Five

Introduction

This study examined the constructs of expert coaching at the highest level of sport competition, namely the Olympic games, by examining current National Team coaches and athletes with previous experience at the Olympics. The study began with an introduction to the purpose of the study and followed with a description of the research questions that guided this endeavor. The purpose of this study was to enhance the development of coaches for participation at International level competition through the improvement of coaching education programming. Although many studies have alluded to the benefit of various coaching education tactics, no study to date had set out to determine the constructs that define an expert coach. Therefore, if a goal of coaching educators is to increase the pool of candidates that can be considered elite level coaches, a working definition of expert coaching was to be determined in order to tailor curriculum and modes of delivery. The study addressed three research questions: (1) What qualities constitute an expert coach? (2) Do coaches and athletes share the same definition of expert coaching? (3) What are the highest and lowest rated concourse items for each factor? Throughout the study I justified the need for this specific research endeavor and provided evidence that answered the aforementioned research questions. As a result, the conclusions yielded from this study may have a positive impact on the coaching profession through the revision of coaching education curriculum.

Prior to beginning the study, an exhaustive search of the relevant literature regarding sport coaching as well as supporting theoretical frameworks such as expert-novice theory and

human capital theory was conducted. Then a proposed a model that blends both human capital and expert-novice theories together to assist in the understanding of expert coaching development at the Olympic level of sport competition was created. Specifically, a model that proposed an expert coach is someone who develops from a novice through the acquisition of human capital through his or her competitive and early coaching opportunities was described. In other words, an expert coach is one who begins to build their human capital from athletic game play as a competitor, then continues to accrue skills and knowledge throughout their development as a coach moving up the ranks in the coaching profession.

The methodology used for this study was Q methodology. This form of data collection, analysis, and interpretation was described in chapter 3. The specific research design for this study was also provided. Specifically, the online software tool, Q-Assessor, was used for data collection and analysis for this study. This program provided a method for the collection of individual Q-sorts and answers to the post-sort questionnaire.

Following the discussion on methodology, a detailed analysis of the data collected through the online statement sorts was provided. This data was reported in conjunction with the relevant demographic information regarding the participants who elected to take part in this study. Together, this chapter provided insight into the factor rotation and subsequent analysis that led to the creation of the 5 factors that were described in this study. Lastly, data collected from the post-sort questionnaire contributed to the descriptions of the factors that were discovered in this study. The five factors that were identified as a result of the data

analysis were named: (a) the Knowledgeable Coach, (b) the Evolving Coach, (c) the Communicating Coach, (d) the Trustworthy Coach, and (e) the Teaching Coach. The interpretation of the 5 factors resulted in the following conclusions and recommendations. Table 1.5 provides a summary of the factors.

Table 1.5

Summary of Identified Factor Characteristics

Factor	Factor Name	Number of Participants	Variance Explained	Constructs of Expert Coaching
A	Knowledgeable Coach	6	46%	(1) Expert coaches have an advanced level of technical knowledge of their sport. (2) Expert coaches identify the needs of individual athletes. (3) Expert coaches can effectively communicate with others.
B	Evolving Coach	5	33%	(1) Expert coaches demonstrate a high commitment level to their profession. (2) Expert coaches regularly consult and learn from other expert coaches. (3) Expert coaches have an advanced level of technical knowledge of their sport.

Table 1.5 Continued

C	Communicating Coach	2	13%	(1) Expert coaches can effectively communicate with others. (2) Expert coaches have previous competitive experience as an athlete. (3) Expert coaches have an advanced level of technical knowledge of sport.
D	Trustworthy Coach	1	7%	(1) Expert coaches are trustworthy. (2) Expert coaches are good teachers. (3) Expert coaches do not overcoach.
E	Teaching Coach	1	7%	(1) Expert coaches are good teachers. (2) Expert coaches display constant adaptations to their own coaching experiences. (3) Expert coaches are trustworthy.

Discussion

Quality of coaching can be surmised to be a limiting factor in elite sporting competitions when the degree of differences in the physiological disposition of competing athletes is small. For instance, a coach has the responsibility of providing technical, tactical, and conditioning instructions to the athletes under their supervision in hopes of besting their

competition. In addition, a coach must know how to motivate their athletes to perform at a level that matches their physical abilities when entering a competition. Thus, a coach who provides these services to their athletes in the most effective manner has positively impacted the chances for competitive success. Typically a coach is assumed to have executed these obligations effectively when they consistently supervise winning teams or athletes. Unfortunately, the assumption that a coach's win-loss record is indicative of expertise does not provide insight into the constructs of quality coaching. Therefore, the perceptions gathered in this study allowed for the creation of factors that shed light on the constructs of expert coaching. Although this study discovered 5 factors that yield distinct and independent beliefs regarding expert coaching, common themes emerged between the factors. These themes suggest a trend in defining expert coaching. This trend supports the foundations for constructing the idealized expert coach. These constructs are described in the following discussion on common themes in expert coaching.

Value of Interpersonal skills. Upon further investigation of the 5 factors and data collected from the questionnaire, it was apparent that coaches and athletes participating in this study shared particular beliefs regarding the meaning of expert coaching. In chapter 2 it was suggested that coaching is a high-directive and high-supportive approach style. In sport coaching directive behaviors are those that assist team members in goal accomplishment through giving directions, establishing goals and methods of evaluation, setting time lines, defining roles, and showing how the goals are to be achieved. Directive behaviors clarify, often with one-way communication, what is to be done, how it is to be done, and who is

responsible for doing it. On the other hand, supportive behaviors help the athletes feel comfortable about themselves, their teammates, and the situation. Supportive behaviors involve two-way communication and responses that show social and emotional support to others. In this approach, the leader focuses communication on both goal achievement and maintenance of subordinates' socioemotional needs. The coaching style requires that the leader involve themselves with subordinates through giving encouragement and soliciting subordinate input.

The assertion that coaching is both a directive and supportive leadership style is supported by the factor arrays resulting from the data analysis. First and foremost, a majority of the individuals participating in this study believe that an expert coach is a good teacher, which was a positively scoring statement for 4 of the 5 factors. Participant 2, a Bobsled athlete who loaded onto Factor E supported this requirement by stating, "Coaches are good teachers. That is what coaching is, teaching." These participants believe that coaches are not only good teachers, but are effective communicators, which was a concourse item that positively loaded onto Factors A and B. The argument that effective communication is a component of good teaching is evidenced in the statement provided by a Skeleton coach who Factor C, "As a head coach, communication is the one key to running a successful high performance program. Unless a coach possesses the ability to communicate their thoughts, all of their knowledge and usefulness may be lost." Extending the argument for effective coaching and the need for interpersonal skills, a Bobsled athlete that loaded onto Factor C wrote, "Expert coaches must be good communicators and teachers. Trust seems to be built

on the ability to communicate". This statement brings attention to concourse item #15, "Expert coaches are trustworthy", which is positively associated to 4 of the 5 factors. A Bobsled athlete who loaded onto factor D explains the importance of trust in the coach-athlete dyad by stating, "Trustworthiness is the most important aspect of coaching. It is no different than any other relationship. If I cannot trust my coach, I will not listen to them." The ability to teach an athlete utilizing effective communication strategies while at the same time nurturing a trusting relationship may give a coach the ability to create a training environment that is favored by the athlete. This assumption may be evidenced by the positive association of concourse item #17, "Expert coaches create a positive training environment" with 3 of the 5 factors.

Collectively the information gathered from the factors resulting from the data analysis suggest that an expert coach is someone who has a firm grasp on effective interpersonal skills, namely the ability to teach and communicate, as well as nurturing a trusting relationship with the athletes under their supervision. Lastly, these coaches ensure the promotion of a positive training environment where athletes can focus on maximizing competitive abilities.

Development of coaching knowledge. Just as important as the component of interpersonal skills is to defining an expert coach is the coach's development of coaching knowledge. As mentioned earlier, this research study proposed that coaching expertise is the result of phasic development from novice status through the acquisition of human capital. Moreover, the human capital that one collects in the coaching profession is in the form of

technical knowledge that can assist in the betterment of athletic success in competition. This postulation was supported by the fact that concourse item #1, "Expert coaches have an advanced level of technical knowledge of their sport", positively associates with 3 of the 5 factors. This finding from the factor arrays is further supported by qualitative data collected from the post-sort questionnaire. For example, a Bobsled coach loading onto Factor A stated, "It is very important for coaches to know strategies to put athletes in a position to win at the highest level". A Biathlon athlete that also loaded onto Factor A supported this claim by suggesting, "Most athletes need to know certain things to improve; they need knowledge." Through the analysis of this commentary it can be understood that the foundations of expert coaching is built upon the coach's technical knowledge.

As previously mentioned, most participants in this study agree that an expert coach is one that has attained an advanced level of technical knowledge regarding their sport. The Skeleton coach that loaded onto Factor C summarized this belief by writing that "A coach has to have a great deal of qualities in his arsenal which comes from educational experiences." Interestingly, additional data collected from the post-sort questionnaire gives rise into the interpretation of valuable educational experiences. Initially, it can be suggested that individuals taking part in this study believe that field-based experiences are the most influential educational opportunities for developing coaching expertise. A Freestyle Ski athlete who is associated with Factor A stated, "Coaches don't need official degrees or certifications to prove that they are a good coach. Some coaches are good just based on their field experience." A Canoe/ Kayak coach, who also loaded onto Factor A, further supports

the need for field-based training. This coach stated, "Coaching as many athletes as possible from beginner to expert gives the most valuable knowledge to the coach and makes the coach the most effective, not formalized education." Through this statement, a trend suggesting the preference for informal, experiential learning opportunities over more formal, traditional learning environments emerges. Further evidence for this trend is found in a statement provided by a Biathlon coach that loaded onto Factor B. This individual wrote, "Educational degrees in sport science are not a necessity. There are other ways to learn coaching such as mentoring, job experience, and coaching conferences. Mine, for example, is a non-traditional background. I have a high school degree and no high-level competitive experience. I developed through passion for the sport, direct mentoring, and learning on the job." Not only did this coach allude to the fact that on-the-job training was an effective method of acquiring technical knowledge, but also that mentoring is a key component in coaching development. One of the Canoe/ Kayak coaches who loaded onto Factor B, supports the benefits of mentoring and peer-based education. This support can be seen in his quote, "Typically I have found that expert coaches are not afraid to consult with other coaches for training advice. Expert coaches are students of the game. They are constantly learning." An athlete from the sport of Biathlon who loaded onto Factor B understood the importance of looking for educational support from others when he wrote that an expert coach "doesn't have to have an elite level of sport science knowledge. They do however need to be able to know where to find that information when they need it." A coach's desire to improve their athlete's competitive chances may be a significant reason for being open to

refining their craft based on interactions with other coaches and professionals in the field. Evidence for this proposition is demonstrated by the statement provided by a Canoe/ Kayak Coach from Factor B, which stated, "I believe that a good coach is motivated to keep learning so they can provide their athletes with competitive advantages." Finally, a Luge athlete from Factor A demonstrates the limitations of a formal education by stating, "Having an education does not make you an expert coach. If you don't have sport knowledge and personality it does not matter how many classes you have taken." Interestingly, this quote ties coaching expertise to not only advanced technical knowledge, but also the aforementioned requirements for sound interpersonal skills.

Collectively, the data highlighted in this theme suggests that an expert coach is someone who acquires technical knowledge from years of experience in the field as an athlete and a coach climbing up the professional ranks. The time spent in the field provides, not only time for experiential learning to occur, but opportunities for interactions with mentors and peer coaches. It can be deduced from the data collected from the questionnaires that an expert coach is also someone who knows where to go for answers regarding difficult questions, and is motivated to pursue this information by their commitment to the profession and their desire to improve their athlete's competitive abilities.

Limitations

This study examined the constructs of expert coaching at the highest level of sport competition by investigating the beliefs of current National Team coaches and athletes employed by sporting federations under the auspices of the United States Olympic Committee. By narrowing the study to only focus on the individuals that work at the National and International level of athletic performance limits the input of coaches working at lower branches of elitism. Therefore, the individuals taking part in this study may not represent the total sum of coaches working at all levels of competitive sport. This choice in sampling population may result in a limited transfer of usage to lower levels of sport employment. In other words, the knowledge gained from this study may not be generalizable to coaches employed across the sporting spectrum.

Further, the decision to study individuals employed by National teams and Olympic sport federations may limit the construction of knowledge as it could be assumed that the researcher believes that expert coaching is a given at this level of sport competition. As detailed in the methodology, the decision to utilize current National team coaches and National team athletes is based on the collective agreement of previous researchers attempting to determine an individual's eligibility as an expert coach (Baker, Cote, & Abernathy, 2003; Cote, Salmela, Trudel, Baria, & Russell, 1995; Cote & Sedgwick, 2003; Horton, Baker, & Deakin, 2005). As a result, coaches who are indeed experts but supervise athletes at lower rankings of sport competition or play have been prevented from providing insight into the subject matter. In addition, it is possible that individual's employed by the

USOC or a given NGB may not be capable of successfully shedding light on the constructs of elitism due to limited information regarding the topic.

Recommendations for Practice

This study set out to define the constructs of expert coaching within the United States Olympic movement. Fifteen current National team coaches and athletes with previous experience at the Olympic games sorted 34 statements yielding 5 unique factors. These 5 factors were supported with the emergence of common themes that were utilized to further develop the constructs of expert coaching. Acknowledging that expert coaching is a limiting factor in sporting success, adoption of these factors and themes in the refinement of coaching education curriculums may be of benefit. Specifically, the charge of most coaching education programs within the United States is to better prepare the coaching profession for sporting success at various levels of competition. Moreover, it can be postulated that the American public has grown accustomed to our Nation's recent success in international competition, which requires a concerted effort by coaching educators to develop strategies that will further grow our coaching population. Ideally, this coaching population will be cultivated using best practices in the field of coaching science and through the adoption of curriculum that develops expert leaders. The first step in developing a population of expert leaders is to understand what defines expertise in elite sport. The results of the study provide a clearer understanding of how coaching expertise is defined by individuals currently coaching and competing in the most elite level of sport, the Olympic games. Using these defining constructs of expert coaching as a guide, coaching educators can provide curriculum

and educational activities that increase the probability of creating expert leaders. This type of programming may be of upmost importance to sports in the Olympic catalog since most of the them, such as Bobsled, Canoe/ Kayak, Biathlon, Ski Jumping, Archery, and Weightlifting, witness the rise of former athletes to coaching positions due to a lack of participation, visibility, and/or interest at the grassroots level of sport in America. While the reasons for this matter are beyond the scope of this research study, it can be deduced that the overriding popularity and economic impact of traditional American sports such as baseball, football, and basketball leave little room for the development of Olympic-based programming at the club, scholastic, and collegiate levels. This limited exposure to a wider population of potential athletes and coaches results in even lesser pools of candidates for high performance coaching positions. Therefore, for lesser-known Olympic sport programs to continue, former athletes may need to graduate into the coaching ranks in order to pass on valuable information regarding technical and tactical developments in the sport. A side effect of the promotion of former athletes to Olympic sport coaches may be the existence of a coaching profession who understands the technical aspects of their sport but lacks awareness in methods of improving interpersonal skills, leadership, pedagogy and andragogy, self-directed learning, and critical reflection, which have all been alluded to play a role in defining coaching expertise by the participants in this study. As such, I recommend that coaching educators within the United States Olympic movement utilize the constructs provided in this study to guide the process of refining educational material and delivery

systems to match not only the needs of athletes who are competing in elite sport, but the demographics of the entering coaches to the profession.

Recommendations for Research

This study set out to determine the constructs of expert coaching by capturing the beliefs and attitudes of current United States National Team coaches and athletes who had previous experience at the Olympic games. While this study did elucidate the preferred characteristics of expert coaching at the most elite level of sport, it did not attempt to determine how the qualities are created and cultivated. In order to successfully develop a strong coaching population, an exploration into coaching expertise development is warranted.

While this study did unearth the belief that coaching expertise is related to an individual's level of technical knowledge that is acquired through years of experience as an athlete and coach in a given sport, it is unknown whether or not additional educational opportunities related to sport science, psychology, sociology, or leadership would bolster this individual's level of expertise. Recall that Stone, Stone, and Sands (2005) bring attention to the fact that most coaches in the United States are unable to study sport or coaching science in the university system due to a lack of financial support for grants and research. If this assertion holds true, then it can be proposed that many of our Nation's athletes do not have the experiences or insight to measure the impact a sport or coaching science-based education has on coaching expertise. As a result, I also advocate that research attempting to measure the success of coaches who have both competitive experience in the sport as well as formalized education in coaching science, sport science, or a related field be completed in

order to provide further insight into the best methods of developing expertise in the coaching ranks.

Conclusion

This study used Q methodology to determine the constructs of expert coaching at the Olympic level of competition within the United States. In order to complete this endeavor, fifteen coaches and athletes who had previous experience at the Olympic games sorted 34 statements regarding expert coaching on a scale of "most like an expert coach" to "least like an expert coach". As a result of the factor analysis on the 15 sorts, a total of 5 factors emerged from the data. These five factors represented the unique perspectives and beliefs regarding expert coaching within the United States Olympic movement. Upon completion of the data analysis and interpretation of answers from the post-sort questionnaire, the 5 factors were identified as (a) the Knowledgeable Coach, (b) the Evolving Coach, (c) the Communicating Coach, (d) the Trustworthy Coach, and (e) the Teaching Coach. Additionally, common themes were discovered between the factors. These commonalities in describing an expert coach were categorized as (a) the value of interpersonal skills, and (b) development of coaching knowledge.

Collectively, the data unearthed in this study expands the current understanding of coaching theory by providing the constructs of how expert coaching is defined. Specifically, an expert coach is an individual who is knowledgeable on the technical demands of their sport and can convey this information to each athlete according to their individual needs and motivational patterns. This ability not only improves the coach-athlete dyad but portrays the

coach as an effective teacher. In addition, expert coaches demonstrate a continued desire to hone their craft through self-directed educational opportunities. The aim of their continued study is to further the competitive chances of the athletes under their supervision.

This study and its findings are meant to provide insight into the current attitudes and beliefs regarding expert coaching at the highest level of international competition, namely the Olympic games. The data collected and interpreted in this study is meant to elucidate important themes that can be used by coaching educators within higher education and coaching education programs within the United States to further improve the profession of coaching. Through improved coaching education, the United States Olympic movement can maintain sporting excellence by fostering a collection of coaches who are armed with the characteristics necessary to achieve success on the international stage.

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APPENDIX

Appendix A

NC STATE UNIVERSITY

Campus Box 7514

Raleigh, North Carolina 27695-7514

919.515.2444 (phone)

919.515.7721 (fax)

From: Deb Paxton, IRB Administrator
North Carolina State University
Institutional Review Board

Date: 9/27/11
Title: Defining the Constructs of Expert Coaching: A Q-methodological Study of Olympic Sport Coaches
IRB#: 2241

Dear Mr. DeWeese:

The research proposal named above has received administrative review and has been approved as exempt from the policy as outlined in the Code of Federal Regulations (Exemption: 46.101. b.2). Provided that the only participation of the subjects is as described in the proposal narrative, this project is exempt from further review.

NOTE:

1. This committee complies with requirements found in Title 45 part 46 of The Code of Federal Regulations. For NCSU projects, the Assurance Number is: FWA00003429.

2. Any changes to the research must be submitted and approved by the IRB prior to implementation.

3. If any unanticipated problems occur, they must be reported to the IRB office within 5 business days.

Please forward a copy of this letter to your faculty sponsor, if applicable.

Thank you.

Sincerely,

Deb Paxton

NC State IRB

Appendix B

Timeline

Written Comprehensive Exams	August 15, 2010
Have Completed Proposal for Chair	August 1, 2011
Send Proposal to Committee	August 11, 2011
Dissertation Proposal Defense	August 19, 2011
Make Revisions	August 20-30, 2011
IRB	September 1, 2011
Recruit Participants/ Data Collection	September 1-30, 2011
Final Edits to Chapter 3	October 1-20, 2011
Analyze Data/ Write Chapter 4	October 20-Nov. 10, 2011
Write Chapter 5	Nov. 10-Dec. 17, 2011
Submit to Chair	December 17, 2011
Revisions	Month of December
Submit to Committee	January 1, 2012
Complete Revisions	January 20, 2012
Defense	February 10, 2012
Send to Graduate School	February 25, 2012

Appendix C

Participant Introduction Letter

Dear Participant <Name>:

As you are aware of, serving as a coach or administrator at the National and International levels of sport are not only a rare occurrence, but also a challenge worthy of expert knowledge. For this reason, I am contacting you to request your participation in a research study constructed to determine the defining constructs of elite sport coaching. You have been identified as a potential participant for study due to your high standing and experience working at the highest level of elitism in sport.

The results of this study will aim to improve the current coaching education protocols by providing a clearer understanding of the key components that shape expert coaching knowledge.

This study is being conducted by Brad H. DeWeese, a doctoral student at North Carolina State University, under the supervision of Dr. James E. Bartlett II, Associate Professor of Leadership, Policy and Adult Higher Education at North Carolina State University. As a result of the researcher's previous work in coaching education and current status with a National team, various Olympic Sport National Governing Bodies including USA Track and Field, and USA Canoe/ Kayak are supporting the study.

Your participation in this study will require you to complete a ranking of statements encompassing the many opinions concerning expert coaches followed by the completion of a brief questionnaire. It is estimated that this study can take 45 minutes to 1.5 hours. Most often, the researcher will present the research material to the participant in person in order to provide any additional clarification. In cases where the research participant is geographically located at a distance beyond the travel of the investigator, the materials will be mailed to the participant.

The research team will do everything possible to ensure your privacy. Your final statement sorting and questionnaire responses will be kept confidentially. Your identity will not be revealed in any publication that may follow this study.

Please contact me at dlive11@gmail.com or call me at 828-280-4108 for any questions or concerns that you may have. In addition, you are obliged to contact the research supervisor, Dr. James E. Bartlett II, at james_bartlett@ncsu.edu.

Thank you for your time and consideration.

Sincerely,

Brad H. DeWeese

Appendix D

Q-Sort Guidelines

Sort the cards on a range of +4 to -4 from the characteristics that you feel best define an elite coach (+4) to those characteristics that least define an elite coach (-4).

Instructions for completing the online sort:

1. When you are ready to begin the online statement sort, click the active link found within the invitation email.
2. Once you have arrived at http://q-assessor.com you will take part in a series of steps that ask you to place virtual cards (statements) in various boxes based on your personal beliefs regarding expert sport coaching.
3. Begin by reading all of the 34 cards provided in order to become familiar with the statements.
4. When ready, drag each card to one of three virtual boxes at the bottom of the screen until all cards have been placed. These virtual boxes can be defined as:
    a. **Category 1**: (*right hand side*): Statements you believe define an elite coach.
    b. **Category 2**: (*left hand side*): Statements you do not believe define an elite coach.
    c. **Category 3**: (*middle*): Statements that you are unsure about.
5. Once all cards have been placed into one of three categories, you will be automatically taken to the next webpage where you will continue to rank the statements even further.
6. Begin step 2 by taking the statements from **Category 1** and place the top two cards that you believe best define an elite coach and place them in any order under the far right position (+4) as seen below.
7. Next, take two cards from **Category 2** and place them in any order under the far left position (-4).
8. Return to **Category 1** and choose three statements that represent the next most important defining characteristics of an elite coach and place them in any order under position (+3). Continue this process by performing the exact same steps for **Category 2** but position them under (-3).
9. You should continue this process of moving towards the middle of the diagram. Once you exhaust the cards from **Category 1** and **Category 2**, you may then begin to place cards from the **Category 3** pile.
10. Upon completing the sorting process, you should have the following number of cards under each designated position:
    a. 2 Cards under positions +4 and -4.
    b. 3 cards under positions +3 and -3.

c. 4 cards under positions +2 and -2.
d. 5 cards under positions +1 and -1.
e. 6 cards under position 0.

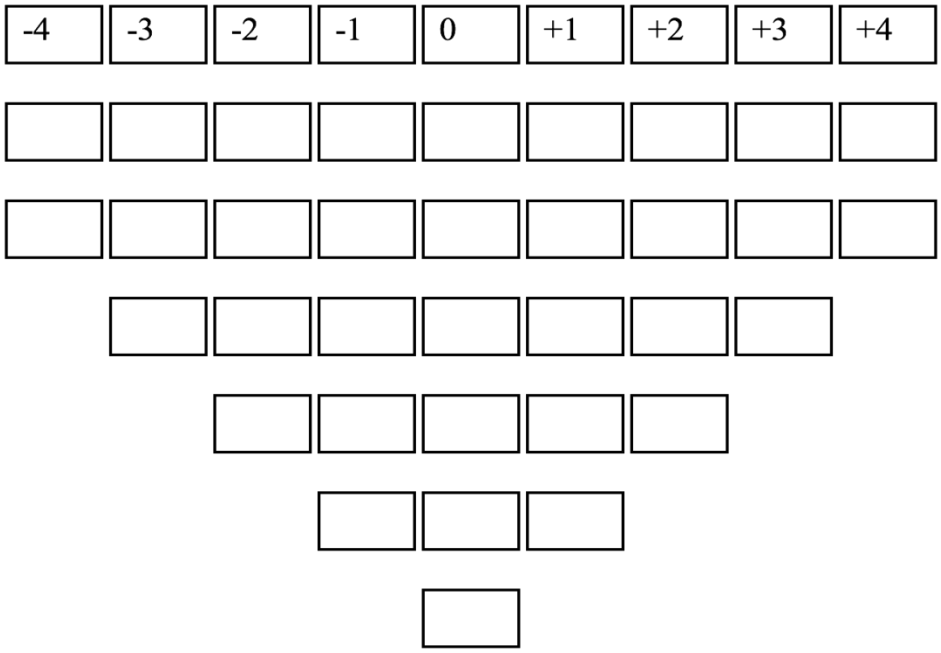
11. You are allowed to move the cards around during the sorting process until you are completely satisfied with your final layout.

12. Once you are satisfied with your final sort, you will then be asked to confirm your decisions by clicking the link that is automatically displayed upon the placement of the final statement.

13. Upon completion of the online card sort, you will be asked to answer a series of questions that will assist the researcher in understanding the influencing factors regarding each card sort.

Appendix E

Conceptual Q-Sort Grid



Appendix F

Post Card-Sort Questionnaire

1. Please provide the number of one card that was placed under +4 and your explanation for doing so.

   Card #: _____

   Explanation:

   _____

   _____

   _____

   _____

2. Please provide the number for one card that was placed under -4 and your explanation for doing so.

   Card #: _____

   Explanation:

   _____

   _____

   _____

   _____

3. Please provide the number for one card that was placed under -2 and your explanation for doing so.

   Card #: _____

   Explanation:

   _____

   _____

4. What specific statements were the most difficult to place? Provide two examples and explain your thoughts.

   Card #: _____ Card #: _____

   Explanation(s):

5. In your opinion, what factors influenced or shaped the way in which you sorted the cards? Please provide any information that you feel is relevant to this study.

6. When performing this card sort, where there any topics or statements that you felt should have been included? If so, please list below.

_____

_____

_____

_____

_____

_____

_____

_____

_____

7. While you reflect on your final sort, are there any recommendations you would provide a National Governing Body or accrediting agency with regard to the shaping of curriculum in order to improve elite coaching knowledge?

_____

_____

_____

_____

_____

_____

_____

_____

Appendix G

Subject Demographics

_____: Identification Number Provided By Q-Assessor *(Researcher Only)*

1. Birthday: _____
2. Gender: _____ Female (1)_____ Male (2)
3. Positions Previously or Currently Held (check all that apply):

    _____ National Team Head Coach

    _____ National Team Staff

    _____ Director of High Performance (NGB)

    _____ Director of Coaching Education (NGB)

    _____ Other: _____

4. How many years have you served at the National/ International Level of Sport? _____
5. Primary Sport of Employment: _____
6. Highest Coaching Position Attained:

    _____ No Coaching Experience (0)

    _____ High School Coach (1)

    _____ Collegiate Coach (2)

    _____ Club Coach (3)

    _____ Professional Team Coach (4)

    _____ National Team Coach (5)

    _____ Olympic Team Coach (6)

7. Highest Level of Sport Participation as an Athlete:

    _____ High School (1)

    _____ College (2)

_____ Professional (3)

_____ National Competition (4)

_____ International Competition/ Non-Olympic (5)

_____ Olympic competition (6)

8. Highest level of success achieved by athletes under your direction:

_____ Conference Champion

_____ All-American

_____ National Champion

_____ World Champion

_____ Olympian

_____ Olympic Medalist

_____ Olympic Gold Medalist

_____ Other: _____

9. Do you hold any coaching certifications/ credentials?

_____ Yes (1)

_____ No (0)

10. If yes, please provide a list. *For example, USA Track & Field Level 2*.

_____

_____

_____

Appendix H

Initial Concourse List

Knowledge Base

1. An expert coach has above average knowledge in injury prevention and rehabilitation.
2. An expert coach has advanced knowledge in program design.
3. An expert coach has advanced knowledge in training theory.
4. An expert coach has advanced knowledge of biomechanics.
5. An expert coach has advanced knowledge in the role of nutrition in performance.
6. An expert coach has advanced knowledge of physiology.
7. An expert coach has above average knowledge of many sports.

Athletic Experience

8. Expert coaches were exceptional athletes.
9. An expert coach has previous experience as an athlete at the International level of competition.
10. An expert coach was an athlete in the sport they coach.

Coaching Relationships

11. An expert coach is a great motivator.
12. An expert coach is a good listener.
13. An expert coach shows compassion towards their athletes.
14. An expert coach is an effective communicator.
15. An expert coach makes themselves available to their athletes away from practice and competition.
16. An expert coach is a leader
17. An expert coach has the ability to relate to their athlete's experiences.
18. An expert coach is authoritative.
19. An expert coach trusts his or her athletes.
20. An expert coach understands the unique differences between coaching male and female athletes.
21. An expert coach gives individual attention.
22. An expert coach is open to other's ideas and viewpoints.
23. An expert coach serves as a mentor to younger, newer coaches.

Coaching Experience

24. A coach is considered an expert if they coach an Olympian.
25. A coach is considered an expert if they coach National Champions.
26. An expert coach has a high winning percentage.
27. An expert coach can have a losing record.

Coaching Characteristics

28. An expert coach does not place an emphasis on winning.
29. An expert coach emphasizes goal attainment.
30. An expert coach insists on winning at all costs.
31. An expert coach understands how minute details intertwine into the big picture.
32. An expert coach is successful at completing administrative duties and assignments.
33. An expert coach knows his or her own limitations.
34. An expert coach can develop a talented athlete.
35. An expert coach effectively manages established talented athletes.
36. An expert coach knows when "enough is enough", in other words when to shut a practice down before negative experiences occur.
37. An expert knows the limits of their expertise.
38. An expert coach displays consistent and repeated measures of successful performances.
39. The athlete's under the direction of an expert coach display superior performances in comparison to athletes under the supervision of non-expert coaches.
40. An expert coach understands the intertwining of the smaller parts in a complex system.
41. An expert coach displays consistency in their approach to training philosophy.
42. An expert coach can quickly adapt to changes.
43. An expert coach makes correct decisions under pressure.
44. An expert coach has an emotional understanding of the complexities of the sport.

Acquisition of Expertise

45. Expert coaching is the culmination of many hours spent learning the sport and related sciences.
46. Expert coaches identify their weaknesses and deliberately study in order to strengthen their knowledge base on that given subject.
47. A coach is considered an expert if they have coached for more than 10 years.
48. Expertise is gained through formal education.
49. Expertise is gained through apprenticeship.
50. Expert coaches served as an understudy to an established expert coach.
51. Expert coaching is a natural, innate talent.
52. Expertise is domain/ occupational specific.
53. An expert coach is in the eye of the beholder.
54. Expertise is a designation bestowed on a coach by their peers and colleagues.

Educational Resources

55. An expert coach takes part in continuing education opportunities offered by National Governing Bodies.
56. An expert coach gains additional professional insight casually from other expert coaches.

57. An expert coach holds coaching certifications provided by National Governing Bodies.
58. An expert coach has a formal degree in sport science or related field.
59. An expert coach has access to other experts in supporting fields such as medicine and science.

Appendix I

Revised Concourse List

Knowledge Base

1. Expert coaches have an advanced level of technical knowledge of their sport. (Gibbons, et. al, 2003; Larkin, et al., 2007).
2. Expert coaches have an advanced level of tactical knowledge of their sport. (Larkin, et al., 2007)
3. Expert coaches have an advanced ability to design training programs. (Gibbons, et al., 2003; Larkin, et al., 2007).
4. Expert coaches have an advanced level of knowledge regarding sport science. (Stone, et al., 2003)
5. Expert coaches have a bachelor's degree or higher in a discipline of or relating to sport science, exercise physiology, or physical education. (Erickson, et al., 2007).

Athletic Experience

6. Expert coaches were exposed to early leadership opportunities as a youth through sport play. (Erickson, et al., 2007).
7. Expert coaches have competitive experience as an athlete in the sport they coach. (Larkin, et al., 2007)
8. Expert coaches have competitive experience at the most elite level of competition in the sport they coach. (Erickson, et al., 2007; Schinke, et al., 1995)

Coaching Relationships

9. Expert coaches can effectively communicate with others. (Larkin, et al., 2007)
10. Expert coaches are knowledgeable and understanding of personal issues facing the athletes under their supervision. (Larkin, et al., 2007)
11. Expert coaches have the ability to identify the needs of the athletes under their supervision. (Larkin, et al., 2007)
12. Expert coaches have reasonable expectations of their athletes. (Gould, et al., 2002)
13. Expert coaches are good teachers. (Cote, et al., 2003; Gibbons, et al., 2003).
14. Expert coaches know how to motivate and encourage their athletes. (Gibbons, et al., 2003).
15. Expert coaches are trustworthy. (Gibbons, et al., 2003).
16. Expert coaches facilitate their athlete's goal setting. (Cote, et al., 2003).
17. Expert coaches create a positive training environment. (Cote, et al., 2003).

Coaching Characteristics

18. Expert coaches have a clearly defined role at athletic competitions. (Larkin, et al., 2007)
19. Expert coaches are able to keep things simple for the athlete. (Gould, et al., 2002)
20. Expert coaches do not "over-coach". In other words, expert coaches know when to say when. (Gibbons, et al., 2003; Gould, et al., 2002).

21. Expert coaches are able to make decisive but fair decisions. (Gould, et al., 2002)
22. Expert coaches are those that are assigned to the National Team or National Governing Body. (Gibbons, et al., 2003).
23. Expert coaches make decisions based on instinct and experience rather than theoretical principles. (Berliner, 1988).
24. Expert coaches are quicker in their ability to solve problems successfully. (Berliner, 2004; Conford, et al., 1995).
25. Expert coaches are flexible. In other words, they know how to align their own competencies such that they are congruent with the needs of their athletes and the context of the competitive setting (Berliner, 2004; Cote, 2007).
26. Expert coaches demonstrate a high commitment level to their profession. (Gibbons, et al., 2003).
27. Expert coaches display constant adaptations to their own coaching experiences. (Conford, et al., 1995; Larkin, et al., 2007)
28. Expert coaches consistently produce successful athletes and/or teams. (Ericsson, et al., 2007).

Educational Practices

29. Expert coaches take part in self-directed learning such as reading books, journals, and watching videos. (Cote, 2006)
30. Expert coaches regularly consult and learn from other expert coaches. (Cote, 2006).
31. Expert coaches practice critical reflection. (Cote, 2006; Larkin, et al., 2007)
32. Expert coaches have an official coaching qualification or certification. (Erickson, et al., 2007; Larkin, et al., 2007).
33. Expert coaches worked under a mentor or master coach early in their career. (Larkin, et al., 2007).
34. Expert coaches consistently attend coaching conferences. (Cote, 2006).

Appendix J

Means and Standard Deviations for each Q-Sort Statement

Statements	-4	-3	-2	-1	0	1	2	3	4
1	0	0	0	2	0	2	2	2	7
2	0	0	1	0	4	2	3	3	2
3	0	2	2	3	3	2	2	1	0
4	0	1	5	4	1	0	4	0	0
5	6	2	3	2	1	1	0	0	0
6	2	6	2	5	0	0	0	0	0
7	0	5	1	1	1	2	2	2	1
8	4	2	2	4	1	2	0	0	0
9	1	0	0	0	5	0	3	3	3
10	1	1	3	2	3	2	2	1	0
11	0	0	0	1	3	1	7	1	2
12	0	0	3	3	5	3	1	0	0
13	0	0	0	1	2	3	3	2	4
14	0	0	0	0	2	2	4	5	2
15	0	0	1	0	2	3	2	5	2
16	0	1	2	2	3	3	2	2	0
17	1	0	0	1	3	4	2	3	1
18	0	2	2	5	2	1	1	2	0
19	0	0	5	3	1	2	3	1	0
20	1	0	0	3	5	2	2	2	0
21	0	0	2	5	2	3	2	0	1
22	7	6	1	1	0	0	0	0	0
23	0	2	2	4	2	4	1	0	0
24	0	0	6	2	3	4	0	0	0
25	0	0	1	0	5	7	1	1	0
26	0	0	0	0	3	6	1	3	2
27	0	0	0	3	5	3	2	0	2
28	1	2	2	4	1	4	1	0	0
29	0	0	2	6	4	2	0	0	1
30	0	0	1	1	3	3	4	3	0
31	0	1	0	1	6	2	2	3	0
32	6	3	3	2	1	0	0	0	0
33	0	6	3	2	3	0	1	0	0
34	0	3	5	2	5	0	0	0	0
Mean Occurrence Per Statement	0.882	1.324	1.765	2.206	2.647	2.206	1.765	1.324	0.882
Standard Deviation	1.904	1.902	1.671	1.684	1.668	1.683	1.539	1.492	1.513

Appendix K

P Set Demographic Data

Sort ID	Sport	Position	Gender	Years Experience	Highest Level of Competitive Success
1	Bobsled	Athlete	Female	4	Olympic Medalist
2	Bobsled	Athlete	Male	8	Olympic Medalist
3	Bobsled	Athlete	Male	14	Olympic Medalist
4	Bobsled	Athlete	Female	9	Olympian
5	Bobsled	Coach	Male	2	Coached Olympian/ Olympic Medalist as Athlete
6	Biathlon	Coach	Male	3	Coached Olympian
7	Freestyle Ski	Athlete	Female	3	Olympian
8	Canoe/ Kayak	Coach	Male	25	Coached Olympic Medalist
9	Canoe/ Kayak	Coach	Male	11	Coached Olympic Medalist
10	Canoe/ Kayak	Coach	Male	9	Coached Olympic Medalist
11	Luge	Athlete	Female	12	Olympian
12	Biathlon	Athlete	Male	12	Olympian
13	Skeleton	Coach	Male	13	Coached Olympic Medalist
14	Ski Jump	Coach	Male	8	Coached Olympian
15	Biathlon	Athlete	Female	4	Olympian

Appendix L

Standard Errors for Differences in Normalized Factor Scores

Factors	A	B	C	D	E
A	0.344	0.412	0.509	0.509	0.509
B	0.412	0.471	0.557	0.557	0.557
C	0.509	0.557	0.632	0.632	0.632
D	0.509	0.557	0.632	0.632	0.632
E	0.509	0.557	0.632	0.632	0.632
F	1.029	1.054	1.095	1.095	1.095
G	1.029	1.054	1.095	1.095	1.095

Appendix M

Original Unrotated Factors

Sorts	Factor A	Factor B	Factor C	Factor D	Factor E
1	0.64875	-0.08405	0.00417	0.00765	0.18607
2	0.3858	0.05679	0.00372	-0.18141	0.38811
3	0.62143	0.36909	0.13936	-0.45319	-0.16569
4	0.83732	0.16623	0.02814	-0.1162	0.16872
5	0.798	0.20347	0.04104	0.08617	-0.0681
6	0.68968	-0.4252	0.16934	-0.14663	-0.02759
7	0.84585	-0.08944	0.0058	-0.13511	-0.29978
8	0.61996	-0.16939	0.02116	0.1917	0.02251
9	0.50311	-0.23497	0.04357	-0.16926	0.03904
10	0.26061	-0.50354	0.26362	0.09682	-0.142
11	0.80261	0.32485	0.1061	-0.02045	-0.12513
12	0.76209	-0.32413	0.0898	0.16041	0.20478
13	0.40677	0.45919	0.2345	0.16694	0.26457
14	0.80491	0.11604	0.01437	0.28753	-0.21386
15	0.7469	0.11157	0.01306	0.18586	-0.29835
Eigenvalues	6.7867	1.1892	0.1972	0.545	0.621
% Total Variance	45.2447	7.928	1.3147	3.6333	4.14