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YOUTH SPORT COACHING EFFICACY:
COACH EDUCATION LEVEL AS A PREDICTOR OF COACHING EFFICACY

By

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A THESIS

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YOUTH SPORT COACHING EFFICACY:
COACH EDUCATION LEVEL AS A PREDICTOR OF COACHING EFFICACY

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University of Nebraska, 2013

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The purpose of this research was to evaluate coaches' level of education as a predictor of their coaching efficacy level. The study tested ten hypotheses. Two for each of the five types of coaching efficacy identified: (1) Coaches with a higher level of education will not exhibit a higher level of coaching efficacy and (2) male coaches will not exhibit a higher level of coaching efficacy than similarly educated female coaches. Individuals (N=1669) coaching teams within the YMCA of Lincoln, NE Youth Sports Branch were emailed a link to an online survey developed using Qualtrics software. An analysis of variance (ANOVA) and a linear regression analysis were run for each hypothesis on all five identified levels of coaching efficacy. Results showed that education level alone could not be used as a predictor of coaching efficacy. Only when the interaction of coach gender with coach education level is considered, a significant difference in game strategy efficacy and physical conditioning efficacy is observed between similarly educated male and female coaches. Results suggest that in order for female coaches to increase their coaching efficacy levels to that of their similarly educated male counter-parts, they must be sought out, encouraged, and given the opportunity to gain coaching experience. Coaching education programs to raise self-efficacy of coaches should also be created or modified with the

goal of targeting female coaches and increasing their understanding of typical male approaches to coaching.

Keywords: Self-efficacy, coaching, youth, sport

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CHAPTER 1: INTRODUCTION

Sport is woven into the fabric of many cultures. A statement that is no less true of those residing in the United States of America where sport, at the youth level, is particularly important. Parents and experts alike tout the many social, physical, and psychological benefits the over 40 million youth who participate in organized leagues and programs can gain through their participation in these organized activities (Le Menestrel & Perkins, 2007).

Socially, sport activities put youth in environments where they have a chance to interact with their peers as well as their coaches. This is important in the development of social skills like, teamwork, compromise, leadership, and conflict resolution.

Physically, it gets youth off of the couch and away from the cyber worlds that can take up much of their time and attention. By involving themselves in some type of physical activity, at an early age, youth get the necessary energy expenditure that is key to controlling weight and maintaining physical well-being. Early physical activity can also cement exercise and healthy eating habits for a lifetime. These healthy habits are more likely to lead to longer, healthier, and more fulfilling lives. Psychologically, youth are put in situations where they may be challenged while dealing with success, failures, and criticism. They are given the chance to develop a great sense of themselves, with high self-esteem, incredible focus, drive, and an uncanny ability to conquer adversity. The social, physical, and psychological skills described above are all-valuable and have the

potential to positively impact each individual's life and interactions with the greater world. However, these skills also have the potential to do the opposite, negatively impacting each individual's life and interactions. Physically, youth can become burnt out and injured at an early age. Overuse injuries and head injuries can affect young athletes' much later in life.

Socially, youth can be ostracized, excluded from the group or bullied because of some real or perceived difference. This can have some damaging psychological repercussions. Instead of being built up with a strong sense of self, high self-esteem, incredible focus, drive, and great ability to overcome adversity, they can be just the opposite. Based on these early experiences, youth, and later adults, can struggle to know themselves, have low self-esteem, appear erratic in their behaviors, and struggle to overcome adversity. At the center of this early sport experience is the coach. They play an incredibly important role and hold a place of great respect within our society.

The skills and abilities of the coaches leading these activities can dramatically impact the child's experience. Just the word, coach, evokes extreme and powerful connotations (Short & Short, 2005). Filling the roles of teacher, organizer, competitor, learner, friend, and mentor, coaches have great influence on the physical and psychological development of their athletes. By filling these roles, coaches enable athletes to attain levels of performance not otherwise achievable. Whether they were good or bad they each have an effect or influence on the individuals in their charge.

Given their power to permanently influence young players, it is reasonable that we seek to find out as much as we can about individuals tasked with such an important and influential job? How do they feel about what they are doing, are they confident? Are there better ways to equip/educate them to be more successful at creating positive experiences for youth athletes?

Purpose Statement/Hypotheses

The purpose of this research was to shed light on these questions by evaluating coaches' level of education as a predictor of their coaching efficacy level. The study tested two hypotheses. (1) Coaches with a higher level of education will not exhibit a higher level of coaching efficacy and (2) male coaches will not exhibit a higher level of coaching efficacy than similarly educated female coaches.

CHAPTER 2: RELEVANT LITERATURE REVIEW

Self-Efficacy

Bandura (1994) defines self-efficacy as people's beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives. He theorizes that these self-efficacy beliefs affect how we feel, think, and act (p. 71). High self-efficacy enhances the individual, making it easier to tackle tough challenges, become engrossed in activities, and recover quicker from setbacks (p. 71). High self-efficacy has also been shown to reduce stress and instances of depression (p. 71). High self-efficacy individuals rationalize failure as a result of a lack of effort or

insufficient knowledge and skills (p 71). They feel they can easily fix this issue with increased effort or the acquisition of additional knowledge (p. 71).

Conversely, those with low self-efficacy are not as likely to tackle tough tasks, have trouble focusing on the task they do choose, and take much longer to recover from setbacks (Bandura, 1994). As one might expect, these individuals are much more likely to suffer from depression and the effects of stress (p. 72). Individuals with low self-efficacy rationalize failure as a result of poor performance or a lack of aptitude, leading them to quickly give up.

Bandura (1977) identifies four main sources of self-efficacy. The first of these is performance accomplishments or personal mastery experiences. These experiences are particularly powerful in developing high self-efficacy. Successful early experiences lead to increased effort and resilience in the face of failure.

Vicarious experience, the act of watching others perform tasks with adverse consequences is the second source of self-efficacy (Bandura, 1977). By watching, the observer can generate expectations that they too can get better if they continue to work at the task. Because the observer is not having experiences firsthand, this is a much less formative source of self-efficacy than performance accomplishments.

The third source is verbal persuasion. Verbal persuasion is receiving suggestions, which lead the listener into believing that they can handle and overcome that which has previously given them trouble (Bandura, 1977). Again, this self-efficacy source is much lower than an individual's performance accomplishments.

Fourth and last, is emotional arousal. This self-efficacy source is an evaluation of an individual's reaction to stressful and taxing situations (Bandura, 1977). High arousal is usually associated with diminished performance. Therefore, if a person is able to control their emotional response they are likely to have a greater expectation of success. If they are overcome by their emotions this is likely to further emotional distress and diminish expectation of success (p. 199).

Bandura (1977) also noted, four psychological processes affect human function. Cognitive processes are the first. Effects are evident in goal setting, visualization/imagery, and task orientation. A person with high self-efficacy is able to set higher goals and be more committed to reaching them than a person with low self-efficacy. High self-efficacy individuals visualize and mentally rehearse scenarios in which they are being successful. They can then draw on this when confronted with stressful situations. On the other hand, individuals with low self-efficacy struggle to visualize themselves in successful situations and get too caught up thinking about everything that can go wrong. Finally, high self-efficacy individuals have a much easier time sticking to tasks when confronted with adverse situations and environments because

they are able to control their emotional responses. Low self-efficacy individuals struggle in these situations because they begin thinking erratically. Meaning they cannot focus on the task at hand or visualize themselves being successful.

Self-efficacy also plays a role in motivation. Bandura (1977) describes motivation as cognitively generated and centered on three types of motivators: causal attributions, outcome expectancies, and cognized goals. These match to three theories, attribution theory, expectancy value theory, and goal theory. The first is attribution theory. The idea that those with high self-efficacy relate failure to a lack of effort and those with low self-efficacy relate failure to a lack of ability. Second is expectancy-value theory, the idea that a certain behavior will result in a certain outcome of a certain value. Individuals with high self-efficacy are more open to a wider variety of possibilities and place a greater value on outcomes than low self-efficacy individuals. Third is goal theory. Goal theory deals with the ability to exercise self-influence by goal challenges and evaluative reactions to one's own attainments. Self-efficacy comes into play by guiding what goals people set for themselves, how much effort they expend to reach the goals, how long they persevere in the face of difficulties, and their resilience to failures. Those with high self-efficacy are better at working through adversity to reach their goals whereas, those with low self-efficacy struggle, doubt their abilities, and give up quicker.

Affective Processes involves how people's perception of their coping abilities affects the amount of stress and depression they experience in threatening or difficult situations.

Those with high self-efficacy in their coping abilities are able to limit the amount of stress that affects them and do not create disturbing thought patterns. Those people with low self-efficacy in their coping abilities are stuck on their coping deficiency, which ultimately affects their performance. Those with high self-efficacy are also more willing to take on stressful and taxing activities. Low self-efficacy can also lead people to depression. This is done through unfulfilled aspirations, low social self-efficacy, and low self-efficacy to control ruminative thought.

Self-efficacy can also have an effect on an individual's health. A lack of ability to cope with stress can weaken the immune system and make people more susceptible to sickness, affect their cardiovascular system, and lead people to unhealthy habits. Those with high self-efficacy have an easier time of breaking unhealthy habits and having better overall health.

Finally, Bandura (1977) studied selection processes. This is the idea that people are partly shaped by their environment. Self-efficacy helps to drive the choices people make. These choices set the course of an individual's life by influencing interests, social networks, and skills acquisition. Those with high self-efficacy open a wider range of possibilities and choices leading to greater levels of success in life. On the other hand, those with low self-efficacy limit themselves greatly.

Bandura (1994) considered childhood to be a formative time for self-efficacy with the school at the center. In this setting, there is a lot of cultivation and social validation of cognitive competencies enabling children to gather knowledge and problem solving skills to operate in society. Creating a positive environment for cognitive growth falls largely on teachers. Teachers succeed or fail to create this positive environment based on their own self-efficacy and talents. Successful teachers help to raise student self-efficacy in their ability to master academic activities, which affects their aspirations, level of interest in academic activities, and their academic accomplishments.

In summary, Bandura described four sources of self-efficacy: performance accomplishment/personal mastery, vicarious experience, verbal persuasion, and emotional arousal. He also describes four psychological processes that affect human function. The four processes are: cognitive processes, motivational processes, affective processes, and selection processes. Taken together these four sources of self-efficacy, and four processes effect our self-efficacy beliefs that in turn affect how we feel, think, and act on a daily basis. On the whole, those with high self-efficacy are more likely to take on challenges, have greater focus on their tasks, recover quicker from failure, and live with lower stress levels. Those with low self-efficacy are exactly the opposite. They struggle to take on tough challenges, sometimes lose focus on tasks, spend a longer time recovering from failures, and have higher individual levels of stress.

These same teacher self-efficacy ideas can be applied to coaching. After all, athletic coaches are also teachers (Feltz, Chase, Moritz, & Sullivan, 1999).

Coaching Efficacy

Coach efficacy, or the extent to which coaches believe they have the capacity to affect the learning and performance of their athletes (Feltz et al., 1999), has been linked to successful coaching of player/team: performance, satisfaction, behavior, and attitude in numerous studies (Feltz, et al., 1999; Feltz, Hepler, Roman, & Paiement, 2009; Haselwood, Joyner, Burke, Geyerman, Czech, Munkasy, & Zwald, 2005; Jackson & Beauchamp, 2010; Jackson, Grove, & Beauchamp, 2010; Jackson, Knapp, & Beauchamp, 2009; Kavusaanu, Boardley, Jutkiewichz, Vincent, & Ring, 2008; Myers, Chase, Pierce, & Martin, 2011; Myers, Feltz, Chase, & Reckase, 2008; Myers, Wolfe, & Feltz, 2005; Vargas-Tonsing, Warners, & Feltz, 2003; Wiersma & Sherman, 2005).

It appears however, that there is a lack of research into how one develops coaching confidence or coach efficacy (Feltz et al., 1999). Due to this lack of research into how one develops coaching confidence Feltz et al. (1999) set out to develop, “a framework that is adapted and logically formulated from general psychological theories and related literature to study sport specific issues in education such as the self-efficacy of coaches (Feltz et al., 1999, p. 766).”

The original model, called the Coaching Efficacy Scale (CES) is based on Denham and Michael's (1981) multidimensional model of teacher self-efficacy, Bandura's (1977, 1986, and 1997) conceptualization of self-efficacy, and Park's (1992) initial measure of coaching confidence (Feltz et al., 1999 & Myers et al., 2011). The model breaks coaching efficacy into four distinct dimensions; game strategy efficacy, motivation efficacy, teaching technique efficacy, and character building efficacy (Feltz et al., 1999). Subsequent revisions of this model have added a fifth dimension of physical conditioning efficacy (Myers et al., 2008).

Game strategy efficacy refers to confidence coaches have in their own ability to coach during competition and lead their team to successful performance (Feltz et al., 1999). Motivation efficacy is the confidence the coaches have in their ability to affect the psychological skills and states of their athletes (p. 766). Technique efficacy is the belief coaches have in their instructional and diagnostic skills (p. 766). Character building efficacy involves the confidence coaches have in their ability to influence the personal development of positive attitude toward sport in their athletes (p. 766). Physical conditioning efficacy is defined as the confidence a coach has in their ability to prepare his or her athletes physically for participation in their sport (Myers et al., 2008).

The five dimensions of coaching efficacy are influenced by several sources (Feltz, 1999). These sources are the coach's past experience and preparation, previous won-lost record,

the perceived skill or talent of one's athletes, and the perceived social support received from the school, community and parents (p. 766).

The expected outcomes of coaching efficacy are that it will have an effect on how one coaches, how the players/team perform, how satisfied the players/team are with their coach, and how confident and motivated the players/team are (Feltz, 1999). High coaching efficacy coaches should have more success motivating players/teams, instilling confidence in players/teams, teaching technique, winning, committing themselves to coaching, putting in the necessary time, and satisfying players/teams than low coaching efficacy coaches (p. 767).

As noted earlier, the original CES has undergone some revision and refinement. Myers et al. (2005) undertook the first sustentative evaluation of the psychometric properties of the CES. Several areas that needed to be addressed or revised included problems with the rating scale categorization structure, limited discriminant validity between game strategy efficacy and technique efficacy, the operational definition for each dimension, revision or exclusion of several items, and resultant imprecise measures (Myers et al., 2008).

Using Myers et al. (2005) recommendations, Myers et al. (2008) undertook the first major revision of the CES. This resulted in the development of a scale directed specifically for use with high school coaches, the Coaching Efficacy Scale II – High School Teams (CES II-HST) (Myers et al., 2008). Other changes included were the new

dimension of physical conditioning efficacy mentioned earlier and revised definitions of character building efficacy and technique efficacy to make them more clear (Myers et al., 2011).

The next major effort resulted in the Coaching Efficacy Scale II – Youth Sport Teams (CES II-YST) (Myers et al., 2011). As the name would indicate, this scale is intended for use with coaches of youth sport teams (p. 784). Youth athletes were defined as those from ages 8 to 13. The CES II-YST measurement instrument borrowed many of the same elements from the CES II-HST measurement instrument. Major differences were the exclusion of some questions deemed inappropriate for youth athletes and the inclusion of several that were targeted to the youth level (p. 787). In total, 9 of the 18 items on the CES II-HST measurement instrument were changed or eliminated to fit the CES II-YST measurement instrument's intended audience, specifically, coaching confidence at the youth sports level (Myers et al., 2011). Because of its culturally unique nature and potential to exert great influence over the sport experience of the participating children, coaching confidence is of particular importance at the youth level (Myers et al. (2011), p. 782 as in Feltz et al., 2009, p. 25.)

Coaching Youth

As stated earlier, millions of youth are participating in youth sports programs. At the center of this, is the youth sports coach. Several studies argue that youth sports coaches play the most important role in a young athlete's development and enjoyment of sport

(Hedstrom & Gould, 2004; McCallister, Blinde, & Weiss, 2000; Gilbert, Gilbert, & Trudel, 2001). The development stages of, “childhood and adolescence are critical periods for the learning of socially appropriate values and life skills that provide the foundation for adulthood. (McCallister, Blinde, & Weiss, 2000, p. 35).” Young athletes are constantly observing their environment and taking cues from authority figures within it as to how they should react to various conditions. This early sport experience also plays a major role in determining future participation in sport and physical activity, further underscoring the importance of the coach creating a positive learning and development environment (McCallister, Blinde, & Weiss, 2000; Gilbert, Gilbert, Trudel, 2001). So, what values or skills are representative of this positive environment, who are the people tasked with such an important job, and what issues will they face?

Factors constituting a positive youth sports learning and development environment can be divided into broad groups focused on physical, psychological, and social development (Hedstrom & Gould, 2004). More specific are the constructs of good sportsmanship (honesty, playing by the rules), value of support and encouragement for teammates regardless of ability and mistakes, respect for opponents, the importance of teamwork, winning, participation, fun, and decision making (McCallister, Blinde, & Weiss, 2000).

The youth sports coach is a varied individual. Their sport experience runs the gamut from those who have never played to those who are current/retired professionals (Hedstrom & Gould, 2004). Most, however, are male, married, and untrained, only becoming involved

because their child was participating and there was no one else interested in the position (Hedstrom & Gould, 2004; McCallister, Blinde, & Weiss, 2000). Many feel that minimal preparation is needed to be an effective coach (McCallister, Blinde, & Weiss, 2000). Coaches rely on past sport experience as a player, or spectator. Many times coaching a sport(s) in which they have no experience (Hedstrom & Gould, 2004). Alarming, many coaches spend up to 11 hours a week with youth athletes but lack training or knowledge of sports safety, training and conditioning, and child development (p. 9). These are only a few areas they are ill equipped to face.

Other issues facing coaches are, structuring a practice to utilize limited practice time, athlete behavior, athlete performance, personal characteristics, parental influence, and team organization (Hedstrom & Gould, 2004; Gilbert, Gilbert, & Trudel, 2001a).

Many times, coaches are left to coach a whole team themselves (Hedstrom & Gould, 2004). Without adequate training, they struggle to create a learning environment to reach the team/athlete's desired goals (McCallister, Blinde, & Weiss, 2000). Many coaches seek some type of coaching education to improve their ability to provide effective skill instruction and improve the athlete experience (Hedstrom & Gould, 2004).

Athlete behavior can have a positive and negative effect on the whole team (Gilbert, Gilbert, & Trudel, 2001a). Coaches have to find ways to ensure athletes are attending practices/games, staying focused while they are there, discipline them when they are not, and keep the team/individuals happy and working together after facing adversity.

Strategies such as parent/coach meetings, player/coach meetings, codes of conduct, behavior contracts, and visualization all help coaches address these issues (p. 30-31).

Athlete performance is a constant concern to coaches. Teams are bound to have lulls in performance, especially at the youth level (Gilbert, Gilbert, & Trudel, 2001a). Many coaches attribute these lulls to, “the athlete physically [being] unable to properly execute a skill or that the athlete is in a mental rut and lacks concentration and effort (Gilbert, Gilbert, & Trudel, 2001a, p. 32).” To combat this, coaches have to walk a fine line between repetition and variation. Just the right amount is needed to ensure the athletes are mastering basic skills but not losing focus/concentration (p. 32).

Personal characteristics are another important issue a coach faces. Whether it is the athletes’ or their own personal characteristics, coaches must be cognizant of the fact that their teams consist of individuals with a wide range of athletic skills, maturity levels, physical development, and communication styles (Gilbert, Gilbert, & Trudel, 2001b). As a result, coaches must vary how they communicate in an effort to get their message across to each athlete (p. 41).

Coaches must also be prepared to deal with parental influence. Parental influence refers to interactions with the parents of players on the team and other coaches/adults that can become negative (Gilbert, Gilbert, & Trudel, 2001b). These situations typically stem from the coach’s style or techniques (p. 42). Strategies to prevent this are having the

parents sign a behavior contract and laying out expectations to them at a parent meeting (p. 42). Some also implement the 24-hour rule. This means a parent cannot approach the coach for at least 24 hours if they disagree with something that went on at a game (p. 43).

Finally, and perhaps most challenging, is team organization. Team organization is often a very time consuming activity. Tilbert, Gilbert & Trudel (2004) talk about four types of team organization: coaching staff, fundraising, team lineup, and practice planning (p. 43). It is essential to have parents and others helping with the team organization so the coach can focus on coaching (p. 43). Fundraising is important but challenging (p. 43). It is a good idea to include parents in this process to maintain transparency and minimize the potential for negative influence (p. 43). Team lineup is another component of team organization. It can sometime become difficult to select the team, organize athletes on the field and make sure each has adequate playing time (p. 43). Coaches often utilize an independent evaluator or a group of coaches to assist in making teams (p. 43). Playing time is sometimes divided up by giving everyone equal time (p. 44). Another strategy is giving a greater amount of playing time to those athletes who are more committed and make positive contributions to the team (p. 45). Practice planning is the last of the team organization issues. Without a lot of curriculum to guide them coaches often experiment with different activities, or divide the practice into smaller sections each dealing with an activity related to the central theme of the practice (p. 45).

From this information, we can see that the youth sports coach is a highly influential person in the life of many youth. Largely, male, married, and inexperienced, coaches face obstacles such as athlete behavior, athlete performance, personal characteristics, parental influence, and team organization. All the while, serving as role models and teachers, striving to create a positive environment focused on physical, psychological, and social development. In such an environment, athletes learn skills that will help them in later life.

Despite the great importance of the coach, research into who these people are is fairly limited (Hedstrom & Gould, 2004). There is a need to investigate the thoughts and perceptions of the coaches working in the youth arena (McCallister, Blinde, & Weiss, 2000). That is why a study, such as this, to evaluate a coaches' level of education as a predictor of their coaching efficacy level is so important

CHAPTER 3: METHODS

The study examined coaches' level of education and gender as they impacted the five elements of coaching efficacy. By testing ten hypotheses this study will add to the body of research in an area that is lacking. Each individual hypothesis is listed below.

Hypotheses**Hypothesis 1**

Coaches with a higher level of education will not exhibit a higher level of motivation efficacy.

Hypothesis 2

Male coaches will not exhibit a higher level of motivation efficacy than similarly educated female coaches.

Hypothesis 3

Coaches with a higher level of education will not exhibit a higher level of game strategy efficacy.

Hypothesis 4

Male coaches will not exhibit a higher level of game strategy efficacy than similarly educated female coaches.

Hypothesis 5

Coaches with a higher level of education will not exhibit a higher level of technique efficacy.

Hypothesis 6

Male coaches will not exhibit a higher level of technique efficacy than similarly educated female coaches.

Hypothesis 7

Coaches with a higher level of education will not exhibit a higher level of character building efficacy.

Hypothesis 8

Male coaches will not exhibit a higher level of character building efficacy than similarly educated female coaches.

Hypothesis 9

Coaches with a higher level of education will not exhibit a higher level of physical conditioning efficacy.

Hypothesis 10

Male coaches will not exhibit a higher level of physical conditioning efficacy than similarly educated female coaches.

Survey Research

Surveys are a data collection method in which a subset of people is asked to respond to questions on a specific topic. These responses are then generalized to the larger population (Bennet et. al, 2011). Surveys are typically used to address topics such as individual self-reporting about beliefs, knowledge, attitudes, opinions, or satisfaction (p. 2). With increased accessibility to the Internet the popularity of online delivery of surveys has increased (Alessi & Martin, 2010). The positives of online survey delivery are many. They include the ability to easily connect with many diverse groups of people, ease of: survey design, survey disbursement, data coding and data review, and low cost (p. 122, 125).

As with most things, there are always drawbacks. The biggest drawbacks to online survey delivery are ethics, privacy, and reporting concerns. Privacy concerns center around the tracking of computer information such as IP addresses or the online survey delivery system sending Cookies (p. 127). The biggest ethical concern is ensuring those who should not be accessing a survey are actually not gaining access, specifically minors. (p. 127). Reporting concerns revolve around the limited guidance provided on how to report survey research (Bennet et. al, 2011). This lack of guidance can call into question the transparency and reproducibility of research that is crucial for learning and adding to the overall body of knowledge (p. 9).

Sampling Procedure

After approval was received from the institutional review board, N=1669 individuals coaching teams within the YMCA of Lincoln, NE Youth Sports Branch were emailed a link to an online survey developed using Qualtrics software. The survey consisted of an informed consent acknowledgement, questions dealing with demographic data such as: age, sex, sport(s) coaching, years coaching, level of education and whether or not they have participated in any coaching education courses. It also contained the complete Coaching Efficacy Scale II – Youth Sport Teams (CES II-YST) (Myers et al., 2011).

Sample

The YMCA of Lincoln, NE agreed to allow the distribution of an online survey to all youth sports coaches within the YMCA program. This was 1669 coaches in total. The sports represented in the population are baseball, basketball, flag football, soccer, softball, and volleyball. A majority of the volunteers represented in this survey receive no significant compensation for their time spent coaching. However, some of these individuals may receive monetary compensation for their services without the knowledge of the YMCA.

Instrument

The study utilized Qualtrics, a web-based survey software program to develop and distribute the data collection instrument. The instrument was an online survey that was divided into three parts. The first part was the informed consent. In this portion, the study participants were presented with the purpose of the research, procedures used for data collection, risks and/or discomforts that may be experienced by participating in this study, benefits that may be gained by participating in this study, procedures used to ensure the confidentiality of their responses, the compensation that they could expect for their participation in the study, contact information of the researcher allowing them to have any questions answered, a statement about their freedom to withdraw from the study at any time, and a statement about their consent and right to receive a copy of the form. At the bottom of this section was a choice to consent to participation or a button to indicate an absence of consent. If participants chose to withhold their consent they were

taken to a page at the end of the survey thanking them for their time. If they chose the button consenting to participate they were taken to section two of the survey.

The second portion of the survey contained questions relating to demographic information. It asked participants to identify their gender, age, ethnicity, highest level of education completed, the sport(s) they coached, how many years they have coached, and if they had ever participated in a coaching education course (other than short preseason clinics offered by the Youth Sports Branch).

The final portion of the survey was the complete 18 question CES II-YST measurement instrument (Myers et al., 2011). Developed specifically for use with youth sports coaches the CES II-YST measurement instrument breaks coaching efficacy into five dimensions (p. 787). These dimensions are: Motivation Efficacy (ME), the confidence a coach has in his/her ability to affect the psychological mood and skills of her/his athletes, Game Strategy Efficacy (GSE), the confidence a coach has in his/her ability to lead during competition, Technique Efficacy (TE), the confidence a coach has in his/her ability to use her/his instructional and diagnostic skills during practices, Character Building Efficacy (CBE), the confidence a coach has in his/her ability to positively influence the character development of his/her athletes through sport, and Physical Conditioning Efficacy (PCE), the confidence a coach has in his/her ability to prepare his/her athletes physically for participation in her/his sport (p. 781).

Coaches were asked to respond to questions in each of these areas using a ratings scale with 4 levels, low, moderate, high, or complete confidence (p.787). Myers et al. (2011) were able to show validity of the CES II-YST measurement instrument using exploratory structural equation modeling (ESEM). They were also able to show the power of the tool with a relatively small sample (p. 799).

Limitations of this study were the scope of the sample. The coaches surveyed are from one particular Midwestern metropolitan area. The sample also included a proportionally larger number of males than females. This may have some effect on the ability to show a relationship between male and female coaching efficacy.

Concerns with the online survey delivery method were addressed in this study by not tracking individual IP addresses of survey respondents, protecting data within a password protected database on a password protected computer. Any printed data was kept in a secure location.

CHAPTER 4: RESULTS/STATISTICAL ANALYSIS

In total, there were 199 (12% of population) responses to the survey. Of those 199 responses, 197 (99%) consented to completing the survey and two (1%) withheld their consent to participate. One hundred eighty-nine people (95%) responded to every question. One hundred thirty-five (69%) respondents classified themselves as male and 62 (31%) classified themselves as female. One hundred eighty-six (95%) respondents

classified their ethnicity as White, the next highest total was three (2%) giving no response. Two people (1%) each classified themselves as Hispanic/Latino and Not Hispanic/Latino. One person (1%) each classified himself or herself as American Indian or Alaska Native, Black or African American, and Native Hawaiian or Other Pacific Islander.

Coach ages ranged from 20 years old to 57 years old. The number of years coached ranged from one to 32. One hundred fifty-seven (80%) coaches had some personal playing experience in the sport(s) they were coaching. Thirty-nine (20%) had no prior personal playing experience.

As shown in Figure 1, 95 respondents (48%) held a bachelor's degree followed by 48 (24%) with a Masters/Professional Degree, 23 (12%) with some college, 13 (7%) with an Associates/Technical Degree, 12 (6%) with a Doctorate, two (1%) each with just a high school diploma and GED, and one (1%) with no response.

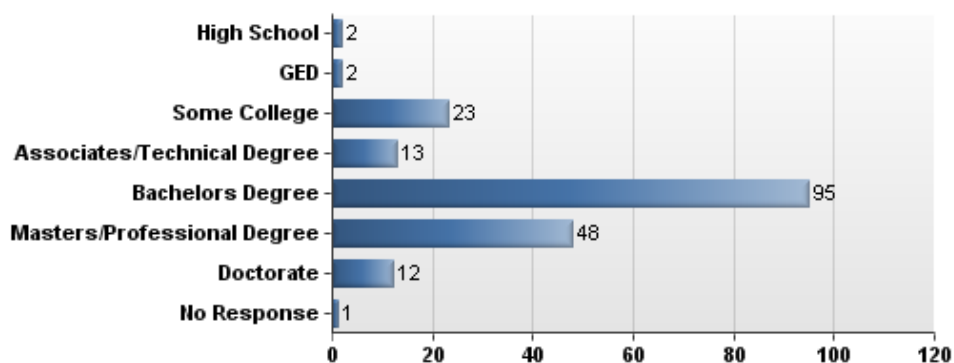


Figure 1 – Education Level of Responding Coaches

Figure 2 shows the sport(s) coached by respondents. Sixty-seven (34%) coached soccer, followed closely by 63 (32%) who coached multiple sports. There was then a sharp drop to 26 (13%) volleyball coaches, 19 (10%) basketball coaches, 12 (6%) baseball coaches, six (3%) flag football coaches, and three (2%) who gave no response.

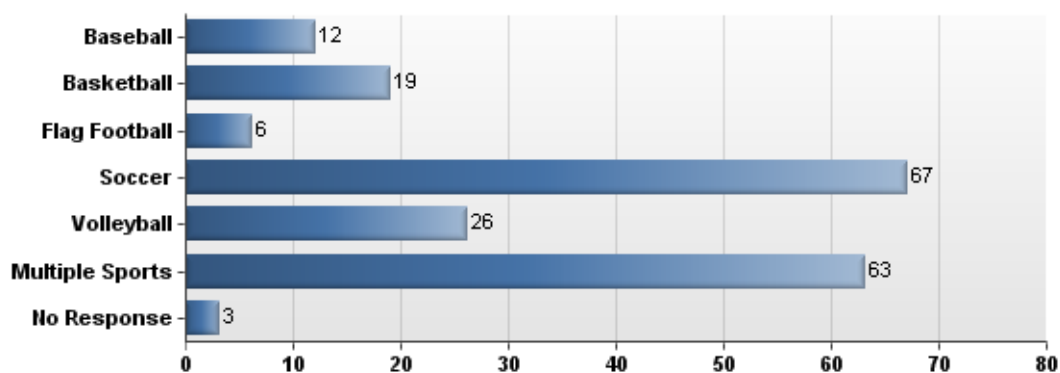


Figure 2 – Number of Coaches Responding Per Sport

Analysis Procedures

After collection, data were exported from Qualtrics into SPSS for analysis. An analysis of variance (ANOVA) was run for each hypothesis on all five identified levels of coaching efficacy. Because error terms for PCE and CBE were not normal, a computer-intensive, nonparametric approach to statistical inference (i.e., bootstrapping) was used in their analyses (Anderson-Knott, 2008). The approach used the variability within a sample to estimate that sampling distribution empirically by randomly resampling with replacement from the sample many times in a way that mimicked the original sampling scheme (Anderson-Knott, 2008). When testing the first hypothesis, the type of coaching efficacy (ME, GSE, TE, CBE, PCE) served as the dependent variable. Education level was the only predictor. When testing the second hypothesis, the type of coaching efficacy was again the only dependent variable. Predictors were level of education and sex. All ANOVA data can be found in Appendix B. A linear regression analysis was also run on each type of coaching efficacy for each hypothesis. This yielded coefficients used to develop a formula for each level of coaching efficacy using each hypothesis. A summary of all coefficient data can be found in Tables 1 and 2. Data was then imported into Excel and, using each formula, charts were developed to better illustrate the relationship between education level and coaching efficacy and sex, education level, and coaching efficacy.

Education Level Coefficients Table			
Efficacy	Constant	X₁	R²
ME	12.562	-0.077	0.001
GSE	10.848	0.079	0.001
TE	11.620	0.002027276	0.0000007
CBE	12.954	0.200	0.010
PCE	5.507	0.055	0.002

Table 1 – Hypothesis 1: Education Level Coefficients Table

Gender/Education Level Coefficients Table				
Efficacy	Constant	X₁	X₂	R²
ME	13.230	-0.083	-0.484	0.001
GSE	12.818	0.048	-1.39*	0.005
TE	12.669	-0.011439451	-0.745616931	0.0161
CBE	13.885	0.192	-0.677	0.029
PCE	6.576	0.040	-0.761	0.054

*** Significant at $\alpha < 0.05$**

Table 2 – Hypothesis 2: Gender/Education Level Coefficients Table

Hypothesis 1, 3, 5, 7, 9 Results

Motivation Efficacy

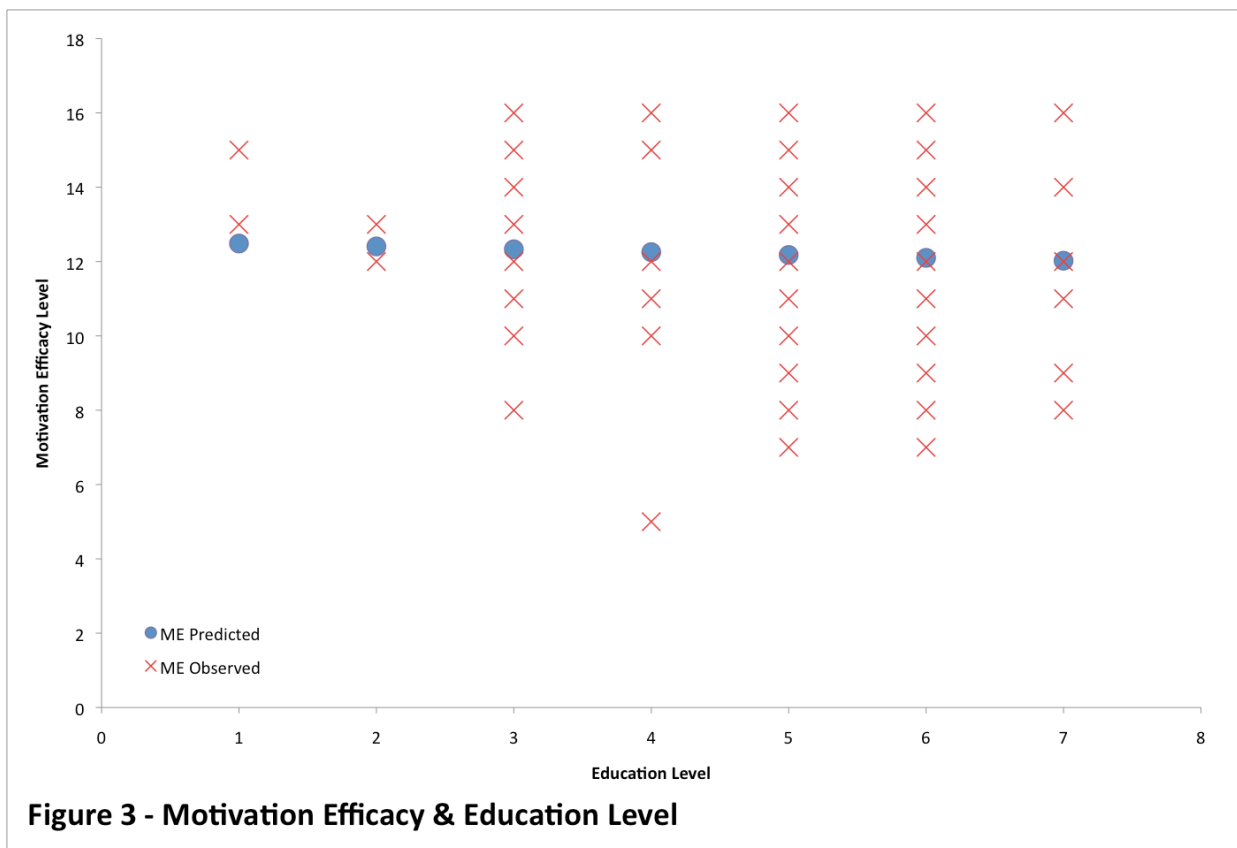


Figure 3 shows predicted and observed ME using coach education level as a predictor.

ME Predicted was plotted using a regression formula, $[y = -0.077x_1 + 12.562]$, developed from the coefficients table located in Appendix B. In this formula, X_1 is the value associated with each individual coach's level of education (1 = High School, 2 = GED, 3 = Some College, 4 = Associates/Technical Degree, 5 = Bachelors Degree, 6 = Masters/Professional Degree, 7 = Doctorate). ME Observed was plotted using each coach's level of education and level of ME. The value for ME is the total value of individual coach responses to ME questions on the survey instrument. Results show that

educational level is not significant ($\text{sig.} = .610$, $R^2 = .001$) with regard to predicting ME level. Therefore the null hypothesis that education level has no effect on ME level cannot be rejected.

Game Strategy Efficacy

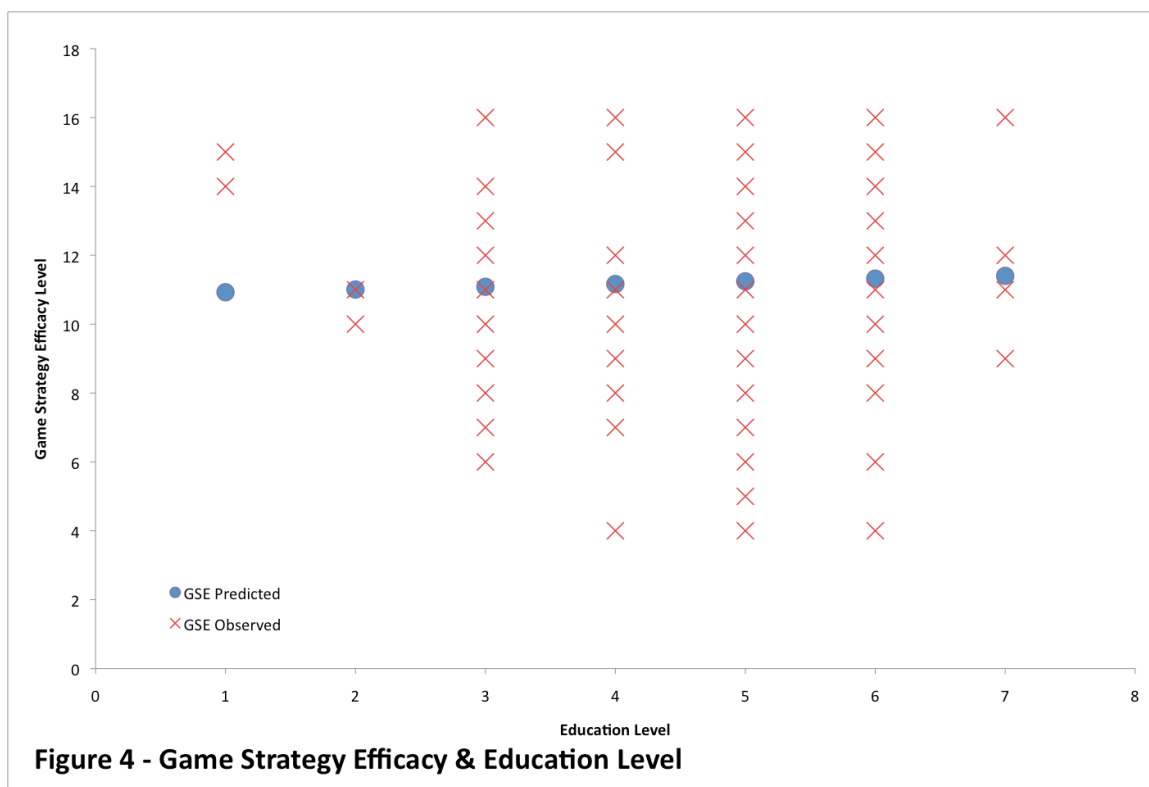


Figure 4 shows predicted and observed GSE using coach education level as a predictor. GSE Predicted was plotted using a regression formula, $[y = 0.079x_1 + 10.848]$, developed from the coefficients table located in Appendix B. In this formula, X_1 is the value associated with each individual coach's level of education (1 = High School, 2 = GED, 3 = Some College, 4 = Associates/Technical Degree, 5 = Bachelors Degree, 6 =

Masters/Professional Degree, 7 = Doctorate). GSE Observed was plotted using each coach's level of education and level of GSE. Level of GSE is the total value of individual coach responses to GSE questions on the survey instrument. Results show that education level is not significant ($\text{sig.} = .664$, $R^2 = .001$) with regard to predicting GSE level. Therefore the null hypothesis that education level has no effect on GSE level cannot be rejected.

Technique Efficacy

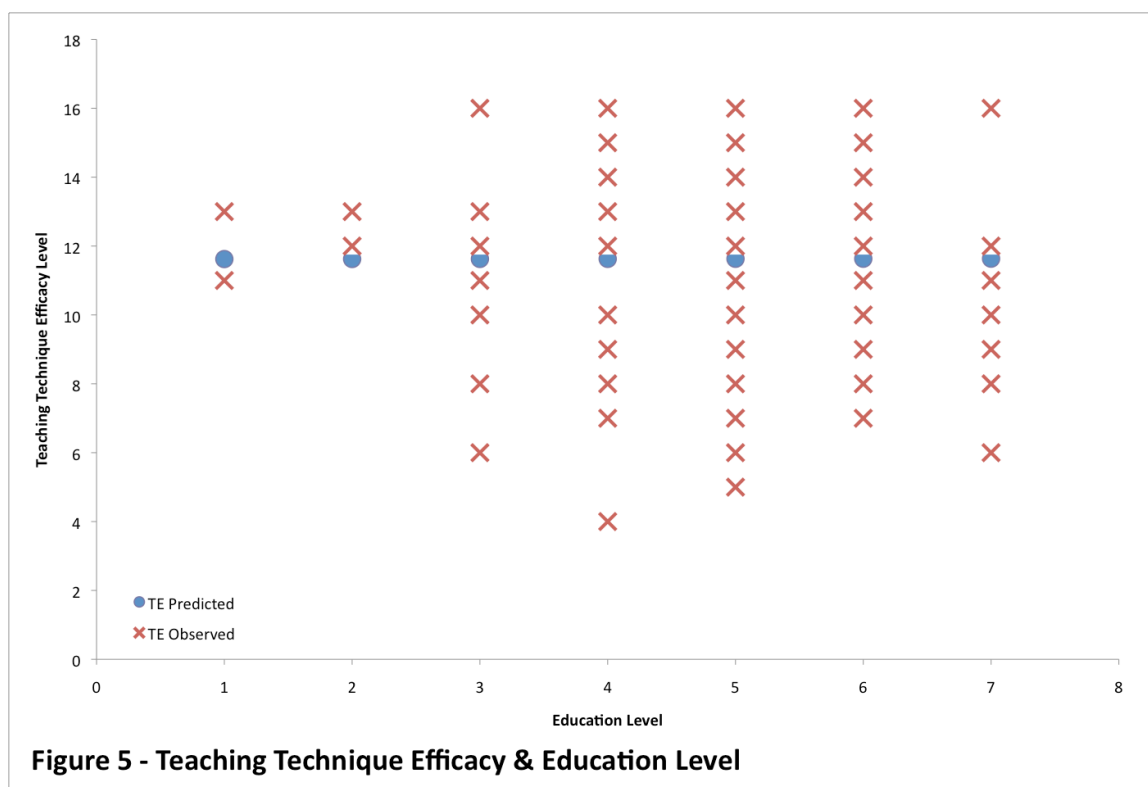


Figure 5 shows predicted and observed TE using coach education level as a predictor. TE Predicted was plotted using a regression formula, $[y = 0.002027276x_1 + 11.62]$,

developed from the coefficients table located in Appendix B. In this formula, X_1 is the value associated with each individual coach's level of education (1 – High School, 2 = GED, 3 = Some College, 4 = Associates/Technical Degree, 5 = Bachelors Degree, 6 = Masters/Professional Degree, 7 = Doctorate). TE Observed was plotted using each coach's level of education and level of TE. The value for TE is the total value of individual coach responses to TE questions on the survey instrument. Results show that education level is not significant (sig. = .991, $R^2 = .0000007$) with regard to predicting TE level. Therefore the null hypothesis that education level has no effect on TE level cannot be rejected.

Character Building Efficacy

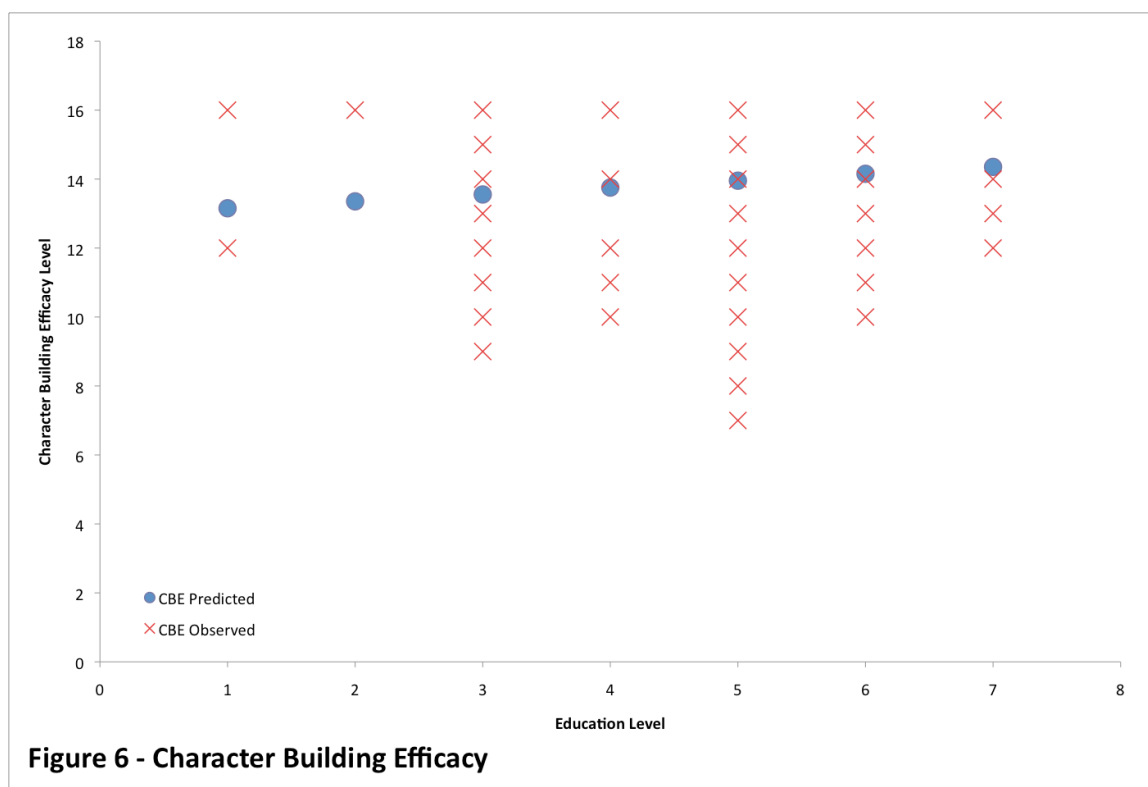


Figure 6 shows predicted and observed CBE using coach education level as a predictor. CBE Predicted was plotted using a regression formula, $[y = 0.200x_1 + 12.954]$, developed from the coefficients table located in Appendix B. In this formula, X_1 is the value associated with each individual coach's level of education (1 – High School, 2 = GED, 3 = Some College, 4 = Associates/Technical Degree, 5 = Bachelors Degree, 6 = Masters/Professional Degree, 7 = Doctorate). CBE Observed was plotted using each coach's level of education and level of CBE. The value for CBE is the total value of individual coach responses to CBE questions on the survey instrument. Results show that education level is not significant ($\text{sig.} = .173$, $R^2 = .010$) with regard to predicting CBE

level. Therefore the null hypothesis that education level has no effect on CBE level cannot be rejected.

Physical Conditioning Efficacy

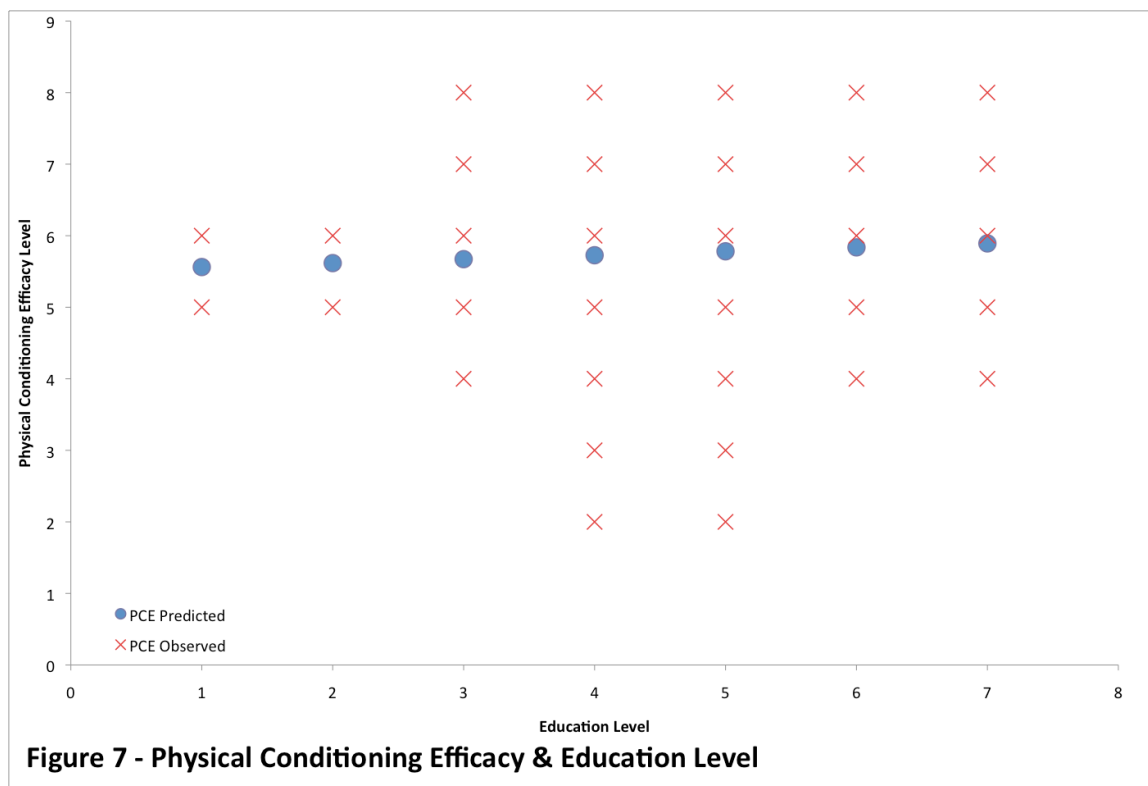


Figure 7 shows predicted and observed PCE using coach education level as a predictor. PCE Predicted was plotted using a regression formula, $[y = 0.055x_1 + 5.507]$, developed from the coefficients table located in Appendix B. In this formula, X_1 is the value associated with each individual coach's level of education (1 – High School, 2 = GED, 3 = Some College, 4 = Associates/Technical Degree, 5 = Bachelors Degree, 6 = Masters/Professional Degree, 7 = Doctorate). PCE Observed was figured by plotting each

coach's level of education and level of PCE. The value for PCE is the total value of their responses to PCE questions on the survey instrument. Results show that education level is not significant ($\text{sig.} = .580$, $R^2 = .002$) with regard to predicting PCE level. Therefore the null hypothesis that education level has no effect on PCE level cannot be rejected.

Hypothesis 2, 4, 6, 8, 10 Results

Motivation Efficacy

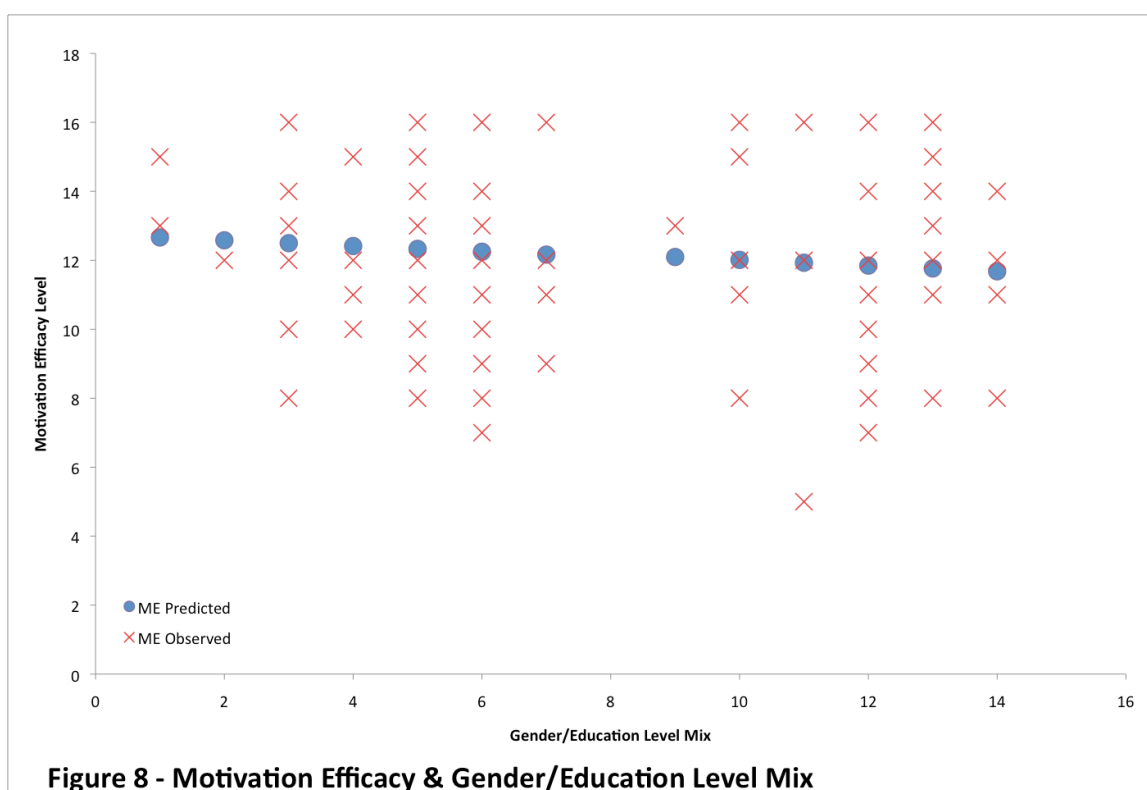


Figure 8 shows predicted and observed ME using coach gender and education level as predictors. ME Predicted was plotted using a regression formula, $[y = -0.083x_1 + -0.484x_2 + 13.230]$, developed from the coefficients table located in Appendix B. In the

formula, X_1 is each individual coach's level of education (1 = High School, 2 = GED, 3 = Some College, 4 = Associates/Technical Degree, 5 = Bachelors Degree, 6 = Masters/Professional Degree, 7 = Doctorate). To create separation between males and females data points the constant value of 7 was added to each female's education value (8 = Female with High School, 9 = Female with GED, 10 = Female with Some College, 11 = Female Associates/Technical Degree, 12 = Female Bachelors Degree, 13 = Female Masters/Professional Degree, 14 = Female Doctorate). X_2 is the value associated with each coach's gender (1 = males, 2 = females). ME Observed was plotted using the value for each coach's level of education and gender combined. This combined value was calculated by multiplying gender value (1 or 2) by education level value (1-7 & 9-14, constant of 7 added to all female education levels). Value for ME is the total value of individual coach responses to ME questions on the survey instrument. Results show that gender of similarly educated coaches is not significant (sig. education level = .582, sig. gender = .192, $R^2 = .001$) with regard to predicting ME level. Therefore the null hypothesis that gender makes no difference in ME between similarly educated individuals cannot be rejected. Although not significant, data does indicate that women do have lower ME than that of similarly educated men.

Game Strategy Efficacy

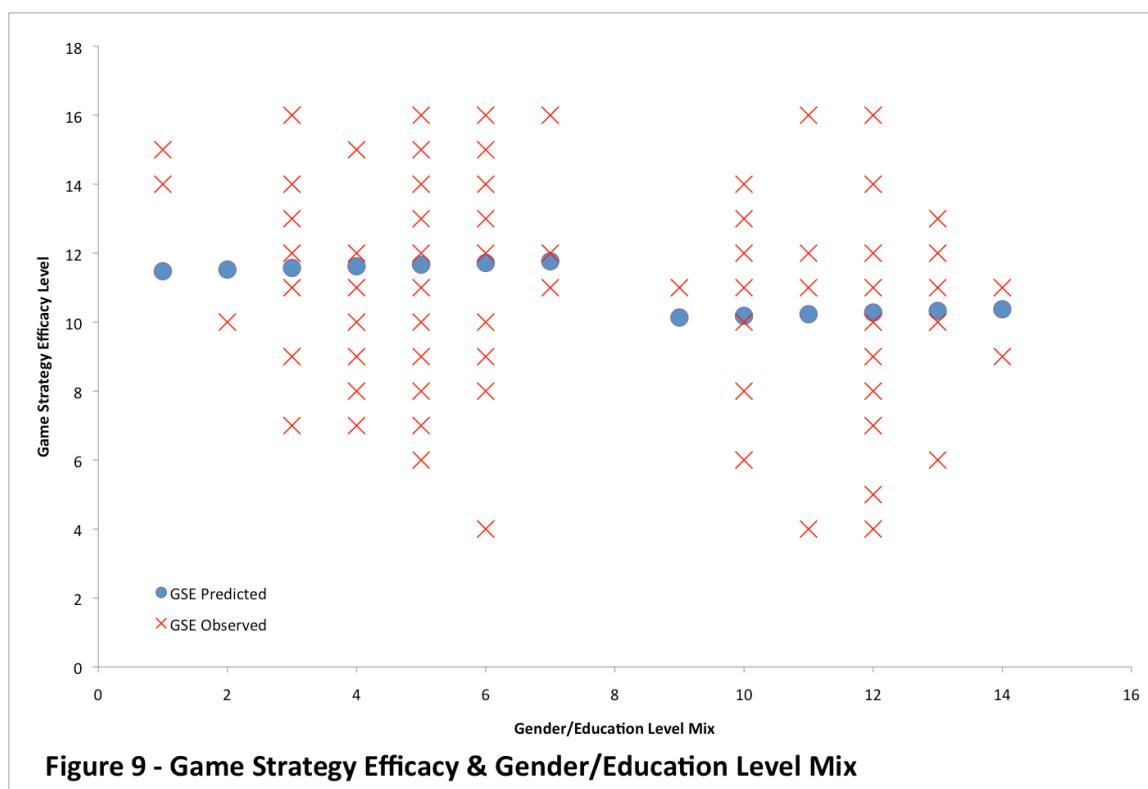


Figure 9 shows predicted and observed GSE using coach gender and education level as predictors. GSE Predicted was plotted using a regression formula, $[y = 0.048x_1 + 1.390x_2 + 12.818]$, developed from the coefficients table located in Appendix B. In this formula, X_1 is each individual coach's level of education (1 = High School, 2 = GED, 3 = Some College, 4 = Associates/Technical Degree, 5 = Bachelors Degree, 6 = Masters/Professional Degree, 7 = Doctorate). To create separation between males and females data points the constant value of 7 was added to each female's education value (8 = Female with High School, 9 = Female with GED, 10 = Female with Some College, 11 = Female Associates/Technical Degree, 12 = Female Bachelors Degree, 13 = Female

Masters/Professional Degree, 7 = Female Doctorate). X_2 is the value associated with each coach's gender (1 = males, 2 = females). GSE Observed was plotted using the value for each coach's level of education and gender combined. This combined value was calculated by multiplying gender value (1 or 2) by education level value (1-7 & 9-14, constant of 7 added to all female education levels). Value for GSE is the total value of individual coach responses to GSE questions on the survey instrument. Results show that gender of similarly educated coaches is significant (sig. education level = .785, sig. gender = .002, $R^2 = .055$) with regard to predicting GSE level. The null hypothesis that gender makes no difference in GSE between similarly educated individuals is rejected. Therefore the alternative hypothesis that men have higher GSE than similarly educated females is accepted.

Technique Efficacy

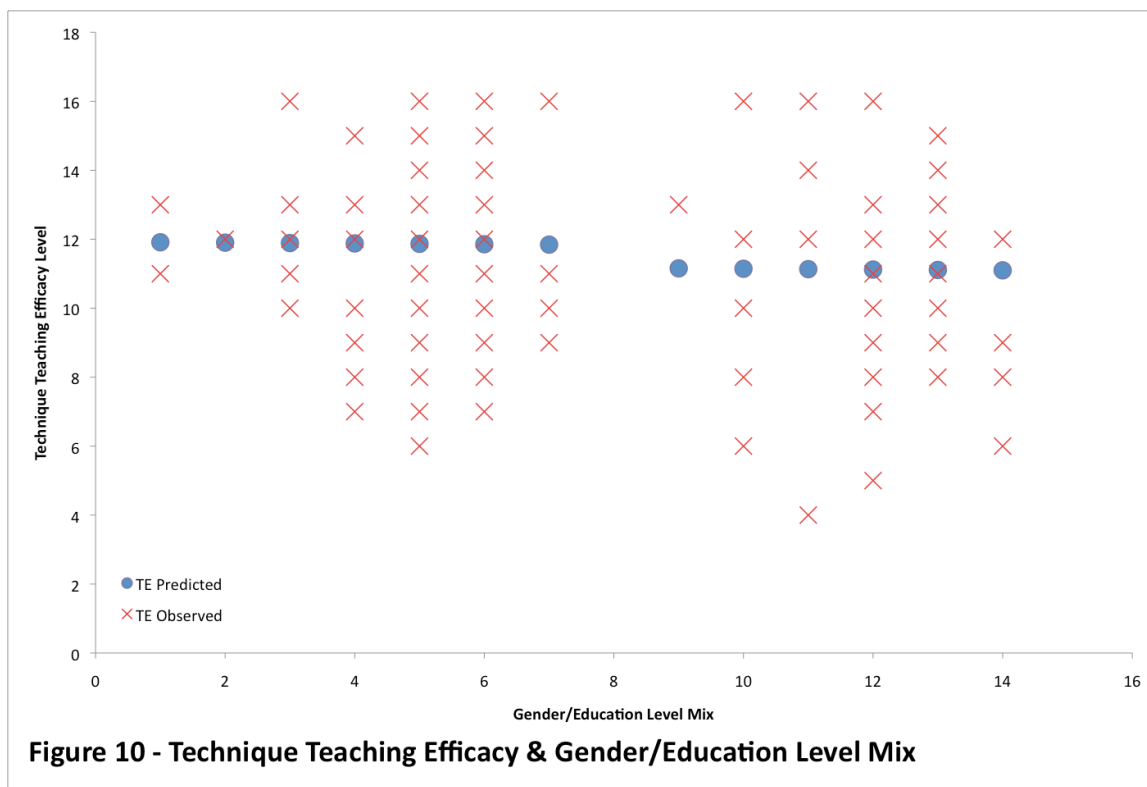


Figure 10 shows predicted and observed TE using coach gender and education level as predictors. TE Predicted was plotted using a regression formula, $[y = -0.011439451x_1 + -0.745616931x_2 + 12.669]$, developed from the coefficients table located in Appendix B. In this formula, X_1 is each individual coach's level of education (1 = High School, 2 = GED, 3 = Some College, 4 = Associates/Technical Degree, 5 = Bachelors Degree, 6 = Masters/Professional Degree, 7 = Doctorate). To create separation between males and females data points the constant value of 7 was added to each female's education value (8 = Female with High School, 9 = Female with GED, 10 = Female with Some College, 11 = Female Associates/Technical Degree, 12 = Female Bachelors Degree, 13 = Female

Masters/Professional Degree, 7 = Female Doctorate). X_2 is the value associated with each coach's gender (1 = males, 2 = females). TE Observed was plotted using the value for each coach's level of education and sex combined. This combined value was calculated by multiplying gender value (1 or 2) by education level value (1-7 & 9-14, constant of 7 added to all female education levels). Value for TE is the total value of individual coach responses to TE questions on the survey instrument. Results show that gender of similarly educated coaches is not significant (sig. education level = .949, sig. gender = .087, R^2 = .0161) with regard to predicting TE level. Therefore the null hypothesis that gender makes no difference in TE between similarly educated individuals cannot be rejected. Although not significant, data does indicate that women do have lower TE than that of similarly educated men.

Character Building Efficacy

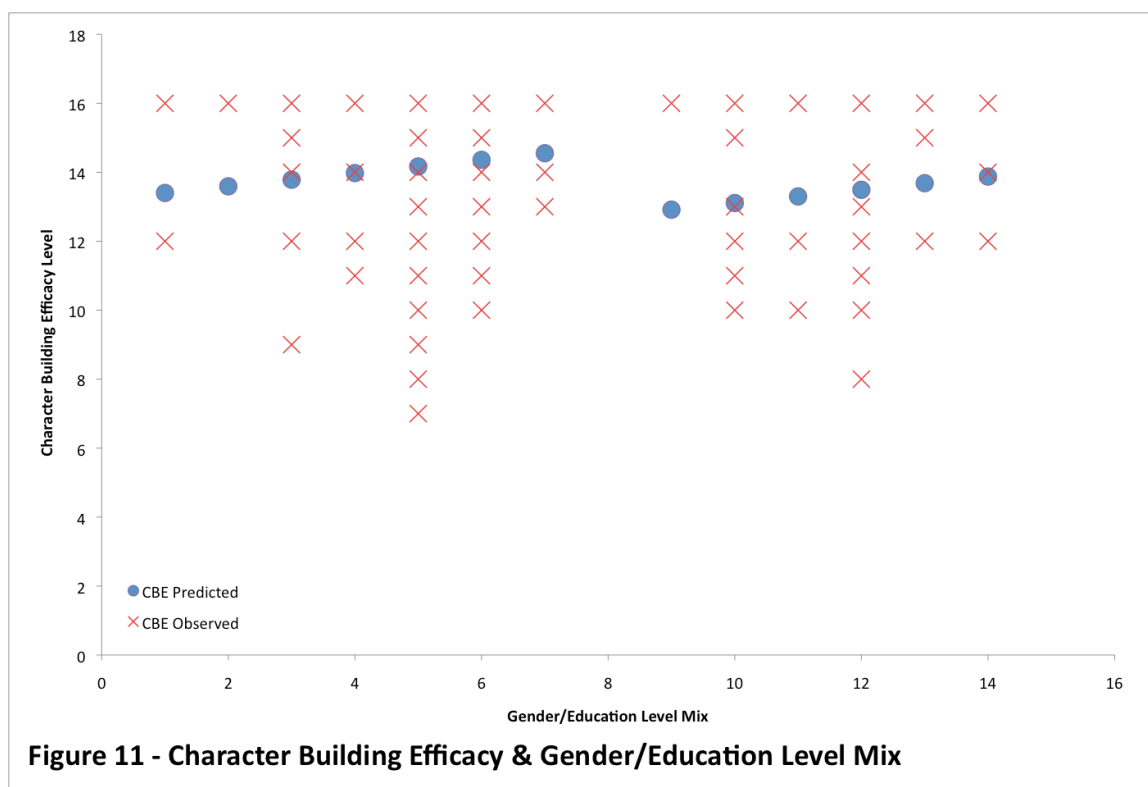


Figure 11 shows predicted and observed CBE using coach gender and education level as predictors. CBE Predicted was plotted using a regression formula, $[y = 0.192x_1 + 0.667x_2 + 13.885]$, developed from the coefficients table located in Appendix B. In this formula, X_1 is each individual coach's level of education (1 = High School, 2 = GED, 3 = Some College, 4 = Associates/Technical Degree, 5 = Bachelors Degree, 6 = Masters/Professional Degree, 7 = Doctorate). To create separation between males and females data points the constant value of 7 was added to each female's education value (8 = Female with High School, 9 = Female with GED, 10 = Female with Some College, 11 = Female Associates/Technical Degree, 12 = Female Bachelors Degree, 13 = Female

Masters/Professional Degree, 7 = Female Doctorate). X_2 is the value associated with each coach's gender (1 = males, 2 = females). CBE Observed was plotted using the value for each coach's level of education and gender combined. This combined value was calculated by multiplying sex value (1 or 2) by education level value (1-7 & 9-14, constant of 7 added to all female education levels). Value for CBE is the total value of individual coach responses to CBE questions on the survey instrument. Results show that gender of similarly educated coaches is not significant (sig. education level = .949, sig. gender = .087, $R^2 = .029$) with regard to predicting CBE level. Therefore the null hypothesis that gender makes no difference in coach efficacy between similarly educated individuals cannot be rejected. Although not significant, data does indicate that women do have lower CBE than that of similarly educated men.

Physical Conditioning Efficacy

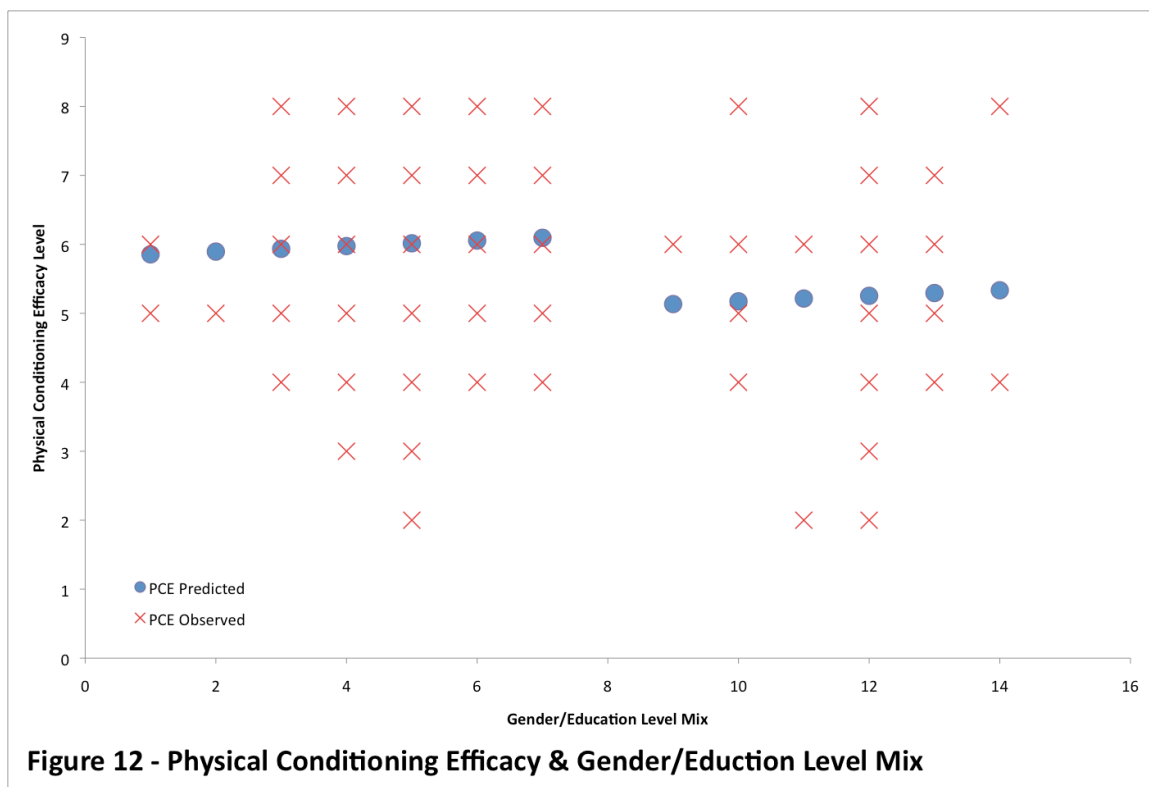


Figure 12 shows predicted and observed PCE using coach gender and education level as predictors. PCE Predicted was plotted using a regression formula, $[y = 0.040x_1 - 0.761x_2 + 6.576]$, developed from the coefficients table located in Appendix B. In this formula, X_1 is each individual coach's level of education (1 = High School, 2 = GED, 3 = Some College, 4 = Associates/Technical Degree, 5 = Bachelors Degree, 6 = Masters/Professional Degree, 7 = Doctorate). To create separation between males and females data points the constant value of 7 was added to each female's education value (8 = Female with High School, 9 = Female with GED, 10 = Female with Some College, 11 = Female with Associates/Technical Degree, 12 = Female with Bachelors Degree, 13 =

Female with Masters/Professional Degree, 7 = Female with Doctorate). X_2 is the value associated with each coach's gender (1 = males, 2 = females). PCE Observed was plotted using the value for each coach's level of education and gender combined. This combined value was calculated by multiplying gender value (1 or 2) by education level value (1-7 & 9-14, constant of 7 added to all female education levels). Value for PCE is the total value of individual coach responses to PCE questions on the survey instrument. Results show that gender of similarly educated coaches is significant (sig. education level = .642, sig. gender = .004, $R^2 = .054$) with regard to predicting PCE level. The null hypothesis that gender makes no difference in PCE between similarly educated individuals is rejected. Therefore the alternative hypothesis that men have higher PCE than similarly educated females is accepted.

CHAPTER 5: DISCUSSION

The purpose of this study was to evaluate the validity of using coaches' level of education as a predictor of their level of coaching efficacy, or the extent to which coaches believe they have the capacity to affect the learning and performance of their athletes (Feltz et al., 1999). Two hypotheses were tested for each of the five types of coaching efficacy (10 in total) identified using the CES II-YST measurement instrument of Myers et al. (2011). Hypotheses 1, 3, 5, 7, and 9 were "coaches with a higher level of education will not exhibit a higher level of ME, GSE, TE, CBE, and PCE." Hypotheses 2, 4, 6, 8, and 10 were "male coaches will not exhibit a higher level of ME, GSE, TE, CBE, and PCE than similarly educated female coaches." Results of this study failed to reject the

null hypothesis that coaches with a higher level of education will not exhibit a higher level of coach efficacy across the five types of coaching efficacy (ME, GSE, TE, CBE, and PCE). Results also failed to reject the null hypothesis that male coaches will not exhibit a higher level of ME, TE, and CBE than similarly educated female coaches. In the case of GSE and PCE, results were significant thereby rejecting the null hypotheses that male coaches will not exhibit a higher level of coaching efficacy. Although not significant, females also exhibited lower coaching efficacy across the three remaining types of coaching efficacy (ME, TE, and CBE) when compared to similarly educated males. The lower level of GSE amongst female coaches is consistent with some prior research (e.g. Marback et al., 2005 & Kavussanu et al., 2008) and inconsistent with other prior research (e.g. Myers et al., 2011). The significantly lower level of PCE amongst female coaches is inconsistent with prior research using the CES II-YST measurement instrument (e.g., Myers et al., 2011).

The overall lower level of coaching efficacy for female coaches in this study, as compared to their similarly educated male counterparts, can be explained by the perception that sport coaching is a male-dominated activity. Myers et al. (2011) reported level of confidence was affected for female coaches who were fewer in number and with less coaching experience than male counterparts. Males tended to have higher confidence and females had lower confidence (Myers et al., 2011).

The lower level of GSE amongst female coaches, as compared to similarly educated male coaches, can be explained because “male coaches reported significantly higher beliefs in their ability to coach and lead their teams to a successful performance during competition than female coaches” (Kavussanu et al., 2008). This higher belief is due to the, “gender differences in coaches’ views of what it takes to be a good coach. Specifically, male coaches tend to identify producing winners as one of their top priorities, whereas female coaches rank being a good role model and understanding athletes’ feelings as their top priorities” (Kavussanu et al., 2008). So, “due to the importance they place on winning, male coaches spend more of their time developing their skills to lead the team to success during competition thereby enhancing their GSE” (Kavussanu et al., 2008).

As noted earlier, the significantly lower PCE level for females within this study was inconsistent with results of another CES II-YST measurement instrument based study (Myers et al., 2011). Because of the newness and uniqueness of the CES II-YST measurement instrument, Myers et al. (2011) had a difficult time supporting their results with past research. As a result, they theorized that, “an incredibly talented group of adult females (with a lot of athletic experience relevant to technique and GSE) may be willing and invited to coach at the youth sport level while being unwilling and/or less likely to be invited (as compared to males) to coach at higher levels of competition” (Myers et al., 2011). This theory is based largely on Bandura’s (1977) work on self-efficacy theory and Feltz et al. (1999) work on predictors of coaching efficacy.

As noted earlier, Bandura (1977) identified four main sources of self-efficacy. The first, and most powerful in developing high self-efficacy, was performance accomplishments or personal mastery experiences. In other words, past coaching experience. Feltz et al. (1999) went so far as to call past coaching experience the most dependable for forming an coach efficacy judgment and the strongest predictor of coaching efficacy. Two other studies (Kavussanu et al., 2008; Marback et al., 2005) also showed a link between a greater amount of past coaching experience and higher coaching efficacy. Thus, we can explain the higher PCE of male coaches in the current study by applying the same theory. In the current study, the average number of years coached by all the male coaches was 7.5 years versus the females at 3.5 years of coaching. At more than double the average years coached it is no surprise that male coaches reported higher PCE. These conflicting results make GSE and PCE between the genders a potential target for future examination using the CES II-YST measurement instrument, specifically.

There are numerous other future research opportunities surrounding youth sports coaching efficacy. As a relatively new instrument, continued work must be conducted to refine, evaluate, and validate the CES II-YST measurement instrument. Work could also be conducted to examine the effect of coaching education programs on the coaching efficacy of both male and female coaches. In general, more about youth sports as a whole needs to become known. Only recently has much attention been paid to youth sports so every additional bit of research expands the body of knowledge concerning coaching in youth sports.

Future opportunities aside, the results of this research are applicable to several different audiences. The results can be used by directors of youth sport programs and youth sport coaching education organizations as a guide to evaluating and improving their coaching recruitment and education programs. Improvements may include the creation of specialized coaching education and recruitment programs that target females and emphasize game strategy and physical conditioning components.

In conclusion, this study has shown that education level alone cannot be used as a predictor of coaching efficacy. Only when the interaction of coach gender with coach education level is considered, a significant difference in coaching efficacy is observed between similarly educated male and female coaches. Specifically, female coaches had significantly lower GSE and PCE than similarly educated male coaches. These findings suggest that in order for female coaches to increase their coaching efficacy levels to that of their similarly educated male counter-parts, they must be sought out, encouraged, and given the opportunity to gain coaching experience. Furthermore, coaching education programs to raise self-efficacy of coaches should be created or modified with the goal of targeting female coaches and increasing their understanding of typical male approaches to coaching.

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APPENDIX A

Efficacy Scale II—Youth Sports Teams (CES II-YST)

Motivation Efficacy (ME): confidence a coach has in his/her ability to affect the psychological mood and skills of her/his athletes

me1: motivate your athletes to work hard.

me2: motivate your athletes to like to participate in sport.

me3: help your athletes to maintain confidence in their ability to perform when they are performing poorly.

me4: help your athletes to be confident in their ability relative to their skill level.

Game Strategy Efficacy (GSE): confidence a coach has in his/her ability to lead during competition.

gse1: make effective strategic decisions in pressure situations during competition.

gse2: develop effective strategies during competition that your athletes understand.

gse3: devise strategies that minimize an opposing team's strengths during competition.

gse4: devise strategies that maximize the positive effects of your team's strengths during competition.

Technique Efficacy (TE): confidence a coach has in his/her ability to use her/his instructional and diagnostic skills during practices.

te1: instruct all of the different positional groups of your athletes on appropriate technique during practices.

te2: teach your athletes the complex technical skills of your sport relative to their skill level during practice.

te3: make corrections for technique errors by playing during practices.

te4: teach your athletes new skills in a safe manner during practices.

Character Building Efficacy (CBE): confidence a coach has in his/her ability to positively influence the character development of her/his athletes through sport.

cbe1: effectively promote good sportsmanship in your athletes.

cbe2: positively influence a sense of fair play in your athletes.

cbe3: positively influence the character development of your athletes.

cbe4: teach life lessons to your athletes through sport.

Physical Conditioning Efficacy (PCE): confidence a coach has in his/her ability to prepare her/his athletes physically for participation in her/his sport.

pce1: prepare your athletes to be in physical condition to play the game

pce2: accurately assess your athletes' physical conditioning.

Myers, N. D., Chase, M. A., Pierce, S. W., & Martin, E. (2011). Coaching efficacy and exploratory structural equation modeling: a substantive-methodological synergy. *Journal of Sport & Exercise Psychology*, 33, 779-806.

APPENDIX B**Motivation Efficacy**

HP 1 Education Level

ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	1.467	1	1.467	.262	.610 ^b
Residual	1043.740	186	5.612		
Total	1045.207	187			

a. Dependent Variable: motivation efficacy

b. Predictors: (Constant), What is your highest level of education?

Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	12.562	.775		16.215	.000
What is your highest level of education?	-.077	.151	-.037	-.511	.610

a. Dependent Variable: motivation efficacy

HP 2 Education Level & Gender

ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	11.038	2	5.519	.987	.375 ^b
Residual	1034.170	185	5.590		
Total	1045.207	187			

a. Dependent Variable: motivation efficacy

b. Predictors: (Constant), What is your sex?, What is your highest level of education?

Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	13.230	.927		14.277	.000
What is your highest level of education?	-.083	.151	-.040	-.551	.582
What is your sex?	-.484	.370	-.096	-1.308	.192

a. Dependent Variable: motivation efficacy

Game Strategy Efficacy

HP 3 Education Level

ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	1.455	1	1.455	.190	.664 ^b
Residual	1357.216	177	7.668		
Total	1358.670	178			

a. Dependent Variable: game strategy efficacy

b. Predictors: (Constant), What is your highest level of education?

Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	10.848	.923		11.754	.000
What is your highest level of education?	.079	.181	.033	.436	.664

a. Dependent Variable: game strategy efficacy

HP 4 Education Level & Gender

ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	74.860	2	37.430	5.131	.007 ^b
Residual	1283.811	176	7.294		
Total	1358.670	178			

a. Dependent Variable: game strategy efficacy

b. Predictors: (Constant), What is your sex?, What is your highest level of education?

Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	12.818	1.094		11.722	.000
What is your highest level of education?	.048	.177	.020	.273	.785
What is your sex?	-1.390	.438	-.233	-3.172	.002

a. Dependent Variable: game strategy efficacy

Technique Efficacy

HP 5 Education Level

ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	.001	1	.001	.000	.991 ^b
Residual	1370.869	182	7.532		
Total	1370.870	183			

a. Dependent Variable: teaching efficacy

b. Predictors: (Constant), What is your highest level of education?

Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	11.620	.920		12.633	.000
What is your highest level of education?	.002	.179	.001	.011	.991

a. Dependent Variable: teaching efficacy

HP 6 Education Level & Gender

ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	22.039	2	11.019	1.479	.231 ^b
Residual	1348.831	181	7.452		
Total	1370.870	183			

a. Dependent Variable: teaching efficacy

b. Predictors: (Constant), What is your sex?, What is your highest level of education?

Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	12.669	1.099		11.523	.000
What is your highest level of education?	-.011	.178	-.005	-.064	.949
What is your sex?	-.746	.434	-.127	-1.720	.087

a. Dependent Variable: teaching efficacy

Character Building Efficacy

HP 7 Education Level

ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	9.781	1	9.781	1.876	.173 ^b
Residual	964.786	185	5.215		
Total	974.567	186			

a. Dependent Variable: char_build_efficacy

b. Predictors: (Constant), What is your highest level of education?

Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	12.954	.748		17.327	.000
What is your highest level of education?	.200	.146	.100	1.369	.173

a. Dependent Variable: char_build_efficacy

HP 8 Education Level & Gender

ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	28.457	2	14.229	2.767	.065 ^b
Residual	946.109	184	5.142		
Total	974.567	186			

a. Dependent Variable: character building efficacy

b. Predictors: (Constant), Education, Gender

Bootstrap for Coefficients

Model	B	Bias	Std. Error	Sig. (2- tailed)	Bootstrap	
					95% Confidence Interval	
					Lower	Upper
1 (Constant)	13.885	-.042	.811	.001	12.242	15.414
Gender	-.677	.011	.360	.065	-1.347	.072
Education	.192	.005	.133	.140	-.070	.476

Physical Conditioning Efficacy

HP 9 Education Level

ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	.724	1	.724	.307	.580 ^b
Residual	426.533	181	2.357		
Total	427.257	182			

a. Dependent Variable: physical conditioning efficacy

b. Predictors: (Constant), What is your highest level of education?

Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	5.507	.508		10.834	.000
What is your highest level of education?	.055	.100	.041	.554	.580

a. Dependent Variable: physical conditioning efficacy

HP 10 Education Level & Gender

ANOVA						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	23.166	2	11.583	5.160	.007 ^b
	Residual	404.091	180	2.245		
	Total	427.257	182			

a. Dependent Variable: physical conditioning efficacy
b. Predictors: (Constant), Education, Gender

Bootstrap for Coefficients							
		Bootstrap					
		B	Bias	Std. Error	Sig. (2-tailed)	95% Confidence Interval	
Model						Lower	Upper
1	(Constant)	6.576	.004	.576	.001	5.483	7.699
	Gender	-.761	.003	.250	.004	-1.233	-.277
	Education	.040	-.002	.085	.642	-.125	.200

APPENDIX C

Survey

Q12 Identification of Project: Youth Sports Coaching Efficacy: Coach Education level as predictors of coaching efficacy IRB#20130513512 EX

Purpose of the Research: The purpose of this quantitative study is to evaluate a coaches' level of education as a predictor of their coaching efficacy level.

Procedures: You have been asked to participate in this study because you are a YMCA of Lincoln, NE Youth Sports coach. Participation in the study will require approximately 5 minutes of your time. You will be asked to respond to a number of questions related to your demographic information and confidence surrounding five types of coaching efficacy (Motivation Efficacy, Game Strategy Efficacy, Technique Efficacy, Character Building Efficacy, & Physical Conditioning Efficacy). The questions will ask that you click boxes/circles as well as type in some number answers.

Risks and/or Discomforts: There are no known risks or discomforts associated with this research.

Benefits: You may find the learning experience will provide you with an opportunity for self-reflection and increased awareness of the importance of coaching youth sports. The information gained from this study may help to better understand the relationship between coaching efficacy and athlete success.

Confidentiality: Any information obtained during this study which could identify you will be kept strictly confidential. Digital data will be stored on Qualtrics' password protected database and on the investigator's password protected computer. It will only be accessed by the investigator. Printed data will be stored in a locked cabinet in the investigator's office and will only be seen by the investigator during the study and for three years after the study is complete. The information obtained in this study may be published in scientific journals or presented at scientific meetings but the data will be reported as aggregated data.

Compensation: There will be no material/monitory compensation given for participating in this research. However, the investigator does wish to convey his thanks to all who participate.

Opportunity to Ask Questions: You may ask any questions concerning this research and have those questions answered before agreeing to participate in or during the study by contacting any member of the research team, Geoff Weller (geoffreyvweller@gmail.com, 402-770-6638) or Dr. Deb Mullen (dmullen1@unl.edu, 402-472-5426). If you have questions concerning your rights as a research subject that have not been answered by the investigators or to report any concerns about the study, you may contact the University of Nebraska-Lincoln Institutional Review Board, telephone (402) 472-6965.

Freedom to Withdraw: You are free to decide not to participate in this study or to withdraw at any time without adversely affecting your relationship with the investigators, the University of Nebraska or the YMCA of Lincoln, NE. Your decision will not result in any loss or benefits to which you are otherwise entitled.

Consent, Right to Receive a Copy: You are voluntarily making a decision whether or not to participate in this research

study. By clicking the "I Consent" box below you certify that you have decided to participate having read and understood the information presented. You will be given a chance to print a copy of this consent form to keep at the conclusion of the survey.

- ☐ I Consent (1)
- ☐ I do not wish to participate. (2)

If I do not wish to participate. Is Selected, Then Skip To End of Survey

Q6 What is your sex?

- ☐ Male (1)
- ☐ Female (2)
- ☐ No response (3)

Q10 What is your age?

Q14 What is your ethnicity?

- ☐ Hispanic/Latino (1)
- ☐ Not Hispanic/Latino (2)
- ☐ American Indian or Alaska Native (3)
- ☐ Asian (4)
- ☐ Black or African American (5)
- ☐ Native Hawaiian or Other Pacific Islander (6)
- ☐ White (7)
- ☐ No response (8)

Q7 What is your highest level of education?

- ☐ High School (1)
- ☐ GED (2)
- ☐ Some College (3)
- ☐ Associates/Technical Degree (4)
- ☐ Bachelors Degree (5)
- ☐ Masters/Professional Degree (6)
- ☐ Doctorate (7)
- ☐ No Response (8)

Q9 What sport(s) do you coach?

- ☐ Baseball (1)
- ☐ Basketball (2)
- ☐ Flag Football (3)
- ☐ Soccer (4)
- ☐ Volleyball (5)
- ☐ Multiple Sports (6)
- ☐ No Response (7)

Q15 Do you have any personal playing experience in the sport you are coaching?

- ☐ Yes (1)
- ☐ No (2)

Q11 How many years have you coached?

Q13 Have you ever participated in any coaching education courses?

- ☐ Yes (1)
- ☐ No (2)

Q1 Motivation Efficacy (ME): confidence a coach has in his/her ability to affect the psychological mood and skills of her/his athletes. Below, please rate your confidence to:

	Low (1)	Moderate (2)	High (3)	Complete Confidence (4)	N/A (5)
motivate your athletes to work hard. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
motivate your athletes to like to participate in sport. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
help your athletes to maintain confidence in their ability to perform when they are performing poorly. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
help your athletes to be confident in their ability relative to their skill level. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q2 Game Strategy Efficacy (GSE): confidence a coach has in his/her ability to lead during competition. Below, please rate your confidence to:

	Low (1)	Moderate (2)	High (3)	Complete Confidence (4)	N/A (5)
make effective strategic decisions in pressure situations during competition. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
develop effective strategies during competition that your athletes understand. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
devise strategies that minimize an opposing team's strengths during competition. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
devise strategies that maximize the positive effects of your team's strengths during competition. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q3 Technique Efficacy (TE): confidence a coach has in his/her ability to use her/his instructional and diagnostic skills during practices. Below, please rate your confidence to:

	Low (1)	Moderate (2)	High (3)	Complete Confidence (4)	N/A (5)
instruct all of the different positional groups of your athletes on appropriate technique during practices. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
teach your athletes the complex technical skills of your sport relative to their skill level during practice. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
make corrections for technique errors by playing during practices. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
teach your athletes new skills in a safe manner during practices. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q4 Character Building Efficacy (CBE): confidence a coach has in his/her ability to positively influence the character development of her/his athletes through sport. Below, please rate your confidence to:

	Low (1)	Moderate (2)	High (3)	Complete Confidence (4)	N/A (5)
effectively promote good sportsmanship in your athletes. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
positively influence a sense of fair play in your athletes. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
positively influence the character development of your athletes. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
teach life lessons to your athletes through sport. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q5 Physical Conditioning Efficacy (PCE): confidence a coach has in his/her ability to prepare her/his athletes physically for participation in her/his sport. Below, please rate your confidence to:

	Low (1)	Moderate (2)	High (3)	Complete Confidence (4)	N/A (5)
prepare your athletes to be in physical condition to play the game. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
accurately assess your athletes' physical conditioning. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

APPENDIX D
Motivation Efficacy Raw Data

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Coach	SEX	EDU LEVEL	SxE Level	ME 1	ME 2	ME 3	ME 4	ME Observed	ME SxE Predicted	ME EDU Level Predicted
1	1	1	1	4	3	3	3	13	12.663	12.485
2	1	1	1	4	3	4	4	15	12.663	12.485
3	1	2	2	3	3	3	3	12	12.58	12.408
4	1	3	3	2	2	2	2	8	12.497	12.331
5	1	3	3	2	3	2	3	10	12.497	12.331
6	1	3	3	2	2	3	3	10	12.497	12.331
7	1	3	3	3	3	3	3	12	12.497	12.331
8	1	3	3	3	3	3	3	12	12.497	12.331
9	1	3	3	3	3	3	3	12	12.497	12.331
10	1	3	3	3	4	3	3	13	12.497	12.331
11	1	3	3	3	3	4	3	13	12.497	12.331
12	1	3	3	4	3	3	4	14	12.497	12.331
13	1	3	3	4	4	3	3	14	12.497	12.331
14	1	3	3	4	4	3	3	14	12.497	12.331
15	1	3	3	4	4	4	4	16	12.497	12.331
16	1	3	3	4	4	4	4	16	12.497	12.331
17	1	3	3	4	4	4	4	16	12.497	12.331
18	1	4	4	2	4	2	2	10	12.414	12.254
19	1	4	4	2	3	3	2	10	12.414	12.254
20	1	4	4	3	3	2	2	10	12.414	12.254
21	1	4	4	2	3	3	3	11	12.414	12.254
22	1	4	4	3	3	2	3	11	12.414	12.254
23	1	4	4	3	4	2	3	12	12.414	12.254
24	1	4	4	3	3	3	3	12	12.414	12.254
25	1	4	4	4	4	3	4	15	12.414	12.254
26	1	5	5	2	2	2	2	8	12.331	12.177
27	1	5	5	2	3	2	2	9	12.331	12.177
28	1	5	5	2	3	2	2	9	12.331	12.177
29	1	5	5	2	3	2	2	9	12.331	12.177
30	1	5	5	2	3	2	2	9	12.331	12.177
31	1	5	5	2	3	2	3	10	12.331	12.177
32	1	5	5	2	3	2	3	10	12.331	12.177
33	1	5	5	2	3	2	3	10	12.331	12.177
34	1	5	5	3	2	2	3	10	12.331	12.177
35	1	5	5	2	3	3	2	10	12.331	12.177
36	1	5	5	2	2	4	2	10	12.331	12.177
37	1	5	5	3	2	3	2	10	12.331	12.177
38	1	5	5	2	3	3	3	11	12.331	12.177
39	1	5	5	3	3	2	3	11	12.331	12.177
40	1	5	5	3	3	2	3	11	12.331	12.177
41	1	5	5	3	3	2	3	11	12.331	12.177
42	1	5	5	3	2	3	3	11	12.331	12.177
43	1	5	5	3	2	3	3	11	12.331	12.177
44	1	5	5	3	2	3	3	11	12.331	12.177
45	1	5	5	3	2	3	3	11	12.331	12.177
46	1	5	5	3	2	3	3	11	12.331	12.177
47	1	5	5	3	3	3	2	11	12.331	12.177
48	1	5	5	2	3	3	4	12	12.331	12.177
49	1	5	5	2	4	3	3	12	12.331	12.177
50	1	5	5	3	4	2	3	12	12.331	12.177
51	1	5	5	3	4	2	3	12	12.331	12.177
52	1	5	5	3	3	3	3	12	12.331	12.177
53	1	5	5	3	3	3	3	12	12.331	12.177
54	1	5	5	3	3	3	3	12	12.331	12.177
55	1	5	5	3	3	3	3	12	12.331	12.177
56	1	5	5	3	3	3	3	12	12.331	12.177
57	1	5	5	3	3	3	3	12	12.331	12.177
58	1	5	5	3	3	3	3	12	12.331	12.177
59	1	5	5	3	3	3	3	12	12.331	12.177
60	1	5	5	3	3	3	3	12	12.331	12.177
61	1	5	5	3	3	3	3	12	12.331	12.177
62	1	5	5	4	2	3	3	12	12.331	12.177

Coach	SEX	EDU LEVEL	SxE Level	ME 1	ME 2	ME 3	ME 4	ME Observed	ME SxE Predicted	ME EDU Level Predicted
63	1	5	5	3	4	3	2	12	12.331	12.177
64	1	5	5	3	4	2	4	13	12.331	12.177
65	1	5	5	3	4	3	3	13	12.331	12.177
66	1	5	5	3	4	3	3	13	12.331	12.177
67	1	5	5	3	4	3	3	13	12.331	12.177
68	1	5	5	3	3	4	3	13	12.331	12.177
69	1	5	5	4	3	3	3	13	12.331	12.177
70	1	5	5	4	3	3	3	13	12.331	12.177
71	1	5	5	4	3	3	3	13	12.331	12.177
72	1	5	5	4	3	3	4	14	12.331	12.177
73	1	5	5	3	4	4	3	14	12.331	12.177
74	1	5	5	3	4	4	3	14	12.331	12.177
75	1	5	5	4	3	4	3	14	12.331	12.177
76	1	5	5	3	4	4	4	15	12.331	12.177
77	1	5	5	4	4	3	4	15	12.331	12.177
78	1	5	5	4	4	3	4	15	12.331	12.177
79	1	5	5	4	4	3	4	15	12.331	12.177
80	1	5	5	4	4	4	4	16	12.331	12.177
81	1	5	5	4	4	4	4	16	12.331	12.177
82	1	5	5	4	4	4	4	16	12.331	12.177
83	1	5	5	4	4	4	4	16	12.331	12.177
84	1	5	5	4	4	4	4	16	12.331	12.177
85	1	5	5	4	4	4	4	16	12.331	12.177
86	1	5	5	4	4	4	4	16	12.331	12.177
87	1	6	6	2	2	2	1	7	12.248	12.1
88	1	6	6	2	3	1	2	8	12.248	12.1
89	1	6	6	2	2	2	2	8	12.248	12.1
90	1	6	6	2	2	3	2	9	12.248	12.1
91	1	6	6	3	2	2	2	9	12.248	12.1
92	1	6	6	3	2	2	2	9	12.248	12.1
93	1	6	6	2	3	2	3	10	12.248	12.1
94	1	6	6	2	2	3	3	10	12.248	12.1
95	1	6	6	2	3	3	3	11	12.248	12.1
96	1	6	6	3	3	3	3	12	12.248	12.1
97	1	6	6	3	3	3	3	12	12.248	12.1
98	1	6	6	3	3	3	3	12	12.248	12.1
99	1	6	6	3	3	3	3	12	12.248	12.1
100	1	6	6	3	3	3	3	12	12.248	12.1
101	1	6	6	3	3	3	3	12	12.248	12.1
102	1	6	6	3	3	3	3	12	12.248	12.1
103	1	6	6	3	3	3	3	12	12.248	12.1
104	1	6	6	4	2	3	3	12	12.248	12.1
105	1	6	6	4	4	2	2	12	12.248	12.1
106	1	6	6	3	4	3	3	13	12.248	12.1
107	1	6	6	3	3	4	3	13	12.248	12.1
108	1	6	6	4	3	3	3	13	12.248	12.1
109	1	6	6	4	4	3	2	13	12.248	12.1
110	1	6	6	3	4	3	4	14	12.248	12.1
111	1	6	6	3	3	4	4	14	12.248	12.1
112	1	6	6	4	3	3	4	14	12.248	12.1
113	1	6	6	4	4	3	3	14	12.248	12.1
114	1	6	6	4	4	4	4	16	12.248	12.1
115	1	6	6	4	4	4	4	16	12.248	12.1
116	1	6	6	4	4	4	4	16	12.248	12.1
117	1	6	6	4	4	4	4	16	12.248	12.1
118	1	6	6	4	4	4	4	16	12.248	12.1
119	1	6	6	4	4	4	4	16	12.248	12.1
120	1	6	6	4	4	4	4	16	12.248	12.1
121	1	7	7	2	2	3	2	9	12.165	12.023
122	1	7	7	2	3	3	3	11	12.165	12.023
123	1	7	7	2	3	3	3	11	12.165	12.023
124	1	7	7	3	3	2	3	11	12.165	12.023

Coach	SEX	EDU LEVEL	SxE Level	ME 1	ME 2	ME 3	ME 4	ME Observed	ME SxE Predicted	ME EDU Level Predicted
125	1	7	7	3	3	3	3	12	12.165	12.023
126	1	7	7	3	3	3	3	12	12.165	12.023
127	1	7	7	4	4	4	4	16	12.165	12.023
128	1	7	7	4	4	4	4	16	12.165	12.023
129	2	2	9	3	4	3	3	13	12.096	12.408
130	2	3	10	2	2	2	2	8	12.013	12.331
131	2	3	10	2	2	2	2	8	12.013	12.331
132	2	3	10	3	2	3	3	11	12.013	12.331
133	2	3	10	3	2	3	4	12	12.013	12.331
134	2	3	10	3	3	3	3	12	12.013	12.331
135	2	3	10	4	4	3	4	15	12.013	12.331
136	2	3	10	4	4	4	4	16	12.013	12.331
137	2	3	10	4	4	4	4	16	12.013	12.331
138	2	4	11	1	2	1	1	5	11.93	12.254
139	2	4	11	3	3	3	3	12	11.93	12.254
140	2	4	11	3	3	3	3	12	11.93	12.254
141	2	4	11	3	3	3	3	12	11.93	12.254
142	2	4	11	4	4	4	4	16	11.93	12.254
143	2	5	12	2	2	1	2	7	11.847	12.177
144	2	5	12	2	2	2	2	8	11.847	12.177
145	2	5	12	2	2	2	2	8	11.847	12.177
146	2	5	12	2	2	2	3	9	11.847	12.177
147	2	5	12	2	3	2	2	9	11.847	12.177
148	2	5	12	3	2	2	2	9	11.847	12.177
149	2	5	12	2	3	2	3	10	11.847	12.177
150	2	5	12	2	3	3	2	10	11.847	12.177
151	2	5	12	3	3	2	2	10	11.847	12.177
152	2	5	12	3	2	3	2	10	11.847	12.177
153	2	5	12	3	3	2	3	11	11.847	12.177
154	2	5	12	3	3	2	3	11	11.847	12.177
155	2	5	12	3	2	3	3	11	11.847	12.177
156	2	5	12	3	2	3	3	11	11.847	12.177
157	2	5	12	3	3	3	2	11	11.847	12.177
158	2	5	12	2	4	3	3	12	11.847	12.177
159	2	5	12	3	3	3	3	12	11.847	12.177
160	2	5	12	3	3	3	3	12	11.847	12.177
161	2	5	12	3	3	3	3	12	11.847	12.177
162	2	5	12	3	3	3	3	12	11.847	12.177
163	2	5	12	3	3	3	3	12	11.847	12.177
164	2	5	12	3	3	3	3	12	11.847	12.177
165	2	5	12	3	3	3	3	12	11.847	12.177
166	2	5	12	3	4	3	4	14	11.847	12.177
167	2	5	12	4	4	3	3	14	11.847	12.177
168	2	5	12	4	4	4	4	16	11.847	12.177
169	2	5	12	4	4	4	4	16	11.847	12.177
170	2	5	12	4	4	4	4	16	11.847	12.177
171	2	5	12	4	4	4	4	16	11.847	12.177
172	2	6	13	2	2	2	2	8	11.764	12.1
173	2	6	13	2	3	3	3	11	11.764	12.1
174	2	6	13	3	3	3	3	12	11.764	12.1
175	2	6	13	3	3	3	3	12	11.764	12.1
176	2	6	13	3	3	3	3	12	11.764	12.1
177	2	6	13	3	3	3	3	12	11.764	12.1
178	2	6	13	3	3	3	3	12	11.764	12.1
179	2	6	13	3	2	4	3	12	11.764	12.1
180	2	6	13	3	4	3	3	13	11.764	12.1
181	2	6	13	4	4	3	3	14	11.764	12.1
182	2	6	13	4	4	3	4	15	11.764	12.1
183	2	6	13	4	4	4	4	16	11.764	12.1
184	2	6	13	4	4	4	4	16	11.764	12.1
185	2	7	14	2	2	2	2	8	11.681	12.023
186	2	7	14	3	3	2	3	11	11.681	12.023
187	2	7	14	3	3	3	3	12	11.681	12.023
188	2	7	14	3	3	4	4	14	11.681	12.023

Game Strategy Efficacy Raw Data

Coach	SEX	EDU LEVEL	SxE Level	GSE 1	GSE 2	GSE 3	GSE 4	GSE Observed	GSE Predicted	GSE EDU Predicted
1	1	1	1	4	3	3	4	14	11.476	10.927
2	1	1	1	4	3	4	4	15	11.476	10.927
3	1	2	2	2	3	2	3	10	11.524	11.006
4	1	3	3	2	2	1	2	7	11.572	11.085
5	1	3	3	2	2	2	3	9	11.572	11.085
6	1	3	3	3	2	2	4	11	11.572	11.085
7	1	3	3	3	3	2	3	11	11.572	11.085
8	1	3	3	2	3	2	4	11	11.572	11.085
9	1	3	3	4	3	2	3	12	11.572	11.085
10	1	3	3	3	3	3	3	12	11.572	11.085
11	1	3	3	3	3	3	3	12	11.572	11.085
12	1	3	3	3	3	3	3	12	11.572	11.085
13	1	3	3	3	3	4	3	13	11.572	11.085
14	1	3	3	3	3	3	4	13	11.572	11.085
15	1	3	3	4	3	3	4	14	11.572	11.085
16	1	3	3	4	3	3	4	14	11.572	11.085
17	1	3	3	4	4	4	4	16	11.572	11.085
18	1	4	4	2	2	1	2	7	11.62	11.164
19	1	4	4	2	2	2	2	8	11.62	11.164
20	1	4	4	2	2	2	2	8	11.62	11.164
21	1	4	4	2	2	2	3	9	11.62	11.164
22	1	4	4	3	2	2	3	10	11.62	11.164
23	1	4	4	3	2	3	3	11	11.62	11.164
24	1	4	4	3	3	3	3	12	11.62	11.164
25	1	4	4	4	4	3	4	15	11.62	11.164
26	1	5	5	2	1	1	2	6	11.668	11.243
27	1	5	5	2	2	1	2	7	11.668	11.243
28	1	5	5	2	1	3	2	8	11.668	11.243
29	1	5	5	2	2	2	2	8	11.668	11.243
30	1	5	5	2	2	2	2	8	11.668	11.243
31	1	5	5	2	2	2	2	8	11.668	11.243
32	1	5	5	2	2	2	2	8	11.668	11.243
33	1	5	5	2	2	2	2	8	11.668	11.243
34	1	5	5	2	2	2	2	8	11.668	11.243
35	1	5	5	2	2	2	3	9	11.668	11.243
36	1	5	5	2	2	2	3	9	11.668	11.243
37	1	5	5	2	2	2	3	9	11.668	11.243
38	1	5	5	2	2	2	3	9	11.668	11.243
39	1	5	5	3	2	2	2	9	11.668	11.243
40	1	5	5	2	3	2	2	9	11.668	11.243
41	1	5	5	2	3	3	2	10	11.668	11.243
42	1	5	5	2	3	3	2	10	11.668	11.243
43	1	5	5	3	3	2	2	10	11.668	11.243
44	1	5	5	2	2	3	3	10	11.668	11.243
45	1	5	5	2	2	3	3	10	11.668	11.243
46	1	5	5	2	2	3	3	10	11.668	11.243
47	1	5	5	2	2	3	3	10	11.668	11.243
48	1	5	5	2	3	2	3	10	11.668	11.243
49	1	5	5	3	2	3	3	11	11.668	11.243
50	1	5	5	3	3	3	2	11	11.668	11.243
51	1	5	5	3	3	2	3	11	11.668	11.243
52	1	5	5	3	3	2	3	11	11.668	11.243
53	1	5	5	4	2	2	3	11	11.668	11.243
54	1	5	5	3	3	2	3	11	11.668	11.243
55	1	5	5	3	3	2	3	11	11.668	11.243
56	1	5	5	3	3	3	3	12	11.668	11.243
57	1	5	5	3	3	3	3	12	11.668	11.243
58	1	5	5	3	3	3	3	12	11.668	11.243
59	1	5	5	3	3	3	3	12	11.668	11.243
60	1	5	5	3	3	3	3	12	11.668	11.243
61	1	5	5	4	3	2	3	12	11.668	11.243
62	1	5	5	3	3	3	3	12	11.668	11.243
63	1	5	5	3	3	3	3	12	11.668	11.243
64	1	5	5	3	3	3	3	12	11.668	11.243
65	1	5	5	3	3	3	3	12	11.668	11.243
66	1	5	5	3	4	2	4	13	11.668	11.243
67	1	5	5	3	3	3	4	13	11.668	11.243
68	1	5	5	4	3	3	3	13	11.668	11.243
69	1	5	5	4	3	3	3	13	11.668	11.243
70	1	5	5	3	3	3	4	13	11.668	11.243
71	1	5	5	4	3	3	3	13	11.668	11.243
72	1	5	5	2	3	5	3	13	11.668	11.243

Coach	SEX	EDU LEVEL	SxE Level	GSE 1	GSE 2	GSE 3	GSE 4	GSE Observed	GSE Predicted	GSE EDU Predicted
73	1	5	5	4	3	3	3	13	11.668	11.243
74	1	5	5	5	3	3	3	14	11.668	11.243
75	1	5	5	3	3	4	4	14	11.668	11.243
76	1	5	5	4	3	3	4	14	11.668	11.243
77	1	5	5	3	3	4	4	14	11.668	11.243
78	1	5	5	4	4	3	4	15	11.668	11.243
79	1	5	5	4	3	4	4	15	11.668	11.243
80	1	5	5	3	4	4	4	15	11.668	11.243
81	1	5	5	4	4	4	4	16	11.668	11.243
82	1	5	5	4	4	4	4	16	11.668	11.243
83	1	5	5	4	4	4	4	16	11.668	11.243
84	1	5	5	4	4	4	4	16	11.668	11.243
85	1	5	5	4	4	4	4	16	11.668	11.243
86	1	5	5	4	4	4	4	16	11.668	11.243
87	1	6	6	1	1	1	1	4	11.716	11.322
88	1	6	6	2	2	2	2	8	11.716	11.322
89	1	6	6	2	2	2	2	8	11.716	11.322
90	1	6	6	2	2	2	2	8	11.716	11.322
91	1	6	6	2	2	2	2	8	11.716	11.322
92	1	6	6	2	2	1	3	8	11.716	11.322
93	1	6	6	2	2	2	3	9	11.716	11.322
94	1	6	6	2	3	2	3	10	11.716	11.322
95	1	6	6	2	2	3	3	10	11.716	11.322
96	1	6	6	2	3	2	3	10	11.716	11.322
97	1	6	6	3	2	2	3	10	11.716	11.322
98	1	6	6	2	3	2	3	10	11.716	11.322
99	1	6	6	3	3	3	3	12	11.716	11.322
100	1	6	6	3	3	3	3	12	11.716	11.322
101	1	6	6	3	3	3	3	12	11.716	11.322
102	1	6	6	3	3	3	3	12	11.716	11.322
103	1	6	6	4	3	2	3	12	11.716	11.322
104	1	6	6	3	3	3	3	12	11.716	11.322
105	1	6	6	3	3	3	3	12	11.716	11.322
106	1	6	6	3	3	4	3	13	11.716	11.322
107	1	6	6	3	4	3	4	14	11.716	11.322
108	1	6	6	4	3	3	4	14	11.716	11.322
109	1	6	6	4	4	3	4	15	11.716	11.322
110	1	6	6	4	3	4	4	15	11.716	11.322
111	1	6	6	4	3	4	4	15	11.716	11.322
112	1	6	6	4	4	3	4	15	11.716	11.322
113	1	6	6	4	4	4	4	16	11.716	11.322
114	1	6	6	4	4	4	4	16	11.716	11.322
115	1	6	6	4	4	4	4	16	11.716	11.322
116	1	6	6	4	4	4	4	16	11.716	11.322
117	1	6	6	4	4	4	4	16	11.716	11.322
118	1	6	6	4	4	4	4	16	11.716	11.322
119	1	6	6	4	4	4	4	16	11.716	11.322
120	1	7	7	2	3	2	4	11	11.764	11.401
121	1	7	7	3	3	3	3	12	11.764	11.401
122	1	7	7	3	3	3	3	12	11.764	11.401
123	1	7	7	3	3	3	3	12	11.764	11.401
124	1	7	7	3	3	3	3	12	11.764	11.401
125	1	7	7	3	3	3	3	12	11.764	11.401
126	1	7	7	3	3	3	3	12	11.764	11.401
127	1	7	7	4	4	4	4	16	11.764	11.401
128	2	2	9	3	3	2	3	11	10.134	11.006
129	2	3	10	1	2	1	2	6	10.182	11.085
130	2	3	10	2	2	2	2	8	10.182	11.085
131	2	3	10	2	3	2	3	10	10.182	11.085
132	2	3	10	3	3	2	3	11	10.182	11.085
133	2	3	10	3	4	2	3	12	10.182	11.085
134	2	3	10	3	3	3	3	12	10.182	11.085
135	2	3	10	3	3	4	3	13	10.182	11.085
136	2	3	10	3	4	3	4	14	10.182	11.085
137	2	4	11	1	1	1	1	4	10.23	11.164
138	2	4	11	3	3	2	3	11	10.23	11.164
139	2	4	11	3	3	3	3	12	10.23	11.164
140	2	4	11	4	4	4	4	16	10.23	11.164
141	2	5	12	1	1	1	1	4	10.278	11.243
142	2	5	12	1	1	1	2	5	10.278	11.243
143	2	5	12	2	2	1	2	7	10.278	11.243
144	2	5	12	1	2	2	2	7	10.278	11.243

Coach	SEX	EDU LEVEL	SxE Level	GSE 1	GSE 2	GSE 3	GSE 4	GSE Observed	GSE Predicted	GSE EDU Predicted
145	2	5	12	2	2	2	2	8	10.278	11.243
148	2	5	12	2	2	2	2	8	10.278	11.243
149	2	5	12	2	2	2	2	8	10.278	11.243
152	2	5	12	2	2	2	2	8	10.278	11.243
153	2	5	12	2	2	2	2	8	10.278	11.243
154	2	5	12	2	2	2	3	9	10.278	11.243
155	2	5	12	3	3	2	2	10	10.278	11.243
156	2	5	12	2	3	2	3	10	10.278	11.243
157	2	5	12	3	3	2	3	11	10.278	11.243
158	2	5	12	3	3	2	3	11	10.278	11.243
159	2	5	12	3	3	3	3	12	10.278	11.243
160	2	5	12	3	3	3	3	12	10.278	11.243
161	2	5	12	3	3	3	3	12	10.278	11.243
162	2	5	12	3	3	3	3	12	10.278	11.243
163	2	5	12	3	3	3	3	12	10.278	11.243
164	2	5	12	3	3	3	3	12	10.278	11.243
165	2	5	12	3	3	3	3	12	10.278	11.243
166	2	5	12	3	3	3	3	12	10.278	11.243
167	2	5	12	3	4	3	4	14	10.278	11.243
168	2	5	12	4	4	4	4	16	10.278	11.243
169	2	6	13	1	1	2	2	6	10.326	11.322
170	2	6	13	3	2	2	3	10	10.326	11.322
171	2	6	13	2	3	3	3	11	10.326	11.322
172	2	6	13	3	3	2	3	11	10.326	11.322
173	2	6	13	3	3	2	3	11	10.326	11.322
174	2	6	13	3	3	2	3	11	10.326	11.322
175	2	6	13	3	3	3	2	11	10.326	11.322
176	2	6	13	3	3	3	3	12	10.326	11.322
177	2	6	13	3	3	3	3	12	10.326	11.322
178	2	6	13	3	3	3	3	12	10.326	11.322
179	2	6	13	3	3	3	4	13	10.326	11.322
180	2	6	13	4	3	3	3	13	10.326	11.322
181	2	7	14	3	2	2	2	9	10.374	11.401
182	2	7	14	3	3	2	3	11	10.374	11.401

Technique Teaching Efficacy Raw Data

Coach	SEX	EDU LEVEL	SxE Level	TE 1	TE 2	TE 3	TE 4	TE Observed	TE SxE Predicted	TE EDU Predicted
1	1		1	1	3	2	3	3	11	11.91194362
2	1		1	1	3	3	3	4	13	11.91194362
3	1		2	2	3	3	3	3	12	11.90050417
4	1		3	3	2	2	3	3	10	11.88906472
5	1		3	3	2	2	3	3	10	11.88906472
6	1		3	3	3	3	2	3	11	11.88906472
7	1		3	3	3	3	2	3	11	11.88906472
8	1		3	3	3	2	3	3	11	11.88906472
9	1		3	3	3	3	3	3	12	11.88906472
10	1		3	3	3	3	3	3	12	11.88906472
11	1		3	3	3	3	2	4	12	11.88906472
12	1		3	3	4	3	3	3	13	11.88906472
13	1		3	3	3	3	4	3	13	11.88906472
14	1		3	3	4	4	4	4	16	11.88906472
15	1		3	3	4	4	4	4	16	11.88906472
16	1		4	4	2	1	2	2	7	11.87762527
17	1		4	4	2	2	2	2	8	11.87762527
18	1		4	4	3	2	2	2	9	11.87762527
19	1		4	4	2	2	2	3	9	11.87762527
20	1		4	4	2	2	3	3	10	11.87762527
21	1		4	4	3	3	3	3	12	11.87762527
22	1		4	4	2	3	4	4	13	11.87762527
23	1		4	4	3	4	4	4	15	11.87762527
24	1		5	5	2	1	1	2	6	11.86618581
25	1		5	5	2	1	2	2	7	11.86618581
26	1		5	5	2	1	2	2	7	11.86618581
27	1		5	5	2	2	2	2	8	11.86618581
28	1		5	5	2	2	2	2	8	11.86618581
29	1		5	5	2	2	2	2	8	11.86618581
30	1		5	5	1	1	3	3	8	11.86618581
31	1		5	5	3	2	2	2	9	11.86618581
32	1		5	5	3	2	2	2	9	11.86618581
33	1		5	5	3	2	2	2	9	11.86618581
34	1		5	5	3	2	2	2	9	11.86618581
35	1		5	5	2	3	2	2	9	11.86618581
36	1		5	5	2	3	2	2	9	11.86618581
37	1		5	5	2	2	2	3	9	11.86618581
38	1		5	5	2	2	2	3	9	11.86618581
39	1		5	5	2	2	2	3	9	11.86618581
40	1		5	5	1	2	3	3	9	11.86618581
41	1		5	5	3	2	2	3	10	11.86618581
42	1		5	5	3	2	2	3	10	11.86618581
43	1		5	5	2	3	3	2	10	11.86618581
44	1		5	5	2	2	3	3	10	11.86618581
45	1		5	5	2	2	3	3	10	11.86618581
46	1		5	5	2	2	3	3	10	11.86618581
47	1		5	5	2	2	3	3	10	11.86618581
48	1		5	5	2	2	3	3	10	11.86618581

Coach	SEX	EDU LEVEL	SxE Level	TE 1	TE 2	TE 3	TE 4	TE Observed	TE SxE Predicted	TE EDU Level Predicted
49	1		5	5	3	3	2	3	11	11.86618581
50	1		5	5	3	2	3	3	11	11.86618581
51	1		5	5	2	3	3	3	11	11.86618581
52	1		5	5	2	2	3	4	11	11.86618581
53	1		5	5	2	2	3	4	11	11.86618581
54	1		5	5	3	3	3	3	12	11.86618581
55	1		5	5	3	3	3	3	12	11.86618581
56	1		5	5	3	3	3	3	12	11.86618581
57	1		5	5	3	3	3	3	12	11.86618581
58	1		5	5	3	3	3	3	12	11.86618581
59	1		5	5	3	3	3	3	12	11.86618581
60	1		5	5	3	3	3	3	12	11.86618581
61	1		5	5	3	4	3	3	13	11.86618581
62	1		5	5	3	3	4	3	13	11.86618581
63	1		5	5	3	3	3	4	13	11.86618581
64	1		5	5	3	3	3	4	13	11.86618581
65	1		5	5	3	3	3	4	13	11.86618581
66	1		5	5	4	3	3	4	14	11.86618581
67	1		5	5	4	3	3	4	14	11.86618581
68	1		5	5	3	4	4	3	14	11.86618581
69	1		5	5	3	3	4	4	14	11.86618581
70	1		5	5	3	3	4	4	14	11.86618581
71	1		5	5	4	4	3	4	15	11.86618581
72	1		5	5	4	3	4	4	15	11.86618581
73	1		5	5	4	3	4	4	15	11.86618581
74	1		5	5	3	4	4	4	15	11.86618581
75	1		5	5	3	4	4	4	15	11.86618581
76	1		5	5	3	4	4	4	15	11.86618581
77	1		5	5	4	4	4	4	16	11.86618581
78	1		5	5	4	4	4	4	16	11.86618581
79	1		5	5	4	4	4	4	16	11.86618581
80	1		5	5	4	4	4	4	16	11.86618581
81	1		5	5	4	4	4	4	16	11.86618581
82	1		5	5	4	4	4	4	16	11.86618581
83	1		5	5	4	4	4	4	16	11.86618581
84	1		5	5	4	4	4	4	16	11.86618581
85	1		6	6	2	1	2	2	7	11.85474636
86	1		6	6	2	1	1	3	7	11.85474636
87	1		6	6	1	1	2	3	7	11.85474636
88	1		6	6	2	2	2	2	8	11.85474636
89	1		6	6	2	2	2	2	8	11.85474636
90	1		6	6	2	1	2	3	8	11.85474636
91	1		6	6	2	2	2	3	9	11.85474636
92	1		6	6	3	2	2	3	10	11.85474636
93	1		6	6	2	2	3	3	10	11.85474636
94	1		6	6	2	2	3	3	10	11.85474636
95	1		6	6	3	2	3	3	11	11.85474636
96	1		6	6	2	3	3	3	11	11.85474636

Coach	SEX	EDU LEVEL	SxE Level	TE 1	TE 2	TE 3	TE 4	TE Observed	TE SxE Predicted	TE EDU Level Predicted	
97	1		6	6	2	3	3	3	11	11.85474636	11.63216366
98	1		6	6	2	3	3	3	11	11.85474636	11.63216366
99	1		6	6	3	3	3	3	12	11.85474636	11.63216366
100	1		6	6	3	3	3	3	12	11.85474636	11.63216366
101	1		6	6	3	3	3	3	12	11.85474636	11.63216366
102	1		6	6	3	3	3	3	12	11.85474636	11.63216366
103	1		6	6	3	3	4	3	13	11.85474636	11.63216366
104	1		6	6	3	3	3	4	13	11.85474636	11.63216366
105	1		6	6	3	3	3	4	13	11.85474636	11.63216366
106	1		6	6	3	4	3	4	14	11.85474636	11.63216366
107	1		6	6	3	3	4	4	14	11.85474636	11.63216366
108	1		6	6	4	3	4	4	15	11.85474636	11.63216366
109	1		6	6	4	3	4	4	15	11.85474636	11.63216366
110	1		6	6	4	3	4	4	15	11.85474636	11.63216366
111	1		6	6	3	4	4	4	15	11.85474636	11.63216366
112	1		6	6	4	4	4	4	16	11.85474636	11.63216366
113	1		6	6	4	4	4	4	16	11.85474636	11.63216366
114	1		6	6	4	4	4	4	16	11.85474636	11.63216366
115	1		6	6	4	4	4	4	16	11.85474636	11.63216366
116	1		6	6	4	4	4	4	16	11.85474636	11.63216366
117	1		6	6	4	4	4	4	16	11.85474636	11.63216366
118	1		6	6	4	4	4	4	16	11.85474636	11.63216366
119	1		7	7	2	2	3	2	9	11.84330691	11.63419093
120	1		7	7	2	3	2	3	10	11.84330691	11.63419093
121	1		7	7	3	2	3	3	11	11.84330691	11.63419093
122	1		7	7	2	3	3	3	11	11.84330691	11.63419093
123	1		7	7	2	3	3	3	11	11.84330691	11.63419093
124	1		7	7	4	4	4	4	16	11.84330691	11.63419093
125	1		7	7	4	4	4	4	16	11.84330691	11.63419093
126	1		7	7	4	4	4	4	16	11.84330691	11.63419093
127	2		2	9	4	3	2	4	13	11.15488724	11.62405455
128	2		3	10	1	1	2	2	6	11.14344779	11.62608183
129	2		3	10	2	2	2	2	8	11.14344779	11.62608183
130	2		3	10	2	1	3	2	8	11.14344779	11.62608183
131	2		3	10	2	2	3	3	10	11.14344779	11.62608183
132	2		3	10	3	3	3	3	12	11.14344779	11.62608183
133	2		3	10	3	3	3	3	12	11.14344779	11.62608183
134	2		3	10	4	4	4	4	16	11.14344779	11.62608183
135	2		3	10	4	4	4	4	16	11.14344779	11.62608183
136	2		4	11	1	1	1	1	4	11.13200833	11.6281091
137	2		4	11	3	3	3	3	12	11.13200833	11.6281091
138	2		4	11	3	3	3	3	12	11.13200833	11.6281091
139	2		4	11	3	3	4	4	14	11.13200833	11.6281091
140	2		4	11	4	4	4	4	16	11.13200833	11.6281091
141	2		5	12	1	1	1	2	5	11.12056888	11.63013638
142	2		5	12	2	1	2	2	7	11.12056888	11.63013638
143	2		5	12	2	2	2	2	8	11.12056888	11.63013638
144	2		5	12	2	2	2	2	8	11.12056888	11.63013638

Coach	SEX	EDU LEVEL	SxE Level	TE 1	TE 2	TE 3	TE 4	TE Observed	TE SxE Predicted	TE EDU Level Predicted
149	2		5	12	3	2	2	3	10	11.12056888
150	2		5	12	2	2	3	3	10	11.12056888
151	2		5	12	3	3	2	3	11	11.12056888
152	2		5	12	3	3	2	3	11	11.12056888
153	2		5	12	3	2	3	3	11	11.12056888
154	2		5	12	3	2	3	3	11	11.12056888
155	2		5	12	3	2	3	3	11	11.12056888
156	2		5	12	2	3	3	3	11	11.12056888
157	2		5	12	3	3	3	3	12	11.12056888
158	2		5	12	3	3	3	3	12	11.12056888
159	2		5	12	3	3	3	3	12	11.12056888
160	2		5	12	3	3	3	3	12	11.12056888
161	2		5	12	3	3	3	3	12	11.12056888
162	2		5	12	3	3	3	3	12	11.12056888
163	2		5	12	3	3	3	3	12	11.12056888
164	2		5	12	3	3	3	3	12	11.12056888
165	2		5	12	2	3	3	4	12	11.12056888
166	2		5	12	2	3	3	4	12	11.12056888
167	2		5	12	3	3	3	4	13	11.12056888
168	2		5	12	4	4	4	4	16	11.12056888
169	2		5	12	4	4	4	4	16	11.12056888
170	2		6	13	2	2	2	2	8	11.10912943
171	2		6	13	2	2	2	3	9	11.10912943
172	2		6	13	3	2	2	3	10	11.10912943
173	2		6	13	3	2	3	3	11	11.10912943
174	2		6	13	3	3	3	3	12	11.10912943
175	2		6	13	3	3	3	3	12	11.10912943
176	2		6	13	3	3	3	3	12	11.10912943
177	2		6	13	3	3	3	3	12	11.10912943
178	2		6	13	3	3	3	3	12	11.10912943
179	2		6	13	2	3	4	4	13	11.10912943
180	2		6	13	3	3	4	4	14	11.10912943
181	2		6	13	4	3	4	4	15	11.10912943
182	2		7	14	2	1	2	1	6	11.09768998
183	2		7	14	2	2	2	2	8	11.09768998
184	2		7	14	2	2	2	3	9	11.09768998
185	2		7	14	3	2	3	4	12	11.09768998

Character Building Efficacy Raw Data

Coach	SEX	EDU LEVEL	SxE Level	CBE 1	CBE 2	CBE 3	CBE 4	CBE Observed	CBE SxE Predicted	CBE EDU Predicted
1	1	1	1	1	3	3	3	3	12	13.4
2	1	1	1	1	4	4	4	4	16	13.4
3	1	2	2	2	4	4	4	4	16	13.592
4	1	3	3	3	2	2	3	2	9	13.784
5	1	3	3	3	3	3	3	3	12	13.784
6	1	3	3	3	3	3	3	3	12	13.784
7	1	3	3	3	4	4	3	3	14	13.784
8	1	3	3	3	4	4	3	3	14	13.784
9	1	3	3	3	4	4	3	3	14	13.784
10	1	3	3	3	3	3	4	4	14	13.784
11	1	3	3	3	4	4	4	3	15	13.784
12	1	3	3	3	4	4	4	3	15	13.784
13	1	3	3	3	3	4	4	4	15	13.784
14	1	3	3	3	4	4	4	4	16	13.784
15	1	3	3	3	4	4	4	4	16	13.784
16	1	3	3	3	4	4	4	4	16	13.784
17	1	3	3	3	4	4	4	4	16	13.784
18	1	4	4	4	3	3	3	2	11	13.976
19	1	4	4	4	3	3	3	2	11	13.976
20	1	4	4	4	3	3	3	3	12	13.976
21	1	4	4	4	3	3	3	3	12	13.976
22	1	4	4	4	4	3	4	3	14	13.976
23	1	4	4	4	4	4	4	4	16	13.976
24	1	4	4	4	4	4	4	4	16	13.976
25	1	4	4	4	4	4	4	4	16	13.976
26	1	5	5	5	2	2	2	1	7	14.168
27	1	5	5	5	2	3	2	1	8	14.168
28	1	5	5	5	2	2	2	2	8	14.168
29	1	5	5	5	3	2	2	2	9	14.168
30	1	5	5	5	2	2	2	3	9	14.168
31	1	5	5	5	3	3	2	2	10	14.168
32	1	5	5	5	3	3	2	2	10	14.168
33	1	5	5	5	3	3	3	2	11	14.168
34	1	5	5	5	3	3	3	2	11	14.168
35	1	5	5	5	3	2	3	3	11	14.168
36	1	5	5	5	4	3	2	3	12	14.168
37	1	5	5	5	3	3	3	3	12	14.168
38	1	5	5	5	3	3	3	3	12	14.168
39	1	5	5	5	3	3	3	3	12	14.168
40	1	5	5	5	3	3	3	3	12	14.168
41	1	5	5	5	3	3	3	3	12	14.168
42	1	5	5	5	3	3	3	3	12	14.168
43	1	5	5	5	3	3	3	3	12	14.168
44	1	5	5	5	3	3	3	3	12	14.168
45	1	5	5	5	3	3	3	3	12	14.168
46	1	5	5	5	3	3	3	3	12	14.168
47	1	5	5	5	3	4	3	3	13	14.168
48	1	5	5	5	4	4	3	3	14	14.168
49	1	5	5	5	4	4	3	3	14	14.168
50	1	5	5	5	4	4	3	3	14	14.168
51	1	5	5	5	4	3	4	3	14	14.168
52	1	5	5	5	3	4	3	4	14	14.168
53	1	5	5	5	3	4	4	3	14	14.168
54	1	5	5	5	4	4	3	4	15	14.168
55	1	5	5	5	4	4	4	3	15	14.168
56	1	5	5	5	4	4	4	3	15	14.168
57	1	5	5	5	4	4	4	3	15	14.168

Coach	SEX	EDU LEVEL	SxE Level	CBE 1	CBE 2	CBE 3	CBE 4	CBE Observed	CBE SxE Predicted	CBE EDU Level Predicted
58	1		5	5	4	4	4	3	15	14.168
59	1		5	5	4	4	4	3	15	14.168
60	1		5	5	4	4	4	3	15	14.168
61	1		5	5	4	4	4	3	15	14.168
62	1		5	5	4	3	4	4	15	14.168
63	1		5	5	3	4	4	4	15	14.168
64	1		5	5	4	4	4	4	16	14.168
65	1		5	5	4	4	4	4	16	14.168
66	1		5	5	4	4	4	4	16	14.168
67	1		5	5	4	4	4	4	16	14.168
68	1		5	5	4	4	4	4	16	14.168
69	1		5	5	4	4	4	4	16	14.168
70	1		5	5	4	4	4	4	16	14.168
71	1		5	5	4	4	4	4	16	14.168
72	1		5	5	4	4	4	4	16	14.168
73	1		5	5	4	4	4	4	16	14.168
74	1		5	5	4	4	4	4	16	14.168
75	1		5	5	4	4	4	4	16	14.168
76	1		5	5	4	4	4	4	16	14.168
77	1		5	5	4	4	4	4	16	14.168
78	1		5	5	4	4	4	4	16	14.168
79	1		5	5	4	4	4	4	16	14.168
80	1		5	5	4	4	4	4	16	14.168
81	1		5	5	4	4	4	4	16	14.168
82	1		5	5	4	4	4	4	16	14.168
83	1		5	5	4	4	4	4	16	14.168
84	1		5	5	4	4	4	4	16	14.168
85	1		5	5	4	4	4	4	16	14.168
86	1		5	5	4	4	4	4	16	14.168
87	1		6	6	3	3	2	2	10	14.36
88	1		6	6	2	3	3	2	10	14.36
89	1		6	6	3	3	2	3	11	14.36
90	1		6	6	4	4	4	4	16	14.36
91	1		6	6	3	3	3	3	12	14.36
92	1		6	6	3	3	3	3	12	14.36
93	1		6	6	3	3	3	3	12	14.36
94	1		6	6	3	3	3	3	12	14.36
95	1		6	6	3	3	3	4	13	14.36
96	1		6	6	4	4	3	3	14	14.36
97	1		6	6	4	4	4	3	15	14.36
98	1		6	6	4	4	4	3	15	14.36
99	1		6	6	4	4	4	3	15	14.36
100	1		6	6	4	3	4	4	15	14.36
101	1		6	6	4	4	4	4	16	14.36
102	1		6	6	4	4	4	4	16	14.36
103	1		6	6	4	4	4	4	16	14.36
104	1		6	6	4	4	4	4	16	14.36
105	1		6	6	4	4	4	4	16	14.36
106	1		6	6	4	4	4	4	16	14.36
107	1		6	6	4	4	4	4	16	14.36
108	1		6	6	4	4	4	4	16	14.36
109	1		6	6	4	4	4	4	16	14.36
110	1		6	6	4	4	4	4	16	14.36
111	1		6	6	4	4	4	4	16	14.36
112	1		6	6	4	4	4	4	16	14.36
113	1		6	6	4	4	4	4	16	14.36
114	1		6	6	4	4	4	4	16	14.36

Coach	SEX	EDU LEVEL	SxE Level	CBE 1	CBE 2	CBE 3	CBE 4	CBE Observed	CBE SxE Predicted	CBE EDU Level Predicted
115	1		6	6	4	4	4	4	16	14.36
116	1		6	6	4	4	4	4	16	14.36
117	1		6	6	4	4	4	4	16	14.36
118	1		6	6	4	4	4	4	16	14.36
119	1		6	6	4	4	4	4	16	14.36
120	1		6	6	4	4	4	4	16	14.36
121	1		7	7	3	4	3	3	13	14.552
122	1		7	7	4	4	3	3	14	14.552
123	1		7	7	4	4	4	4	16	14.552
124	1		7	7	4	4	4	4	16	14.552
125	1		7	7	4	4	4	4	16	14.552
126	1		7	7	4	4	4	4	16	14.552
127	1		7	7	4	4	4	4	16	14.552
128	1		7	7	4	4	4	4	16	14.552
129	2		2	9	4	4	4	4	16	12.915
130	2		3	10	3	2	2	3	10	13.107
131	2		3	10	3	3	3	2	11	13.107
132	2		3	10	3	3	3	3	12	13.107
133	2		3	10	4	3	3	3	13	13.107
134	2		3	10	4	3	4	4	15	13.107
135	2		3	10	4	4	4	4	16	13.107
136	2		3	10	4	4	4	4	16	13.107
137	2		3	10	4	4	4	4	16	13.107
138	2		4	11	3	3	2	2	10	13.299
139	2		4	11	3	3	3	3	12	13.299
140	2		4	11	3	3	3	3	12	13.299
141	2		4	11	4	4	4	4	16	13.299
142	2		4	11	4	4	4	4	16	13.299
143	2		5	12	2	2	2	2	8	13.491
144	2		5	12	2	2	2	2	8	13.491
147	2		5	12	3	3	3	2	11	13.491
148	2		5	12	3	3	3	2	11	13.491
151	2		5	12	3	3	3	3	12	13.491
152	2		5	12	3	3	3	3	12	13.491
153	2		5	12	3	3	3	3	12	13.491
154	2		5	12	3	3	3	3	12	13.491
155	2		5	12	3	3	3	3	12	13.491
156	2		5	12	3	3	3	3	12	13.491
157	2		5	12	3	3	3	3	12	13.491
158	2		5	12	4	4	3	2	13	13.491
159	2		5	12	4	3	3	3	13	13.491
160	2		5	12	3	4	3	3	13	13.491
161	2		5	12	4	4	3	3	14	13.491
162	2		5	12	4	4	3	3	14	13.491
163	2		5	12	3	4	3	4	14	13.491
164	2		5	12	3	3	4	4	14	13.491
165	2		5	12	4	4	4	4	16	13.491
166	2		5	12	4	4	4	4	16	13.491
167	2		5	12	4	4	4	4	16	13.491
168	2		5	12	4	4	4	4	16	13.491
169	2		5	12	4	4	4	4	16	13.491
170	2		5	12	4	4	4	4	16	13.491
171	2		5	12	4	4	4	4	16	13.491

Coach	SEX	EDU LEVEL	SxE Level	CBE 1	CBE 2	CBE 3	CBE 4	CBE Observed	CBE SxE Predicted	CBE EDU Level Predicted
172	2		6	13	3	3	3	3	12	13.683
173	2		6	13	3	3	3	3	12	13.683
174	2		6	13	3	3	3	3	12	13.683
175	2		6	13	3	3	3	3	12	13.683
176	2		6	13	4	4	3	4	15	13.683
177	2		6	13	4	4	4	4	16	13.683
178	2		6	13	4	4	4	4	16	13.683
179	2		6	13	4	4	4	4	16	13.683
180	2		6	13	4	4	4	4	16	13.683
181	2		6	13	4	4	4	4	16	13.683
182	2		6	13	4	4	4	4	16	13.683
183	2		6	13	4	4	4	4	16	13.683
184	2		6	13	4	4	4	4	16	13.683
185	2		7	14	3	3	3	3	12	13.875
186	2		7	14	3	3	3	3	12	13.875
187	2		7	14	3	3	4	4	14	13.875
188	2		7	14	4	4	4	4	16	13.875

Physical Conditioning Efficacy Raw Data

Coach	SEX	EDU LEVEL	SxE Level	PCE 1	PCE 2	PCE Observed	PCE SxE Predicted	PCE EDU Level Predicted
1	1	1	1	1	3	2	5	5.855
2	1	1	1	1	3	3	6	5.855
3	1	2	2	2	2	3	5	5.895
4	1	3	3	3	2	2	4	5.935
5	1	3	3	3	2	2	4	5.935
6	1	3	3	3	2	3	5	5.935
7	1	3	3	3	3	2	5	5.935
8	1	3	3	3	2	3	5	5.935
9	1	3	3	3	3	3	6	5.935
10	1	3	3	3	3	3	6	5.935
11	1	3	3	3	3	3	6	5.935
12	1	3	3	3	3	3	6	5.935
13	1	3	3	3	4	3	7	5.935
14	1	3	3	3	4	4	8	5.935
15	1	3	3	3	4	4	8	5.935
16	1	3	3	3	4	4	8	5.935
17	1	3	3	3	4	4	8	5.935
18	1	4	4	4	1	2	3	5.975
19	1	4	4	4	2	2	4	5.975
20	1	4	4	4	3	2	5	5.975
21	1	4	4	4	3	3	6	5.975
22	1	4	4	4	3	4	7	5.975
23	1	4	4	4	4	3	7	5.975
24	1	4	4	4	4	4	8	5.975
25	1	4	4	4	4	4	8	5.975
26	1	5	5	5	1	1	2	6.015
27	1	5	5	5	1	1	2	6.015
28	1	5	5	5	1	2	3	6.015
29	1	5	5	5	2	1	3	6.015
30	1	5	5	5	2	2	4	6.015
31	1	5	5	5	2	2	4	6.015
32	1	5	5	5	2	2	4	6.015
33	1	5	5	5	2	2	4	6.015
34	1	5	5	5	2	2	4	6.015
35	1	5	5	5	2	2	4	6.015
36	1	5	5	5	2	2	4	6.015
37	1	5	5	5	2	2	4	6.015
38	1	5	5	5	2	2	4	6.015
39	1	5	5	5	2	2	4	6.015
40	1	5	5	5	2	2	4	6.015
41	1	5	5	5	3	2	5	6.015
42	1	5	5	5	2	3	5	6.015
43	1	5	5	5	3	2	5	6.015
44	1	5	5	5	2	3	5	6.015
45	1	5	5	5	2	3	5	6.015
46	1	5	5	5	2	3	5	6.015
47	1	5	5	5	3	3	6	6.015
48	1	5	5	5	3	3	6	6.015
49	1	5	5	5	3	3	6	6.015
50	1	5	5	5	3	3	6	6.015
51	1	5	5	5	3	3	6	6.015
52	1	5	5	5	3	3	6	6.015
53	1	5	5	5	3	3	6	6.015
54	1	5	5	5	3	3	6	6.015
55	1	5	5	5	3	3	6	6.015
56	1	5	5	5	3	3	6	6.015
57	1	5	5	5	3	3	6	6.015
58	1	5	5	5	3	3	6	6.015
59	1	5	5	5	3	3	6	6.015
60	1	5	5	5	3	3	6	6.015
61	1	5	5	5	3	3	6	6.015

Coach	SEX	EDU LEVEL	SxE Level	PCE 1	PCE 2	PCE Observed	PCE SxE Predicted	PCE EDU Level Predicted	
62	1		5	5	3	3	6	6.015	5.782
63	1		5	5	3	3	6	6.015	5.782
64	1		5	5	2	4	6	6.015	5.782
65	1		5	5	4	3	7	6.015	5.782
66	1		5	5	4	3	7	6.015	5.782
67	1		5	5	4	3	7	6.015	5.782
68	1		5	5	4	3	7	6.015	5.782
69	1		5	5	3	4	7	6.015	5.782
70	1		5	5	4	3	7	6.015	5.782
71	1		5	5	4	3	7	6.015	5.782
72	1		5	5	4	3	7	6.015	5.782
73	1		5	5	3	4	7	6.015	5.782
74	1		5	5	3	4	7	6.015	5.782
75	1		5	5	4	4	8	6.015	5.782
76	1		5	5	4	4	8	6.015	5.782
77	1		5	5	4	4	8	6.015	5.782
78	1		5	5	4	4	8	6.015	5.782
79	1		5	5	4	4	8	6.015	5.782
80	1		5	5	4	4	8	6.015	5.782
81	1		5	5	4	4	8	6.015	5.782
82	1		5	5	4	4	8	6.015	5.782
83	1		5	5	4	4	8	6.015	5.782
84	1		5	5	4	4	8	6.015	5.782
85	1		5	5	4	4	8	6.015	5.782
86	1		5	5	4	4	8	6.015	5.782
87	1		6	6	2	2	4	6.055	5.837
88	1		6	6	2	2	4	6.055	5.837
89	1		6	6	2	2	4	6.055	5.837
90	1		6	6	2	2	4	6.055	5.837
91	1		6	6	3	2	5	6.055	5.837
92	1		6	6	3	2	5	6.055	5.837
93	1		6	6	2	3	5	6.055	5.837
94	1		6	6	3	3	6	6.055	5.837
95	1		6	6	3	3	6	6.055	5.837
96	1		6	6	3	3	6	6.055	5.837
97	1		6	6	3	3	6	6.055	5.837
98	1		6	6	3	3	6	6.055	5.837
99	1		6	6	3	3	6	6.055	5.837
100	1		6	6	3	3	6	6.055	5.837
101	1		6	6	3	3	6	6.055	5.837
102	1		6	6	3	3	6	6.055	5.837
103	1		6	6	3	3	6	6.055	5.837
104	1		6	6	3	3	6	6.055	5.837
105	1		6	6	3	3	6	6.055	5.837
106	1		6	6	3	3	6	6.055	5.837
107	1		6	6	3	3	6	6.055	5.837
108	1		6	6	3	4	7	6.055	5.837
109	1		6	6	3	4	7	6.055	5.837
110	1		6	6	4	4	8	6.055	5.837
111	1		6	6	4	4	8	6.055	5.837
112	1		6	6	4	4	8	6.055	5.837
113	1		6	6	4	4	8	6.055	5.837
114	1		6	6	4	4	8	6.055	5.837
115	1		6	6	4	4	8	6.055	5.837
116	1		6	6	4	4	8	6.055	5.837
117	1		6	6	4	4	8	6.055	5.837
118	1		6	6	4	4	8	6.055	5.837
119	1		6	6	4	4	8	6.055	5.837
120	1		7	7	2	2	4	6.095	5.892
121	1		7	7	3	2	5	6.095	5.892
122	1		7	7	2	3	5	6.095	5.892

Coach	SEX	EDU LEVEL	SxE Level	PCE 1	PCE 2	PCE Observed	PCE SxE Predicted	PCE EDU Level Predicted	
124	1		7	7	3	3	6	6.095	5.892
125	1		7	7	3	3	6	6.095	5.892
126	1		7	7	4	3	7	6.095	5.892
127	1		7	7	4	4	8	6.095	5.892
128	2		2	9	3	3	6	5.134	5.617
129	2		3	10	2	2	4	5.174	5.672
130	2		3	10	2	2	4	5.174	5.672
131	2		3	10	2	3	5	5.174	5.672
132	2		3	10	3	2	5	5.174	5.672
133	2		3	10	3	3	6	5.174	5.672
134	2		3	10	3	3	6	5.174	5.672
135	2		3	10	3	3	6	5.174	5.672
136	2		3	10	4	4	8	5.174	5.672
137	2		4	11	1	1	2	5.214	5.727
138	2		4	11	3	3	6	5.214	5.727
139	2		4	11	3	3	6	5.214	5.727
140	2		4	11	3	3	6	5.214	5.727
141	2		5	12	1	1	2	5.254	5.782
142	2		5	12	1	1	2	5.254	5.782
143	2		5	12	2	1	3	5.254	5.782
144	2		5	12	2	2	4	5.254	5.782
145	2		5	12	2	2	4	5.254	5.782
146	2		5	12	2	2	4	5.254	5.782
149	2		5	12	2	2	4	5.254	5.782
150	2		5	12	2	2	4	5.254	5.782
152	2		5	12	2	2	4	5.254	5.782
153	2		5	12	2	2	4	5.254	5.782
154	2		5	12	2	3	5	5.254	5.782
155	2		5	12	2	3	5	5.254	5.782
156	2		5	12	3	3	6	5.254	5.782
157	2		5	12	3	3	6	5.254	5.782
158	2		5	12	3	3	6	5.254	5.782
159	2		5	12	3	3	6	5.254	5.782
160	2		5	12	3	3	6	5.254	5.782
161	2		5	12	3	3	6	5.254	5.782
162	2		5	12	3	3	6	5.254	5.782
163	2		5	12	3	3	6	5.254	5.782
164	2		5	12	3	3	6	5.254	5.782
165	2		5	12	3	3	6	5.254	5.782
166	2		5	12	4	3	7	5.254	5.782
167	2		5	12	4	4	8	5.254	5.782
168	2		5	12	4	4	8	5.254	5.782
169	2		5	12	4	4	8	5.254	5.782
170	2		6	13	2	2	4	5.294	5.837
171	2		6	13	2	2	4	5.294	5.837
172	2		6	13	2	2	4	5.294	5.837
173	2		6	13	3	2	5	5.294	5.837
174	2		6	13	3	3	6	5.294	5.837
175	2		6	13	3	3	6	5.294	5.837
176	2		6	13	3	3	6	5.294	5.837
177	2		6	13	3	3	6	5.294	5.837
178	2		6	13	3	3	6	5.294	5.837
179	2		6	13	3	3	6	5.294	5.837
180	2		6	13	3	4	7	5.294	5.837
181	2		7	14	2	2	4	5.334	5.892
182	2		7	14	2	2	4	5.334	5.892
183	2		7	14	4	4	8	5.334	5.892