Attitude and Agility Scores of Co-Occurring and Single Sport High School Girl Volleyball Players Following Completion of an Invitational Summer Strength and Conditioning Program

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Attitude and Agility Scores of Co-Occurring and Single Sport High School Girl Volleyball Players Following Completion of an Invitational Summer Strength and Conditioning Program

By
Joseph J. Toczek

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Abstract

ATTITUDE AND AGILITY SCORES OF CO-OCCURRING AND SINGLE SPORT HIGH SCHOOL GIRL VOLLEYBALL PLAYERS FOLLOWING COMPLETION OF AN INVITATIONAL SUMMER STRENGTH AND CONDITIONING PROGRAM

Joseph J. Toczek

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The purpose of the study was to determine the effects of a school sponsored invitational eight-week summer strength and conditioning program on the attitudes and agility of high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club sports compared to the attitudes and agility of high school girl volleyball players who specialize in volleyball and participated in the school sponsored invitational eight-week summer strength and conditioning program alone. This exploratory study focused on volleyball players who attended the same high school and who were members of the same volleyball program. The data suggest that co-occurring sports and/or club sports and volleyball alone players source of motivation was internal, well established, and that self-reported pretest-posttest mean differences indicated subscale stability, not easily changed by the new challenges presented during the school sponsored invitational eight-week summer strength and conditioning program. Furthermore, players in both groups reported themselves as moderately externally motivated but not at all amotivated. No posttest-posttest between group differences was observed. Finally, it may be said that the co-occurring sports and/or club sports players
and volleyball alone players had robust agility skills for approach jump reach, block jump reach, basketball throw, and mile run before they began participation in the school sponsored invitational eight-week summer strength and conditioning program and that these scores remained statistically unchanged following participation in the school sponsored invitational eight-week summer strength and conditioning program. However, agility run scores showed statistically significant improvement following the new challenges presented during the school sponsored invitational eight-week summer strength and conditioning program. Posttest-posttest findings suggest near equipoise for the agility outcomes of both groups of players. Overall, the findings of this study indicated that the high school girl volleyball players’ participation in co-occurring sports and/or club sports during the off-season and summer resulted in positive outcomes with no comparable negative consequences and multiple-sport participation is, therefore, deemed to be fully compatible with and contributory to a continued positive motivational outlook and conditioned athletic ability successful life course for these varsity athletes.
Acknowledgements

Major accomplishments in school, sports, work, and life all require a supporting cast. This dissertation is a result of the supporting cast members in my life which include my family, friends, fellow educators, fellow volleyball coaches, the Papillion-La Vista High School volleyball players, the Papillion-La Vista High School volleyball co-captains of the 2007 and 2008 seasons, my fellow Papillion-La Vista High School girls sports coaches, my fellow University of Nebraska at Omaha CADRE Associates, my Educational Administration Doctoral Program classmates, and the Educational Administration faculty at the University of Nebraska at Omaha. I am grateful to all of you for your continued encouragement and support through my doctoral journey.

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CHAPTER ONE

Introduction

High school volleyball coaches are feeling the pressure to build winning programs while at the same time striving to keep alive the ideal of athletics as a life long learning experience for their players (Davenport, 2001). High school volleyball coaches are not just leaders on the court of play, they are educators first, and are therefore, professionally obligated to keep volleyball as an extension of the classroom and, in turn, help today’s young adolescents be prepared to succeed in their academic and life pursuits (Russell, 2007; NSAA, 2009). Seefeldt, Ewing, and Brown (1996) state although sports are not viewed as a panacea for society’s ills, sports participation that emphasizes skill-building and socially acceptable responses to personal relations has proven to be a popular aid in the education of youth (Seefeldt, Ewing, & Brown, 1996).

In order to decide what is in the best interest of the developing student-athlete, high school volleyball coaches must wear numerous hats as they: (a) build successful winning programs (Coy & Masterson, 2007), (b) train players (Merrett, 2004), (c) communicate in a positive way the volleyball program mission to parents (Jackson, 2007), and (d) support student athletic participation in other high school sports and outside of school sponsored club programs (McLaughlin, 2009).

Building Successful Winning Programs

Turman (2003) and Matheson, Mathes, and Murray (1997) suggest athletes’ come and go, continually changing the make-up and quality of their teams. This causes educators and coaches to wonder how a team could be successful one year and then become less successful the following year. Moreover, there are teams with significant
numbers of talented athletes that are unable to perform at high levels, while other teams with limited talent are able to beat the odds and win championships (Turman, 2003; Matheson, Mathes, & Murray, 1997).

**Cohesion.** According to Turman (2003) and colleagues, cohesion is one factor that has often been connected to group performance and has been considered to be an individual’s sense of belonging to a particular group including feelings of morale associated with group membership (Turman, 2003; Bollen & Hoyle, 1990). Cohesion is the overall force that causes individuals to continue membership in the group (Turman, 2003; Bird, 1977). Recent research has attempted to connect cohesion with one of five leadership styles used by coaches. They are: (a) autocratic, (b) social support, (c) democratic, (d) training and instruction, and (e) positive feedback. Coaches can promote higher levels of task cohesion for their players by using training and instruction, democratic behavior, social support, and positive feedback styles and avoiding the use of autocratic coaching strategies (Turman, 2003; Gardner, Shields, Bredemeier & Bostrom, 1996; Westre & Weiss, 1991).

Successful and winning programs that are cohesive tend to be rooted in strong coach-athlete relationships. According to Jowett and Cockerill (2002), the coach-athlete relationship is not an add-on to, or by-product of, the coaching process, neither is it based on the athlete’s performance, age, or gender. Instead, it is the foundation of coaching. The coach and athlete intentionally develop a relationship, which is characterized by a growing appreciation and respect for each other as individuals. Overall, the coach-athlete relationship is embedded in the dynamic and complex coaching process and provides the
means by which coaches’ and athletes’ needs are expressed and fulfilled (Jowett & Cockerill, 2002).

**Teamwork.** Teamwork, a byproduct of cohesion, is another component in successful volleyball programs. According to Cook (2008), all great teams must have a shared vision. They must strive to make good decisions both on and off the court and follow “The Golden Rule” – Treat others as you would like to be treated. Teamwork must center around “we” and not “I,” and each member must get past instant gratification and put their team above self. Trust and love must be the foundation of the group if teamwork is to exist. By giving more of one’s self to their team, the more each individual walks away with. In the end, Cook suggests that team members must develop and strengthen three bones. They must develop a backbone to stand-up to challenges, a wishbone so they can dream big and set high goals, and finally, a funny bone, so they can have fun and enjoy the life-long learning experiences of being part of a team (Cook, 2008).

**Pressure to have only winning seasons.** With pressure on high school volleyball coaches to have only winning seasons, many times that pressure is contagious and affects not only the coaches negatively, but also the players of the team causing physical, mental, and emotional stress resulting in less than ideal performance and even athlete burnout. According to Raedeke and colleagues (2002) and Maslach and Jackson (1984), burnout is a psychological syndrome of emotional exhaustion, depersonalization, and reduced personal accomplishment that can occur among individuals who work with people. The construct of burnout has served as a strong impetus for youth athletes examining their psychological, emotional, and physical withdrawal from a formerly pursued and
enjoyable activity as a result of excessive stress (Raedeke, Lunney, & Venables, 2002; Maslach & Jackson, 1984; Smith, 1986).

Parkin (2002) suggests recruiting star players, as an antidote to low team morale and to insure only winning seasons, will fail without positive leadership from a coach that has high regard for his or her players even when times are tough and the wins are few and far between (Parkin, 2002). A positive attitude by the coaching staff, as well as by current and incoming players, is critical. According to Rose (2007), athlete’s attitudes, about life as well as sport, are important. Many times winning and losing does not come down to skill, but a player’s passion. Passion for the game, passion for their team, and passion for the competition, all promoted in an environment where players can have fun, focus on their academics, and work and play hard (Rose, 2007).

Winning is fun, but in reality the hard work presupposed by success is often anything but fun (Carson, 2004). Repetitions--drill techniques--if done with persistency and passion will ultimately result in success (Watson, 2009). Playing hard, smart, and together, on the court and in the classroom will ultimately carryover into life enabling student-athletes to make good decisions not only during the game, but in social situations as well (Smith, 2006). The result is coaching staff, players, parents, and program all perform in sync, insuring a positive learning experience for student athletes.

**Parental Support and Volleyball Player Achievement**

Coakley (2006) and Leff and Hoyle (1995) state parental support has been defined as behaviors by parents perceived by their children as facilitating athletic participation and performance (Coakley, 2006; Leff & Hoyle, 1995). According to Collins and Barber (2004) and Scanlan (1986), parental support affects children’s participation and their
performance in sport. Therefore, coaches should find diplomatic ways to communicate to parents about potential pitfalls that may inadvertently hinder the achievement of their athlete.

Central to concepts of achievement and motivation are the potential pressures from parents associated with a competitive environment. Within Expectancy-Value models, these pressures negatively impact the subjective task value by increasing the costs of participation for athletes. Pressures in competitive environments lead to the competitive stress so prevalent today in many aspects of sport (Collins & Barber, 2004; Scanlan, 1986).

Collins and Barber (2004), James and Collins (1997), Martens (1975), and Scanlan (1986) suggest research over the past thirty years has focused on the importance of social evaluation in competitive anxiety (Collins & Barber, 2004; James & Collins, 1997; Martens, 1975; Scanlan, 1986). Collins and Barber (2004) and Scanlan and colleagues (1979; 1984; 1986; 1989) have emphasized that social evaluation, thought of as information about one’s ability received from other people, is influential in creating competitive stress. Social evaluation, whether through parents, peers, or coaches, has the potential to increase anxiety and thereby diminish performance. Parents must keep their perspective in check and make sure they are supportive of their child first so that they do not become a critical evaluator of their athlete’s performance (Collins & Barber, 2004; Scanlan, 1984). Parents are often found in coaching or fan roles that inevitably provide opportunities for them to evaluate their children (Collins & Barber, 2004; Scanlan, 1984).

Parents and coaches are individuals who unwittingly promote competitive stress through social evaluation, and ultimately add to the perceived emotional costs.
experienced by athletes. Participation in this evaluative setting can be potentially threatening to an athlete (Collins & Barber, 2004; Scanlan et al., 1989). Additionally, Collins and Barber (2004) and Scanlan et al. (1989) state that an understanding of the adult’s role in the stress process is critical in determining the complete picture of the sources of competitive stress. Coaches and parents must have a clear understanding of each athlete’s skill, performance level, and team role in order to provide appropriate expectations and supportive feedback. Communicating this understanding to the athlete may reduce nonproductive competitive stress (Collins & Barber, 2004; Scanlan et al., 1989).

**Balancing Student Athletic Participation**

Student athletes should be encouraged to be multi-sport players who are also involved in extracurricular activities. However, a balance must be attained in order for these young athletes to achieve personal and scholastic success. This may include a balance of beliefs, as well as a balance of club play and multi-sport participation.

**Balancing beliefs.** Beliefs about success, and expectations for success in the present, often are given greater priority than long-term investments and success in the future. Clearly, differentiating between the importance of being successful and expectations of success later is critical to attaining balance. Perceptions about beliefs and expectations can influence expectations for success. However, an athlete’s perceptions of parents’ beliefs and behaviors may be interpreted as beliefs about importance (Collins & Barber, 2004; Eccles & Harold, 1991; Eccles, Wigfield, & Schiefele, 1998; Martin, Jackson, Richardson, & Weiller, 1999; Parsons, Adler, & Kaczala, 1982).
According to Collins and Barber (2004) and Eccles and colleagues (1991 & 1998), parents exhibit certain beliefs and develop expectations for behavior. For instance, parents may enroll their daughter in a select team sport program and purchase expensive equipment. In turn, the athlete interprets these behaviors and develops beliefs about her parents’ expectations. Subsequently she incorporates these expectations into her own goal orientations and perceptions of ability. The athlete may feel that because her parents encourage her to play on a team and bought the best equipment, she must believe that she is of high ability and is expected to demonstrate this ability. These perceptions and expectations may be reinforced and internalized. With these goals come certain expectations of success and subsequent achievement-related choices. The critical factor in this process is the initial interpretation of parents’ beliefs and expectations (Collins & Barber, 2004; Eccles & Harold, 1991; Eccles et al., 1998; Martin, et al., 1999; Parsons et al., 1982). How the child interprets her parents’ actions and beliefs is central to the development of perceived ability and expectations for success (Collins & Barber, 2004).

**Volleyball club play.** Participation in volleyball club play along with play in other club sports, has become increasingly popular as an outside of school sport participation outlet for elementary through high school age girls. Volleyball club play refers to private agencies that recruit girls to play in tournaments locally, regionally, and nationally in a January to July nonstop round robin of events. Melrose and colleagues (2007) state that club volleyball is currently among the most popular club sports in the U.S.A.
In 2005, the Amateur Athletic Union reported 610 volleyball clubs nationwide (Melrose, Spanoil, Bohling, & Bonnette, 2007). USA Volleyball also documents that adolescent girls make up the largest number of athletes associated with its organization. Currently, there are approximately 174,045 adolescent girls participating in the junior club ranks nationally with 4,865 girls participating in USAV volleyball in the state of Nebraska alone (GPVB, 2009).

According to the College Volleyball Coach.com website (2007), rapid growth has resulted in an over abundance of club volleyball teams. As club coaches and parents have discovered, establishing a club team can be as easy as finding a gym and filling-out some paperwork. Not good news if parents believe that there is professional, athletic, and developmental expertise backing each and every team (College Volleyball Coach, 2007). Many of these sports clubs are social institutions that have official, as well as unofficial agendas (Kirk & Macphail, 2003). According to the Website College Volleyball Coach (2007), USA Volleyball provides all registration forms, insurance coverage, and instructional manuals to anyone interested in forming a club. Like a business, more playing opportunities generate more operational money via membership fees, dues, and tournament registration fees (College Volleyball Coach, 2007).

Once signed onto a volleyball team most girls are encouraged to play continuously in all games. This constant train and play often blurs the line between high school and club-sponsored sports (Chatelain, 2008). Nationally, club play volleyball today represents an increase of approximately 11% from just 10 years ago (Melrose, et al., 2007). Club play volleyball also represents significant parent financial obligations and time commitments.
However, it is not clear that girls who participate fully on club volleyball teams have greater success on their school teams. Moreover, there is concern that multiple team, school and club, play may result in injuries that could shorten a girl’s career. Concern for skill development and team cohesion—school team values—verses playing to win—club team values—must also be considered in light of each players long term goals (Rauh, Ji, Macera, & Wiksten, 2007; Turman, 2003). Leff and Hoyle (1995) suggest club play may also indicate that parents have certain expectations of success for their daughter without considering the long-term effects of participation in this achievement-related choice (Leff & Hoyle, 1995). While club volleyball does provide athletes with additional playing venues, the unanswered question remains, at what physical and emotional cost for the athlete and whose agenda is being served by participating (Freeman, 2006; Sanchez, 2006)?

According to the College Volleyball website (2007), what many parents may not know or fully understand is that volleyball players are thought to improve by either receiving quality skill instruction or mimicking the skills of other players that are superior—not simply playing more, the result of club play. Moreover, with so many club teams the number of skilled players are often highly recruited and teams may end up with players who will not improve because the strong player role models are thinly distributed. Theoretically, in the absence of strong player role models, a student athlete will advance only under the direction of a coach with not only superior technical training skills, but also with a background in education where academic success and an emphasis on sacrifice for the good of the team and the school itself is stressed—a scenario more likely to occur in a school volleyball program (Mango, 2009; Frost, 2008; College Volleyball
Coach, 2007). This concern for developing competitive level playing skills also holds true for parents who hope that simply more playing time for their daughter on a club team will lead to a college volleyball scholarship (Sanchez, 2006).

**Multi-sport participation.** Multi-sport participation has become commonplace with many of today’s high school volleyball players who are also elite school varsity athletes. Students also may believe that with continuous sport participation they will have a better opportunity to attain college athletic scholarships. Unfortunately, club sports coaches who tend to have a *win at all costs* coaching style often reinforce this perspective, while high school coaches often use *positive coaching* techniques that many times result in greater success. The end result Collins and Barber (2004) and Duda (2002) suggest has the potential to have players performing in two different yet distinct modes, ego orientation/scoreboard orientation, and task orientation/mastery orientation respectively (Collins & Barber, 2004; Duda, 2002). Since the inception of Title IX legislation, high school girls have had the greatest opportunity to be involved in athletics than any other time in history, but with these opportunities come critical choices and opportunity costs as well as physical, mental, and emotional risks. In the end, who is really looking-out for these high school girls? This eye to the future falls on all involved, including the players themselves and their parents, but most importantly it is the high school volleyball coach faced with the challenge of coaching fundamental volleyball skills, providing competitive training, and teaching players how to balance school, sports, and life that carries the greatest responsibility.
Purpose of the Study

The purpose of the study was to determine the effects of a school sponsored invitational eight-week summer strength and conditioning program on the attitudes and agility of high school girl volleyball players’ who participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club sports compared to the attitudes and agility of high school girl volleyball players who specialized in volleyball and participated in the school sponsored invitational eight-week summer strength and conditioning program alone. This exploratory study focuses on volleyball players who attended the same high school and who are members of the same volleyball program. Papillion-La Vista High School, the research school, provided returning sophomore, junior, and senior volleyball players the opportunity to participate in a school sponsored invitational eight-week summer strength and conditioning program during the summer 2008. The school also provided the volleyball players the opportunity to participate in co-occurring sports, other than volleyball during the same time frame.

Research Questions

Overarching Pretest-Posttest Motivation Research Question #1. Do high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program who also participated in co-occurring sports and/or club sports lose, maintain, or improve their Sport Motivation Scale Questionnaire (a) to know, (b) to accomplish, and (c) to experience stimulation internal motivation scores?
**Sub-Question 1a.** Is there a statistically significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program who also participated in co-occurring sports and/or club sports beginning compared to ending summer program to know internal motivation scores?

**Sub-Question 1b.** Is there a statistically significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program who also participated in co-occurring sports and/or club sports beginning compared to ending summer program to accomplish internal motivation scores?

**Sub-Question 1c.** Is there a statistically significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program who also participated in co-occurring sports and/or club sports beginning compared to ending summer program to experience stimulation internal motivation scores?

**Overarching Pretest-Posttest Motivation Research Question #2.** Do high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program who also participated in co-occurring sports and/or club sports lose, maintain, or improve their Sport Motivation Scale Questionnaire (a) identified, (b) introjected, and (c) external regulation external motivation scores?

**Sub-Question 2a.** Is there a statistically significant difference between high school girl volleyball players who participated in the school sponsored invitational
eight-week summer strength and conditioning program who also participated in co-
occurring sports and/or club sports beginning compared to ending summer program
identified external motivation scores?

Sub-Question 2b. Is there a statistically significant difference between
high school girl volleyball players who participated in the school sponsored invitational
eight-week summer strength and conditioning program who also participated in co-
occurring sports and/or club sports beginning compared to ending summer program introjected external motivation scores?

Sub-Question 2c. Is there a statistically significant difference between
high school girl volleyball players who participated in the school sponsored invitational
eight-week summer strength and conditioning program who also participated in co-
occurring sports and/or club sports beginning compared to ending summer program to
external regulation external motivation scores?

Overarching Pretest-Posttest Motivation Research Question #3. Do high
school girl volleyball players who participated in the school sponsored invitational eight-
week summer strength and conditioning program who also participated in co-occurring
sports and/or club sports lose, maintain, or improve their Sport Motivation Scale
Questionnaire amotivation scores?

Sub-Question 3a. Is there a statistically significant difference between
high school girl volleyball players who participated in the school sponsored invitational
eight-week summer strength and conditioning program who also participated in co-
occurring sports and/or club sports beginning compared to ending summer program
amotivation scores?
Overarching Pretest-Posttest Motivation Research Question #4. Do high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone lose, maintain, or improve their Sport Motivation Scale Questionnaire (a) to know, (b) to accomplish, and (c) to experience stimulation internal motivation scores?

Sub-Question 4a. Is there a statistically significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone beginning compared to ending summer program to know internal motivation scores?

Sub-Question 4b. Is there a statistically significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone beginning compared to ending summer program to accomplish internal motivation scores?

Sub-Question 4c. Is there a statistically significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone beginning compared to ending summer program to experience stimulation internal motivation scores?

Overarching Pretest-Posttest Motivation Research Question #5. Do high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone lose, maintain, or improve their Sport Motivation Scale Questionnaire (a) identified, (b) introjected, and (c) to external regulation external motivation scores?
Sub-Question 5a. Is there a statistically significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone beginning compared to ending summer program identified external motivation scores?

Sub-Question 5b. Is there a statistically significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone beginning compared to ending summer program introjected external motivation scores?

Sub-Question 5c. Is there a statistically significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone beginning compared to ending summer program to external regulation external motivation scores?

Overarching Pretest-Posttest Motivation Research Question #6. Do high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone lose, maintain, or improve their Sport Motivation Scale Questionnaire amotivation scores?

Sub-Question 6a. Is there a statistically significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone beginning compared to ending summer program amotivation scores?

Overarching Posttest-Posttest Motivation Research Question #7. Do high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club
sports have different or congruent ending eight-week Sport Motivation Scale Questionnaire (a) internal, (b) external (c) amotivation compared to high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone ending eight-week Sport Motivation Scale Questionnaire scores for (a) internal, (b) external, and (c) amotivation?

**Sub-Question 7a.** Is there a significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club sports ending eight-week summer strength and conditioning program internal motivation scores (a) to know, (b) to accomplish, and (c) to experience stimulation compared to high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone ending eight-week summer strength and conditioning program internal motivation scores (a) to know, (b) to accomplish, and (c) to experience stimulation?

**Sub-Question 7b.** Is there a significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club sports ending eight-week summer strength and conditioning program external motivation scores (a) identified, (b) introjected, and (c) external regulations compared to high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone ending eight-week summer strength and conditioning program external motivation scores (a) identified, (b) introjected, and (c) external regulations?
**Sub-Question 7c.** Is there a significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club sports ending eight-week summer strength and conditioning program amotivation scores compared to high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone ending eight-week summer strength and conditioning program amotivation scores?

**Overarching Posttest-Posttest Motivation Research Question #8.** Do high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club sports have different or congruent ending eight-week Sport Motivation Scale Questionnaire scores for (a) internal motivation, (b) external motivation, and (c) amotivation?

**Sub-Question 8a.** Is there a significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club sports ending eight-week summer strength and conditioning program Sport Motivation Scale Questionnaire (a) internal motivation scores?

**Sub-Question 8b.** Is there a significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club sports
Sub-Question 8c. Is there a significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club sports ending eight-week summer strength and conditioning program Sport Motivation Scale Questionnaire (c) amotivation scores?

Overarching Posttest-Posttest Motivation Research Question #9. Do high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone have different or congruent ending eight-week Sport Motivation Scale Questionnaire scores for (a) internal motivation, (b) external motivation, and (c) amotivation?

Sub-Question 9a. Is there a significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone ending eight-week summer strength and conditioning program Sport Motivation Scale Questionnaire (a) internal motivation scores?

Sub-Question 9b. Is there a significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone ending eight-week summer strength and conditioning program Sport Motivation Scale Questionnaire (b) external motivation scores?
Sub-Question 9c. Is there a significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone ending eight-week summer strength and conditioning program Sport Motivation Scale Questionnaire (c) amotivation scores?

Overarching Pretest-Posttest Agility Outcomes Research Question #10. Do high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program who also participated in co-occurring sports and/or club sports lose, maintain, or improve their agility outcomes scores for (a) approach jump reach, (b) block jump reach, (c) agility run, (d) basketball throw and (e) mile run?

Sub-Question 10a. Is there a statistically significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program who also participated in co-occurring sports and/or club sports beginning compared to ending approach jump reach score?

Sub-Question 10b. Is there a statistically significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program who also participated in co-occurring sports and/or club sports beginning compared to ending block jump reach score?

Sub-Question 10c. Is there a statistically significant difference between high school girl volleyball players who participated in the school sponsored invitational
eight-week summer strength and conditioning program who also participated in co-
occuring sports and/or club sports beginning compared to ending agility run score?

**Sub-Question 10d.** Is there a statistically significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program who also participated in co-
occuring sports and/or club sports beginning compared to ending basketball throw score?

**Sub-Question 10e.** Is there a statistically significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program who also participated in co-
occuring sports and/or club sports beginning compared to ending mile run score?

**Overarching Pretest-Posttest Agility Outcomes Research Question #11.** Do high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone lose, maintain, or improve their agility outcomes scores for (a) approach jump reach, (b) block jump reach, (c) agility run, (d) basketball throw, and (e) mile run?

**Sub-Question 11a.** Is there a statistically significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone beginning compared to ending approach jump reach score?

**Sub-Question 11b.** Is there a statistically significant difference between high school girl volleyball players who participated in the school sponsored invitational
eight-week summer strength and conditioning program alone beginning compared to ending block jump reach score?

**Sub-Question 11c.** Is there a statistically significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone beginning compared to ending agility run score?

**Sub-Question 11d.** Is there a statistically significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone beginning compared to ending basketball throw score?

**Sub-Question 11e.** Is there a statistically significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone beginning compared to ending mile run score?

**Overarching Posttest-Posttest Agility Outcomes Research Question #12.** Do high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club sports have different or congruent ending eight-week summer strength and conditioning program agility outcomes scores compared to high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone ending eight-week summer strength and conditioning program agility outcomes scores for (a) approach jump reach, (b) block jump reach, (c) agility run, (d) basketball throw, and (e) mile run?
**Sub-Question 12a.** Is there a significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club sports ending eight-week summer strength and conditioning program approach jump scores compared to high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone ending eight-week summer strength and conditioning program approach jump reach scores?

**Sub-Question 12b.** Is there a significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club sports ending eight-week summer strength and conditioning program block jump scores compared to high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone ending eight-week summer strength and conditioning program block jump reach scores?

**Sub-Question 12c.** Is there a significant difference between high school girl volleyball players who participated in the school sponsored eight-week invitational summer strength and conditioning program and co-occurring sports and/or club sports ending eight-week summer strength and conditioning program agility run scores compared to high school girl volleyball players who participated in the school sponsored eight-week summer strength and conditioning program alone ending eight-week summer strength and conditioning program agility run scores?

**Sub-Question 12d.** Is there a significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week
summer strength and conditioning program and co-occurring sports and/or club sports ending eight-week summer strength and conditioning program mile run scores compared to high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone ending eight-week summer strength and conditioning program basketball throw scores?

**Sub-Question 12e.** Is there a significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club sports ending eight-week summer strength and conditioning program basketball throw scores compared to high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone ending eight-week summer strength and conditioning program mile run scores?

**Assumptions**

This study has several strong features. The two research groups, students who participated in 8-weeks of summer strength and conditioning and co-occurring sports and/or club sports in combination and students who participated in eight-weeks of summer strength and conditioning alone would be considered demographically congruent. Both groups of students were members of the Papillion-La Vista High School volleyball program. The two groups also received identical strength and conditioning workouts. Furthermore, students in both groups were academically sound with many students receiving academic honors (Miazga, 2009). It is also assumed that Papillion-La Vista High School Volleyball Staff and Strength and Conditioning Staff had an equally positive impact on the success of the outcomes of the volleyball players from both
independent variable groups. Moreover, volleyball players from both groups had identical strength and conditioning training experiences.

**Study Delimitations**

This study is delimitated to returning 10th-grade, 11th-grade, and 12th-grade volleyball players attending Papillion-La Vista High School in Papillion, Nebraska. The study findings will pertain only to those students who participated in volleyball and co-occurring sports and/or club sports at Papillion-La Vista High School. Pretest and posttest summer strength and conditioning and volleyball player motivation data were collected in June before the program began and again in August at the program conclusion. All data were routinely collected and consistent with the information needed by coaches to maintain optimal student performance and safety.

**Limitations**

The success indicators of the effects of the eight-week summer strength and conditioning program and effects of the Sports Motivation Survey are subject to individual judgment by the researcher, the Papillion-La Vista High School Volleyball Coaching Staff, and by the Strength and Conditioning Staff. The small sample size for each group, students who participated in volleyball and co-occurring sports and/or club sports ($n = 9$) and students who participated in volleyball alone ($n = 12$), may skew the statistical results and limit the potential to adequately interpret and generalize the study findings.
Definition of Terms

**Abdomen/Core Work.** Abdomen/core work are exercises that utilizes the core area of the body. The trunk of the body moves all different directions (laterally, forward, backwards, and rotational). Abdomen/core work exercises are designed to use all different ranges of motion. Medicine balls, stability balls/exercise balls, and exercisebands/therabands can be used to help strengthen the core area of the body. Balance and power all derive from the core. Without strong core strength, balance in an athlete can become an issue.

**Agility outcomes.** Agility outcomes are posttest outcomes for the physical agility skills of approach jump reach, block jump reach, agility run, basketball throw, and mile run.

**Agility run.** Agility run is a timed sprint using the perimeter of the volleyball court to measure quickness.

**Amotivation.** Amotivation is the inability or unwillingness to participate in a normal situation.

**Approach jump reach.** Approach jump reach is a two-step volleyball-attacking jump used to measure lower core strength, coordination, timing, and upper body reach and extension.

**Athlete burnout.** Athlete burnout is physical and emotional exhaustion, sport devaluation, and reduced athletic accomplishment.

**Basketball throw.** Basketball throw is an agility test using a women’s basketball, which is 28.5 inches/72.4 centimeters in circumference, used to measure overhand coordination and core and upper-body strength.
**Bicep curls.** Bicep curls are a single joint exercise done with a curl bar or dumbbell utilizing the bicep muscles.

**Block jump reach.** Block jump reach is a standing jump used to measure lower core strength, and upper reach and extension.

**Box jumps.** Box jumps are a power exercise accomplished without taking a step while bending at the knees and exploding upwards decelerating on top of the box sticking the landing on the middle of the feet with the hips, back, and knees not over the toes. This exercise creates lower body strength and power.

**Cleans.** Cleans is an explosive complex lift used for power, which deals with timing and speed. Athlete’s instructions are: starting at the top of knees with bar, move the bar up in a straight line shrugging shoulders and getting up on toes, trying not to bend arms. Then, transfer the weight onto heels, getting hips underneath the weight and elbows out in front, finishing in the rack position. If done correctly, utilizes triple extension, which deals with ankles, knees, and hips.

**Club sports.** Club sports are private organizations in which athletes pay to play to compete in local, regional, and national tournaments.

**Club volleyball.** Club volleyball is a private organization in which athletes pay to play to compete in local, regional, and national tournaments. The United States of America Volleyball Organization and the Junior Volleyball Directors Association are two types of club volleyball organizations/associations.

**Coach efficacy.** Coach efficacy is the belief by coaches that they have the ability to enact behaviors and fulfill tasks expected of them.
**Conditioning.** Conditioning is exercise, a component of physical activity to develop and maintain physical fitness.

**Co-occurring sports.** Co-occurring sports are additional sports athletes are involved in within their school. Basketball, swimming, soccer, track, and tennis are all examples of co-occurring sports.

**Expectancy-value models.** Expectancy-value models are theories that state that attitudes are developed and modified based on assessments about beliefs and values.

**External motivation.** External motivation is the condition of being motivated by a circumstance, by another individual, or by an incentive.

**External regulation.** External regulation is behavior that is regulated through external means, such as rewards and constraints.

**Horizontal bench press.** Horizontal bench press is a lift that strengthens the upper part of the pectorals. Athlete’s instructions are: begin lift in horizontal position. Get bar off rack, bring bar down to chest, and press/push the bar back up.

**Identified regulation.** Identified regulation means athletes highly value an activity, judging it to be important, and choosing to engage in it.

**Incline bench press.** Incline bench press is a lift that strengthens the upper part of the pectorals and is done in a reclined position. Athlete’s instructions are: begin lift setting at an incline. Get bar off rack, bring bar down to chest, and press/push the bar back up.

**Internal motivation.** Internal motivation is the psychological feature that arouses an individual to action toward a desired goal.
**Introjected regulation.** Introjected regulation refers to individuals beginning to internalize the reasons for their actions.

**Inverted pull-ups.** Inverted pull-ups are a multi-joint exercise used to strengthen the upper body by pulling the body up to the bar, legs straightened underneath the bar, pulling chest up to the bar.

**Medicine ball training.** Medicine ball training is the use of weighted medicine balls for core strength training by throwing, lifting, squatting, and/or using in a push-up position.

**Mile run.** The mile run is a distance run of 1,600 meters used to measure endurance.

**Motivation.** Motivation is the act or process of motivating.

**Parental influences.** Parental influences are thoughts or actions of parents that affect their child’s participation outcomes in athletics and activities.

**Player efficacy.** Player efficacy is the belief by players that they have the ability to perform the skills necessary to fulfill tasks expected of them.

**Push-press.** Push-press is an upper-body strengthening exercise done in a rack position of clean. Athlete’s instructions are: with elbows out and the bar resting on chest, slight knee bend and then press the weight up and over the head getting full extension at the top. Finish with the bar in line with the back of your head for full range of motion.

**School varsity volleyball.** School varsity volleyball is the principal athletic volleyball team representing a school during the fall athletic season.
**Seated rows.** Seated rows are an exercise used to strengthen lateral muscles, rear deltoids, and biceps. Athlete’s instructions are: sitting down with back straight, pull the extension to chest, while getting a full range of motion.

**Self-esteem.** Self-esteem is a person’s overall evaluation of his or her self-worth.

**Skull crushers.** An exercise designed to utilize and strengthen tricep muscles. Athlete’s instructions are: lying down on a bench with the weighted bar above the forehead, bending at the elbows, bring the bar down to the forehead and then back up again.

**Sports Motivation Scale (SMS).** The Sports Motivation Scale (Pelletier & Tuscon, 1995) is a measure of athlete motivation toward sport assessing internal motivation, external motivation, and amotivation. The Sport Motivation Scale Questionnaire was administered for this research study and the revised 28 Question Sport Motivation Scale Questionnaire domains internal motivation--to know, to accomplish, to experience stimulation; external motivation - identified, introjected, and external regulation; and amotivation were regarded. The Sports Motivation Scale was developed by L. G. Pelletier and K. M. Tuscon, of the University of Ottawa, Canada.

**Stability ball/exercise ball training.** Exercises performed on a physio-ball to stabilize the core and help develop a strong core strength and balance.

**Summer strength and conditioning program.** The summer strength and conditioning program is an 8-week weight lifting and conditioning program at Papillion-La Vista High School in Papillion, Nebraska, which is offered to Papillion-La Vista High School Volleyball Players during the months of June, July, and August. The program is in its sixth year.
**Team cohesion.** Team cohesion is a dynamic process that is reflected in the tendency of a team to stick together and remain untied in pursuit of its goals and objectives.

**Team efficacy.** Team efficacy is the belief by teams that they have the ability to perform the skills necessary to fulfill tasks expected of them.

**Title IX.** Title IX of the Education Amendments of 1972, now known as the Patsy T. Mink Equal Opportunity in Education Act in honor of its principal author in the United States, states, “No person in the United States shall on the basis of sex, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving Federal assistance.” Although the most prominent *public face* of Title IX is its impact on high school and collegiate athletics, the original statute made no reference to athletics (United States Department of Labor, 2009).

**To accomplish.** To accomplish pertains to engaging in a given activity for the pleasure and satisfaction experienced while one is attempting to accomplish or create something, or to surpass self.

**To experience stimulation.** To experience stimulation means when one engages in an activity to experience pleasant sensations associated mainly with one’s senses.

**To know.** To know refers to engaging in an activity for the pleasure and satisfaction that one experiences while learning, exploring, or trying to understand something new.

**Tricep curls.** Tricep curls is a single joint exercise used to utilize and strengthen the tricep muscles. Athlete’s instructions are: take a dumbbell over the head, keeping elbows in and extending arms upward getting a full range of motion.
**Volleyball.** Volleyball is a team sport in which two teams of six active players are separated by a net. Each team tries to score points against one another by grounding a ball on the other team’s court under organized rules.

**Volleyball participation rates.** Volleyball participation rates are the number of girl volleyball players, grades 9 through 12, involved in playing volleyball in a school and/or club setting.

**Weighted lunges.** Weighted lunges are a multi-join exercise to help utilize and strengthen hip, glute, and quad muscles. Athlete’s instructions are: using a medicine ball or dumbbell, lunge out with one leg, making sure that the knee is not over the toe and the glute is parallel to knee. Push up with the front of the heel and come back to the beginning position. Then, do the same with the other leg.

**Significance of Study**

This study has the potential to contribute to research, practice, and policy. The significance of this study lies with the debate about how and if summer weights and conditioning programs effectively benefit high school volleyball players’ overall attitudes and agility when used in combination with co-occurring sports and/or club sports. The two groups of volleyball players within the same school make for a reliable comparison. The consistency in the delivery of the summer weights and conditioning program, the Papillion-La Vista High School Volleyball and Strength and Conditioning Staff, demographics, policies and procedures, and expectations provide a solid foundation for this study. The results of this study will inform high school volleyball coaches based on the improvement of volleyball players’ agility and attitudes.
Contribution to research. This study will inform the literature on what means will help high school girl volleyball players improve their agility and attitude after engaging in an eight-week summer strength and conditioning program, and whether or not hoped for gains in agility and attitudes are enhanced by co-occurring volleyball or other sport participation during this eight-week period. Emerging work on off-season and summer strength and conditioning, co-occurring sport participation, and involvement in club play will provide high school volleyball coaches critical information about the needs of today’s girl athletes. The combination of research on the physical, mental, and motivational needs of high school girls in a positive and structured environment will provide all high school girl coaches critical data needed to help them create and sustain successful girls’ sports programs.

Contribution to practice. The results of this study will be communicated to the leadership and decision makers of the Papillion-La Vista High School Girls Athletic Program. Findings from the study and review of literature will inform the Papillion-La Vista High School Volleyball Coaching Staff, fellow Papillion-La Vista High School Girls Sports Coaches, and the Papillion-La Vista High School Athletic Director, about the outcomes of the Papillion-La Vista High School’s Girls Summer Strength and Conditioning Program.

Contribution to policy. The results of this study will be presented for consideration to the Papillion-La Vista High School Athletic Department. The Papillion-La Vista High School Athletic Department is responsible for making recommendation to Papillion-La Vista High School Girls Sports Coaches relative to their programs both in and off-season.
Organization of the Study

The literature review relevant to this study is presented in Chapter 2. Chapter 3 describes the research design, methodology, and procedures used to gather and analyze the data of the study. Chapter 4 reports the research results and Chapter 5 provides conclusions and discussion of the research results.
CHAPTER TWO

Review of Literature

Summer Strength Training

VanDyke (2005) suggests strength training dominates most athletes’ fitness and conditioning throughout the year. In particular, volleyball players are well known to have one of the highest levels of strength training dedication. These athletes realize the benefits of a proper strength and conditioning program (VanDyke, 2005). According to Hofmann-Nein (2007), Agel (2007) and colleagues, and Healy (2005), although strength training and conditioning is key to the success of any athlete, volleyball players must engage in planned training, or periodization, as part of their training program. Periodization provides volleyball players with a predictable set schedule of repetition and over-learning leading to muscle memory mastery through: (a) medicine ball training, (b) exerciseband/theraband training, (c) abdomen crunch stations, (d) inverted pull-ups, (e) push-press, (f) incline bench press, (g) horizontal bench press, (h) cleans, (i) bicep curls, (j) tricep curls, (k) skull crushers, (l) weighted lunges, (m) box jumps, (n) stability ball/exercise ball exercises, and (o) seated rows. These key conditioning exercises also protect girl volleyball players from injuries during fast-paced competition (Hofmann-Nein, 2007; Agel, J., Palmieri-Smith, R. M., Dick, R., Wojtys, E. M., & Marshall, S. W., 2007; Healy, 2005).

Muscle memory mastery. Strength training and conditioning are crucial for volleyball players and especially multi-sport athletes (Swanson, 2004; VanDyke, 2005). During the off-season, especially during the summer months, is a critical time for high school volleyball players to not only hone their volleyball skills, but also to become
bigger, faster, and stronger multi-sport athletes. Carrera and Reyes (2009) suggest that volleyball is a fast-paced game and that strength training to build big muscles is not necessary, however strength training is essential to develop physical attributes necessary to improve a player’s performance. Strength training is very important to volleyball players and strength should not be developed independently from other attributes such as agility, quickness, and endurance (Carrera & Reyes, 2009).

Hofmann (2008) states in order for high school girl volleyball players to develop strength and agility, a goal oriented coaching staff with a set mission and clear objectives must establish the training agenda (Hofmann, 2008). According to Shea (2008), the key to the implementation of proper strength and conditioning programs is an open-minded coaching staff with goals and aspirations for greater success. If the athletes are excited about the program, and are seeing great on-court success, they will work harder at their strength and conditioning routines--which require great individual motivation and initiative away from the spotlight and excitement of competition. Thus the old adage that *a team is built through hard work* and the *best teams work the hardest*, remains true even today (Shea, 2008).

**Summer Agility Training and Volleyball Skill**

Vescovi (2006) states along with working on fundamental strength skills, the next priority in becoming a better volleyball player is working on movement, quickness, and flexibility skills referred to overall as agility. In order to maximize ones potential as a volleyball player, agility is key. For a player’s body to move from point A to point B they must have agility, and athletes with good agility are more likely to posses dynamic balance, spatial awareness, rhythm, and visual processing (Vescovi, 2006). Whether
serving, passing, digging, setting, attacking, or blocking, volleyball athletes must have control over their bodies. According to Galloway (2005), agility training for volleyball athletes must begin with stretching and body-weight exercises such as (a) push-ups, (b) pull-ups, (c) body-weight squats, (d) medicine ball work, and (e) stability ball sets (Galloway, 2005).

Wendler (2009) suggests long gone are the days of beginning workouts a month or so before preseason practice begins. High school athletes today must train year-round to attain true athlete status as well as superiority over opponents during competition (Wendler, 2009). This includes volleyball players. Whether the level of training is basic or advanced, concentration must be improving throughout the year (Scates & Linn, 2002). According to Carpentier (2007), as volleyball coaches begin to work with their school’s strength and conditioning coach, they need to develop a convenient year-round strength and conditioning program which should meet three times weekly, even during the off-season (Carpentier, 2007; Asher, 1997). Sheppard and Borgeaud (2008) state since volleyball involves frequent bouts of intense activities such as jumping, diving, and lateral movements, strength and agility training, required to insure endurance, are necessary for players to be successful school team members and club program players (Sheppard & Borgeaud, 2008).

**Playing at full potential.** According to Gabbett (2006), and colleagues along with strength training, a well-structured volleyball agility training program can increase (a) explosive power, (b) vertical jump height, (c) endurance and speed, and (d) agility around the court. Skill training alone will not develop the physical traits necessary to play to the athlete’s full potential (Gabbett, T., Georgieff, B., Anderson, S., Cotton, B,
Savovic, D, & Nicholson, L, 2006). Agility programs that are well designed will also help reduce the incidence and severity of injury in volleyball players (Bahr, Lian, & Bahr, 1997; Souza, 2000; Stasinopoulos, 2004; Young, Cook, Purdam, Kiss, & Alfredoson, 2005). De Lose (1995) and Reeser (2008) state it is critical for high school volleyball players to not only be strong, but to have agility skill and aerobic endurance, as most volleyball injuries occur between the ages of 14 and 20 (De Lose, 1995; Reeser, 2008). Emma (2003) suggests that every competitive and non-competitive athlete must make a priority of improving and maintaining flexibility. Continuous strength, conditioning, and agility training combined with regular stretching makes volleyball players less susceptible to injury, enhances recovery time, improves speed, agility, and explosive power (Emma, 2003). Finally, Russell (2007) suggests the physical development in sports is of utmost importance. Being strong and well conditioned is being a confident player. Engaging in the proper amount of work both during the season and in the off-season, athletes will have the tools necessary to develop into strong, well-conditioned confident players (Russell, 2007).

**Attitude and Motivation**

Wardell (2009) and Russell (2007) state mental toughness is critical for team foundation. By creating controlled anxiety situations (this next point is for the championship, one more curl and the school record is yours) in practice, during strength and agility training, and during competition situations, players will be able to respond appropriately to adversity. Mental development is a trained behavior and coaches need to teach their players to properly channel their emotions and responses (Wardell, 2009; Russell, 2007). Lyons (2004) suggests that in most athletic programs, coaching attitude,
motivation, and mental toughness is more of an art than a science. Each coach has his/her own style and method of motivating players. However, for coaches to have winning programs and for players to reach their potential, players must be taught how to think to win, making motivation not just a feeling place but rather a thoughtful process (Lyons, 2004).

**The psychological notion that motivation is a thoughtful process.** According to Asher (1997) and Zinsser, Wrisberg, and Draper (1997), athletes and their coaches continually are searching for ways to hone not only their physical skills, but to increase their overall ability to psychologically perform at an optimal level. To be able to throw away any and all fear during competition, to handle distractions and remain positive in the face of setbacks, is characteristic of an outstanding athlete. In order for an athlete to achieve a high level of mental focus, the mind-body connection must be maximized both during practice and competition (Asher, 1997; Zinsser, et al., 1997). Baum (1999) suggests that by changing ones thought process, huge dividends can be gained and success is more likely to be achieved. By using perception stretchers athletes may alter their thinking and develop a positive frame of mind by: reframing loss as a gain; reminding oneself if you do what you’ve always done you’ll get what you’ve always gotten; believing the imagination is more powerful than the will; knowing that bodies work perfectly--the mind gets in the way; knowing that limitations are temporary; remembering that anyone can play any sport; seeing that events have no meaning except what you give them; insisting that getting better is more important than winning; practicing like you play; and learning that the more you expect from a situation, the more you will achieve (Baum, 1999).
Mack and Casstevens (2001) suggest that one of the biggest factors to achieving success in athletics is learning how to focus on the task and not let negative thoughts intrude. The mind can concentrate on only one thing at a time. Rather than suppressing what one does not want to happen, athletes must focus on what they do want to happen or focus on some neutral thought. The end result is that confidence is developed (Mack & Casstevens, 2001). Asher (1997) and Zinsser et al. (1997) state that confidence in competitive sport is the result of particular thinking habits. When these positive habits are continually practiced, athletes retain and benefit from these experiences in which they have been successful. Also of importance relaxation training, attention control (focusing on specific clues), mental rehearsal, and goal setting all contribute to the psychological success of an athlete, team, coaching staff, and overall volleyball program (Asher, 1997; Zinsser, et al., 1997).

**Intrinsic Motivation, Extrinsic Motivation, and Amotivation**

Sport motivation focuses on why athletes choose to play their sport, how hard they compete, how long they choose to participate, as well as what makes them quit (Hsia, Lu, & Huang, 2001; Deci & Ryan, 1985). According to Hsia, Lu, and Huang (2001) and Deci and Ryan (1985), motivation can be classified as three motivation constructs, (a) intrinsic motivation, (b) extrinsic motivation and (c) amotivation (Hsia, et al., 2001; Deci & Ryan, 1985).

**Intrinsic motivation.** Intrinsic motivation refers to the situation that individuals participate in activities for having fun and satisfying inner needs (Hsia, et al., 2001; Deci & Ryan, 1985). Hsia et al. (2001) asserts that only the intrinsically motivated athlete will continue to be enthusiastic about their sport. Three types of intrinsic motivation include
(a) intrinsic motivation to know, which refers to engaging in an activity for the pleasure and satisfaction that one experiences while learning, exploring, or trying to understand something new, (b) intrinsic motivation toward accomplishments, which pertains to engaging in a given activity for the pleasure and satisfaction experienced while one is attempting to accomplish or create something, or to surpass self, and (c) motivation to experience stimulation, which means when one engages in an activity to experience pleasant sensations associated mainly with one’s senses (Hsia, et al., 2001; Pelletier, Fortier, Vallerand, Tuson, & Briere, 1995).

High school athletics can provide extrinsic rewards to students and help them form social bonds and relationships within school (Crain, 1981; Din, 2006; Slavin & Madden, 1979; Trent & Braddock, 1992). Din (2006) and Kavussanu and McAuley (1995) state sports participation also fosters the development of intrinsic values as students ultimately grow to view themselves as having assets, that is skills, strengths, and abilities, which allow them to use their skills, strengths, and abilities to do and accomplish good things not compared to anyone else (which is a comparative value system)--one of the truest paradoxes of competing successfully, or even at all. Ultimately, even for the most talented youthful athlete, winning and losing is but a metaphor for dealing successfully with life and all that is yet to be (Din, 2006; Kavussanu & McAuley, 1995).

As players learn to discover their own intrinsic value systems, coaches have the task of finding the right individuals with the right attitudes and the right motivational tactics to help lead their team. Pettit (2008) suggests that when evaluating the leadership of a team, extraordinary leaders lead from the front of the people they are leading,
especially during difficult times. This leadership style is based on trust. Through the good and bad, these individuals stay steadfast. Team leaders with these skills operate on a two-way system of communication in a personal environment where the goal of the team and of the season is one of a journey, and not that of a destination (Pettit, 2008).

**Extrinsic motivation.** Extrinsic motivation refers to individuals who take part in activities for gaining external rewards (Hsia, et al., 2001; Pelletier, et al., 1995). Hsia et al. (2001) and Pelletier et al. (1995) state the four types of extrinsic motivation are (a) external regulation, behavior that is regulated through external means, such as rewards and constraints, (b) introjected regulation, which refers to individuals beginning to internalize the reasons for their actions, (c) identified regulation, which means athletes highly valuing an activity, judging it to be important, and choosing to engage in it (Hsia, et al., 2001; Pelletier, et al., 1995).

**Amotivation.** Hsia et al. (2001) and Pelletier et al. (1995) suggest the concept of amotivation is similar to that of learned helplessness (Abramson, Seligman, & Teasdale, 1978; Pelletier, et al., 1995). Amotivated individuals lose interest in the athletic activity itself and its result. They usually do not experience feelings of competence, and lack sense of control (Hsia, et al., 2001; Deci & Ryan, 1985; Pelletier, et al., 1995). Individuals under amotivation fail to find reasons to continue to keep training. In the end most amotivated individuals may choose to quit the sport entirely (Hsia, et al., 2001; Pelletier, et al., 1995).

**The Winning Coach**

According to Stice (2006), coaches motivate by being positive, yet persistent. In response to positive, yet persistent coaching, players maximize their physical and mental
effort at every practice and every competition. Winning occurs when players are positive about themselves and towards each other creating an environment where learning takes place no matter what the outcome of any single game may be (Stice, 2006).

Lyons (2004) states players must be goal and task-oriented and must also visualize and meditate to learn how to change harmful thoughts into helpful ones (Lyons, 2004). Motivating players and creating a positive attitude can create confidence in players. Moreno (2005) suggests the biggest confidence booster in volleyball is verbal communication (Moreno, 2005). Whether a player is calling the ball, letting fellow teammates know if the ball is in or out, short or deep, and/or who will be making the first contact with the ball; reminding fellow players of hitter tendencies, letting fellow teammates know if the opposing player is hitting cross, angle/cut, deep, and/or if they are tipping; stressing to teammates to cover on defense, reminding fellow teammates to cover their hitter and/or not letting the ball hit the floor; or by giving simple verbal cues, including be a statue when a player is done serving; keep arms up and shoulders down when a teammate is passing; swing high and fast when hitting; or be stiff like a board, not a mattress when blocking, all result in big dividends that will begin to pay-out as the season continues (Chapple, 2007).

Trust and mistrust. According to Riley (1993), athletes rely on trust. With trust, athletes work hard, attain success, give their coaches effort, play by the rules, produce results, and assume all will be fine. However, if anything contrary to these beliefs crosses their paths negative feelings may develop and mistrust may ensue. Mistrust is thought to be the result of ascribing poor, bad, or unwanted outcomes to personal inadequacy or focusing only on the negative outcome of a game or situation
rather than viewing the process as one where all played well, but simply lost. During adolescence, young persons may hold rigidly held beliefs about doing the right thing, and assume that if the right thing is done than a positive e.g. winning outcome will automatically ensue. This seems to be even more so for the adolescent when a trusted friend or maybe even a revered adult, such as a parent or coach, has made the connection between doing the right thing and winning (Riley, 1993).

Riley (1993) also states that motivation is the core of teamwork and teamwork is life. By blending skill, talents, and strengths of individuals the force becomes greater than the sum of its parts. Great teamwork, which requires trust in oneself as much as in others, is the only way to reach ultimate moments, to create breakthroughs, to fulfill our lives with lasting significance and memories (Riley, 1993).

**Motivating the coach.** Through the wins and losses, and keeping volleyball players attitudes and motivation in check, Elway (2006) suggests that coaches check-in with themselves and make sure that they realize that losing is not an indictment of their coaching ability. Coaches also need to continually review their program’s mission and season goals with their players and keep expectations consistent (Elway, 2006). Cohn and Cohn (2009) state emotional control on the part of both coaches and players is key, and everyone must stay positive, knowing that at times this may be difficult (Cohn & Cohn, 2009). Continual assessment of the season and monitoring and adjusting practice and game plans, though difficult at times, will help players, coaches, and the volleyball program as a whole evolve. Din (2006) suggests that the role of sport participation for high school students improves student motivation, improves student grades, keeps them in school, and raises their educational aspirations. All are important educational
outcomes for students and a major source of motivation for coaches (Casey, 1989; Din, 2006; Melnick, Sabo, & Vanfossen, 1992; Parker & Johnson, 1981).

**Athletic Participation: Too Much of a Good Thing?**

Din (2006) and Kavussanu and McAuley (1995) suggest athletes who participate in sports are highly active and involved students who are more optimistic and experience greater self-esteem than less active or noninvolved individuals (Din, 2006; Kavussanu & McAuley, 1995). However, for girl volleyball players there are data to suggest that while participation in co-occurring non-volleyball sports may be beneficial to their athletic development, additional participation in club play volleyball may be detrimental (Watts, 2002). According to Ulrich (2008), Dr. Joel Brenner, Director of Sports Medicine and Adolescent Medicine at the Children’s Hospital of the King’s Daughter, Norfolk, VA, suggests today’s single sport athletes are being treated in larger numbers than the past for injuries that used to be reserved for much older patients. Strains, pulls, and stress fractures are only the most visible manifestation of why early sport specialization, such as in volleyball, may be a bad idea--the adolescents he treats, moreover, are often psychologically burned out on their sport as well (Ulrich, 2008). Weiss and Fretwell (2005) state as early as the age of eight, some children are being pressured into a year-round commitment to a single sport based on a coach’s recommendation to parents. This is particularly problematic because most coaches of children this young do not have the ability to determine a child’s athletic potential into the future and may not even have any specific training or experience in the very sport they are coaching (Weiss & Fretwell, 2005). Accurately assessing the pre-pubescent child’s long-term physical development and fit for post-pubescent athletic participation is exceedingly difficult. According to
Pound (2008), adults cannot know with any certainty how children will turn out athletically. With this in mind, both high school and club coaches alike need to encourage athletes to participate in co-occurring sports while at the same time making it an enjoyable learning experience (Pound, 2008). Although the current single-sport trend persists, numerous sports medicine specialists are calling for a halt to youth sport specialization, and many public school coaches are supporting this call (Sondheimer, 2009; Ulrich, 2008). For example, the Michigan High School Athletic Association (2009) suggests that schools, coaches, and parents need to encourage multi-sport participation.

According to McInally (2009), school sports offer more than what most see—youth playing games. For families, sports offer a physical place to be together. Moreover, at critical times in their lives, sports offer children a way to connect with other children and work towards a common goal (McInally, 2009).

**Above All Else, Learning**

As with all athletes at the high school level, as a coach, it is important to make sure that practice as well as the game situation is a learning experience. For volleyball players, the court must first be the classroom. Fuglestad (2007) suggests that effective coaches are also effective teachers who do not merely furnish the answer, but bring students along in the process of self-discovery. Athletes need to be inspired to take risks and be independent thinkers and decision makers. They are enabled to do this by having coaches who are thoughtful and well-organized planners who have a mission, strong beliefs, and who know how to utilize curriculum and resource materials to help them better their skills and improve their craft (Paling, 2002). As rules and guidelines change
and evolve, coaches are perforce life-long learners who are contributing to the well being of the next generation of life-long learners (Fuglestad, 2007).
CHAPTER THREE

Methodology

Purpose of the Study

The purpose of the study was to determine the effects of a school sponsored invitational eight-week summer strength and conditioning program on the attitudes and agility of high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club sports compared to the attitudes and agility of high school girl volleyball players who specialize in volleyball and participated in the school sponsored invitational eight-week summer strength and conditioning program alone. This exploratory study focused on volleyball players who attend the same high school and who were members of the same volleyball program. Papillion-La Vista High School, the research school, provided returning sophomore, junior, and senior volleyball players the opportunity to participate in a school sponsored invitational eight-week summer strength and conditioning program during the summer 2008. The school also provided the volleyball players the opportunity to participate in co-occurring sports, other than volleyball, during the same time frame.

Description of Procedures

Research design. The pretest-posttest, posttest-posttest two-group comparative efficacy study design is displayed in the following notation:

Group 1  \( X_1 O_1 Y_1 O_2 \)

Group 2  \( X_1 O_1 Y_2 O_2 \)
Group 1 = study participants #1. Naturally formed group of sophomore, junior, and senior returning girl volleyball players \( (n = 9) \) in the research school.

Group 2 = study participants #2. Naturally formed group of sophomore, junior, and senior returning girl volleyball players \( (n = 12) \) in the research school.

\( X_1 = \text{study constant} \). Sophomore, junior, and senior returning girl volleyball players who participated in a school sponsored invitational eight-week summer strength and conditioning program.

\( Y_1 = \text{study independent variable, girl volleyball players, condition #1} \). Sophomore, junior, and senior returning volleyball players who completed the invitational eight-week summer strength and conditioning program and participated in co-occurring sports and/or club sports.

\( Y_2 = \text{study independent variable, girl volleyball players, condition #2} \). Sophomore, junior, and senior returning volleyball players who completed the invitational eight-week summer strength and conditioning program and specialized in volleyball only.

\( O_1 = \text{study pretest dependent measures} \). (1) Beginning of eight-week summer 2008 strength and conditioning program motivation as measured by the Sport Motivation Scale Questionnaire (Pelletier, et al., 1995) for the following subscales: (a) internal motivation, (b) external motivation, and (c) amotivation. (2) Conditioning as measured by agility outcomes for (a) approach jump reach, (b) block jump reach, (c) agility run, (d) basketball throw, and (e) mile run.

\( O_2 = \text{study posttest dependent measures} \). (1) Ending of eight-week summer 2008 strength and conditioning program motivation as measured by the Sport Motivation Scale Questionnaire (Pelletier, et al., 1995) for the following subscales: (a) internal motivation, (b) external motivation, and (c) amotivation. (2) Conditioning as measured by agility outcomes for (a) approach jump reach, (b) block jump reach, (c) agility run, (d) basketball throw, and (e) mile run.
Scale Questionnaire (Pelletier, et al., 1995) for the following subscales: (a) internal motivation, (b) external motivation, and (c) amotivation. (2) Conditioning as measured by agility outcomes for (a) approach jump reach, (b) block jump reach, (c) agility run, (d) basketball throw, and (e) mile run.

**Study Constant**

The study constant for this study was the summer strength and conditioning program. All participants received strength and conditioning specific skill and technique feedback, weight lifting activities and guidance, and cardiovascular and endurance exercises. Following is a schedule of activities for each day of participation in 15 stations. The weight lifting, and cardiovascular and endurance activities were led by Papillion-La Vista High School Strength and Conditioning Coach Evan Feezell, along with then Head Volleyball Coach J. J. Toczek, Assistant Volleyball Coach Justine McMurray, Head Girls Basketball Coach Dave Hubert, Assistant Girls Basketball Coach Corey Clemenger, Assistant Girls Basketball Coach Seth Ryser, Assistant Girls Basketball Coach and Assistant Softball Coach Clint Hoelscher, Assistant Softball Coach Nikki Rother, Head Varsity Soccer Coach Katie DeVries, Head Girls Track Coach Rob Vitera, and Assistant Girls Track Coach Amy Thompson.

**Weight Lifting Activities**

Each morning began at 9:00 a.m. with group stretching led by the upcoming senior girl athletes. Stretching consisted of arm, shoulder, leg, thigh, lower back, and neck exercises. After the stretching exercises, all girl athletes were divided into groups of two or three at each of the stations. Stations consisted of medicine ball training, exerciseband/theraband training, abdomen crunch stations, inverted pull-ups, push-press,
incline bench press, horizontal bench press, cleans, bicep curls, tricep curls, skull crushers, weighted lunges, box jumps, stability ball/exercise ball exercises, and seated rows. Each group participated in each station for three sets, with each set consisting of 45 seconds per group member. All group members were cued by Coach Feezell, who controlled a visible time clock, on when to rotate each set and to each station. After the weight training stations were completed, Coach Feezell led all female athletes in an abdomen/core strength routine. After the abdomen and core strength exercises were completed, the entire group of girl athletes, as well as the coaches, would use the Papillion-La Vista High School track, tennis court, parking lot, or gyms to engage in the cardiovascular and endurance conditioning activities.

**Cardiovascular and Endurance Conditioning Activities**

Each Papillion-La Vista girl athlete involved in the summer strength and conditioning program engaged in a cardiovascular and endurance conditioning activity at the end of each session. Mondays consisted of sprint workouts where girl athletes ran ladders on the track. The ladders consisted of two 100-meter sprints, two 200-meter sprints, two 400-meter sprints, two 200-meter sprints, and two 100-meter sprints. Wednesdays consisted of distance/endurance workouts where the girl athletes were required to run 1 mile/1600 meters in 9 minutes or less. This activity was also used as a team building exercise, as the girls each had a partner. One partner was the time-keeper/encourager during the first mile run and during the second mile run, the partners roles reversed. This cardiovascular and endurance activity not only helped the girls improve physically, but also mentally and emotionally, as a team player. Thursdays consisted of jump-roping, line jumps, and hill runs. The girl athletes again would
partner-up taking turns jump roping using various techniques (right foot jumps, left foot jumps, both feet jumps, high knee jumps, butt-kick jumps, triangle jumps, square jumps, and scissor jumps). The same jump sequences were also performed while doing the line jumps. The final Thursday activity consisted of hill runs with the 8 pound medicine balls. While partner one ran up the hill and jogged back down the hill, partner two would be engaging in sit-ups, push-ups, mountain climbers, or pillars.

Each cardiovascular and endurance session ended with encouraging and positive comments from the coaching staff, feedback from the senior girl athletes, and a group break were everyone came together and yelled in unison, “MONARCHS!”

**Dependent Measures**

The following dependent variables were measured, (1) internal motivation, (2) external motivation, (3) amotivation, (4) approach jump reach, (5) block jump reach, (6) agility run, (7) basketball throw, and (8) mile run.

**Internal motivation.** Internal motivation was measured by the Sport Motivation Scale Questionnaire.

**External motivation.** External motivation was measured by the Sport Motivation Scale Questionnaire.

**Amotivation.** Amotivation was measured by the Sport Motivation Scale Questionnaire.

**Approach jump reach.** Approach jump reach was measured by the measuring tape approach apparatus and the 10-foot basketball rim.

**Block jump reach.** Block jump reach was measured by the measuring tape apparatus and the 10-foot basketball rim.
**Agility run.** Agility run was measured by the perimeter of the volleyball court 10-foot line to serving line and was timed via a stopwatch.

**Basketball throw.** Basketball throw was measured by a 100-foot measure tape with a women’s basketball measuring 72.4 centimeters in circumference.

**Research Questions and Data Analysis**

**Overarching Pretest-Posttest Motivation Research Question #1.** Do high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program who also participated in co-occurring sports and/or club sports lose, maintain, or improve their Sport Motivation Scale Questionnaire (a) to know, (b) to accomplish, and (c) to experience stimulation internal motivation scores?

**Sub-Question 1a.** Is there a statistically significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program who also participated in co-occurring sports and/or club sports beginning compared to ending summer program to know internal motivation scores?

**Sub-Question 1b.** Is there a statistically significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program who also participated in co-occurring sports and/or club sports beginning compared to ending summer program to accomplish internal motivation scores?

**Sub-Question 1c.** Is there a statistically significant difference between high school girl volleyball players who participated in the school sponsored invitational
eight-week summer strength and conditioning program who also participated in co-
occurring sports and/or club sports beginning compared to ending summer program to
experience stimulation internal motivation scores?

**Analysis.** Research Sub-Questions #1a, 1b, and 1c were analyzed using
dependent *t* tests to examine the significance of the difference between high school girl
volleyball players who participated in the school sponsored invitational eight-week
summer strength and conditioning program who also participated in co-occurring sports
and/or club sports beginning compared to ending summer program Sport Motivation
Scale Questionnaire scores for internal motivation, (a) to know, (b) to accomplish, and (c)
to experience motivation. Because multiple statistical tests were conducted, a one-tailed
.01 alpha level was employed to help control for Type 1 errors. Means and standard
deviations are displayed in tables.

**Overarching Pretest-Posttest Motivation Research Question #2.** Do high
school girl volleyball players who participated in the school sponsored invitational eight-
week summer strength and conditioning program who also participated in co-occurring
sports and/or club sports lose, maintain, or improve their Sport Motivation Scale
Questionnaire (a) identified, (b) introjected, and (c) external regulation external
motivation scores?

**Sub-Question 2a.** Is there a statistically significant difference between
high school girl volleyball players who participated in the school sponsored invitational
eight-week summer strength and conditioning program who also participated in co-
occurring sports and/or club sports beginning compared to ending summer program
identified external motivation scores?
Sub-Question 2b. Is there a statistically significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program who also participated in co-occurring sports and/or club sports beginning compared to ending summer program introjected external motivation scores?

Sub-Question 2c. Is there a statistically significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program who also participated in co-occurring sports and/or club sports beginning compared to ending summer program to external regulation external motivation scores?

Analysis. Research Sub-Questions #2a, 2b, and 2c were analyzed using dependent $t$ tests to examine the significance of the difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program who also participated in co-occurring sports and/or club sports beginning compared to ending summer program Sport Motivation Scale Questionnaire scores for external motivation, (a) identified, (b) introjected, and (c) external regulation. Because multiple statistical tests were conducted, a one-tailed .01 alpha level was employed to help control for Type 1 errors. Means and standard deviations are displayed in tables.

Overarching Pretest-Posttest Motivation Research Question #3. Do high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program who also participated in co-occurring
Sports and/or club sports lose, maintain, or improve their Sport Motivation Scale Questionnaire amotivation scores?

**Sub-Question 3a.** Is there a statistically significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program who also participated in co-occurring sports and/or club sports beginning compared to ending summer program amotivation scores?

**Analysis.** Research Sub-Question #3a was analyzed using dependent *t* tests to examine the significance of the difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program who also participated in co-occurring sports and/or club sports beginning compared to ending summer program Sport Motivation Scale Questionnaire scores for (a) amotivation. Because multiple statistical tests were conducted, a one-tailed .01 alpha level was employed to help control for Type I errors. Means and standard deviations are displayed in tables.

**Overarching Pretest-Posttest Motivation Research Question #4.** Do high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone lose, maintain, or improve their Sport Motivation Scale Questionnaire (a) to know, (b) to accomplish, and (c) to experience stimulation internal motivation scores?

**Sub-Question 4a.** Is there a statistically significant difference between high school girl volleyball players who participated in the school sponsored invitational
eight-week summer strength and conditioning program alone beginning compared to ending summer program to know internal motivation scores?

**Sub-Question 4b.** Is there a statistically significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone beginning compared to ending summer program to accomplish internal motivation scores?

**Sub-Question 4c.** Is there a statistically significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone beginning compared to ending summer program to experience stimulation internal motivation scores?

**Analysis.** Research Sub-Questions #4a, 4b, and 4c were analyzed using dependent $t$ tests to examine the significance of the difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone beginning compared to ending summer program Sport Motivation Scale Questionnaire scores for internal motivation (a) to know, (b) to accomplish, and (c) to experience stimulation. Because multiple statistical tests were conducted, a one-tailed .01 alpha level was employed to help control for Type 1 errors. Means and standard deviations are displayed in tables.

**Overarching Pretest-Posttest Motivation Research Question #5.** Do high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone lose, maintain, or improve their Sport Motivation Scale Questionnaire (a) identified, (b) introjected, and (c) to external regulation external motivation scores?
**Sub-Question 5a.** Is there a statistically significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone beginning compared to ending summer program identified external motivation scores?

**Sub-Question 5b.** Is there a statistically significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone beginning compared to ending summer program introjected external motivation scores?

**Sub-Question 5c.** Is there a statistically significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone beginning compared to ending summer program to external regulation external motivation scores?

**Analysis.** Research Sub-Questions #5a, 5b, and 5c were analyzed using dependent *t* tests to examine the significance of the difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone beginning compared to ending summer program Sport Motivation Scale Questionnaire scores for external motivation, (a) identified, (b) introjected, and (c) external regulation. Because multiple statistical tests were conducted, a one-tailed .01 alpha level was employed to help control for Type 1 errors. Means and standard deviations are displayed in tables.

**Overarching Pretest-Posttest Motivation Research Question #6.** Do high school girl volleyball players who participated in the school sponsored invitational eight-
week summer strength and conditioning program alone lose, maintain, or improve their Sport Motivation Scale Questionnaire amotivation scores?

**Sub-Question 6a.** Is there a statistically significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone beginning compared to ending summer program amotivation scores?

**Analysis.** Research Sub-Question #6a was analyzed using a dependent $t$ test to examine the significance of the difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone beginning compared to ending summer program Sport Motivation Scale Questionnaire scores for (a) amotivation. Because multiple statistical tests were conducted, a one-tailed .01 alpha level was employed to help control for Type 1 errors. Means and standard deviations are displayed in tables.

**Overarching Posttest-Posttest Motivation Research Question #7.** Do high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club sports have different or congruent ending eight-week Sport Motivation Scale Questionnaire (a) internal, (b) external, and (c) amotivation compared to high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone ending eight-week Sport Motivation Scale Questionnaire scores for (a) internal, (b) external, and (c) amotivation?

**Sub-Question 7a.** Is there a significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week
summer strength and conditioning program and co-occurring sports and/or club sports ending eight-week summer strength and conditioning program internal motivation scores (a) to know, (b) to accomplish, and (c) to experience stimulation compared to high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone ending eight-week summer strength and conditioning program internal motivation scores (a) to know, (b) to accomplish, and (c) to experience stimulation?

**Sub-Question 7b.** Is there a significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club sports ending eight-week summer strength and conditioning program external motivation scores (a) identified, (b) introjected, and (c) external regulations compared to high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone ending eight-week summer strength and conditioning program external motivation scores (a) identified, (b) introjected, and (c) external regulations?

**Sub-Question 7c.** Is there a significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club sports ending eight-week summer strength and conditioning program amotivation scores compared to high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone
ending eight-week summer strength and conditioning program amotivation amotivation scores?

**Analysis.** Research Sub-Questions #7a, 7b, and 7c were analyzed using an independent \( t \) test to examine the significance of the difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club sports ending eight-week summer strength and conditioning program and high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone ending eight-week summer strength and conditioning program Sport Motivation Scale Questionnaire scores (a) identified, (b) introjected, and (c) external regulation. Because multiple statistical tests were conducted, a one-tailed .01 alpha level was employed to help control for Type 1 errors. Means and standard deviations are displayed in tables.

**Overarching Posttest-Posttest Motivation Research Question #8.** Do high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club sports have different or congruent ending eight-week Sport Motivation Scale Questionnaire scores for (a) internal motivation, (b) external motivation, and (c) amotivation?

**Sub-Question 8a.** Is there a significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club sports
ending eight-week summer strength and conditioning program Sport Motivation Scale Questionnaire (a) internal motivation scores?

Sub-Question 8b. Is there a significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club sports ending eight-week summer strength and conditioning program Sport Motivation Scale Questionnaire (b) external motivation scores?

Sub-Question 8c. Is there a significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club sports ending eight-week summer strength and conditioning program Sport Motivation Scale Questionnaire (c) amotivation scores?

Analysis. Research Sub-Questions #8a, 8b, and 8c were analyzed using a single classification Analysis of Variance (ANOVA) to determine the main effect between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club sports ending eight-week summer strength and conditioning program Sport Motivation Scale Questionnaire scores for (a) internal motivation--to know, to accomplish, and to experience stimulation, (b) external motivation--identified, introjected, external regulations, and (c) amotivation. An F ratio was calculated and an alpha level of .05 was utilized to test the null hypothesis. Independent t tests were used for contrast analysis if a significant F ratio was observed.
**Overarching Posttest-Posttest Motivation Research Question #9.** Do high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone have different or congruent ending eight-week Sport Motivation Scale Questionnaire scores for (a) internal motivation, (b) external motivation, and (c) amotivation?

**Sub-Question 9a.** Is there a significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone ending eight-week summer strength and conditioning program Sport Motivation Scale Questionnaire (a) internal motivation scores?

**Sub-Question 9b.** Is there a significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone ending eight-week summer strength and conditioning program Sport Motivation Scale Questionnaire (b) external motivation scores?

**Sub-Question 9c.** Is there a significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone ending eight-week summer strength and conditioning program Sport Motivation Scale Questionnaire (c) amotivation scores?

**Analysis.** Research Sub-Questions #9a, 9b, and 9c were analyzed using a single classification Analysis of Variance (ANOVA) to determine the main effect between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone ending eight-week summer
strength and conditioning program Sport Motivation Scale Questionnaire scores for (a) internal motivation--to know, to accomplish, and to experience stimulation, (b) external motivation--identified, introjected, external regulations, and (c) amotivation. An $F$ ratio was calculated and an alpha level of .05 was utilized to test the null hypothesis. Independent $t$ tests were used for contrast analysis if a significant $F$ ratio was observed.

**Overarching Pretest-Posttest Agility Outcomes Research Question #10.** Do high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program who also participated in co-occurring sports and/or club sports lose, maintain, or improve their agility outcomes scores for (a) approach jump reach, (b) block jump reach, (c) agility run, (d) basketball throw, and (e) mile run?

**Sub-Question 10a.** Is there a statistically significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program who also participated in co-occurring sports and/or club sports beginning compared to ending approach jump reach score?

**Sub-Question 10b.** Is there a statistically significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program who also participated in co-occurring sports and/or club sports beginning compared to ending block jump reach score?

**Sub-Question 10c.** Is there a statistically significant difference between high school girl volleyball players who participated in the school sponsored invitational
eight-week summer strength and conditioning program who also participated in co-occurring sports and/or club sports beginning compared to ending agility run score?

**Sub-Question 10d.** Is there a statistically significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program who also participated in co-occurring sports and/or club sports beginning compared to ending basketball throw score?

**Sub-Question 10e.** Is there a statistically significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program who also participated in co-occurring sports and/or club sports beginning compared to ending mile run score?

**Analysis.** Research Sub-Questions #10a, 10b, 10c, 10d, and 10e were analyzed using dependent \( t \) tests to examine the significance of the difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program who also participated in co-occurring sports and/or club sports beginning compared to ending summer program agility outcomes scores for (a) approach jump reach, (b) block jump reach, (c) agility run, (d) basketball throw, and (e) mile run. Because multiple statistical tests were conducted, a one-tailed .01 alpha level was employed to help control for Type 1 errors. Means and standard deviations are displayed in tables.

**Overarching Pretest-Posttest Agility Outcomes Research Question #11.** Do high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone lose, maintain, or improve
their agility outcomes scores for (a) approach jump reach, (b) block jump reach, (c) agility run, (d) basketball throw, and (e) mile run?

**Sub-Question 11a.** Is there a statistically significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone beginning compared to ending approach jump reach score?

**Sub-Question 11b.** Is there a statistically significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone beginning compared to ending block jump reach score?

**Sub-Question 11c.** Is there a statistically significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone beginning compared to ending agility run score?

**Sub-Question 11d.** Is there a statistically significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone beginning compared to ending basketball throw score?

**Sub-Question 11e.** Is there a statistically significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone beginning compared to ending mile run score?
Analysis. Research Sub-Questions #11a, 11b, 11c, 11d, and 11e were analyzed using dependent t tests to examine the significance of the difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone beginning compared to ending summer program agility outcomes scores for (a) approach jump reach, (b) block jump reach, (c) agility run, (d) basketball throw, and (e) mile run. Because multiple statistical tests were conducted, a one-tailed .01 alpha level was employed to help control for Type 1 errors. Means and standard deviations are displayed in tables.

Overarching Posttest-Posttest Agility Outcomes Research Question #12. Do high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club sports have different or congruent ending eight-week summer strength and conditioning program agility outcomes scores compared to high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone ending eight-week summer strength and conditioning program agility outcomes scores for (a) approach jump reach, (b) block jump reach, (c) agility run, (d) basketball throw, and (e) mile run?

Sub-Question 12a. Is there a significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club sports ending eight-week summer strength and conditioning program approach jump scores compared to high school girl volleyball players who participated in the school sponsored
invitational eight-week summer strength and conditioning program alone ending eight-week summer strength and conditioning program approach jump reach scores?

**Sub-Question 12b.** Is there a significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club sports ending eight-week summer strength and conditioning program block jump scores compared to high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone ending eight-week summer strength and conditioning program block jump reach scores?

**Sub-Question 12c.** Is there a significant difference between high school girl volleyball players who participated in the school sponsored eight-week invitational summer strength and conditioning program and co-occurring sports and/or club sports ending eight-week summer strength and conditioning program agility run scores compared to high school girl volleyball players who participated in the school sponsored eight-week summer strength and conditioning program alone ending eight-week summer strength and conditioning program agility run scores?

**Sub-Question 12d.** Is there a significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club sports ending eight-week summer strength and conditioning program mile run scores compared to high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone ending eight-week summer strength and conditioning program basketball throw scores?
Sub-Question 12e. Is there a significant difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club sports ending eight-week summer strength and conditioning program basketball throw scores compared to high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone ending eight-week summer strength and conditioning program mile run scores?

Analysis. Research Sub-Questions #12a, 12b, 12c, 12d, and 12e will be analyzed using an independent $t$ test to examine the significance of the difference between high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club sports ending eight-week summer strength and conditioning program agility outcomes scores and high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone ending eight-week summer strength and conditioning program agility outcomes scores for (a) approach jump reach, (b) block jump reach, (c) agility run, (d) basketball throw, and (e) mile run. Because multiple statistical tests were conducted, a one-tailed .01 alpha level was employed to help control for Type 1 errors. Means and standard deviations are displayed in tables.

Participants

Number of participants. Study participants consisted of two naturally formed groups. Returning members of the research school volleyball program ($N = 21$) were subjects. Varsity, junior varsity, and reserve volleyball players ($n = 9$) who participated
in the summer strength and conditioning program and who also participated in a co-occurring school sponsored sports and/or a club sports and varsity, junior varsity, and reserve volleyball players \( (n = 12) \) who participated in the summer strength and conditioning program alone will be the study subjects.

**Gender of participants.** Volleyball players \( (N = 21) \) who participated in the co-occurring sports and/or club sports group were female \( (n = 9) \). Volleyball players who participated in the volleyball alone group were also female \( (n = 12) \). These numbers represent a unique player population of girls who participated in the varsity, junior varsity, and reserve volleyball program at the research school.

**Age range of participants.** Volleyball players in this study ranged in age from 15-years to 17-years of age in the co-occurring sports and/or club sports group at the end of the study. Volleyball players in this study ranged in age from 14-years to 17-years in the volleyball alone group at the end of the study.

**Racial and ethnic origin of participants.** The racial and ethnic origin ratio was congruent with the Papillion-La Vista School District enrollment patterns.

**Inclusion criteria.** Volleyball players who were returning members from the 2007 volleyball program in the research school were included in this study.

**Method of subject identification and recruitment.** Of the total number of subjects \( (N = 21) \), all were participants in the summer strength and conditioning program.

**Performance site.** The research was conducted in the public school setting through normal education and coaching practices. Both programs in the study operated in two buildings within the Papillion-La Vista School District. Papillion-La Vista High School is a 9th-grade through 12th-grade school building. La Vista Junior High is a 7th-


grade and 8th-grade school building. Both are located in a suburban area of southwest Omaha, Nebraska.

**Institutional Review Board (IRB) for the Protection of Human Subjects Approval**

**Category**

The exemption category for this study is category 4 45CFR46:101 (b). The research was conducted in the public school setting through normal educational practices. The study procedures did not interfere in anyway with the normal educational practices of the public school and did not involve coercion or discomfort of any kind. Permission from the appropriate school and district personnel has been obtained. A letter of research support from the school district was reviewed by the IRB before approval.
CHAPTER FOUR

Results

Purpose of the Study

The purpose of the study was to determine the effects of a school sponsored invitational eight-week summer strength and conditioning program on the attitudes and agility of high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club sports compared to the attitudes and agility of high school girl volleyball players who specialized in volleyball and participated in the school sponsored invitational eight-week summer strength and conditioning program alone. This exploratory study focused on volleyball players who attended the same high school and who were members of the same volleyball program. Papillion-La Vista High School, the research school, provided returning sophomore, junior, and senior volleyball players the opportunity to participate in a school sponsored invitational eight-week summer strength and conditioning program during the summer 2008. The school also provided the volleyball players the opportunity to participate in co-occurring sports, other than volleyball, during the same time frame.

The study’s two dependent variables were, (1) sports motivation including (a) internal motivation, (b) external motivation, and (c) amotivation measured by the Sport Motivation Scale Questionnaire and (2) athlete agility (a) approach jump reach, (b) block jump reach, (c) agility run, (d) basketball throw, and (e) mile run as measured by direct observation and performance testing.
Table 1 displays demographic information of individual high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club sports. Table 2 displays demographic information of individual high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone. Sport Motivation Scale Questionnaire internal motivation scores of individual high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club sports are found in Table 3. Sport Motivation Scale Questionnaire external motivation scores of individual high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club sports may be found in Table 4. Table 5 displays Sport Motivation Scale Questionnaire amotivation scores of individual high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club sports. Table 6 displays Sport Motivation Scale Questionnaire internal motivation scores of individual high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone. Sport Motivation Scale Questionnaire external motivation scores of individual high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone may be found in Table 7. Table 8 displays Sport Motivation Scale Questionnaire amotivation scores of individual
high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone.

**Research Question #1**

The first pretest-posttest hypothesis was tested using the dependent *t* test. The first hypothesis comparing high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program who also participated in co-occurring sports and/or club sports pretest beginning eight-week compared to posttest ending eight-week Sport Motivation Scale Questionnaire to know, to accomplish, and to experience stimulation internal motivation score results were displayed in Table 9. As seen in Table 9, null hypotheses were not rejected for the three measured internal motivation subtests to know, to accomplish, and to experience stimulation. The pretest to know score (*M* = 5.81, *SD* = 0.78) compared to the posttest to know score (*M* = 6.03, *SD* = 0.80) was not statistically significantly different, *t*(8) = 0.70, *p* = .25 (one-tailed), *d* = .28. The pretest to accomplish score (*M* = 6.28, *SD* = 0.73) compared to the posttest to accomplish score (*M* = 6.22, *SD* = 0.61) was not statistically significantly different, *t*(8) = -0.31, *p* = .38 (one-tailed), *d* = .09. The pretest to experience stimulation score (*M* = 6.47, *SD* = 0.86) compared to the posttest to experience stimulation score (*M* = 6.39, *SD* = 0.89) was not statistically significantly different, *t*(8) = -1.00, *p* = .17 (one-tailed), *d* = .09.

Overall, pretest-posttest results indicated high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program who also participated in co-occurring sports and/or club sports pretest beginning eight-week compared to posttest ending eight-week Sport Motivation
Scale Questionnaire to know, to accomplish, and to experience stimulation internal motivation scores remained stable across the eight-week pretest-posttest intervention period. The seven point Sport Motivation Scale Questionnaire Likert Scale is anchored with three ranges of responses including Does Not Correspond at All for numerical responses 1 and 2, Corresponds Moderately for numerical responses 3, 4, and 5, and Corresponds Exactly for numerical responses 6 and 7. Comparing multi-sport players' internal motivation scores with the Sport Motivation Scale Questionnaire Likert Scale 1 to 7 range, indicates self reported posttest scores that fall within the top scores of 6 and 7, Corresponds Exactly range, for all three internal motivation subscales.

Finally, it may be said that the multi-sport players reported themselves as highly internally motivated before they began participation in the school sponsored invitational eight-week summer strength and conditioning program and that these self-reported internal motivation scores remained statistically unchanged following participation in the school sponsored invitational eight-week summer strength and conditioning program. The internal motivation pretest-posttest sub-scale to know mean difference score was +0.22, the internal motivation pretest-posttest sub-scale to accomplish mean difference score was -0.06, and the internal motivation pretest-posttest sub-scale to experience stimulation mean difference score was -0.08. The data suggest that these players source of motivation is internal, well established, and that self-reported pretest-posttest mean differences indicated sub-scale stability, not easily changed by the new challenges presented during the school sponsored invitational eight-week summer strength and conditioning program.
Research Question #2

The second pretest-posttest hypothesis was tested using the dependent \( t \) test. The second hypothesis comparing high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program who also participated in co-occurring sports and/or club sports pretest beginning eight-week compared to posttest ending eight-week Sport Motivation Scale Questionnaire identified, introjected, and external regulation external motivation score results were displayed in Table 10. As seen in Table 10, null hypotheses were not rejected for the three measured external motivation subtests identified, introjected, and external regulation. The pretest identified score (\( M = 5.92, SD = 0.82 \)) compared to the posttest identified score (\( M = 6.11, SD = 0.70 \)) was not statistically significantly different, \( t(8) = 0.61, p = .28 \) (one-tailed), \( d = .25 \). The pretest introjected score (\( M = 4.47, SD = 1.52 \)) compared to the posttest introjected score (\( M = 4.92, SD = 0.89 \)) was not statistically significantly different, \( t(8) = 0.94, p = .19 \) (one-tailed), \( d = .36 \). The pretest external regulation score (\( M = 4.83, SD = 1.19 \)) compared to the posttest external regulation score (\( M = 5.22, SD = 1.16 \)) was not statistically significantly different, \( t(8) = 0.98, p = .18 \) (one-tailed), \( d = .33 \).

Overall, pretest-posttest results indicated high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program who also participated in co-occurring sports and/or club sports pretest beginning eight-week compared to posttest ending eight-week Sport Motivation Scale Questionnaire identified, introjected, and external regulation external motivation scores remained stable across the eight-week pretest-posttest intervention period. The seven point Sport Motivation Scale Questionnaire Likert Scale is anchored with three
ranges of responses including Does Not Correspond at All for numerical responses 1 and 2, Corresponds Moderately for numerical responses 3, 4, and 5, and Corresponds Exactly for numerical responses 6 and 7. Comparing multi-sport players' external motivation scores with the Sport Motivation Scale Questionnaire Likert Scale 1 to 7 range, indicates self reported posttest scores that fall within the middle scores of 3, 4, and 5, Corresponds Moderately range, for two of the external motivation subscales, introjected and external regulations, with the identified score falling within the higher Corresponds Exactly range.

Finally, it may be said that the multi-sport players reported themselves as moderately externally motivated before they began participation in the school sponsored invitational eight-week summer strength and conditioning program and that these self-reported external motivation scores remained statistically unchanged following participation in the school sponsored invitational eight-week summer strength and conditioning program. The external motivation pretest-posttest sub-scale identified mean difference score was +0.19, the external motivation pretest-posttest sub-scale introjected mean difference score was -0.45, and the external motivation pretest-posttest sub-scale external regulation mean difference score was -0.39. The data suggest that these players source of motivation is only moderately external, secondary to internal motivation, well established, and that self-reported pretest-posttest mean differences indicated sub-scale stability, not easily changed by the new challenges presented during the school sponsored invitational eight-week summer strength and conditioning program.

Research Question #3

The third pretest-posttest hypothesis was tested using the dependent $t$ test. The third hypothesis comparing high school girl volleyball players who participated in the
school sponsored invitational eight-week summer strength and conditioning program who also participated in co-occurring sports and/or club sports pretest beginning eight-week compared to posttest ending eight-week Sport Motivation Scale Questionnaire amotivation amotivation score results were displayed in Table 11. As seen in Table 11, the null hypothesis was not rejected for the one measured amotivation subtest amotivation. The pretest amotivated score ($M = 1.28$, $SD = 0.36$) compared to the posttest amotivated score ($M = 1.17$, $SD = 0.28$) was not statistically significantly different, $t(8) = -1.18$, $p = .14$ (one-tailed), $d = .34$.

Overall, pretest-posttest results indicated high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program who also participated in co-occurring sports and/or club sports pretest beginning eight-week compared to posttest ending eight-week Sport Motivation Scale Questionnaire amotivated amotivated scores remained stable across the eight-week pretest-posttest intervention period. The seven point Sport Motivation Scale Questionnaire Likert Scale is anchored with three ranges of responses including Does Not Correspond at All for numerical responses 1 and 2, Corresponds Moderately for numerical responses 3, 4, and 5, and Corresponds Exactly for numerical responses 6 and 7. Comparing multi-sport players' amotivation scores with the Sport Motivation Scale Questionnaire Likert Scale 1 to 7 range, indicates self reported posttest scores that fall within the lowest scores of 1 and 2, Does Not Correspond at All, for the amotivation subscale, amotivation.

Finally, it may be said that the multi-sport players reported themselves as not at all amotivated before they began participation in the school sponsored invitational eight-
week summer strength and conditioning program and that these self-reported amotivation scores remained statistically unchanged following participation in the school sponsored invitational eight-week summer strength and conditioning program. The amotivation pretest-posttest sub-scale identified mean difference score was -0.11. The data suggest that these players reported themselves as not at all amotivated and that the self-reported pretest-posttest mean differences indicated sub-scale stability, not easily changed by the new challenges presented during the school sponsored invitational eight-week summer strength and conditioning program.

**Research Question #4**

The fourth pretest-posttest hypothesis was tested using the dependent $t$ test. The fourth hypothesis comparing high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone pretest beginning eight-week compared to posttest ending eight-week Sport Motivation Scale Questionnaire to know, to accomplish, and to experience stimulation internal motivation score results were displayed in Table 12. As seen in Table 12, null hypotheses were not rejected for the three measured internal motivation subtests to know, to accomplish, and to experience stimulation. The pretest to know score ($M = 5.69, SD = 0.79$) compared to the posttest to know score ($M = 6.04, SD = 1.01$) was not statistically significantly different, $t(11) = 1.10, p = .15$ (one-tailed), $d = .39$. The pretest to accomplish score ($M = 5.71, SD = 0.56$) compared to the posttest to accomplish score ($M = 6.06, SD = 1.00$) was not statistically significantly different, $t(11) = 1.27, p = .12$ (one-tailed), $d = .45$. The pretest to experience stimulation score ($M = 5.90, SD = 0.71$)
compared to the posttest to experience stimulation score ($M = 5.88$, $SD = 0.69$) was not statistically significantly different, $t(11) = -0.43, p = .34$ (one-tailed), $d = .03$.

Overall, pretest-posttest results indicated high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone pretest beginning eight-week compared to posttest ending eight-week Sport Motivation Scale Questionnaire to know, to accomplish, and to experience stimulation internal motivation scores remained stable across the eight-week pretest-posttest intervention period. The seven point Sport Motivation Scale Questionnaire Likert Scale is anchored with three ranges of responses including Does Not Correspond at All for numerical responses 1 and 2, Corresponds Moderately for numerical responses 3, 4, and 5, and Corresponds Exactly for numerical responses 6 and 7. Comparing single-sport players' internal motivation scores with the Sport Motivation Scale Questionnaire Likert Scale 1 to 7 range, indicates self reported posttest scores that fall within the top scores of 6 and 7, Corresponds Exactly range, for two of the internal motivation subscales, to know and to accomplish. The reported to experience stimulation score falls within the Corresponds Moderately range.

Finally, it may be said that the single-sport players reported themselves as moderately internally motivated before they began participation in the school sponsored invitational eight-week summer strength and conditioning program and that these self-reported internal motivation scores remained statistically unchanged following participation in the school sponsored invitational eight-week summer strength and conditioning program despite movement from the reported corresponds moderately to the higher corresponds exactly range. The internal motivation pretest-posttest sub-scale to
know mean difference score was +0.35, the internal motivation pretest-posttest sub-scale to accomplish mean difference score was -0.35, and the internal motivation pretest-posttest sub-scale to experience stimulation mean difference score was -0.02. The data suggest that these players source of motivation is internal, well established, and that self-reported pretest-posttest mean differences indicated sub-scale stability, not easily changed by the new challenges presented during the school sponsored invitational eight-week summer strength and conditioning program.

**Research Question #5**

The fifth pretest-posttest hypothesis was tested using the dependent \( t \) test. The fifth hypothesis comparing high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone pretest beginning eight-week compared to posttest ending eight-week Sport Motivation Scale Questionnaire identified, introjected, and external regulation external motivation score results were displayed in Table 13. As seen in Table 13, null hypotheses were not rejected for the three measured external motivation subtests identified, introjected, and external regulation. The pretest identified score \((M = 6.06, SD = 1.00)\) compared to the posttest identified score \((M = 5.79, SD = 0.98)\) was not statistically significantly different, \(t(11) = -0.78, p = .05\) (one-tailed), \(d = .27\). The pretest introjected score \((M = 5.04, SD = 1.20)\) compared to the posttest introjected score \((M = 4.42, SD = 1.27)\) was not statistically significantly different, \(t(11) = 0.50, p = .09\) (one-tailed), \(d = .50\). The pretest external regulation score \((M = 5.25, SD = 1.13)\) compared to the posttest external regulation score \((M = 4.83, SD = 1.31)\) was not statistically significantly different, \(t(11) = -1.28, p = .11\) (one-tailed), \(d = .34\).
Overall, pretest-posttest results indicated high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone pretest beginning eight-week compared to posttest ending eight-week Sport Motivation Scale Questionnaire identified, introjected, and external regulation external motivation scores remained stable across the eight-week pretest-posttest intervention period. The seven point Sport Motivation Scale Questionnaire Likert Scale is anchored with three ranges of responses including Does Not Correspond at All for numerical responses 1 and 2, Corresponds Moderately for numerical responses 3, 4, and 5, and Corresponds Exactly for numerical responses 6 and 7. Comparing single-sport players' external motivation scores with the Sport Motivation Scale Questionnaire Likert Scale 1 to 7 range, indicates self reported posttest scores that fall within the middle scores of 3, 4, and 5, Corresponds Moderately range, for all three of the external motivation subscales, identified, introjected, and external regulations.

Finally, it may be said that the single-sport players reported themselves as moderately externally motivated before they began participation in the school sponsored invitational eight-week summer strength and conditioning program and that these self-reported external motivation scores remained statistically unchanged following participation in the school sponsored invitational eight-week summer strength and conditioning program. The external motivation pretest-posttest sub-scale identified mean difference score was -0.27, the external motivation pretest-posttest sub-scale introjected mean difference score was -0.62, and the external motivation pretest-posttest sub-scale external regulation mean difference score was -0.42. The data suggest that these players source of motivation is only moderately external, secondary to internal motivation, well
established, and that self-reported pretest-posttest mean differences indicated sub-scale stability, not easily changed by the new challenges presented during the school sponsored invitational eight-week summer strength and conditioning program.

**Research Question #6**

The sixth pretest-posttest hypothesis was tested using the dependent $t$ test. The sixth hypothesis comparing high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone pretest beginning eight-week compared to posttest ending eight-week Sport Motivation Scale Questionnaire amotivation amotivation score results were displayed in Table 14. As seen in Table 14, the null hypothesis was not rejected for the one measured amotivation subtest amotivation. The pretest amotivated score ($M = 1.69, SD = 0.83$) compared to the posttest amotivated score ($M = 1.85, SD = 1.25$) was not statistically significantly different, $t(11) = 0.46, p = .33$ (one-tailed), $d = .15$.

Overall, pretest-posttest results indicated high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone pretest beginning eight-week compared to posttest ending eight-week Sport Motivation Scale Questionnaire amotivated amotivated scores remained stable across the eight-week pretest-posttest intervention period. The seven point Sport Motivation Scale Questionnaire Likert Scale is anchored with three ranges of responses including Does Not Correspond at All for numerical responses 1 and 2, Corresponds Moderately for numerical responses 3, 4, and 5, and Corresponds Exactly for numerical responses 6 and 7. Comparing single-sport players' amotivation scores with the Sport Motivation Scale Questionnaire Likert Scale 1 to 7 range, indicates self reported posttest
scores that fall within the lowest scores of 1 and 2, Does Not Correspond at All, for the amotivation subscale, amotivation.

Finally, it may be said that the single-sport players reported themselves as not at all amotivated before they began participation in the school sponsored invitational eight-week summer strength and conditioning program and that these self-reported amotivation scores remained statistically unchanged following participation in the school sponsored invitational eight-week summer strength and conditioning program. The amotivation pretest-posttest sub-scale identified mean difference score was 0.16. The data suggest that these players reported themselves as not at all amotivated and that the self-reported pretest-posttest mean differences indicated sub-scale stability, not easily changed by the new challenges presented during the school sponsored invitational eight-week summer strength and conditioning program.

Research Question #7

Sub-Question #7a. The seventh posttest-posttest hypothesis was tested using the independent t test. A comparison of high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club sports and high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone posttest compared to posttest ending eight-week summer strength and conditioning program Sport Motivation Scale Questionnaire scores for internal motivation were displayed in Table 15. As seen in Table 15 the predetermined .01 alpha level set for rejecting the null hypothesis was not obtained for any of the three
internal motivation measured subscales to know $p = .49$, to accomplish $p = .34$, and to experience stimulation $p = .08$.

As indicated in Table 15, the posttest high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club sports internal motivation to know score ($M = 6.03, SD = 0.80$) compared to the posttest high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone internal motivation to know score ($M = 6.04, SD = 1.01$) was not statistically significantly different, $t(19) = -0.03, p = .49$ (one-tailed), $d = .01$.

Also as indicated in Table 15, the posttest high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club sports internal motivation to accomplish score ($M = 6.22, SD = 0.61$) compared to the posttest high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone internal motivation to accomplish score ($M = 6.06, SD = 1.00$) was not statistically significantly different, $t(19) = -0.42, p = .34$ (one-tailed), $d = .21$. Finally, as indicated in Table 15, the posttest high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club sports internal motivation to experience stimulation score ($M = 6.39, SD = 0.89$) compared to the posttest high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone internal
motivation to experience stimulation score ($M = 5.88, SD = 0.69$) was not statistically significantly different, $t(19) = 1.49, p = .08$ (one-tailed), $d = .65$.

**Sub-Question #7b.** The seventh posttest-posttest hypothesis was tested using the independent $t$ test. A comparison of high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club sports and high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone posttest compared to posttest ending eight-week summer strength and conditioning program Sport Motivation Scale Questionnaire questionnaire scores for external motivation were displayed in Table 15. As seen in Table 15 the predetermined .01 alpha level set for rejecting the null hypothesis was not obtained for any of the three external motivation measured subscales identified = .21, introjected = .16, and external regulation = .11.

As indicated in Table 15, the posttest high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club sports external motivation identified score ($M = 6.11, SD = 0.70$) compared to the posttest high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone external motivation identified score ($M = 5.79, SD = 0.98$) was not statistically significantly different, $t(19) = 0.83, p = .21$ (one-tailed), $d = .38$. Also as indicated in Table 15, the posttest high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club sports external motivation
to introjected score \((M = 4.92, SD = 0.89)\) compared to the posttest high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone external motivation introjected score \((M = 4.42, SD = 1.27)\) was not statistically significantly different, \(t(19) = 1.01, p = .16\) (one-tailed), \(d = .46\). Finally, as indicated in Table 15, the posttest high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club sports external motivation external regulation score \((M = 5.22, SD = 1.16)\) compared to the posttest high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone external motivation external regulation score \((M = 4.83, SD = 1.31)\) was not statistically significantly different, \(t(19) = -1.28, p = .11\) (one-tailed), \(d = .34\).

**Sub-Question #7c.** The ninth posttest-posttest hypothesis was tested using the independent \(t\) test. A comparison of high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club sports and high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone posttest compared to posttest ending eight-week summer strength and conditioning program sport motivation scale questionnaire scores for amotivation were displayed in Table 15. As seen in Table 15 the predetermined .01 alpha level set for rejecting the null hypothesis was not obtained for the amotivation measured subscale amotivation = .06.
As indicated in Table 15, the posttest high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club sports amotivation score ($M = 1.17, SD = 0.28$) compared to the posttest high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone amotivation score ($M = 1.85, SD = 1.25$) was not statistically significantly different, $t(19) = -1.61, p = .06$ (one-tailed), $d = .88$.

**Research Question #8**

The tenth hypothesis was tested using a single classification Analysis of Variance (ANOVA) to determine the main effect between Sports Motivation Scale Questionnaire internal motivation, external motivation, and amotivation scores of individual high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club sports. Sports Motivation Scale Questionnaire internal motivation, external motivation, and amotivation scores were displayed in Table 16. As seen in Table 16 the null hypothesis was rejected. The internal motivation mean score for to know ($M = 6.03, SD = 0.65$), the internal motivation mean score for to accomplish ($M = 6.22, SD = 0.37$), the internal motivation mean score for to experience stimulation ($M = 6.39, SD = 0.80$), the external motivation mean score for identified ($M = 6.11, SD = 0.49$), the external motivation mean score introjected ($M = 4.92, SD = 0.80$), the external motivation mean score external regulation ($M = 5.22, SD = 1.35$), and the amotivation mean score for amotivation ($M = 1.17, SD = 0.08$) were different and the main effect of overall Sports Motivation Scale Questionnaire internal motivation, external motivation, and amotivation scores was
statistically significant, \((F(6, 56) = 47.12, p < .0001)\). Post hoc Sport Motivation Scale Questionnaire internal, external, and amotivation mean score comparisons for multi-sport players contrast analyses were conducted and displayed in Table 17. As seen in Table 17 the null hypothesis was rejected for the following independent \(t\) test comparisons: TK vs. IN, TK vs. ER, TK vs. AM, TA vs. IN, TA vs. ER, TA vs. AM, TES vs. IN, TES vs. ER, TES vs. AM, ID vs. IN, ID vs. ER, ID vs. AM, IN vs. AM, and ER vs. AM. As seen in Table 17 the null hypothesis was not rejected for the following independent \(t\) test comparisons: TK vs. TA, TK vs. TES, TK vs. ID, TA vs. TES, TA vs. ID, TES vs. ID, and IN vs. ER.

Overall, internal motivation sub-scale scores to know, to accomplish, and to experience stimulation and external motivation sub-scales identified, introjected, and external regulation were most frequently statistically significantly different in contrast to the lone amotivation score as high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club sports consistently reported themselves on the amotivation sub-scale as Does Not Correspond at All. The significant ANOVA variance observed is explained in the robust mean differences noted in Table 17 primarily between high internal motivation sub-scales and the low amotivation subscale. This same contrast is also observed between external motivation sub-scales and the amotivation sub-scale. The largest mean differences observed in Table 17 were for the TK vs. IN (1.11), TK vs. AM (4.89), TA vs. IN (1.30), TA vs. ER (1.00), TA vs. AM (5.05), TES vs. IN (1.47), TES vs. ER (1.17), TES vs. AM (5.22), ID vs. IN (1.19), ID vs. AM (4.94), IN vs. AM (3.75), and ER vs. AM (4.05).
Research Question #9

The eleventh hypothesis was tested using a single classification Analysis of Variance (ANOVA) to determine the main effect between Sports Motivation Scale Questionnaire internal motivation, external motivation, and amotivation scores of individual high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone. Sports Motivation Scale Questionnaire internal motivation, external motivation, and amotivation scores were displayed in Table 18. As seen in Table 18 the null hypothesis was rejected. The internal motivation mean score for to know \( (M = 6.04, SD = 1.02) \), the internal motivation mean score for to accomplish \( (M = 6.06, SD = 0.99) \), the internal motivation mean score to experience stimulation \( (M = 5.88, SD = 0.47) \), the external motivation mean score for identified \( (M = 5.79, SD = 0.95) \), the external motivation mean score introjected \( (M = 4.42, SD = 1.61) \), the external motivation mean score external regulation \( (M = 4.83, SD = 1.71) \), and the amotivation mean score for amotivation \( (M = 1.85, SD = 1.56) \) were different and the main effect of overall Sports Motivation Scale Questionnaire internal motivation, external motivation, and amotivation scores was statistically significant, \( (F(6, 77) = 23.36, p < .0001) \). Post hoc Sport Motivation Scale Questionnaire internal, external, and amotivation mean score comparisons for single-sport players contrast analyses were conducted and displayed in Table 19. As seen in Table 19 the null hypothesis was rejected for the following independent \( t \) test comparisons: TK vs. IN, TK vs. ER, TA vs. IN, TA vs. ER, TES vs. IN, TES vs. ER, TES vs. AM, ID vs. IN, ID vs. ER, ID vs. AM, IN vs. AM, and ER vs. AM. As seen in Table 19 the null hypothesis was
not rejected for the following independent $t$ test comparisons: TK vs. TA, TK vs. TES, TK vs. ID, TA vs. TES, TA vs. ID, TA vs. AM, TES vs. ID, and IN vs. ER.

Overall, internal motivation sub-scale scores to know, to accomplish, and to experience stimulation and external motivation sub-scales identified, introjected, and external regulation were most frequently statistically significantly different in contrast to the lone amotivation score as high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone consistently reported themselves on the amotivation sub-scale as Does Not Correspond at All. The significant ANOVA variance observed is explained in the robust mean differences noted in Table 19 primarily between high internal motivation sub-scales and the low amotivation subscale. This same contrast is also observed between external motivation sub-scales and the amotivation sub-scale. The largest mean differences observed in Table 19 were for the TK vs. IN (1.62), TK vs. ER (1.21), TK vs. AM (4.19), TA vs. IN (1.64), TA vs. ER (1.23), TES vs. IN (1.46), TES vs. ER (1.05), TES vs. AM (4.03), ID vs. IN (1.37), ID vs. AM (3.94), IN vs. AM (2.57), and ER vs. AM (2.98).

Table 20 displays high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program who also participated in co-occurring sports and/or club sports beginning and ending approach jump reach scores. Table 21 displays high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program who also participated in co-occurring sports and/or club sports beginning and ending block jump reach scores. High school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program
who also participated in co-occurring sports and/or club sports beginning and ending agility run scores were displayed in Table 22. Table 23 displays high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program who also participated in co-occurring sports and/or club sports beginning and ending basketball throw scores. Table 24 displays high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program who also participated in co-occurring sports and/or club sports beginning and ending mile run scores. High school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone beginning and ending approach jump reach scores were displayed in Table 25. Table 26 displays high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone beginning and ending block jump reach scores. Table 27 displays high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone beginning and ending agility run scores while Table 28 displays high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone beginning and ending basketball throw scores. High school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone beginning and ending mile run scores were displayed in Table 29.
Research Question #10

The tenth pretest-posttest hypothesis was tested using the dependent \( t \) test. The tenth hypothesis comparing high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program who also participated in co-occurring sports and/or club sports pretest beginning eight-week compared to posttest ending eight-week approach jump reach scores, block jump reach scores, agility run scores, basketball throw scores, and mile run scores were displayed in Table 30. As seen in Table 30, null hypotheses were not rejected for the measured agility tests approach jump reach, block jump reach, agility run, basketball throw, and mile run. The pretest approach jump score (\( M = 8.91, SD = 0.54 \)) compared to the posttest approach jump score (\( M = 8.89, SD = 0.63 \)) was not statistically significantly different, \( t(8) = -.20, p = .42 \) (one-tailed), \( d = .03 \). The pretest to block jump reach score (\( M = 8.48, SD = 0.43 \)) compared to the posttest to block jump reach score (\( M = 8.01, SD = 0.61 \)) was not statistically significantly different, \( t(8) = -2.08, p = .04 \) (one-tailed), \( d = .76 \). The pretest agility run score (\( M = 13.42, SD = 0.55 \)) compared to the posttest to agility run score (\( M = 12.63, SD = 0.70 \)) was statistically significantly different, \( t(8) = -4.25, p = .001 \) (one-tailed), \( d = .25 \). The pretest basketball throw score (\( M = 61.06, SD = 7.46 \)) compared to the posttest to basketball throw score (\( M = 63.54, SD = 9.59 \)) was not statistically significantly different, \( t(8) = 1.55, p = .08 \) (one-tailed), \( d = .29 \). The pretest mile run score (\( M = 7.66, SD = 0.96 \)) compared to the posttest to agility run score (\( M = 7.53, SD = 0.94 \)) was not statistically significantly different, \( t(8) = -0.47, p = .33 \) (one-tailed), \( d = .14 \).
Overall, pretest-posttest results indicated high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program who also participated in co-occurring sports and/or club sports pretest beginning eight-week compared to posttest ending eight-week approach jump reach scores, block jump reach scores, basketball throw scores, and mile run scores remained stable across the eight-week pretest-posttest intervention period. The agility run score showed a statistically significant change which provided evidence that the multi-sport players improved their agility run speed after participation in the school sponsored invitational eight-week summer strength and conditioning program who also participated in co-occurring sports and/or club sports.

Finally, it may be said that the multi-sport players had significant agility skills for approach jump reach, block jump reach, basketball throw, and mile run before they began participation in the school sponsored invitational eight-week summer strength and conditioning program and that these agility scores remained statistically unchanged following participation in the school sponsored invitational eight-week summer strength and conditioning program. The agility pretest-posttest approach jump reach mean difference score was -0.02, the agility pretest-posttest block jump reach mean difference score was -0.47, the agility pretest-posttest basketball throw mean difference score was +2.48 and the agility pretest-posttest mile run mean difference score was -0.13. Though the multi-sport players had significant agility skills for the agility run before they began participation in the school sponsored invitational eight-week summer strength and conditioning program, they did show a statistically significant change in their agility run scores. The agility pretest-posttest agility run mean difference score was -0.79. The data
suggest that these players agility skills were well established for approach jump reach, block jump reach, basketball throw, and mile run and that agility pretest-posttest mean differences indicated stability, not easily changed by the new challenges presented during the school sponsored invitational eight-week summer strength and conditioning program. The data also suggests that these players agility skill for agility run showed statistically significant improvement following the new challenges presented during the school sponsored invitational eight-week summer strength and conditioning program.

**Research Question #11**

The eleventh pretest-posttest hypothesis was tested using the dependent \( t \) test.

The thirteenth hypothesis comparing high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone pretest beginning eight-week compared to posttest ending eight-week approach jump reach scores, block jump reach scores, agility run scores, basketball throw scores, and mile run scores were displayed in Table 31. As seen in Table 31, null hypotheses were not rejected for the measured agility tests approach jump reach, block jump reach, agility run, basketball throw, and mile run. The pretest approach jump score \((M = 8.45, SD = 0.38)\) compared to the posttest approach jump score \((M = 8.43, SD = 0.55)\) was not statistically significantly different, \( t(11) = -.10, p = .46 \) (one-tailed), \( d = .04 \). The pretest to block jump reach score \((M = 8.15, SD = 0.41)\) compared to the posttest to block jump reach score \((M = 7.98, SD = 0.50)\) was not statistically significantly different, \( t(11) = -.96, p = .18 \) (one-tailed), \( d = .37 \). The pretest agility run score \((M = 13.65, SD = 0.88)\) compared to the posttest to agility run score \((M = 13.10, SD = 0.77)\) was statistically significantly different, \( t(11) = -3.80, p = .001 \) (one-tailed), \( d = \)
The pretest basketball throw score ($M = 59.14$, $SD = 10.67$) compared to the posttest to basketball throw score ($M = 58.09$, $SD = 13.68$) was not statistically significantly different, $t(11) = -0.41$, $p = .34$ (one-tailed), $d = .09$. The pretest mile run score ($M = 8.30$, $SD = 0.69$) compared to the posttest to agility run score ($M = 8.57$, $SD = 0.79$) was not statistically significantly different, $t(11) = 1.40$, $p = .09$ (one-tailed), $d = .36$.

Overall, pretest-posttest results indicated high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone pretest beginning eight-week compared to posttest ending eight-week approach jump reach scores, block jump reach scores, basketball throw scores, and mile run scores remained stable across the eight-week pretest-posttest intervention period. The agility run score showed a statistically significant change which provided evidence that the multi-sport players improved their agility run speed after participation in the school sponsored invitational eight-week summer strength and conditioning program alone.

Finally, it may be said that the single-sport players had significant agility skills for approach jump reach, block jump reach, basketball throw, and mile run before they began participation in the school sponsored invitational eight-week summer strength and conditioning program and that these agility scores remained statistically unchanged following participation in the school sponsored invitational eight-week summer strength and conditioning program. The agility pretest-posttest approach jump reach mean difference score was -0.02, the agility pretest-posttest block jump reach mean difference score was -0.17, the agility pretest-posttest basketball throw mean difference score was
-1.05 and the agility pretest-posttest mile run mean difference score was 0.27. Though the single-sport players had significant agility skills for the agility run before they began participation in the school sponsored invitational eight-week summer strength and conditioning program, they did show a statistically significant change in their agility run scores. The agility pretest-posttest agility run mean difference score was -0.55. The data suggest that these players agility skills were well established for approach jump reach, block jump reach, basketball throw, and mile run and that agility pretest-posttest mean differences indicated stability, not easily changed by the new challenges presented during the school sponsored invitational eight-week summer strength and conditioning program. The data also suggest that these players agility skill for agility run showed statistically significant improvement by the new challenges presented during the school sponsored invitational eight-week summer strength and conditioning program.

**Research Question #12**

The twelfth posttest-posttest hypothesis was tested using the independent $t$ test. A comparison of high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club sports and high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone posttest compared to posttest ending eight-week summer strength and conditioning program Sport Motivation Scale Questionnaire scores for internal motivation were displayed in Table 32. As seen in Table 32 the predetermined .01 alpha level set for rejecting the null hypothesis was not obtained for the following agility skills measured approach jump reach $p$(one-tailed) = .05, block jump reach $p$(one-
tailed) = .45, agility run \( p(\text{one-tailed}) = .08 \), and basketball throw \( p(\text{one-tailed}) = .16 \).

Also as seen in Table 32 the predetermined .01 alpha level set for rejecting the null hypothesis was obtained for the following agility skills measured mile run \( p(\text{one-tailed}) = .01 \).

As indicated in Table 32, the posttest high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club sports approach jump reach score \( (M = 8.89, SD = 0.63) \) compared to the posttest high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone approach jump reach score \( (M = 8.43, SD = 0.50) \) was statistically significantly different, \( t(19) = 1.76, p = .05 \) (one-tailed), \( d = .78 \). Also as indicated in Table 32, the posttest high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club sports block jump reach score \( (M = 8.01, SD = 0.61) \) compared to the posttest high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone block jump reach score \( (M = 7.98, SD = 1.00) \) was not statistically significantly different, \( t(19) = 1.76, p = .45 \) (one-tailed), \( d = .05 \). As indicated in Table 32, the posttest high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club sports agility run score \( (M = 12.63, SD = 0.70) \) compared to the posttest high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone agility run score \( (M = 13.10, SD = \)
0.77) was not statistically significantly different, \( t(19) = -1.43, p = .08 \) (one-tailed), \( d = .64 \). Also as indicated in Table 32, the posttest high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club sports basketball throw score \( (M = 63.50, SD = 0.94) \) compared to the posttest high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone basketball throw score \( (M = 58.09, SD = 13.68) \) was not statistically significantly different, \( t(19) = 1.02, p = .16 \) (one-tailed), \( d = .47 \). Finally, as indicated in Table 32, the posttest high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club sports mile run score \( (M = 7.53, SD = 0.94) \) compared to the posttest high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone mile run score \( (M = 8.57, SD = 0.79) \) was statistically significantly different, \( t(19) = -2.75, p = .01 \) (one-tailed), \( d = 1.20 \).
Table 1

Demographic Information of Individual High School Girl Volleyball Players Who Participated In the School Sponsored Invitational Eight-Week Summer Strength and Conditioning Program and Co-Occurring Sports and/or Club Sports

<table>
<thead>
<tr>
<th>Student Number</th>
<th>Grade</th>
<th>Honors Classes</th>
<th>Honor Roll</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Junior</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>2.</td>
<td>Sophomore</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>3.</td>
<td>Senior</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>4.</td>
<td>Sophomore</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>5.</td>
<td>Sophomore</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>6.</td>
<td>Senior</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>7.</td>
<td>Junior</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>8.</td>
<td>Sophomore</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>9.</td>
<td>Junior</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

Note. All students in the research school were sophomore, junior, and senior returning volleyball players. The racial and ethnic origin representation of the subjects is congruent with the returning 10th-grade, 11th-grade, and 12th-grade volleyball players at Papillion-La Vista High School. The racial and ethnic origin ratio was congruent with the Papillion-La Vista School District enrollment patterns.
Table 2
*Demographic Information of Individual High School Girl Volleyball Players Who Participated In the School Sponsored Invitational Eight-Week Summer Strength and Conditioning Program Alone*

<table>
<thead>
<tr>
<th>Student Number</th>
<th>Grade</th>
<th>Honors Classes</th>
<th>Honor Roll</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Junior</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>2</td>
<td>Sophomore</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>3</td>
<td>Sophomore</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>4</td>
<td>Senior</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>5</td>
<td>Sophomore</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>6</td>
<td>Sophomore</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>7</td>
<td>Junior</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>8</td>
<td>Junior</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>9</td>
<td>Junior</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>10</td>
<td>Junior</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>11</td>
<td>Sophomore</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>12</td>
<td>Junior</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

*Note.* All students in the research school were sophomore, junior, and senior returning volleyball players. The racial and ethnic origin representation of the subjects is congruent with the returning 10th-grade, 11th-grade, and 12th-grade volleyball players at Papillion-La Vista High School. The racial and ethnic origin ratio was congruent with the Papillion-La Vista School District enrollment patterns.
Table 3
Sports Motivation Scale Questionnaire Internal Motivation Scores of Individual High School Girl Volleyball Players Who Participated In the School Sponsored Invitational Eight-Week Summer Strength and Conditioning Program and Co-Occurring Sports and/or Club Sports

<table>
<thead>
<tr>
<th>Internal Motivation</th>
<th>To Know</th>
<th>To Accomplish</th>
<th>To Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
<td>Pretest</td>
</tr>
<tr>
<td>1.</td>
<td>5.75</td>
<td>5.50</td>
<td>6.25</td>
</tr>
<tr>
<td>2.</td>
<td>5.75</td>
<td>6.00</td>
<td>6.00</td>
</tr>
<tr>
<td>3.</td>
<td>4.50</td>
<td>5.75</td>
<td>5.00</td>
</tr>
<tr>
<td>4.</td>
<td>6.25</td>
<td>7.00</td>
<td>6.75</td>
</tr>
<tr>
<td>5.</td>
<td>6.75</td>
<td>7.00</td>
<td>7.00</td>
</tr>
<tr>
<td>6.</td>
<td>5.00</td>
<td>7.00</td>
<td>7.00</td>
</tr>
<tr>
<td>7.</td>
<td>6.25</td>
<td>5.75</td>
<td>6.50</td>
</tr>
<tr>
<td>8.</td>
<td>5.25</td>
<td>4.50</td>
<td>5.25</td>
</tr>
<tr>
<td>9.</td>
<td>6.75</td>
<td>6.75</td>
<td>6.75</td>
</tr>
</tbody>
</table>

*Note.* Student numbers correspond with Table 1.
Table 4

Sports Motivation Scale Questionnaire External Motivation Scores of Individual High School Girl Volleyball Players Who Participated In the School Sponsored Invitational Eight-Week Summer Strength and Conditioning Program and Co-Occurring Sports and/or Club Sports

<table>
<thead>
<tr>
<th>Identified</th>
<th>Introjected</th>
<th>External Regulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest</td>
<td>Posttest</td>
<td>Pretest</td>
</tr>
<tr>
<td>1. 5.75</td>
<td>5.50</td>
<td>3.25</td>
</tr>
<tr>
<td>2. 5.00</td>
<td>6.50</td>
<td>5.25</td>
</tr>
<tr>
<td>3. 6.00</td>
<td>6.25</td>
<td>5.25</td>
</tr>
<tr>
<td>4. 6.50</td>
<td>7.00</td>
<td>2.75</td>
</tr>
<tr>
<td>5. 7.00</td>
<td>5.75</td>
<td>6.25</td>
</tr>
<tr>
<td>6. 5.25</td>
<td>6.75</td>
<td>4.25</td>
</tr>
<tr>
<td>7. 7.00</td>
<td>6.00</td>
<td>6.25</td>
</tr>
<tr>
<td>8. 4.75</td>
<td>4.75</td>
<td>2.00</td>
</tr>
<tr>
<td>9. 6.00</td>
<td>6.50</td>
<td>5.00</td>
</tr>
</tbody>
</table>

*Note.* Student numbers correspond with Table 1.
Table 5

Sports Motivation Scale Questionnaire Amotivation Scores of Individual High School Girl Volleyball Players Who Participated In the School Sponsored Invitational Eight-Week Summer Strength and Conditioning Program and Co-Occurring Sports and/or Club Sports

<table>
<thead>
<tr>
<th></th>
<th>Pretest</th>
<th>Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>2</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>3</td>
<td>2.00</td>
<td>1.25</td>
</tr>
<tr>
<td>4</td>
<td>1.25</td>
<td>1.00</td>
</tr>
<tr>
<td>5</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>6</td>
<td>1.25</td>
<td>1.00</td>
</tr>
<tr>
<td>7</td>
<td>1.75</td>
<td>1.75</td>
</tr>
<tr>
<td>8</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>9</td>
<td>1.25</td>
<td>1.50</td>
</tr>
</tbody>
</table>

*Note.* Student numbers correspond with Table 1.
Table 6

*Sports Motivation Scale Questionnaire Internal Motivation Scores of Individual High School Girl Volleyball Players Who Participated In the School Sponsored Invitational Eight-Week Summer Strength and Conditioning Program Alone*

<table>
<thead>
<tr>
<th>Internal Motivation</th>
<th>Pretest</th>
<th>Posttest</th>
<th>Pretest</th>
<th>Posttest</th>
<th>Pretest</th>
<th>Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td>To Know</td>
<td>5.25</td>
<td>6.25</td>
<td>5.50</td>
<td>6.75</td>
<td>6.00</td>
<td>6.00</td>
</tr>
<tr>
<td>To Accomplish</td>
<td>4.75</td>
<td>5.00</td>
<td>4.50</td>
<td>5.25</td>
<td>5.25</td>
<td>5.25</td>
</tr>
<tr>
<td>To Experience</td>
<td>5.00</td>
<td>6.00</td>
<td>5.25</td>
<td>5.75</td>
<td>6.50</td>
<td>6.00</td>
</tr>
<tr>
<td>1.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note.* Student numbers correspond with Table 2.
Table 7

Sports Motivation Scale Questionnaire External Motivation Scores of Individual High School Girl Volleyball Players Who Participated In the School Sponsored Invitational Eight-Week Summer Strength and Conditioning Program Alone

<table>
<thead>
<tr>
<th>External Motivation</th>
<th>Identified</th>
<th>Introjected</th>
<th>External Regulation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
<td>Pretest</td>
</tr>
<tr>
<td>1.</td>
<td>6.75</td>
<td>6.00</td>
<td>4.50</td>
</tr>
<tr>
<td>2.</td>
<td>5.25</td>
<td>4.75</td>
<td>3.75</td>
</tr>
<tr>
<td>3.</td>
<td>5.75</td>
<td>5.25</td>
<td>5.50</td>
</tr>
<tr>
<td>4.</td>
<td>6.75</td>
<td>6.75</td>
<td>6.00</td>
</tr>
<tr>
<td>5.</td>
<td>3.75</td>
<td>4.00</td>
<td>3.75</td>
</tr>
<tr>
<td>6.</td>
<td>5.75</td>
<td>4.75</td>
<td>5.50</td>
</tr>
<tr>
<td>7.</td>
<td>5.50</td>
<td>5.25</td>
<td>6.25</td>
</tr>
<tr>
<td>8.</td>
<td>7.00</td>
<td>7.00</td>
<td>6.00</td>
</tr>
<tr>
<td>9.</td>
<td>6.75</td>
<td>7.00</td>
<td>4.25</td>
</tr>
<tr>
<td>10.</td>
<td>7.00</td>
<td>6.25</td>
<td>2.75</td>
</tr>
<tr>
<td>11.</td>
<td>7.00</td>
<td>6.25</td>
<td>6.50</td>
</tr>
<tr>
<td>12.</td>
<td>5.50</td>
<td>6.25</td>
<td>5.75</td>
</tr>
</tbody>
</table>

Note. Student numbers correspond with Table 2.
Table 8

*Sports Motivation Scale Questionnaire Amotivation Scores of Individual High School Girl Volleyball Players Who Participated In the School Sponsored Invitational Eight-Week Summer Strength and Conditioning Program Alone*

<table>
<thead>
<tr>
<th></th>
<th>Amotivation</th>
<th>Pretest</th>
<th>Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1.00</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>1.75</td>
<td>1.75</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>2.75</td>
<td>2.00</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>1.00</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>3.00</td>
<td>4.25</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>1.50</td>
<td>1.75</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>2.50</td>
<td>2.00</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>1.00</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>1.00</td>
<td>4.50</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>1.00</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>2.75</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>1.00</td>
<td>1.00</td>
<td></td>
</tr>
</tbody>
</table>

*Note.* Student numbers correspond with Table 2.
Table 9

*High School Girl Volleyball Players Who Participated In the School Sponsored Invitational Eight-Week Summer Strength and Conditioning Program Who Also Participated In Co-Occurring Sports and/or Club Sports Pretest Beginning Eight-Week Compared to Posttest Ending Eight-Week Sport Motivation Scale Questionnaire to Know, to Accomplish, and to Experience Stimulation Internal Motivation Scores*

<table>
<thead>
<tr>
<th>Source</th>
<th>Pretest Scores</th>
<th>Posttest Scores</th>
<th>d</th>
<th>t&lt;sup&gt;a&lt;/sup&gt;</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M   SD</td>
<td>M   SD</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TK</td>
<td>5.81 (0.78)</td>
<td>6.03 (0.80)</td>
<td>.28</td>
<td>0.70</td>
<td>.25&lt;sup&gt;+&lt;/sup&gt;</td>
</tr>
<tr>
<td>TA</td>
<td>6.28 (0.73)</td>
<td>6.22 (0.61)</td>
<td>.09</td>
<td>-0.31</td>
<td>.38&lt;sup&gt;+&lt;/sup&gt;</td>
</tr>
<tr>
<td>TES</td>
<td>6.47 (0.86)</td>
<td>6.39 (0.89)</td>
<td>.09</td>
<td>-1.00</td>
<td>.17&lt;sup&gt;+&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

*Note.* TK = To Know; TA = To Accomplish; TES = To Experience Stimulation.

<sup>a</sup>Positive t result is in the direction of higher posttest mean perceived motivation scores. Negative t result is in the direction of lower posttest mean perceived internal motivation scores.

<sup>+</sup>ns.
Table 10

**High School Girl Volleyball Players Who Participated In the School Sponsored Invitational Eight-Week Summer Strength and Conditioning Program Who Also Participated In Co-Occurring Sports and/or Club Sports Pretest Beginning Eight-Week Compared to Posttest Ending Eight-Week Sport Motivation Scale Questionnaire Identify, Introjected, and External Regulations External Motivation Scores**

<table>
<thead>
<tr>
<th>Source</th>
<th>Pretest Scores</th>
<th>Posttest Scores</th>
<th>d</th>
<th>t(^a)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
<td></td>
</tr>
<tr>
<td>ID</td>
<td>5.92 (0.82)</td>
<td>6.11 (0.70)</td>
<td>.25</td>
<td>0.61</td>
<td>.28(\dagger)</td>
</tr>
<tr>
<td>IN</td>
<td>4.47 (1.52)</td>
<td>4.92 (0.89)</td>
<td>.36</td>
<td>0.94</td>
<td>.19(\dagger)</td>
</tr>
<tr>
<td>ER</td>
<td>4.83 (1.19)</td>
<td>5.22 (1.16)</td>
<td>.33</td>
<td>0.98</td>
<td>.18(\dagger)</td>
</tr>
</tbody>
</table>

*Note.* ID = Identified; IN = Introjected; ER = External Regulations.

\(^{a}\)Positive t result is in the direction of higher posttest mean perceived external motivation scores.

\(^{\dagger}ns\).
Table 11

*High School Girl Volleyball Players Who Participated In the School Sponsored Invitational Eight-Week Summer Strength and Conditioning Program Who Also Participated In Co-Occurring Sports and/or Club Sports Pretest Beginning Eight-Week Compared to Posttest Ending Eight-Week Sport Motivation Scale Questionnaire Amotivation Amotivation Scores*

<table>
<thead>
<tr>
<th>Source</th>
<th>M</th>
<th>SD</th>
<th>M</th>
<th>SD</th>
<th>d</th>
<th>t^a</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>AM</td>
<td>1.28 (0.36)</td>
<td></td>
<td>1.17 (0.28)</td>
<td></td>
<td>.34</td>
<td>-1.18</td>
<td>.14^t</td>
</tr>
</tbody>
</table>

*Note.* AM = Amotivation.

^aNegative t result is in the direction of lower posttest mean perceived amotivation scores.

^ns.
Table 12

*High School Girl Volleyball Players Who Participated In the School Sponsored Invitational Eight-Week Summer Strength and Conditioning Program Alone Pretest Beginning Eight-Week Compared to Posttest Ending Eight-Week Sport Motivation Scale Questionnaire to Know, to Accomplish, and to Experience Stimulation Internal Motivation Scores*

<table>
<thead>
<tr>
<th>Source</th>
<th>Pretest Scores</th>
<th>Posttest Scores</th>
<th>d</th>
<th>t&lt;sup&gt;a&lt;/sup&gt;</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>TK</td>
<td>5.69 (0.79)</td>
<td>6.04 (1.01)</td>
<td>.39</td>
<td>1.10</td>
<td>.15&lt;sup&gt;+&lt;/sup&gt;</td>
</tr>
<tr>
<td>TA</td>
<td>5.71 (0.56)</td>
<td>6.06 (1.00)</td>
<td>.45</td>
<td>1.27</td>
<td>.12&lt;sup&gt;+&lt;/sup&gt;</td>
</tr>
<tr>
<td>TES</td>
<td>5.90 (0.71)</td>
<td>5.88 (0.69)</td>
<td>.03</td>
<td>-0.43</td>
<td>.34&lt;sup&gt;+&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

*Note.* TK = To Know; TA = To Accomplish; TES = To Experience Stimulation. *<sup>a</sup>Positive* t result is in the direction of higher posttest mean perceived motivation scores. *Negative* t result is in the direction of lower posttest mean perceived internal motivation scores. *<sup>+</sup>ns.*
Table 13

High School Girl Volleyball Players Who Participated In the School Sponsored Invitational Eight-Week Summer Strength and Conditioning Program Alone Pretest Beginning Eight-Week Compared to Posttest Ending Eight-Week Sport Motivation Scale Questionnaire Identify, Introjected, and External Regulations External Motivation Scores

<table>
<thead>
<tr>
<th>Source</th>
<th>Pretest Scores</th>
<th>Posttest Scores</th>
<th>d</th>
<th>t&lt;sup&gt;a&lt;/sup&gt;</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M   SD</td>
<td>M   SD</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ID</td>
<td>6.06 (1.00)</td>
<td>5.79 (0.98)</td>
<td>.27</td>
<td>-0.78</td>
<td>.05&lt;sup&gt;†&lt;/sup&gt;</td>
</tr>
<tr>
<td>IN</td>
<td>5.04 (1.20)</td>
<td>4.42 (1.27)</td>
<td>.50</td>
<td>-1.41</td>
<td>.09&lt;sup&gt;†&lt;/sup&gt;</td>
</tr>
<tr>
<td>ER</td>
<td>5.25 (1.13)</td>
<td>4.83 (1.31)</td>
<td>.34</td>
<td>-1.28</td>
<td>.11&lt;sup&gt;†&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

Note. ID = Identified; IN = Introjected; ER = External Regulations.

<sup>a</sup>Negative t result is in the direction of lower posttest mean perceived external motivation scores.

<sup>†</sup>ns.
Table 14

High School Girl Volleyball Players Who Participated In the School Sponsored Invitational Eight-Week Summer Strength and Conditioning Program Alone Pretest Beginning Eight-Week Compared to Posttest Ending Eight-Week Sport Motivation Scale Questionnaire Amotivation Amotivation Scores

<table>
<thead>
<tr>
<th>Source</th>
<th>Pretest Scores</th>
<th>Posttest Scores</th>
<th>d</th>
<th>t&lt;sup&gt;a&lt;/sup&gt;</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>AM</td>
<td>1.69 (0.83)</td>
<td>1.85 (1.25)</td>
<td>.15</td>
<td>0.46</td>
<td>.33&lt;sup&gt;†&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

Note. AM = Amotivation.
<sup>†</sup>Positive t result is in the direction of higher posttest mean perceived amotivation scores. <sup>†</sup>ns.
Table 15

High School Girl Volleyball Players Who Participated In the School Sponsored Invitational Eight-Week Summer Strength and Conditioning Program and Co-Occurring Sports and/or Club Sports Ending and High School Girl Volleyball Players Who Participated In the School Sponsored Invitational Eight-Week Summer Strength and Conditioning Program Alone Posttest Compared To Posttest Ending Eight-Week Summer Strength and Conditioning Program Sport Motivation Scale Questionnaire Scores

<table>
<thead>
<tr>
<th>Source</th>
<th>M</th>
<th>SD</th>
<th>M</th>
<th>SD</th>
<th>d</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal Motivation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TK</td>
<td>6.03 (0.80)</td>
<td></td>
<td>6.04 (1.01)</td>
<td></td>
<td>.01</td>
<td>-0.03</td>
<td>.49†</td>
</tr>
<tr>
<td>TA</td>
<td>6.22 (0.61)</td>
<td></td>
<td>6.06 (1.00)</td>
<td></td>
<td>.21</td>
<td>-0.42</td>
<td>.34†</td>
</tr>
<tr>
<td>TES</td>
<td>6.39 (0.89)</td>
<td></td>
<td>5.88 (0.69)</td>
<td></td>
<td>.65</td>
<td>1.49</td>
<td>.08†</td>
</tr>
<tr>
<td>External Motivation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ID</td>
<td>6.11 (0.70)</td>
<td></td>
<td>5.79 (0.98)</td>
<td></td>
<td>.38</td>
<td>0.83</td>
<td>.21†</td>
</tr>
<tr>
<td>IN</td>
<td>4.92 (0.89)</td>
<td></td>
<td>4.42 (1.27)</td>
<td></td>
<td>.46</td>
<td>1.01</td>
<td>.16†</td>
</tr>
<tr>
<td>ER</td>
<td>5.22 (1.16)</td>
<td></td>
<td>4.83 (1.31)</td>
<td></td>
<td>.34</td>
<td>-1.28</td>
<td>.11†</td>
</tr>
<tr>
<td>Amotivation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AM</td>
<td>1.17 (0.28)</td>
<td></td>
<td>1.85 (1.25)</td>
<td></td>
<td>.88</td>
<td>-1.61</td>
<td>.06†</td>
</tr>
</tbody>
</table>

Note. TK = To Know; TA = To Accomplish; TES = To Experience Stimulation. ID = Identified; IN = Introjected; ER = External Regulations. AM = Amotivation.

*Positive t result is in the direction of higher posttest mean perceived motivation scores. Negative t result is in the direction of lower posttest mean perceived internal motivation scores. †ns.
Table 16

Results of Analysis of Variance for Sports Motivation Scale Questionnaire Internal Motivation, External Motivation, and Amotivation Scores of Individual High School Girl Volleyball Players Who Participated In the School Sponsored Invitational Eight-Week Summer Strength and Conditioning Program and Co-Occurring Sports and/or Club Sports

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>df</th>
<th>F^a</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>182.75</td>
<td>30.46</td>
<td>6</td>
<td>47.12***</td>
</tr>
<tr>
<td>Within Groups</td>
<td>36.19</td>
<td>0.65</td>
<td>56</td>
<td></td>
</tr>
</tbody>
</table>

Internal, External, and Amotivation Mean Scores

<table>
<thead>
<tr>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>TK</td>
<td>6.03  (0.65)</td>
</tr>
<tr>
<td>TA</td>
<td>6.22  (0.37)</td>
</tr>
<tr>
<td>TES</td>
<td>6.39  (0.80)</td>
</tr>
<tr>
<td>ID</td>
<td>6.11  (0.49)</td>
</tr>
<tr>
<td>IN</td>
<td>4.92  (0.80)</td>
</tr>
<tr>
<td>ER</td>
<td>5.22  (1.35)</td>
</tr>
<tr>
<td>AM</td>
<td>1.17  (.08)</td>
</tr>
</tbody>
</table>

Note. TK = To Know; TA = To Accomplish; TES = To Experience Stimulation. ID = Identified; IN = Introjected; ER = External Regulations. AM = Amotivation. *Post hoc* results displayed in Table 17.

***p < .0001.
Table 17

*Post Hoc Sports Motivation Scale Questionnaire Internal, External, and Amotivation Mean Score Contrast Analysis Comparisons for Multi-Sport Players*

<table>
<thead>
<tr>
<th>Motivation Scores</th>
<th>$\bar{D}$</th>
<th>$t$ (a)</th>
<th>$d$</th>
<th>$p$</th>
<th>level</th>
</tr>
</thead>
<tbody>
<tr>
<td>TK vs. TA</td>
<td>-0.19</td>
<td>-0.58</td>
<td>.27</td>
<td>.29</td>
<td>ns.</td>
</tr>
<tr>
<td>TK vs. TES</td>
<td>-0.36</td>
<td>-0.90</td>
<td>.43</td>
<td>.19</td>
<td>ns.</td>
</tr>
<tr>
<td>TK vs. ID</td>
<td>-0.08</td>
<td>-0.23</td>
<td>.11</td>
<td>.41</td>
<td>ns.</td>
</tr>
<tr>
<td>TK vs. IN</td>
<td>1.11</td>
<td>2.77</td>
<td>1.31</td>
<td>.01</td>
<td>sig.</td>
</tr>
<tr>
<td>TK vs. ER</td>
<td>0.81</td>
<td>1.71</td>
<td>.83</td>
<td>.05</td>
<td>sig.</td>
</tr>
<tr>
<td>TK vs. AM</td>
<td>4.89</td>
<td>17.12</td>
<td>9.00</td>
<td>&lt; .0001</td>
<td>sig.</td>
</tr>
<tr>
<td>TA vs. TES</td>
<td>-0.17</td>
<td>-0.46</td>
<td>.23</td>
<td>.32</td>
<td>ns.</td>
</tr>
<tr>
<td>TA vs. ID</td>
<td>0.11</td>
<td>0.36</td>
<td>.17</td>
<td>.36</td>
<td>ns.</td>
</tr>
<tr>
<td>TA vs. IN</td>
<td>1.30</td>
<td>3.36</td>
<td>1.73</td>
<td>&lt; .0001</td>
<td>sig.</td>
</tr>
<tr>
<td>TA vs. ER</td>
<td>1.00</td>
<td>2.29</td>
<td>1.12</td>
<td>.02</td>
<td>ns.</td>
</tr>
<tr>
<td>TA vs. AM</td>
<td>5.05</td>
<td>22.75</td>
<td>5.70</td>
<td>&lt; .0001</td>
<td>sig.</td>
</tr>
<tr>
<td>TES vs. ID</td>
<td>0.28</td>
<td>0.74</td>
<td>.35</td>
<td>.24</td>
<td>ns.</td>
</tr>
<tr>
<td>TES vs. IN</td>
<td>1.47</td>
<td>3.50</td>
<td>1.65</td>
<td>&lt; .0001</td>
<td>sig.</td>
</tr>
<tr>
<td>TES vs. ER</td>
<td>1.17</td>
<td>2.39</td>
<td>1.14</td>
<td>.01</td>
<td>sig.</td>
</tr>
<tr>
<td>TES vs. AM</td>
<td>5.22</td>
<td>16.73</td>
<td>8.85</td>
<td>&lt; .0001</td>
<td>sig.</td>
</tr>
<tr>
<td>ID vs. IN</td>
<td>1.19</td>
<td>3.16</td>
<td>1.49</td>
<td>.003</td>
<td>sig.</td>
</tr>
<tr>
<td>ID vs. ER</td>
<td>0.89</td>
<td>1.97</td>
<td>.96</td>
<td>.03</td>
<td>ns.</td>
</tr>
<tr>
<td>ID vs. AM</td>
<td>4.94</td>
<td>19.75</td>
<td>10.10</td>
<td>&lt; .001</td>
<td>sig.</td>
</tr>
<tr>
<td>IN vs. ER</td>
<td>0.70</td>
<td>-0.63</td>
<td>.32</td>
<td>.27</td>
<td>ns.</td>
</tr>
<tr>
<td>IN vs. AM</td>
<td>3.75</td>
<td>12.03</td>
<td>3.21</td>
<td>&lt; .0001</td>
<td>sig.</td>
</tr>
<tr>
<td>ER vs. AM</td>
<td>4.05</td>
<td>10.18</td>
<td>8.27</td>
<td>&lt; .0001</td>
<td>sig.</td>
</tr>
</tbody>
</table>

*Note.* TK = To Know; TA = To Accomplish; TES = To Experience Stimulation. ID = Identified; IN = Introjected; ER = External Regulations. AM = Amotivation.
Table 18

Results of Analysis of Variance for Sports Motivation Scale Questionnaire Internal Motivation, External Motivation, and Amotivation Scores of Individual High School Girl Volleyball Players Who Participated In the School Sponsored Invitational Eight-Week Summer Strength and Conditioning Program Alone

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>df</th>
<th>F&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>166.42</td>
<td>27.74</td>
<td>6</td>
<td>23.36***</td>
</tr>
<tr>
<td>Within Groups</td>
<td>91.43</td>
<td>1.19</td>
<td>77</td>
<td></td>
</tr>
</tbody>
</table>

Internal, External, and Amotivation Mean Scores

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>TK</td>
<td>6.04</td>
<td>(1.02)</td>
</tr>
<tr>
<td>TA</td>
<td>6.06</td>
<td>(0.99)</td>
</tr>
<tr>
<td>TES</td>
<td>5.88</td>
<td>(0.47)</td>
</tr>
<tr>
<td>ID</td>
<td>5.79</td>
<td>(0.95)</td>
</tr>
<tr>
<td>IN</td>
<td>4.42</td>
<td>(1.61)</td>
</tr>
<tr>
<td>ER</td>
<td>4.83</td>
<td>(1.71)</td>
</tr>
<tr>
<td>AM</td>
<td>1.85</td>
<td>(1.56)</td>
</tr>
</tbody>
</table>

Note. TK = To Know; TA = To Accomplish; TES = To Experience Stimulation. ID = Identified; IN = Introjected; ER = External Regulations. AM = Amotivation.

*Post hoc* results displayed in Table 19.

***p < .0001.
Table 19

Post Hoc Sports Motivation Scale Questionnaire Internal, External, and Amotivation
Mean Score Contrast Analysis Comparisons for Single-Sport Players

<table>
<thead>
<tr>
<th>Motivation Scores</th>
<th>$\bar{D}$</th>
<th>$t$ (a)</th>
<th>$d$</th>
<th>$p$</th>
<th>level</th>
</tr>
</thead>
<tbody>
<tr>
<td>TK vs. TA</td>
<td>-0.02</td>
<td>-0.05</td>
<td>.02</td>
<td>.48</td>
<td>ns.</td>
</tr>
<tr>
<td>TK vs. TES</td>
<td>0.17</td>
<td>0.47</td>
<td>.20</td>
<td>.32</td>
<td>ns.</td>
</tr>
<tr>
<td>TK vs. ID</td>
<td>0.25</td>
<td>0.62</td>
<td>.25</td>
<td>.27</td>
<td>ns.</td>
</tr>
<tr>
<td>TK vs. IN</td>
<td>1.62</td>
<td>3.47</td>
<td>1.42</td>
<td>&lt; .0001</td>
<td>sig.</td>
</tr>
<tr>
<td>TK vs. ER</td>
<td>1.21</td>
<td>2.53</td>
<td>1.04</td>
<td>.01</td>
<td>sig.</td>
</tr>
<tr>
<td>TK vs. AM</td>
<td>4.19</td>
<td>6.2</td>
<td>3.71</td>
<td>.27</td>
<td>ns.</td>
</tr>
<tr>
<td>TA vs. TES</td>
<td>0.18</td>
<td>0.54</td>
<td>.11</td>
<td>.30</td>
<td>ns.</td>
</tr>
<tr>
<td>TA vs. ID</td>
<td>0.27</td>
<td>0.67</td>
<td>.27</td>
<td>.25</td>
<td>ns.</td>
</tr>
<tr>
<td>TA vs. IN</td>
<td>1.64</td>
<td>3.54</td>
<td>1.44</td>
<td>&lt; .0001</td>
<td>sig.</td>
</tr>
<tr>
<td>TA vs. ER</td>
<td>1.23</td>
<td>2.59</td>
<td>1.06</td>
<td>.01</td>
<td>sig.</td>
</tr>
<tr>
<td>TA vs. AM</td>
<td>0.27</td>
<td>0.67</td>
<td>.24</td>
<td>.25</td>
<td>ns.</td>
</tr>
<tr>
<td>TES vs. ID</td>
<td>0.09</td>
<td>0.24</td>
<td>.11</td>
<td>.41</td>
<td>ns.</td>
</tr>
<tr>
<td>TES vs. IN</td>
<td>1.46</td>
<td>3.50</td>
<td>1.49</td>
<td>&lt; .0001</td>
<td>sig.</td>
</tr>
<tr>
<td>TES vs. ER</td>
<td>1.05</td>
<td>2.44</td>
<td>1.05</td>
<td>.01</td>
<td>sig.</td>
</tr>
<tr>
<td>TES vs. AM</td>
<td>4.03</td>
<td>9.77</td>
<td>4.14</td>
<td>&lt; .0001</td>
<td>sig.</td>
</tr>
<tr>
<td>ID vs. IN</td>
<td>1.37</td>
<td>2.98</td>
<td>1.21</td>
<td>.003</td>
<td>sig.</td>
</tr>
<tr>
<td>ID vs. ER</td>
<td>0.96</td>
<td>2.04</td>
<td>.83</td>
<td>.03</td>
<td>sig.</td>
</tr>
<tr>
<td>ID vs. AM</td>
<td>3.94</td>
<td>8.60</td>
<td>3.40</td>
<td>&lt; .001</td>
<td>sig.</td>
</tr>
<tr>
<td>IN vs. ER</td>
<td>-0.41</td>
<td>-0.79</td>
<td>-0.32</td>
<td>.22</td>
<td>ns.</td>
</tr>
<tr>
<td>IN vs. AM</td>
<td>2.57</td>
<td>4.99</td>
<td>2.04</td>
<td>&lt; .0001</td>
<td>sig.</td>
</tr>
<tr>
<td>ER vs. AM</td>
<td>2.98</td>
<td>5.71</td>
<td>2.33</td>
<td>&lt; .0001</td>
<td>sig.</td>
</tr>
</tbody>
</table>

Note. TK = To Know; TA = To Accomplish; TES = To Experience Stimulation.
ID = Identified; IN = Introjected; ER = External Regulations. AM = Amotivation.
Table 20

**High School Girl Volleyball Players Who Participated In the School Sponsored Invitational Eight-Week Summer Strength and Conditioning Program Who Also Participated In Co-Occurring Sports and/or Club Sports Beginning and Ending Approach Jump Reach Scores**

<table>
<thead>
<tr>
<th>Approach Jump Reach</th>
<th>Pretest</th>
<th>Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>8.70</td>
<td>8.40</td>
</tr>
<tr>
<td>2.</td>
<td>9.30</td>
<td>9.60</td>
</tr>
<tr>
<td>3.</td>
<td>9.70</td>
<td>9.60</td>
</tr>
<tr>
<td>4.</td>
<td>8.11</td>
<td>8.80</td>
</tr>
<tr>
<td>5.</td>
<td>8.60</td>
<td>8.20</td>
</tr>
<tr>
<td>6.</td>
<td>9.60</td>
<td>9.70</td>
</tr>
<tr>
<td>7.</td>
<td>9.10</td>
<td>9.10</td>
</tr>
<tr>
<td>8.</td>
<td>8.40</td>
<td>8.10</td>
</tr>
<tr>
<td>9.</td>
<td>8.70</td>
<td>8.50</td>
</tr>
</tbody>
</table>

*Note.* Student numbers correspond with Table 1.
Table 21

*High School Girl Volleyball Players Who Participated In the School Sponsored Invitational Eight-Week Summer Strength and Conditioning Program Who Also Participated In Co-Occurring Sports and/or Club Sports Beginning and Ending Block Jump Reach Scores*

<table>
<thead>
<tr>
<th>Block Jump Reach</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest</td>
</tr>
<tr>
<td>----------</td>
</tr>
<tr>
<td>1.</td>
</tr>
<tr>
<td>2.</td>
</tr>
<tr>
<td>3.</td>
</tr>
<tr>
<td>4.</td>
</tr>
<tr>
<td>5.</td>
</tr>
<tr>
<td>6.</td>
</tr>
<tr>
<td>7.</td>
</tr>
<tr>
<td>8.</td>
</tr>
<tr>
<td>9.</td>
</tr>
</tbody>
</table>

*Note.* Student numbers correspond with Table 1.
Table 22

*High School Girl Volleyball Players Who Participated In the School Sponsored Invitational Eight-Week Summer Strength and Conditioning Program Who Also Participated In Co-Occurring Sports and/or Club Sports Beginning and Ending Agility Run Scores*

<table>
<thead>
<tr>
<th>Agility Run</th>
<th>Pretest</th>
<th>Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>13.72</td>
<td>12.88</td>
</tr>
<tr>
<td>2.</td>
<td>12.78</td>
<td>11.44</td>
</tr>
<tr>
<td>3.</td>
<td>12.86</td>
<td>12.66</td>
</tr>
<tr>
<td>4.</td>
<td>13.07</td>
<td>12.80</td>
</tr>
<tr>
<td>5.</td>
<td>13.28</td>
<td>12.30</td>
</tr>
<tr>
<td>6.</td>
<td>13.20</td>
<td>11.69</td>
</tr>
<tr>
<td>7.</td>
<td>14.12</td>
<td>13.19</td>
</tr>
<tr>
<td>8.</td>
<td>14.36</td>
<td>13.18</td>
</tr>
<tr>
<td>9.</td>
<td>13.40</td>
<td>13.53</td>
</tr>
</tbody>
</table>

*Note.* Student numbers correspond with Table 1.
Table 23

_High School Girl Volleyball Players Who Participated In the School Sponsored Invitational Eight-Week Summer Strength and Conditioning Program Who Also Participated In Co-Occurring Sports and/or Club Sports Beginning and Ending Basketball Throw Scores_

<table>
<thead>
<tr>
<th></th>
<th>Pretest</th>
<th>Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>62.0</td>
<td>66.0</td>
</tr>
<tr>
<td>2</td>
<td>75.5</td>
<td>76.0</td>
</tr>
<tr>
<td>3</td>
<td>63.5</td>
<td>70.0</td>
</tr>
<tr>
<td>4</td>
<td>58.0</td>
<td>56.0</td>
</tr>
<tr>
<td>5</td>
<td>59.5</td>
<td>68.0</td>
</tr>
<tr>
<td>6</td>
<td>69.0</td>
<td>73.0</td>
</tr>
<tr>
<td>7</td>
<td>55.0</td>
<td>62.9</td>
</tr>
<tr>
<td>8</td>
<td>52.0</td>
<td>50.0</td>
</tr>
<tr>
<td>9</td>
<td>55.0</td>
<td>50.0</td>
</tr>
</tbody>
</table>

*Note.* Student numbers correspond with Table 1.
Table 24

*High School Girl Volleyball Players Who Participated In the School Sponsored Invitational Eight-Week Summer Strength and Conditioning Program Who Also Participated In Co-Occurring Sports and/or Club Sports Beginning and Ending Mile Run Scores*

<table>
<thead>
<tr>
<th>Mile Run</th>
<th>Pretest</th>
<th>Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>6.47</td>
<td>6.56</td>
</tr>
<tr>
<td>2.</td>
<td>8.55</td>
<td>8.49</td>
</tr>
<tr>
<td>3.</td>
<td>7.36</td>
<td>7.15</td>
</tr>
<tr>
<td>4.</td>
<td>7.36</td>
<td>7.37</td>
</tr>
<tr>
<td>5.</td>
<td>7.06</td>
<td>7.50</td>
</tr>
<tr>
<td>6.</td>
<td>6.40</td>
<td>6.20</td>
</tr>
<tr>
<td>7.</td>
<td>9.18</td>
<td>7.15</td>
</tr>
<tr>
<td>8.</td>
<td>8.40</td>
<td>8.20</td>
</tr>
<tr>
<td>9.</td>
<td>8.14</td>
<td>9.15</td>
</tr>
</tbody>
</table>

*Note.* Student numbers correspond with Table 1.
**Table 25**

*High School Girl Volleyball Players Who Participated In the School Sponsored Invitational Eight-Week Summer Strength and Conditioning Program Alone Beginning and Ending Approach Jump Reach Scores*

<table>
<thead>
<tr>
<th>Approach Jump Reach</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>Pretest</td>
</tr>
<tr>
<td>----------</td>
</tr>
<tr>
<td>1.</td>
</tr>
<tr>
<td>2.</td>
</tr>
<tr>
<td>3.</td>
</tr>
<tr>
<td>4.</td>
</tr>
<tr>
<td>5.</td>
</tr>
<tr>
<td>6.</td>
</tr>
<tr>
<td>7.</td>
</tr>
<tr>
<td>8.</td>
</tr>
<tr>
<td>9.</td>
</tr>
<tr>
<td>10.</td>
</tr>
<tr>
<td>11.</td>
</tr>
<tr>
<td>12.</td>
</tr>
</tbody>
</table>

*Note.* Student numbers correspond with Table 2.
Table 26

*High School Girl Volleyball Players Who Participated In the School Sponsored Invitational Eight-Week Summer Strength and Conditioning Program Alone Beginning and Ending Block Jump Reach Scores*

<table>
<thead>
<tr>
<th>Block Jump Reach</th>
<th>Pretest</th>
<th>Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>8.00</td>
<td>7.10</td>
</tr>
<tr>
<td>2.</td>
<td>8.20</td>
<td>8.00</td>
</tr>
<tr>
<td>3.</td>
<td>8.60</td>
<td>7.11</td>
</tr>
<tr>
<td>4.</td>
<td>8.11</td>
<td>8.80</td>
</tr>
<tr>
<td>5.</td>
<td>8.10</td>
<td>8.00</td>
</tr>
<tr>
<td>6.</td>
<td>8.80</td>
<td>8.30</td>
</tr>
<tr>
<td>7.</td>
<td>8.00</td>
<td>8.40</td>
</tr>
<tr>
<td>8.</td>
<td>8.00</td>
<td>8.00</td>
</tr>
<tr>
<td>9.</td>
<td>7.10</td>
<td>7.60</td>
</tr>
<tr>
<td>10.</td>
<td>8.30</td>
<td>8.20</td>
</tr>
<tr>
<td>11.</td>
<td>8.20</td>
<td>8.00</td>
</tr>
<tr>
<td>12.</td>
<td>8.40</td>
<td>8.10</td>
</tr>
</tbody>
</table>

*Note.* Student numbers correspond with Table 2.
Table 27

*High School Girl Volleyball Players Who Participated In the School Sponsored Invitational Eight-Week Summer Strength and Conditioning Program Alone Beginning and Ending Agility Run Scores*

<table>
<thead>
<tr>
<th>Agility Run</th>
<th>Pretest</th>
<th>Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>13.54</td>
<td>12.50</td>
</tr>
<tr>
<td>2.</td>
<td>13.91</td>
<td>13.12</td>
</tr>
<tr>
<td>3.</td>
<td>13.85</td>
<td>13.94</td>
</tr>
<tr>
<td>4.</td>
<td>11.98</td>
<td>11.84</td>
</tr>
<tr>
<td>5.</td>
<td>15.30</td>
<td>14.70</td>
</tr>
<tr>
<td>6.</td>
<td>13.74</td>
<td>13.22</td>
</tr>
<tr>
<td>7.</td>
<td>14.36</td>
<td>12.71</td>
</tr>
<tr>
<td>8.</td>
<td>12.98</td>
<td>12.53</td>
</tr>
<tr>
<td>9.</td>
<td>14.68</td>
<td>13.71</td>
</tr>
<tr>
<td>10.</td>
<td>12.91</td>
<td>12.50</td>
</tr>
<tr>
<td>11.</td>
<td>13.32</td>
<td>13.21</td>
</tr>
<tr>
<td>12.</td>
<td>13.18</td>
<td>13.16</td>
</tr>
</tbody>
</table>

*Note.* Student numbers correspond with Table 2.
Table 28

*High School Girl Volleyball Players Who Participated In the School Sponsored Invitational Eight-Week Summer Strength and Conditioning Program Alone Beginning and Ending Basketball Throw Scores*

<table>
<thead>
<tr>
<th>Basketball Throw</th>
<th>Pretest</th>
<th>Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>49.5</td>
<td>48.0</td>
</tr>
<tr>
<td>2.</td>
<td>71.0</td>
<td>72.1</td>
</tr>
<tr>
<td>3.</td>
<td>71.0</td>
<td>62.0</td>
</tr>
<tr>
<td>4.</td>
<td>60.0</td>
<td>53.0</td>
</tr>
<tr>
<td>5.</td>
<td>41.0</td>
<td>31.0</td>
</tr>
<tr>
<td>6.</td>
<td>45.2</td>
<td>65.0</td>
</tr>
<tr>
<td>7.</td>
<td>72.0</td>
<td>78.0</td>
</tr>
<tr>
<td>8.</td>
<td>70.0</td>
<td>73.0</td>
</tr>
<tr>
<td>9.</td>
<td>56.0</td>
<td>42.0</td>
</tr>
<tr>
<td>10.</td>
<td>64.0</td>
<td>64.0</td>
</tr>
<tr>
<td>11.</td>
<td>54.0</td>
<td>54.0</td>
</tr>
<tr>
<td>12.</td>
<td>56.0</td>
<td>55.0</td>
</tr>
</tbody>
</table>

*Note.* Student numbers correspond with Table 2.
Table 29

*High School Girl Volleyball Players Who Participated In the School Sponsored Invitational Eight-Week Summer Strength and Conditioning Program Alone Beginning and Ending Mile Run Scores*

<table>
<thead>
<tr>
<th>Mile Run</th>
<th>Pretest</th>
<th>Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>8.42</td>
<td>7.57</td>
</tr>
<tr>
<td>2.</td>
<td>8.19</td>
<td>8.37</td>
</tr>
<tr>
<td>3.</td>
<td>9.48</td>
<td>9.10</td>
</tr>
<tr>
<td>4.</td>
<td>8.02</td>
<td>9.52</td>
</tr>
<tr>
<td>5.</td>
<td>8.36</td>
<td>8.36</td>
</tr>
<tr>
<td>6.</td>
<td>8.45</td>
<td>9.50</td>
</tr>
<tr>
<td>7.</td>
<td>8.46</td>
<td>8.24</td>
</tr>
<tr>
<td>8.</td>
<td>7.24</td>
<td>7.14</td>
</tr>
<tr>
<td>9.</td>
<td>9.48</td>
<td>9.45</td>
</tr>
<tr>
<td>10.</td>
<td>7.57</td>
<td>8.25</td>
</tr>
<tr>
<td>11.</td>
<td>8.34</td>
<td>9.26</td>
</tr>
<tr>
<td>12.</td>
<td>7.54</td>
<td>8.07</td>
</tr>
</tbody>
</table>

*Note.* Student numbers correspond with Table 2.
Table 30

*High School Girl Volleyball Players Who Participated In the School Sponsored Invitational Eight-Week Summer Strength and Conditioning Program Who Also Participated In Co-Occurring Sports and/or Club Sports Pretest Beginning Eight-Week Compared to Posttest Ending Eight-Week Approach Jump Reach Scores, Block Jump Reach Scores, Agility Run Scores, Basketball Throw Scores, and Mile Run Scores*

<table>
<thead>
<tr>
<th>Source</th>
<th>Pretest Scores</th>
<th>Posttest Scores</th>
<th>d</th>
<th>t^a</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>AJR</td>
<td>8.91 (0.54)</td>
<td>8.89 (0.63)</td>
<td>.03</td>
<td>-.20</td>
<td>.42†</td>
</tr>
<tr>
<td>BJR</td>
<td>8.48 (0.43)</td>
<td>8.01 (0.61)</td>
<td>.76</td>
<td>-2.08</td>
<td>.04*</td>
</tr>
<tr>
<td>AR</td>
<td>13.42 (0.55)</td>
<td>12.63 (0.70)</td>
<td>.25</td>
<td>-4.25</td>
<td>.001***</td>
</tr>
<tr>
<td>BBT</td>
<td>61.06 (7.46)</td>
<td>63.54 (9.59)</td>
<td>.29</td>
<td>1.55</td>
<td>.08†</td>
</tr>
<tr>
<td>MR</td>
<td>7.66 (0.96)</td>
<td>7.53 (0.94)</td>
<td>.14</td>
<td>-0.47</td>
<td>.33†</td>
</tr>
</tbody>
</table>

Note. AJR = Approach Jump Reach; BJR = Block Jump Reach; AR = Agility Run; BBT = Basketball Throw; MR = Mile Run.

^aNegative t result is in the direction of lower posttest mean scores.

†ns. *p < .05. ***p = .001.
Table 31

*High School Girl Volleyball Players Who Participated In the School Sponsored Invitational Eight-Week Summer Strength and Conditioning Program Alone Pretest Beginning Eight-Week Compared to Posttest Ending Eight-Week Approach Jump Reach Scores, Block Jump Reach Scores, Agility Run Scores, Basketball Throw Scores, and Mile Run Scores*

<table>
<thead>
<tr>
<th>Source</th>
<th>Pretest Scores</th>
<th>Posttest Scores</th>
<th>t&lt;sup&gt;a&lt;/sup&gt;</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>AJR</td>
<td>8.45 (0.38)</td>
<td>8.43 (0.55)</td>
<td>.04</td>
<td>-.10</td>
</tr>
<tr>
<td>BJR</td>
<td>8.15 (0.41)</td>
<td>7.98 (0.50)</td>
<td>.37</td>
<td>-.96</td>
</tr>
<tr>
<td>AR</td>
<td>13.65 (0.88)</td>
<td>13.10 (0.77)</td>
<td>.69</td>
<td>-3.80</td>
</tr>
<tr>
<td>BBT</td>
<td>59.14 (10.67)</td>
<td>58.09 (13.68)</td>
<td>.09</td>
<td>-0.41</td>
</tr>
<tr>
<td>MR</td>
<td>8.30 (0.69)</td>
<td>8.57 (0.79)</td>
<td>.36</td>
<td>1.40</td>
</tr>
</tbody>
</table>

*Note.* AJR = Approach Jump Reach; BJR = Block Jump Reach; AR = Agility Run; BBT = Basketball Throw; MR = Mile Run.

<sup>a</sup>Negative t result is in the direction of lower posttest mean scores.

<sup>†</sup>ns.  ***p = .001.
Table 32

*High School Girl Volleyball Players Who Participated In the School Sponsored Invitational Eight-Week Summer Strength and Conditioning Program and Co-Occurring Sports and/or Club Sports and High School Girl Volleyball Players Who Participated In the School Sponsored Invitational Eight-Week Summer Strength and Conditioning Program Alone Posttest Compared To Posttest Ending Eight-Week Summer Strength and Conditioning Program Agility Outcomes Scores*

<table>
<thead>
<tr>
<th>Source</th>
<th>Multi-Sport Players</th>
<th>Single-Sport Players</th>
<th>d</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>AJR</td>
<td>8.89 (0.63)</td>
<td>8.43 (0.50)</td>
<td>.78</td>
<td>1.76</td>
<td>.05*</td>
</tr>
<tr>
<td>BJR</td>
<td>8.01 (0.61)</td>
<td>7.98 (1.00)</td>
<td>.05</td>
<td>0.12</td>
<td>.45†</td>
</tr>
<tr>
<td>AR</td>
<td>12.63 (0.70)</td>
<td>13.10 (0.77)</td>
<td>.64</td>
<td>-1.43</td>
<td>.08†</td>
</tr>
<tr>
<td>BBT</td>
<td>63.50 (9.59)</td>
<td>58.09 (13.68)</td>
<td>.47</td>
<td>1.02</td>
<td>.16†</td>
</tr>
<tr>
<td>MR</td>
<td>7.53 (0.94)</td>
<td>8.57 (0.79)</td>
<td>1.20</td>
<td>-2.75</td>
<td>.01**</td>
</tr>
</tbody>
</table>

*Note.* AJR = Approach Jump Reach; BJR = Block Jump Reach; AR = Agility Run; BBT = Basketball Throw; MR = Mile Run.

†ns. *p = .05. **p = .01.
Chapter 5

Conclusions and Discussions

Purpose of Study

The purpose of the study was to determine the effects of a school sponsored invitational eight-week summer strength and conditioning program on the attitudes and agility of high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club sports compared to the attitudes and agility of high school girl volleyball players who specialized in volleyball and participated in the school sponsored invitational eight-week summer strength and conditioning program alone. This exploratory study focused on volleyball players who attended the same high school and who were members of the same volleyball program. Papillion-La Vista High School, the research school, provided returning sophomore, junior, and senior volleyball players the opportunity to participate in a school sponsored invitational eight-week summer strength and conditioning program during the summer 2008. The school also provided the volleyball players the opportunity to participate in co-occurring sports, other than volleyball, during the same time frame.

Conclusions

The following conclusions were drawn from the study for each of the 12 research questions.

Research Question #1

Overall, pretest-posttest results indicated high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and
conditioning program who also participated in co-occurring sports and/or club sports pretest beginning eight-week compared to posttest ending eight-week Sport Motivation Scale Questionnaire to know, to accomplish, and to experience stimulation internal motivation scores remained stable across the eight-week pretest-posttest intervention period. The seven point Sport Motivation Scale Questionnaire Likert Scale is anchored with three ranges of responses including Does Not Correspond at All for numerical responses 1 and 2, Corresponds Moderately for numerical responses 3, 4, and 5, and Corresponds Exactly for numerical responses 6 and 7. Comparing multi-sport players' internal motivation scores with the Sport Motivation Scale Questionnaire Likert Scale 1 to 7 range, indicates self reported posttest scores that fall within the top scores of 6 and 7, Corresponds Exactly range, for all three internal motivation subscales.

Finally, it may be said that the multi-sport players reported themselves as highly internally motivated before they began participation in the school sponsored invitational eight-week summer strength and conditioning program and that these self-reported internal motivation scores remained statistically unchanged following participation in the school sponsored invitational eight-week summer strength and conditioning program. The internal motivation pretest-posttest sub-scale to know mean difference score was +0.22, the internal motivation pretest-posttest sub-scale to accomplish mean difference score was -0.06, and the internal motivation pretest-posttest sub-scale to experience stimulation mean difference score was -0.08. The data suggest that these players source of motivation is internal, well established, and that self-reported pretest-posttest mean differences indicated sub-scale stability, not easily changed by the new challenges.
presented during the school sponsored invitational eight-week summer strength and conditioning program.

**Research Question #2**

Overall, pretest-posttest results indicated high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program who also participated in co-occurring sports and/or club sports pretest beginning eight-week compared to posttest ending eight-week Sport Motivation Scale Questionnaire identified, introjected, and external regulation external motivation scores remained stable across the eight-week pretest-posttest intervention period. The seven point Sport Motivation Scale Questionnaire Likert Scale is anchored with three ranges of responses including Does Not Correspond at All for numerical responses 1 and 2, Corresponds Moderately for numerical responses 3, 4, and 5, and Corresponds Exactly for numerical responses 6 and 7. Comparing multi-sport players’ external motivation scores with the Sport Motivation Scale Questionnaire Likert Scale 1 to 7 range, indicates self reported posttest scores that fall within the middle scores of 3, 4, and 5, Corresponds Moderately range, for two of the external motivation subscales, introjected and external regulations, with the identified score falling within the higher Corresponds Exactly range.

Finally, it may be said that the multi-sport players reported themselves as moderately externally motivated before they began participation in the school sponsored invitational eight-week summer strength and conditioning program and that these self-reported external motivation scores remained statistically unchanged following participation in the school sponsored invitational eight-week summer strength and conditioning program. The external motivation pretest-posttest sub-scale identified mean
difference score was +0.19, the external motivation pretest-posttest sub-scale introjected mean difference score was -0.45, and the external motivation pretest-posttest sub-scale external regulation mean difference score was -0.39. The data suggest that these players source of motivation is only moderately external, secondary to internal motivation, well established, and that self-reported pretest-posttest mean differences indicated sub-scale stability, not easily changed by the new challenges presented during the school sponsored invitational eight-week summer strength and conditioning program.

**Research Question #3**

Overall, pretest-posttest results indicated high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program who also participated in co-occurring sports and/or club sports pretest beginning eight-week compared to posttest ending eight-week Sport Motivation Scale Questionnaire amotivated amotivated scores remained stable across the eight-week pretest-posttest intervention period. The seven point Sport Motivation Scale Questionnaire Likert Scale is anchored with three ranges of responses including Does Not Correspond at All for numerical responses 1 and 2, Corresponds Moderately for numerical responses 3, 4, and 5, and Corresponds Exactly for numerical responses 6 and 7. Comparing multi-sport players' amotivation scores with the Sport Motivation Scale Questionnaire Likert Scale 1 to 7 range, indicates self reported posttest scores that fall within the lowest scores of 1 and 2, Does Not Correspond at All, for the amotivation subscale, amotivation.

Finally, it may be said that the multi-sport players reported themselves as not at all amotivated before they began participation in the school sponsored invitational eight-
week summer strength and conditioning program and that these self-reported amotivation scores remained statistically unchanged following participation in the school sponsored invitational eight-week summer strength and conditioning program. The amotivation pretest-posttest sub-scale identified mean difference score was -0.11. The data suggest that these players reported themselves as not at all amotivated and that the self-reported pretest-posttest mean differences indicated sub-scale stability, not easily changed by the new challenges presented during the school sponsored invitational eight-week summer strength and conditioning program.

**Research Question #4**

Overall, pretest-posttest results indicated high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone pretest beginning eight-week compared to posttest ending eight-week Sport Motivation Scale Questionnaire to know, to accomplish, and to experience stimulation internal motivation scores remained stable across the eight-week pretest-posttest intervention period. The seven point Sport Motivation Scale Questionnaire Likert Scale is anchored with three ranges of responses including Does Not Correspond at All for numerical responses 1 and 2, Corresponds Moderately for numerical responses 3, 4, and 5, and Corresponds Exactly for numerical responses 6 and 7. Comparing single-sport players' internal motivation scores with the Sport Motivation Scale Questionnaire Likert Scale 1 to 7 range, indicates self reported posttest scores that fall within the top scores of 6 and 7, Corresponds Exactly range, for two of the internal motivation subscales, to know and to accomplish. The reported to experience stimulation score falls within the Corresponds Moderately range.
Finally, it may be said that the single-sport players reported themselves as moderately internally motivated before they began participation in the school sponsored invitational eight-week summer strength and conditioning program and that these self-reported internal motivation scores remained statistically unchanged following participation in the school sponsored invitational eight-week summer strength and conditioning program despite movement from the reported Corresponds Moderately to the higher Corresponds Exactly range. The internal motivation pretest-posttest sub-scale to know mean difference score was +0.35, the internal motivation pretest-posttest sub-scale to accomplish mean difference score was -0.35, and the internal motivation pretest-posttest sub-scale to experience stimulation mean difference score was -0.02. The data suggest that these players source of motivation is internal, well established, and that self-reported pretest-posttest mean differences indicated sub-scale stability, not easily changed by the new challenges presented during the school sponsored invitational eight-week summer strength and conditioning program.

**Research Question #5**

Overall, pretest-posttest results indicated high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone pretest beginning eight-week compared to posttest ending eight-week Sport Motivation Scale Questionnaire identified, introjected, and external regulation external motivation scores remained stable across the eight-week pretest-posttest intervention period. The seven point Sport Motivation Scale Questionnaire Likert Scale is anchored with three ranges of responses including Does Not Correspond at All for numerical responses 1 and 2, Corresponds Moderately for numerical responses...
Comparing single-sport players' external motivation scores with the Sport Motivation Scale Questionnaire Likert Scale 1 to 7 range, indicates self reported posttest scores that fall within the middle scores of 3, 4, and 5, Corresponds Moderately range, for all three of the external motivation subscales, identified, introjected, and external regulations.

Finally, it may be said that the single-sport players reported themselves as moderately externally motivated before they began participation in the school sponsored invitational eight-week summer strength and conditioning program and that these self-reported external motivation scores remained statistically unchanged following participation in the school sponsored invitational eight-week summer strength and conditioning program. The external motivation pretest-posttest sub-scale identified mean difference score was -0.27, the external motivation pretest-posttest sub-scale introjected mean difference score was -0.62, and the external motivation pretest-posttest sub-scale external regulation mean difference score was -0.42. The data suggest that these players source of motivation is only moderately external, secondary to internal motivation, well established, and that self-reported pretest-posttest mean differences indicated sub-scale stability, not easily changed by the new challenges presented during the school sponsored invitational eight-week summer strength and conditioning program.

**Research Question #6**

Overall, pretest-posttest results indicated high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone pretest beginning eight-week compared to posttest ending eight-week Sport Motivation Scale Questionnaire amotivated amotivated scores remained
stable across the eight-week pretest-posttest intervention period. The seven point Sport Motivation Scale Questionnaire Likert Scale is anchored with three ranges of responses including Does Not Correspond at All for numerical responses 1 and 2, Corresponds Moderately for numerical responses 3, 4, and 5, and Corresponds Exactly for numerical responses 6 and 7. Comparing single-sport players' amotivation scores with the Sport Motivation Scale Questionnaire Likert Scale 1 to 7 range, indicates self reported posttest scores that fall within the lowest scores of 1 and 2, Does Not Correspond at All, for the amotivation subscale, amotivation.

Finally, it may be said that the single-sport players reported themselves as not at all amotivated before they began participation in the school sponsored invitational eight-week summer strength and conditioning program and that these self-reported amotivation scores remained statistically unchanged following participation in the school sponsored invitational eight-week summer strength and conditioning program. The amotivation pretest-posttest sub-scale identified mean difference score was 0.16. The data suggest that these players reported themselves as not at all amotivated and that the self-reported pretest-posttest mean differences indicated sub-scale stability, not easily changed by the new challenges presented during the school sponsored invitational eight-week summer strength and conditioning program.

Research Question #7

Sub-Question #7a. The predetermined .01 alpha level set for rejecting the null hypothesis was not obtained for any of the three internal motivation measured subscales to know \( p(\text{one-tailed}) = .49 \), to accomplish \( p(\text{one-tailed}) = .34 \), and to experience stimulation \( p(\text{one-tailed}) = .08 \) for the posttest high school girl volleyball players who
participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club sports compared to the posttest high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone.

**Sub-Question #7b.** The predetermined .01 alpha level set for rejecting the null hypothesis was not obtained for any of the three external motivation measured subscales identified $p$(one-tailed) = .21, introjected $p$(one-tailed) = .16, and external regulations $p$(one-tailed) = .11 for the posttest high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club sports compared to the posttest high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone.

**Sub-Question #7c.** The predetermined .01 alpha level set for rejecting the null hypothesis was not obtained for the one amotivation measured subscale amotivation $p$(one-tailed) = .06, for the posttest high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club sports compared to the posttest high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone.

**Research Question #8**

Overall, internal motivation sub-scale scores to know, to accomplish, and to experience stimulation and external motivation sub-scales identified, introjected, and external regulation were most frequently statistically significantly different in contrast to
the lone amotivation score as high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club sports consistently reported themselves on the amotivation sub-scale as does not correspond at all. The significant ANOVA variance observed is explained in the robust mean differences noted in Table 17 primarily between high internal motivation sub-scales and the low amotivation subscale. This same contrast is also observed between external motivation sub-scales and the amotivation sub-scale. The largest mean differences observed in Table 17 were for the TK vs. IN (1.11), TK vs. AM (4.89), TA vs. IN (1.30), TA vs. ER (1.00), TA vs. AM (5.05), TES vs. IN (1.47), TES vs. ER (1.17), TES vs. AM (5.22), ID vs. IN (1.19), ID vs. AM (4.94), IN vs. AM (3.75), and ER vs. AM (4.05).

Research Question #9

Overall, internal motivation sub-scale scores to know, to accomplish, and to experience stimulation and external motivation sub-scales identified, introjected, and external regulation were most frequently statistically significantly different in contrast to the lone amotivation score as high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone consistently reported themselves on the amotivation sub-scale as Does Not Correspond at All. The significant ANOVA variance observed is explained in the robust mean differences noted in Table 19 primarily between high internal motivation sub-scales and the low amotivation subscale. This same contrast is also observed between external motivation sub-scales and the amotivation sub-scale. The largest mean differences observed in Table 19 were for the TK vs. IN (1.62), TK vs. ER (1.21), TK vs. AM (4.19),
TA vs. IN (1.64), TA vs. ER (1.23), TES vs. IN (1.46), TES vs. ER (1.05), TES vs. AM (4.03), ID vs. IN (1.37), ID vs. AM (3.94), IN vs. AM (2.57), and ER vs. AM (2.98).

**Research Question #10**

Overall, pretest-posttest results indicated high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program who also participated in co-occurring sports and/or club sports pretest beginning eight-week compared to posttest ending eight-week approach jump reach scores, block jump reach scores, basketball throw scores, and mile run scores remained stable across the eight-week pretest-posttest intervention period. The agility run score showed a statistically significant change which provided evidence that the multi-sport players improved their agility run speed after participation in the school sponsored invitational eight-week summer strength and conditioning program who also participated in co-occurring sports and/or club sports.

Finally, it may be said that the multi-sport players had robust agility skills for approach jump reach, block jump reach, basketball throw, and mile run before they began participation in the school sponsored invitational eight-week summer strength and conditioning program and that these agility scores remained statistically unchanged following participation in the school sponsored invitational eight-week summer strength and conditioning program. The agility pretest-posttest approach jump reach mean difference score was -0.02, the agility pretest-posttest block jump reach mean difference score was -0.47, the agility pretest-posttest basketball throw mean difference score was +2.48 and the agility pretest-posttest mile run mean difference score was -0.13. Though the multi-sport players had significant agility skills for the agility run before they began
participation in the school sponsored invitational eight-week summer strength and conditioning program, they did show a statistically significant change in their agility run scores. The agility pretest-posttest agility run mean difference score was -0.79. The data suggest that these players agility skills were well established for approach jump reach, block jump reach, basketball throw, and mile run and that agility pretest-posttest mean differences indicated stability, not easily changed by the new challenges presented during the school sponsored invitational eight-week summer strength and conditioning program. The data also suggest that these players agility skill for agility run showed statistically significant improvement by the new challenges presented during the school sponsored invitational eight-week summer strength and conditioning program.

**Research Question #11**

Overall, pretest-posttest results indicated high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program alone pretest beginning eight-week compared to posttest ending eight-week approach jump reach scores, block jump reach scores, basketball throw scores, and mile run scores remained stable across the eight-week pretest-posttest intervention period. The agility run score showed a statistically significant change which provided evidence that the multi-sport players improved their agility run speed after participation in the school sponsored invitational eight-week summer strength and conditioning program alone.

Finally, it may be said that the single-sport players had significant agility skills for approach jump reach, block jump reach, basketball throw, and mile run before they began participation in the school sponsored invitational eight-week summer strength and
conditioning program and that these agility scores remained statistically unchanged following participation in the school sponsored invitational eight-week summer strength and conditioning program. The agility pretest-posttest approach jump reach mean difference score was -0.02, the agility pretest-posttest block jump reach mean difference score was -0.17, the agility pretest-posttest basketball throw mean difference score was -1.05 and the agility pretest-posttest mile run mean difference score was 0.27. Though the single-sport players had significant agility skills for the agility run before they began participation in the school sponsored invitational eight-week summer strength and conditioning program, they did show a statistically significant change in their agility run scores. The agility pretest-posttest agility run mean difference score was -0.55. The data suggest that these players agility skills were well established for approach jump reach, block jump reach, basketball throw, and mile run and that agility pretest-posttest mean differences indicated stability, not easily changed by the new challenges presented during the school sponsored invitational eight-week summer strength and conditioning program. The data also suggest that these players agility skill for agility run showed statistically significant improvement by the new challenges presented during the school sponsored invitational eight-week summer strength and conditioning program.

Research Question #12

Overall, the predetermined .01 alpha level set for rejecting the null hypothesis was not obtained for the following agility skills measured approach jump reach $p$(one-tailed) = .05, block jump reach $p$(one-tailed) = .45, agility run $p$(one-tailed) = .08, and basketball throw $p$(one-tailed) = .16. However, the predetermined .01 alpha level set for rejecting the null hypothesis was obtained for the measured mile run $p$(one-tailed) = .01. These
posttest-posttest findings suggest near equipoise for the agility outcomes of both groups of players and no penalty for multi-sport or volleyball alone participation.

**Discussion**

This study was conducted to determine the effects of a school sponsored invitational eight-week summer strength and conditioning program on the attitudes and agility of high school girl volleyball players who participated in the school sponsored invitational eight-week summer strength and conditioning program and co-occurring sports and/or club sports compared to the attitudes and agility of high school girl volleyball players who specialized in volleyball and participated in the school sponsored invitational eight-week summer strength and conditioning program alone. This exploratory study focuses on volleyball players who attended the same high school and who were members of the same volleyball program. Papillion-La Vista High School, the research school, provided returning sophomore, junior, and senior volleyball players the opportunity to participate in a school sponsored invitational eight-week summer strength and conditioning program during the summer 2008. The school also provided the volleyball players the opportunity to participate in co-occurring sports, other than volleyball, during the same time frame.

**Internally motivated volleyball players.** The most significant data to note in this study is that statistically both co-occurring sports and/or club sports players and players who played volleyball alone, stated that they were motivated to play volleyball specifically by personal gratification. According to Chantal and Guay (1996), motivation is the most important indicator of success in the pursuit and enjoyment of sports participation. Female athletes tend to participate more out of intrinsic pleasure and
satisfaction than for extrinsic reasons (Chantal & Guay, 1996). Wilson (2005), McCullagh (2005), and Weinberg and Gould (2003) suggest that athletes have an individual need to feel competency and pride in all that they do and are, therefore, intrinsically motivated to participate in sports for no apparent reward save for the satisfaction and pleasure they get from the activity itself (Wilson, 2005; McCullagh, 2005; Weinberg & Gould, 2003). Wilson (2005) and Weinberg and Gould (2003) state that intrinsic motivation occurs in three stages (1) to know—when athletes participate in activities because of the pleasure and satisfaction they get from learning, acquiring, and studying something new in the sport, (2) to accomplish—when athletes participate in activities because of the pleasure and satisfaction they get from mastering various skills and reaching goals, and (3) to experience stimulation—because athletes want to experience the pleasant sensations such as danger, pain, or excitement that they as an athlete may feel (Wilson, 2005; Weinberg & Gould, 2003).

**Externally motivated volleyball players.** Sport Motivation Survey

Questionnaire results indicated no significant difference in external motivation when comparing the high school volleyball players in co-occurring sports and/or club sports players to the volleyball players who participated in volleyball alone. According to Wilson (2005) and Deci and Ryan (2000), athletes that are extrinsically motivated participate in sports for external causes such as rewards, positive feedback, and recognition rather than for the inherent satisfaction of performing the activity itself (intrinsic motivation) (Wilson, 2005; Deci & Ryan, 2000). Wilson (2005) and Weinberg and Gould (2003) suggest that extrinsic motivation includes but is not limited to the following stages (1) identified—when athletes participate in an activity because it is
considered of high value, (2) introjected--when athletes participate in an activity because of various outside pressures, and (3) external regulations--when athletes participate in an activity because they feel they have to and/or because they believe they may get an award for participating (Wilson, 2005; Weinberg & Gould, 2003).

**Amotivated volleyball players.** Chantal and Guay (1996) suggest that to be amotivated, individuals do not perceive connections between their own actions and the resulting outcomes. Thus, amotivation is at work when individuals experience pervasive feelings of incompetence and lack of control. Furthermore, athletes who train or compete with no real purpose and with little sense of meaning display amotivation (Chantal & Guay, 1996). Both co-occurring sports and/or club sports players and volleyball alone players showed denied statistically significant amotivation tendencies and overall reported themselves as highly functional, motivated athletes.

**Summer strength and conditioning and agility skills.** According to the website Strength Training Women.com (2009), strength training and conditioning for volleyball needs to be a common and routine part of all players practice schedules, especially during the off-season. Off-season programs need to build a solid foundation for strength as well as for power and endurance. Along with agility, often used high school athlete web sites such as, strength-conditioning.net, states that speed is the difference maker for most athletes, however, at the same time, speed is one of the most difficult skills to develop (Strength Training Women.com, 2009). Surprisingly, the dependent *t* test results of this research study suggest that after participation in the eight-week summer strength and conditioning program there was significant improvement in agility run scores for both the co-occurring sports and/or club sports players and volleyball alone players. Also, the
study found that volleyball players who participated in co-occurring sports had a significant improvement in the mile run compared to their teammates who only participated in volleyball during the off-season eight-week summer session. Bompa and Carrera (2006) contend that the transition phase or off-season is a critical time for volleyball players to gain adequate strength, agility, and stamina. Bompa and Carrera (2006) also suggest that during this training time strength and agility workouts should focus on muscle groups that may not be actively involved as much during the competitive season such as abdominals, lower back, shoulders along with specific prime mover and skill exercise, squats, incline bench press, and bounding exercises all important to volleyball skill development (Bompa & Carrera, 2006).

Finally, it may be said that the results of this study indicate that returning sophomore, junior, and senior Papillion-La Vista High School volleyball players who were involved in co-occurring sports and/or club sports and volleyball players who participated in volleyball alone during the eight-week summer strength and conditioning program had well established attitudes regarding internal motivation, were moderately externally motivated, and statistically, denied amotivation tendencies. This group of girl volleyball players also had well-established strength, conditioning, and agility abilities prior to the off-season training. It also may be said that the co-occurring sports and/or club sports and volleyball alone players had robust agility skills for approach jump reach, block jump reach, basketball throw, and mile run before they began participation in the school sponsored invitational eight-week summer strength and conditioning program and that these scores remained statistically unchanged following participation in the school sponsored invitational eight-week summer strength and conditioning program. However,
agility run scores showed statistically significant improvement following the new challenges presented during the school sponsored invitational eight-week summer strength and conditioning program. Posttest-posttest findings suggest near equipoise for the agility outcomes of both groups of players and no penalty for co-occurring sports and/or club sports or volleyball alone participation.

This exploratory research study warrants the continued participation of Papillion-La Vista High School volleyball players in the eight-week school sponsored strength and conditioning program. Given the players documented internal motivation, guided and focused coaching, training and instruction will continue to foster the democratic behavior, social support, and positive feedback styles increasing task cohesion and strengthening the coach-athlete relationship (Turman, 2003; Gardner, Shields, & Bredemeier, 1996; Westre & Weiss, 1991). It seems that student athletes who perform at championship levels respond positively to a strong coach-athlete rapport environment (Jowett & Cockerill, 2002).

**Implications for future research.** Based on the study’s attitude and agility findings observed for the girl volleyball players, it would be important to know if girl athletes who were not involved in co-occurring sports and/or club sports or volleyball alone, would also benefit from a school sponsored eight-week summer strength and conditioning program. Future research could focus on a school sponsored summer strength and conditioning program designed for 9th-grade through the 12th-grade, Papillion-La Vista High School, Papillion, Nebraska, girl athletes, who were not volleyball players, to determine if a more broad-based program could support their motivational attitudes and agility skills profiles.
Overall, the findings of this study indicated that the high school girl volleyball players’ participation in co-occurring sports and/or club sports during the off-season and summer resulted in positive outcomes with no comparable negative consequences and multiple-sport participation is, therefore, deemed to be fully compatible with and contributory to a continued positive motivational outlook and conditioned athletic ability successful life course for these multi-sport athletes.
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