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Single Sport Specialization:

NCAA DI Collegiate Student Athlete Perceptions

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Abstract

This study seeks to understand the experience and perception of current, NCAA DI athletes with regard to sport specialization. By learning more about their level of specialization prior to their life as an NCAA DI athlete, as well as their perception on the importance of specialization, this study seeks to contribute to the growing body of literature in sport specialization. Specifically, this study will help inform aspiring athletes, coaches and parents about the role and perceptions of sport specialization in today's elite level athlete. Using paper surveys, the perceptions of 138 current 2019-2020 season NCAA DI athletes at a mid-major university in the Midwest was gathered to answer two questions: What are the perceptions of NCAA collegiate athletes regarding specialization and what training methods do they believe are most important to reach their level of success? After analyzing data through Excel, it was found that specialization was not perceived as necessary before high school to reach the NCAA collegiate level, but that some degree of specialization will be necessary during high school. Upon evaluation of the data, an unanticipated discovery was made that athletes from smaller community sizes will rely more on utilizing school teams compared to other training methods. The training method found to be most important consistently between all groups was practicing independently. This study should continue to be replicated with larger sample sizes in other regions for greater comparisons.

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Introduction

Today's society places a high social value on elite sports. It can shape the very meaning of life for some people and create the basis of their moral and ethical beliefs. By placing such meaning and value into sports, society began to implement organized sports into children's lives at earlier and earlier stages. One reason for this shift in earlier involvement according to Coakley (2017) is that "the visibility of high-performance and professional sports has increased awareness of organized competitive sports as a valued part of culture" (p. 82). Children watch professionals on television or social media and decide that they want to follow in those celebrities' steps. This in turn causes parents to invest large amounts of time and money into their children's dreams by seeking out the best organized sports programs for their child to participate in. Data collected by the National Federation of State High Schools Association (2017), found that high school athletic participation has increased drastically over the last several decades, increasing from only 6 million between 1995 and 1996 to 7.9 million between 2016-2017. This number does not take into account the number of unorganized sport participation or the number of organized participants outside of the high school setting. It also only reflects high school aged participation, leaving out those participants aged 6-13 because a valid reporting system for such an age group has yet to be developed.

Regardless, the drastic increase in sports participation has researchers questioning why has there been an increase in participation and how does this affect the health of society's youth? It is speculated that parents and children believe that organized sports are the only chance a child has at potentially receiving a scholarship to pay for college. To reach such an elite level of participation parents, coaches, and athletes themselves

have chosen to move towards a singular training model. This model is also known as single-sport specialization.

Single-sport specialization (SSS) has been defined by researchers as participation in one sport or intensive training, at least eight months or more out of the year, and at the exclusion of other sports (DiFiori et al., 2014; N. Jayanthi, Pinkham, Dugas, Patrick, & LaBella, 2013; Myer et al., 2015). Further research on SSS has led to the development of a system categorizing the level to which athletes are specializing: low, moderate, and high. The athletes are categorized based on identification of one or more of the following SSS factors. They participate in year-round training (at least 8 months out of the year), they have chosen one main sport, and/or they quit all sports to focus on one sport. This ranking system provided researchers, coaches, parents, and personal trainers a better understanding of what risks the athletes are predisposed to, based on where they fall categorically (N. A. Jayanthi, LaBella, Fischer, Dugas, & Pasulka, 2015; Myer et al., 2015).

The debate surrounding SSS questions is how early this intensive training should begin and whether this intensive training is necessary to become successful. Research conducted by Ericsson et al. (1993), supports sport specialization at an early age guided by the principle of deliberate practice. He states that deliberate practice is necessary to gain a level of expertise through effortful activities beginning in childhood. This effortful practice in conjunction with certain stages of development is what sets experts apart from their peers. It was not simply just the years spent practicing, but also the number of hours. Cote (2009) found contradicting evidence. His research further expanded upon Ericsson's by comparing deliberate practice, the act of specifically honing one skill for the purpose

of improving performance, versus deliberate play, the act of participating for enjoyment (Jayanthi et al., 2013). Deliberate play is both structured and free. It allows its participants to still develop the skills needed to become elite, but in a self-regulated manner which minimizes dropout (Côté, Lidor, & Hackfort, 2009).

Current research has provided evidence that early single-sport specialization (ESSS) may be harmful to athletes physically and psychologically and should not be a utilized method for sport development. Studies have also investigated athlete's perceptions of specialization in club, professional, national, and international levels; however, only one study has evaluated the perceptions of DI college athletes. In the United States, collegiate athletics is one of the only available forms of organized sport, after secondary school. Many athletes are unable to reach the national and international forms of organized competition unless they attend some college. For this reason, it is important to understand what athletes feel are necessary training activities to reach the collegiate level first.

This study seeks to understand the experience and perception of current, NCAA DI athletes with regard to sport specialization. By learning more about their level of specialization prior to their life as an NCAA DI athlete, as well as their perception on the importance of specialization, this study seeks to contribute to the growing body of literature in sport specialization. Specifically, to help inform aspiring athletes, coaches and parents about the role and perceptions of sport specialization in today's elite level athlete. Using a survey, the perceptions of current 2019-2020 season NCAA DI athletes at a mid-major university in the Midwest was gathered to further develop what is currently known about the necessary training habits to attain an elite collegiate position.

Literature Review

Specialization is a multilayered concept consisting of training habits, motivations, physical implications, and psychological implications. A basic understanding of each of these pieces is necessary before drawing conclusions about the necessity of specializing, as well as, creating recommendations on proper, safe sport development. This literature review will briefly highlight the important research that has been conducted thus far and where future research should be conducted.

Expertise

The concept of specialization was created to develop a greater degree of expertise in athletes. Current studies have aimed to determine if this training model correlates with a higher degree of sport performance and creating elite athletes. An important aspect of these studies is to understand what makes an athlete elite. Ericsson (2007) stated that superb performers practice intensively, study with devote teachers, and are supported enthusiastically by their families throughout developmental years. The amount of training, as well as, the quality of the training are key indicators to the amount of success that can be achieved. It is believed that experts are always made, not born. Developing a genuine expertise requires deliberate practice, struggle, sacrifice, and honest self-assessments. Expertise according to Ericsson is tested against three distinct measures. The first test is that a person with expertise must show a consistently superior performance than that of the expert's peers. Second, there must be concrete results, as in the outcome of the performance must be as good as the skills themselves. Lastly, true expertise is something that can be measured and replicated, meaning that it can be quantified to see improvement (Ericsson, Prietula, & Cokely, 2007).

Sports are quantifiable, placing subjects into measurable environments which makes determining their expertise easier and comparable throughout time. In track and field there is time, stride length, jump height, jump length or in basketball there are shooting, rebound, and assisting percentages. The level in which someone can participate in a sport also directly reflects what their level of expertise is. Someone who plays in the National Football League would be considered more of an expert in the game of football than someone who plays in a junior football league.

Defining an expert varies on a continuum of validity, as shown by a meta-analysis conducted in 2015 by Swann, Moran, and Piggott. This study concluded that there are eight different ways to define elite, expert athletes. International or national levels of competition were the most commonly cited criteria. These two levels were combined because often national athletes will also compete in international competitions as well during their careers. For example, NBA players can play for the US national team and the Olympics. Experience was the second most commonly used criteria for describing experts. This was measured in time ranging from hours to years in their given sport or level they participated at. Professionalism was the third most commonly used criteria. The subcategories of professionalism involved playing at the professional level (leagues), being a professional athlete, and even semi-professional experience. The next criteria used was training time and frequency. This included daily training load, weekly duration, and weekly frequency. Following frequency was participation in elite talent programs whether that be sport institutes, training centers, or national development programs. Then, participation in regional level competition which included regional, state, and provincial levels were used. The seventh common criteria used was objective

sport/country specific measures. For example, a golf handicap, black belts, and VO2 maxes in triathletes. The University level was the least cited in defining elite.

Other factors in the Swann et al research found to be important included repeated success at the highest level and comparing sports regarding opportunities to progress. Sports with more opportunities to progress to higher levels are easier to compare for an elite status; therefore, it is important to take competitiveness into consideration. Two main samples were determined to be viable ways of defining experts: absolute expertise (studies the remarkable few that set them apart from the masses) and relative approach (focuses on how novices can reach an elite status so that others may can also learn how to become elite) (Chi, 2006; Swann, Moran, & Piggott, 2015). Their conclusion was that research can't seem to agree on consistent criteria for defining elite athletes which has made studies seemingly inconsistent. Defining what makes an expert is highly subjective and is why it is difficult to normalize the data. The inability to describe one definition or repeated criteria shows that research in this area is still in its infancy. No matter the definition, researchers have been working to determine what training efforts work best in helping athletes achieve an elite status.

Deliberate Practice and Deliberate Play

Two of the most highly debated, opposing theories regarding skill development are deliberate practice and deliberate play. Researchers have gone back and forth on the benefits and drawbacks to both development models. It is imperative to understand both concepts before drawing conclusions on single sport specialization as they both incorporate the act of specialization at some point in the sport development timeline. The

leading researchers in the field are Ericsson who studied development using deliberate practice and Côté who studied deliberate play.

Deliberate Practice

Deliberate practice is the key to obtaining expertise according to Ericsson (2007). This does not mean continuing to practice something you are already skilled in, it requires deliberate practice of the skills that you are not strong in or do not have at all. It is a considerable, specific, and sustained practice. It has been shown that genuine experts think deliberately, meaning they don't rely on gut intuition. This allows them to acknowledge a mistake they made, think back to where they made the wrong decision, and improve from there. Gut intuition and automatic responses decrease an expert's sensitivity to rare occurrences, this is known as an intuition bias. Intuition bias usually is unnoticed until an event occurs that they are unprepared for and it ends with a poor result. Deliberate practice involves two learning processes: improving already obtained skills and extending the range of those skills. Concentrating on both of these processes cuts down on the time that can be spent using them. Research on experts' habits have shown that this kind of deliberate concentration can only last 4-5 hours. An agreed upon number by researchers to develop expertise was 10,000 hours over ten years of deliberate practice. This timeframe is why parents and coaches are pushing young athletes to specialize at earlier and earlier ages (Ericsson et al., 2007).

The misunderstanding in deliberate practice's application however has made Ericsson publish several follow-up articles to better explain what he meant in his first study. His initial study conducted in 1993 specifically looked at creating expert musicians, not athletes, and did not produce a specific timeframe related to gaining

expertise. The training for the two activities is very different, thus making similar application difficult. Ericsson defends his initial definition against researchers who applied his expert framework of deliberate practice using their own definitions. While his expert framework can be applied to sport, it cannot be accomplished in the same way he initially published (Ericsson, Krampe, & Tesch-Römer, 1993; Ericsson, 2019).

In one of Ericsson's recent publications, he stated that deliberate practice applied to sport must follow three criteria. The first being an individualized design of an effective practice, meaning a coach identifies an appropriate goal for the athlete and then provides verbal instruction on the best method to reach said goal. The second criteria was to have active responses. In short, while the task is being completed there should be an explicit goal, after given immediate feedback, followed by repetition. The final criterion is an individualized assessment that allows the athlete to continue to develop skill appropriately. It is important to note that true deliberate practice according to Ericsson is based on the method of reaching expert performance, individualized attention, not a specific amount of time (Ericsson, 2019).

Another key factor to gaining expertise through deliberate practice, as mentioned in the criteria in Ericsson's 2007 publication, was having the right coach. Often that means having someone who is critical and candid, even if is sometimes hurtful, to continue moving forward. Experts will focus on what they were doing wrong to then drive themselves to reach higher levels of performance. After a period of time experts will become reliant on self-coaching. This allows experts to reflect on what went wrong and what needs to be changed. Development in this area is said to help drive elite athletes

to compete at higher levels of competition because they are better able to adjust to adverse scenarios (Ericsson et al., 2007).

Deliberate Play

The other theory regarding skill development is deliberate play. Deliberate play was first introduced by Jean Côté in 1999 while studying the influence of family in the development of talent in sport. He proposed through the Developmental Model of Sport Participation (DMSP) that there are three different stages athletes follow in order to develop into elite athletes: sampling years, specializing years, and investment years. This is known as the early diversification trajectory in the DMSP. Deliberate play is primarily evident during the sampling years, ages 6 to 12. It is defined as participation that is voluntary, enjoyable, has immediate gratification, and largely involves intrinsic motivation. Deliberate play still has a small role in the specializing years of development, but ultimately dissipates as athletes begin to focus on one to two main sports with intentional practice around the ages of 13 to 16 (Côté, 1999; Côté & Vierimaa, 2014; Côté, Lidor, & Hackfort, 2009; Strachan, Côté, & Deakin, 2009).

The DMSP pathways have identified seven associated benefits of early sampling. The first benefit is that early sampling does not hinder elite sport performance in sports where elite performance is attained after maturation. Sports like gymnastics and figure skating are an exception because peak performance occurs before or just slightly after puberty. The second benefit states early diversification is linked to longer sport involvement, as well as, shows positive trends for long-term sport participation. Third, sampling allows children to participate in a range of contexts that favor positive youth development. Different sports carry different challenges, different social structures, and

different rules. This allows youth better opportunities to develop physically, socially, and mentally. Another benefit is how high amounts of deliberate play builds a foundation for intrinsic motivation regulation through involvement in activities that are enjoyable. By building their own interests in the activity, children become more motivated. The fifth benefit involves a range of motor and cognitive experiences children obtain from sampling can later benefit them in their principal sport of interest. When participating in multiple sports, youth are able to explore their physical capabilities through various contexts. Benefit number six describes when it is appropriate to begin specializing. It suggests that at the end of primary school children should be allowed to either continue sport in a recreational setting or specialize in their chosen sport. This is partially due to psychological development of identity around this age. The final benefit is that late adolescents have developed enough physically, cognitively, socially, and emotionally to highly specialize in their sport. These benefits address the need for early sampling, as well as, the need for independence when choosing athletic participation to ensure lifelong athletic participation (Côté, Lidor, & Hackfort, 2009).

Deliberate Practice Versus Deliberate Play

Deliberate practice and deliberate play have been largely debated topics over the last decade. Researchers have been searching to determine if one sport model is more beneficial than the other. A study conducted by Strachan, Côté, and Deakin in 2009 compared specialized youth athletes to sampler youth athletes using the two trajectories in the DMSP (early specialization trajectory and early diversification trajectory). They found that although there were some differences in certain subscales, they ultimately had very similar experiences with sport in general. Sport outcomes, as well as, personal

outcomes and enjoyment were identical between the groups. This supports the theory that regardless of sampling or specializing, young athletes can still have positive sport experience and development through participation.

Concerns, however, were also identified by the researchers and involved levels of burnout and personal experiences. The specialized group scored greater in the exhaustion dimension of burnout. This can be seen as significant because exhaustion has been shown to be the precursor to burnout and can ultimately lead to dropout from sport participation. Samplers had strong experiences involving both family and the community; whereas, the athletes identified as specializers had diverse peer group experiences. The diverse peer experience may provide an explanation of why the athletes identified as specializers had an equally enjoyable sport experience; however, the authors recommend that to avoid burnout stronger familial and community relations should be stressed in their experiences (Strachan et al., 2009). Another explanation for similar positive experiences between the two groups could be the level of specialization these athletes were participating at. With the understanding that both training methods can lead to a positive sport experience the bigger question remains on whether specializing is necessary to gain an elite status. Specifically paying attention to specializing between the ages of 6-12, and its necessity in becoming a successful elite athlete. To answer these questions, it is important to analyze the effects of starting the specialization phase before going through the sampling phase.

Physical Implications to Specializing Early

As mentioned above, both skill development models can lead to positive sport experiences throughout athletic careers, but this now required researchers to investigate further to determine which development model is physically safest to follow. When

studying the risk of injury in early specialized youth, researchers have found it is in part affected by factors such as age, competitive level, growth rate, and maturation stage (N. Jayanthi et al., 2013). Defined in a clinical report by the American Academy of Pediatrics, an overuse injury is one in which the body is not given enough time to heal or repair and can affect structures like bone, muscle, and tendon. This is how one of the most frequently cited physical implications to specializing before puberty. Overuse injuries are commonly seen in pediatric athletes, comprising of half of all pediatric sport injuries. Researchers have classified these injuries into four stages beginning with only having pain after physical activity. Stage two has pain during the activity, but it doesn't yet inhibit the ability of the athlete to perform. In stage three the pain occurs during the activity, as well as, inhibiting the ability of the athlete to perform. Lastly, the pain affects the athlete even at rest. These injuries are detrimental in the youth population because their bones are not yet matured and typically most children cannot cognitively process a vague symptom as something that could become a problem or be the precursor to an injury (Brenner, 2007).

A later follow-up study conducted by Brenner (2016), evaluated more potential physical harm when the training levels are too intensive in youth populations. He found that no studies at that time identified adverse cardiovascular effects. In young females, intensive training can lead to amenorrhea. This is concerning because in conjunction with the possibility of low energy availability and low bone mineral density, young females who over-train are at a greater risk for developing the female athlete triad. These athletes must be monitored closely to ensure they are not developing these symptoms, or they will be at an increased risk for stress fractures. Studies have not shown any adverse effects in

males when it comes to puberty and maturation with an intense training volume. Evaluating sports that specifically require specialization due to peak performance being prior to puberty; such as figure skating, gymnastics, and diving; it has not been found that there are any adverse effects on puberty in these sports (Brenner, 2016).

In addition to these findings, the AOSSM early specialization consensus statement discovered stress fractures are the most common youth overuse injury and are often confused for growing pains. This is concerning when evaluating the fact that 50% of youth athletes who experience back pain are suffering from a stress fracture of the spine known as spondylolysis. The studies they evaluated to create the consensus statement demonstrated that higher training volumes have a direct relationship to a higher rate of overuse injuries. Also, children who specialize early do not receive the opportunity to fully develop neuromuscular patterns. These patterns have the possibility to protect them from injury. By only participating in one sport, however, they often execute less age-appropriate skills which deny them the ability to develop these patterns (LaPrade et al., 2016). The lack of diverse neuromuscular training can account for improper biomechanics that later lead to general injury, as well as, overuse injury from improper form. This is demonstrated by a ten-year retrospective research study conducted in 2002. It was discovered that one in five elite athletes cited injuries for the cause of their dropout. Pressure to perform and personal commitment were also frequently mentioned reasons in that group. It is important to note that lack of enjoyment was not a cited reason for these athletes (Butcher, Lindner, & Johns, 2002). Educating young athletes to recognize signs and symptoms of injury is key and is of great concern to the research community.

Psychological Implications to Specializing Early

Another concerning issue for researchers, aside from injury, is youth burnout and dropout from participation. It is well known that physical activity is healthy across all aspects of life from youth through adulthood. For people to continue to be physically active, it is important to understand what can intrinsically and extrinsically motivate individuals to participate. The same idea can be applied with specialized athletes and promoting life-long activity. Research has not only evaluated the physical effects of specializing, but also the motivations and psychological effects of choosing to specialize. Studies in recent years have been evaluating the risks of burnout in youth who specialize and how it effects their sport participation long-term, primarily when it comes to withdrawing from participation eventually. Researchers Grant Hill and Jeffery Simmons in 1989 surveyed athletic directors to determine their perceptions of specialization. Within their findings it was determined that the three leading factors contributing to the sudden influx in specialization included pressure from coaches, encouragement from college recruiters, and high parental expectations (Hill & Simmons, 1989).

Following this research, a clinical review evaluated how the pressures of adult-driven training effected youth athletes' psychological health (Myer et al., 2015). To promote healthy participation into adulthood, it is important for young athletes to enjoy their participation and develop intrinsic motivation to aid exercise adherence. The pressures to obtain scholarships take away from this and often pushes kids to train for sport-specific skills out of necessity. Children often become isolated during this training due to time spent specifically focusing on skill attainment which can lead to feelings of stress and lack of control (Baker, 2003; Myer et al., 2015). Similarly, the AOSSM

consensus statement (2016) described that specialized youth are isolated from peers, are at an increased risk for burnout, and may likely withdrawal from sport due to the pressure and stress (LaPrade et al., 2016).

Burnout can begin from perfectionism and the pressure to perform; or it can come from physiological factors like over training and a lack of sleep. Burnout athletes typically lose motivation, lack enjoyment in their participation, and report high levels of stress, anxiety and mood disturbances. Youth athletes potentially have ineffective or limited coping strategies due to their age. For this reason, it is important that young athletes be allowed a balance between sport participation and social development such as time for friends, school, and extracurricular activities to prevent burnout (LaPrade et al., 2016; Strachan et al., 2009). It is important to note that contrary to Myer (2015) and LaPrade's (2016) findings that specialized youth become isolated, Strachan et al., found that youth who specialize are able to create deeper, more meaningful relationships with their peers. This in turn, can create an overall better sport experience; unlike their sampler peers who may not as easily make these relationships due to the number of diverse experiences playing with a variety of other athletes through playing multiple sports.

Necessity of Early Specialization

With a basic understanding of the different developmental paths a youth athlete can take, as well as the current concerns with the early specialization path, researchers have been working to determine if following the early specialization trajectory is necessary to reach elite levels of athletic participation. This is a difficult question to answer because the development of an athlete is multidimensional. Several factors must be considered when making such a determination; however, even these factors are not

static. Since every athletic experience is unique to the individuals involved in them, the common factors used for comparison can be either subjective (burnout and perceptions of necessity) or objective (injury rate and time in the elite setting). The current research conducted in this area has been retrospective, relying heavily on what can be recalled by the elite athletes, given they have reached their athletic goals.

One of the first elite levels that most athletes try to reach in the United States is the collegiate level. A study published in 2017 by Martin and colleagues evaluated the perceptions of the importance of specialization in DI collegiate athletes. After evaluating a sample of 1,041 athletes, across several sports teams, researchers concluded that early sport specialization is not perceived as a requirement to reach elite level performance. Those athletes who identified as specialists prior to college, reported a mean age of 12 years old as the age they began specializing. This finding is interesting because according to the DMSP, it is around this time frame that specialization is recommended. Another interesting finding from this study was that regardless of being a specialist or multisport athlete, most athletes did not find specializing as important or not important. Only soccer and gymnastic athletes reported that they felt specializing before high school was important. The scholarship and expected playing time of the athletes proved to be insignificant in perceptions of the importance of specializing (Martin, Ewing, & Oregon, 2017). Another study also published in 2016 evaluating DI collegiate athletes found that although athletes began to specialize in their high school careers, there was no evidence that early specialization is necessary to reach the collegiate level. These participants cited that sport enjoyment was their main reason for choosing to participate in a main sport at

the exclusion of others followed by the chance to earn a scholarship and wanting to be the best (Post et al., 2016).

Research conducted for Olympic talent identification by Vaeyens, Gullich, Warr, and Philippaerts in 2009 evaluated the past training histories of senior international elite athletes and found similar findings to the two previously discussed studies. Their findings support the conclusion that higher, sport specific training volumes at a younger age does not correlate with senior elite level success. In fact, when comparing world-class athletes (top ten in Olympic Games and/or World Championships) to national-level senior athletes, the world-class athletes not only started their training for international championships later, but also majority of them trained and competed in other sports more so than their main sport. This supports the claim that early-single sport specialization is not necessary to be successful at the elite level (Vaeyens, Gullich, Warr, & Philippaerts, 2009).

There is controversy when it comes to the specialization debate in the American professional leagues. Researchers Wilhelm, Choi, and Deitch (2017) conducted research using a survey for professional baseball players in the Atlantic League of Professional Baseball who were active during the 2016 season. They discovered that about half of their 102-player sample identified at specializing before high school, with a mean age of 8.91 years old. The study also found that those who specialized had more injuries than their peers who had not specialized. When asked on their feelings toward sport specialization, 63.4 percent stated that they did not think specializing before high school is necessary to reach the professional level (Wilhelm, Choi, & Deitch, 2017). Similarly, the results of a study evaluating the National Basketball Association in 2018 showed that

majority, 85 percent, of the first-round draft picks from 2008-2015 specialized in basketball in high school. This would support the idea that specializing is necessary in this basketball to make it to the professional, elite level. It is important to note in this study that compared to their multisport peers, the draft picks who specialized played in fewer games throughout the seasons, were more likely to sustain serious injury, and had shorter careers in the league. This leads to questioning the value of specialization when it pertains to career length at the elite level and overall health (Rugg, Kadoor, Feeley, & Pandya, 2018).

Current Recommendations

Current research is lacking regarding the need to specialize before puberty in order to reach elite levels of sport participation. It has been recommended that colleges begin recruiting in the later years of high school careers and early national ranking should be eliminated. By doing so, student athletes and parents will have less pressure to push themselves too hard out of fear of missing a recruitment opportunity (Brenner, 2016). There is insufficient evidence regarding specialization, but many experts have agreed that to some degree specializing is necessary. It is still undetermined when that transition from diverse experience to singular experience should begin. Several consensus and position statements have been published to better guide adults in how best to implement training in the youth population. Current common recommendations include that children who practice or train for more hours per week than their age, for more than sixteen hours per week of intensive training or specialize should be closely monitored for signs of injury, burnout, and overtraining.

Another recommended activity that youth can benefit from is Integrative Neuromuscular Training (INT). This would especially benefit youth who only participate in one sport year-round. With this training there should be isolated periods of just INT to promote diverse motor skills to reduce the potential for injury. Additionally, parents, coaches, and trainers it is important to promote diversification. It has been shown that multisport experience does not decrease athletic capability. It helps focus on the importance of being active throughout life and parents should be educated on how detrimental lack of activity can be on the long-term health of children. It is also important that parent's, trainers, and coaches recognize that every sport is different with different stresses both physically and mentally (Feeley, Agel, & LaPrade, 2016).

In regard to injury prevention, athletes should be given 1-2 days off per week to recover. Weekly training time, repetitions, and/or total distance should never increase by more than 10% each week. Encourage athletes to only play one sport per season and take off at least 2-3 months after competition periods. Athletes can do cross training during this break, but it should be something different from structured sport. To help prevent burnout, coaches and parents should keep workouts interesting and fun by using different games and training techniques. This ensures young athletes know how to listen to their bodies and recognize when they need to change up training or take a break. Attention should be focused on the child's goals rather than the coach or parent's goals. Once their motivation is identified they can better set their own goals for their participation. Lastly, regarding diversification, multisport athletes can still be prone to overuse injuries when the sports have a major focus on the same body part. For example, if an athlete is a swimmer and baseball pitcher the upper extremity is still the same primary body part

being utilized. It is important to make sure athletes are participating in sports that place different loads on different body parts to ensure greater skill development without injury (Brenner, 2007).

The most up-to-date recommendations come from the National Athletic Trainer's Association (NATA) published in 2019. They recognized a growing concern with youth sport specialization and in conjunction with the Professional Football Athletic Trainers Society (PFATS), Professional Hockey Athletic Trainers Society (PHATS), Professional Soccer Athletic Trainers Society (PSATS), National Basketball Athletic Trainers' Association (NBATA), Professional Baseball Athletic Trainers Society (PBATS), and the NATA Intercollegiate Council for Sports Medicine (ICSM) they created 6 recommendation points. Similar to those points listed above the NATA recommends: delaying specializing in a single sport for as long as possible, participate in one organized team per season, do not play in a single sport more than eight months per year, do not train in more hours per week than the athlete's age, take two rest days per week, and at the end of each competitive season take time to rest between organized sports (NATA, 2019).

Implications and Conclusions

Current literature identifies several gaps in the research that is currently available. Mostly a limited understanding of when an athlete should specialize, researchers David Bell and Andrea Stracciolini published an article in 2019 to help guide where future research should be aimed. One of the largest gaps remaining on the topic is determining a correct or best age to specialize. Children all develop differently so it is difficult to treat the issue as though it can apply to every individual athlete. Similarly, research has yet to

determine how burnout, anxiety, and stress are associated with choosing to specialize in early childhood. Another gap in the research demonstrates a lack of evidence regarding later specialization promoting lifelong fitness (Bell & Stracciolini, 2019). Specialization in recent years has become a very important research topic. The literature review demonstrates there are still many questions to be answered on its effectiveness and necessity.

Purpose of Study

The purpose of this research is to further investigate the perceptions of athletes who have reached the NCAA collegiate level, specifically evaluating if specialization is necessary for future athletes to attain the same level of success by reaching the NCAA collegiate level. As demonstrated in the literature review, there is a lack of research in the area surrounding college athletes and their perceptions towards specializing in their sport. Only one study has previously evaluated this area and this study will add to the current knowledge in this field. This study will also evaluate what training methods are most important for youth athletes to reach the NCAA collegiate level.

Research Questions and Hypotheses

There are two main questions this study will aim to answer.

1. What are the perceptions of NCAA collegiate athletes at a mid-major D1 institution in the Midwest regarding specialization?
2. Do NCAA collegiate athletes at a mid-major D1 institution in the Midwest believe being a multisport or single sport athlete are more important to reach their level of success?

It is hypothesized that specialization will not be perceived as necessary before high school to reach the NCAA collegiate level, but specialization will be necessary during high school in some form.

Delimitations and Limitations

Parameters were set to gather a specific population of participants for this study. First, participants must be current NCAA collegiate athletes at a mid-major D1 institution in the Midwest. Second, participants must be a part of the 2019-2020 team of their chosen sport. Per the Institution Review Board's (IRB) orders, permission was granted by the assistant athletic director at an NCAA mid-major D1 institution in the Midwest to survey their 2019-2020 varsity athletic teams on campus.

There were some limitation to this study. First, athletes may not have fully understood sport specialization. When questioned about whether they specialized or not before college, it is based on their own self-identification of what they know as specializing. This could create a difference in subgroups if their definition differs from the researcher's definition. Second, an unforeseen pandemic forced a change in how data was collected. Students were moved off campus and spring sports were cancelled. The IRB granted permission to collect data through electronic methods. This had a low turnout in numbers compared to the paper surveying that had already been completed. Several teams also did not respond to taking the electronic survey, thus greatly affecting sample size.

Assumptions

Several assumptions were made with the study population. First, athletes will be completely honest in their responses and will read carefully to answer thoughtfully. Since

surveys were anonymous and completed at the athlete's own pace it is assumed they will fill out the survey to the best of their ability. Second, it is assumed that athletes will have knowledge on what it means to specialize. With the increasing attention that has been brought to specializing over the last decade, it can be assumed that most if not all athletes are aware of a general definition of specialized training. Third, it is assumed that the athletes taking the survey will fill it out completely.

Operational Definitions

The following terms are defined to clarify their use in the study:

Single-sport specialization: participation in one sport or intensive training, at least eight months or more out of the year, and at the exclusion of other sports (DiFiori et al., 2014; N. Jayanthi, Pinkham, Dugas, Patrick, & LaBella, 2013; Myer et al., 2015).

Research Plan

Using a validated survey tool, NCAA collegiate athletes at a mid-major D1 institution in the Midwest will be asked about their perceptions on the necessity of early specialization and what training habits they believe are necessary to reach the same level of sport participation they have attained. The study was approved by Eastern Illinois University's IRB office for in-person surveying and later updated to electronic surveying after classes were moved off campus due to the COVID-19 pandemic. To assist in the discussion of the surveyed institution, it will be given the pseudonym of University Blue. Permission was granted by University Blue's assistant athletic director to contact coaches and athletes. Athletes were given surveys initially through the academic center at University Blue. However, the academic center is not utilized by every athlete on campus. Surveys were then dispersed to the athletes through team athletic trainers,

graduate assistant coaches, and the researcher before practices. Each team that granted permission for their student athletes to be surveyed was given a manila envelope containing surveys according to the number on their roster on University Blue's athletics webpage. Once classes were moved to online only, the survey was made available through Qualtrics and was shared by coaching staff through e-mails. After survey collection was completed, data was compiled into a data sheet and analyzed through Excel.

Significance of the Study

There is a lack of research regarding collegiate athlete perceptions on specializing in sport. In the United States, college is a pre-requisite for most professional leagues; meaning that it is the first level most athletes try to attain when on the path for becoming an elite athlete. Several studies have been conducted looking at the perceptions of club athletes, professional athletes, national athletes, and international athletes; however, only one study has researched the perceptions of collegiate student athletes. The aim of this study will be to add to the limited knowledge on collegiate athletes' perceptions and their feelings on the need to specialize early. This study will also evaluate what training habits these athletes believe to be most important to attain the same success they have. Only one study has previously evaluated this area, this study will add to the current knowledge on the topic.

Methods

This study was conducted at University Blue, a DI NCAA college in the Midwest. Participants were all current 2019-2020 Varsity athletes at University Blue. Data was

collected through the academic center, at practices, and later online through Qualtrics by the researcher, athletic trainers, and graduate assistant coaches.

A validated survey tool created by Eric Martin and his colleagues was used to survey student athletes on campus through paper. He was contacted by e-mail and the researcher was given permission to replicate the study using his original survey instrument. The written permission statement provided through e-mail can be viewed under Appendix A. The questionnaire contained descriptive questions (age, gender, sport, playing time, scholarship status), past sport participation experience, past training history, and questions on their perception of specializing before and during high school. The initial survey was adjusted by removing some questions to better reflect the purpose of this study. The survey and adjustments are reflected in the Appendix B.

The questionnaire was shared through the academic center, at practices, and later online through Qualtrics by the researcher, athletic trainers, and graduate assistant coaches. Data collection occurred over a two-month period to allow as much time to gather data as possible. Paper surveys were used to gather responses until classes were moved online, from which point Qualtrics was utilized. Once the time window was closed for gathering surveys, the data was organized into an Excel spreadsheet for analyzing. Using the results from the questionnaire, averages were computed to determine any significant differences in perceptions of specializing in a single sport before high school and during high school.

Results

At the end of the surveying window, 138 athletes total completed the survey. The population consisted of 67 males and 71 females. The data was grouped by whether

athletes specialized in their athletic careers before college. It was found that 73 athletes self-identified as having specialized prior to college while the remaining 65 athletes self-identified as having not specialized prior to college. Academically, the population was made up of 43 freshmen, 31 sophomores, 35 juniors, 23 seniors, 2 fifth year students, and 4 graduate students. Out of 138 surveys, 126 reported on the age they first played in organized/competitive sports. The average age was 8.75 years. In the specialized group, out of 73 athletes, 65 respondents reported an age. The average age these athletes chose to specialize was 11.54 years. Below are summaries of the data gathered from their responses.

Perceptions of Specializing

As mentioned above, 73 athletes self-identified as having specialized prior to college and 65 self-identified as having not specialized prior to college. This was determined by the question, “did you specialize and play in only one sport prior to college?” Two questions following evaluated the athletes’ perceptions on the necessity to specialize before high school and during high school. The data was analyzed in whole and again by categorizing the two groups. Athletes were given a 9-point Likert scale ranging from ‘not at all important’ to ‘very important’. The ranges went as follows: 1-2 ‘not at all important’, 3-4 ‘less important’, 5-6 ‘somewhat important’, 7-8 ‘more important’, 9 ‘very important’. Refer to figure 1 below to see a side by side comparison.

On average, the total population of athletes found specializing before high school to be between ‘less important’ and ‘somewhat important’ with a Likert score of 4.54. When asked about specializing during high school, the average response was between ‘somewhat important’ and ‘more important’ with a Likert score of 6.33. Specialized

athletes were differing in their average ranking. Their perceptions on specializing prior to high school averaged a Likert score of 5.33, ‘somewhat important’; while their perception on specializing during high school averaged a Likert score of 7.07, ‘more important’. The non-specialized athletes on average perceived specializing before high school as ‘less important’ with a Likert score of 3.66 and specializing during high school as ‘somewhat important’ with a Likert score of 5.51.

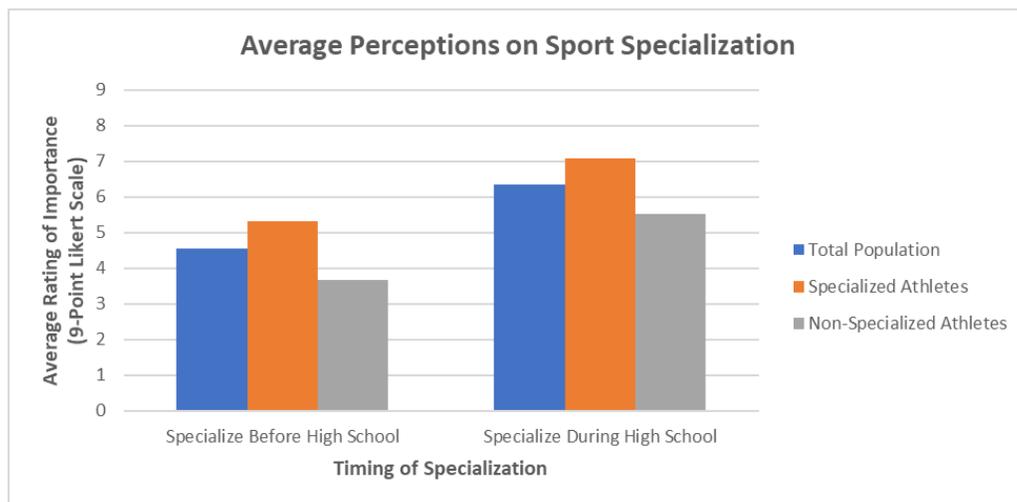


Figure 1. Average perceptions on sport specialization by group.

*Total population (n=138)

**Specialized athletes (n=73) as indicated on survey.

***Non-specialized athletes (n=65) as indicated on survey.

Training Methods

A section of the survey asked the athletes to rank how important they feel certain training activities are for today’s youth to succeed in their chosen sport at the college level on a 5-point Likert scale. The scale ranged from ‘not at all important’ to ‘extremely important’. Their options included travel team/club, school team, private lessons, participating in multiple sports, community recreation center, practicing on your own,

neighborhood play, pick-up games/play, sport specific camps, instructional videos, strength training, parent instruction, and other opportunities. The data was analyzed by total population, specialized athletes, non-specialized athletes, and community size.

On average the total population found practicing on your own (4 points) as 'more important' training compared to the other available options. School team (3.86 points), travel/club (3.83 points), strength training (3.69 points), sport specific camps (3.31 points), private lessons (3.24 points), multiple sports (3.24 points), and other opportunities (3.05 points) were ranked between being 'somewhat important' and 'more important' training methods compared to the other available options. In the specialized athlete population travel/club (4.08 points) was ranked as a 'more important' training method. Other methods such as school team (3.99 points), practicing on your own (3.95 points), strength training (3.95 points), sport specific camps (3.36 points), private lessons (3.15 points), and instructional videos (3.12 points) were ranked between 'somewhat important' and 'more important'. Non-specialized athletes ranked practicing on your own (4.2 points) and school team (4.12 points) as 'more important' training methods. Ranking between 'somewhat important' and 'more important' were strength training (3.98 points), multiple sports (3.85 points), travel/club (3.69 points), sport specific camps (3.54), and private lessons (3.12 points). Training methods relating to group type are reflected in Figure 2.

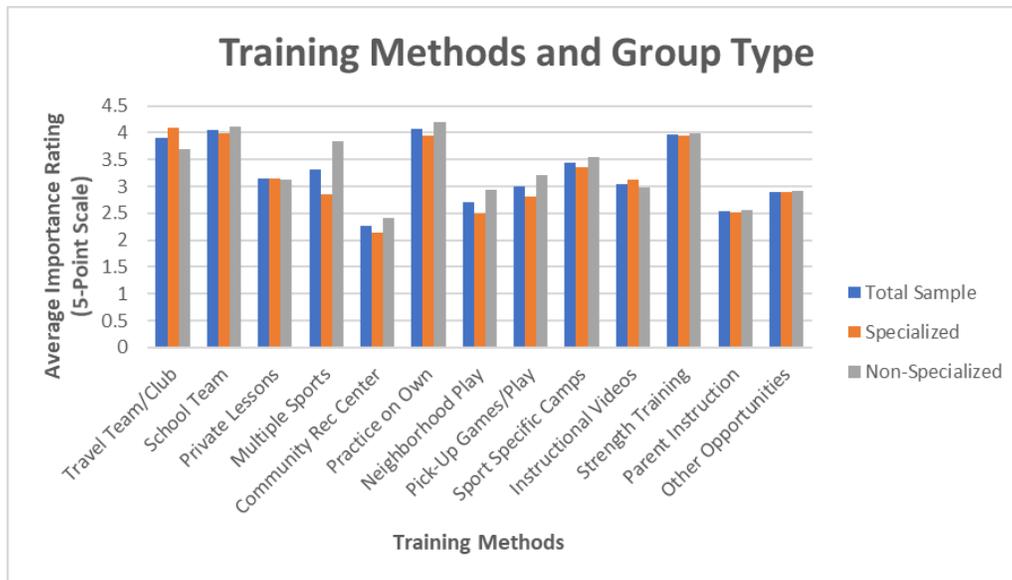


Figure 2. Training methods importance by group type.

Additional Findings

During the evaluation of the data, unanticipated but remarkable findings were discovered. One was related to the size of the communities the student athletes grew up in. The other was related to athletic scholarship.

Training methods relating to community size are reflected in Figure 2. The small-town (n=36), less than 10,000 people, athletes on average found school teams and practicing on your own to be ‘more important’. Travel/club team, multiple sports, and sport specific camps were ranked to be ‘somewhat important’ in this group. The next community size up is the large town/small city group (n=36), between 10,000 and 50,000 people. On average they ranked travel/club team, school team, practicing on your own, and strength training as ‘more important’. Then ranked as ‘somewhat important’ in this group included private lessons, multiple sports, sport specific camps, and instructional videos. Next, the medium city group (n=24), between 50,000 and 250,000 people, on average ranked travel/club team, school team, practicing on your own, and strength

training as ‘more important’. Private lessons, multiple sports, pick-up games, sport specific camps, and instructional videos were found to be ‘somewhat important’ training methods. Last was the large city (n=42), more than 250,000 people. These athletes found practicing on your own to be ‘more important’ than other training methods. Ranked as ‘somewhat important’ to this group included travel/club team, school teams, private lessons, multiple sports, sport specific camps, strength training, and other opportunities. Training methods relating to community size are reflected in Figure 3.



Figure 3. Training methods related to community size.

The athletic scholarship statuses of both the specialized and non-specialized groups were broken down into percentages. These percentages are reflected in Figure 4. In the specialized group 13.8% were receiving a full scholarship, 28.3% were receiving a partial scholarship, and 10.9% were not receiving any athletic scholarship. In the non-specialized group 10.1% were receiving full scholarship, 23.2% were receiving a partial scholarship, and 13.8% were not receiving any athletic scholarship. There was no

correlation or statistically significant difference between scholarship status and specializing status.

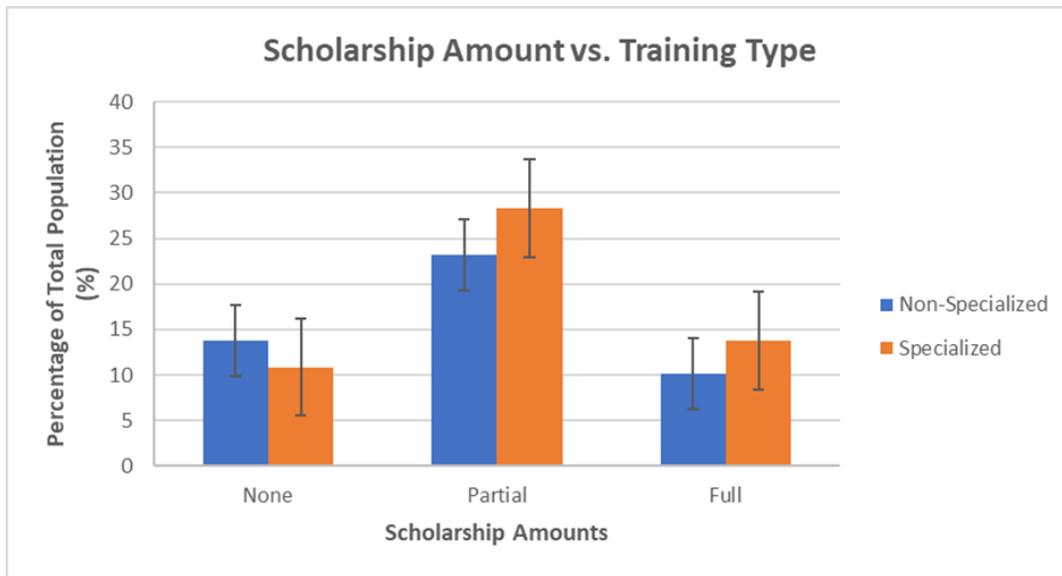


Figure 4. Scholarship amounts and percentage per group.

Discussion

The resulting data supported the hypothesis that specialization is not perceived as necessary before high school to reach the NCAA collegiate level, but that specialization will be necessary during high school in some form. This aligns with the DMSP's early diversification trajectory and the current research stating that specialization should be held off until after puberty or high school (Côté, 1999; Côté & Vierimaa, 2014; Côté, Lidor, & Hackfort, 2009; Strachan, Côté, & Deakin, 2009). This also aligns with the original research conducted in 2017 by Martin, Ewing, & Oregon. In their study athletes who identified as specializers prior to college, reported a mean age of 12 years old as the age they began specializing. The mean age is incredibly close to the results of this study which was 11.54 years. One weakness identified in this reporting measure is that the athletes self-identified whether they specialized or not. While the main goal of the study

is to gather athlete perceptions, it is important to understand that some athletes who self-identified as specializing may not have specialized according to the given definition that most research applies. It is also important to note that the original study had a sample size of 1,041 athletes, meaning the current sample is only 13% of what the original study investigated (Martin, Ewing, & Oregon, 2017). This data produced consistent results even with a smaller sample size and is important in demonstrating that the data can be replicated, and the current measure is meaningful.

Additional noted findings demonstrated that community sizes were influential, while scholarship status was not statistically significant. Smaller community sizes will rely more on school teams compared to other training methods. However, they surprisingly only found multiple sports to be ‘somewhat important’. This finding was interesting after reviewing some of the additional comments the athletes left at the bottom of the survey regarding why specializing is not important. These comments can be viewed in table D2 under Appendix D. Many of the additional comments cited less injury, more connections, and better versatility from participating in multiple sports compared to specializing. When considering smaller communities, it is assumed that with fewer numbers of athletes and smaller schools’, athletes will rely on school teams. That in turn requires them to play multiple sports. As shown in the data, this may not be the case. Multiple sports were ranked the highest in the small-town size group compared to the other groups, but was about even in ranking compared with travel/club teams.

As for larger cities, they relied more on individual practice. It was the only training method chosen as ‘more important’ in large cities. This may be related to the fact that in larger cities, there are denser populations. Even with access to more amenities to

train, there is more competition and it is imperative to stand out amongst peers. That requires extra time training outside of practices and teams. This is reflected in some of the extended responses the athletes shared at the end of the survey which can be viewed in table C1 under Appendix C. Many of their responses were centered around showing a serious passion and dedication to the sport to stand out to coaches, perfect skills, and become the most skilled through experience.

Some responses also cited that specializing is important for attaining scholarships. As the data demonstrated, specialized athletes did not have a statistically significant difference compared with the non-specialized group in receiving a scholarship. However, in the total sample, a specialized athlete was more likely to receive some form of scholarship compared to the non-specialized athletes. It is important to note that the question on the survey did not take into consideration academic scholarship.

Future Research

This study, as well as the original study, evaluated NCAA D1 collegiate student athletes' perceptions regarding single sport specialization. I would recommend future replications of this research be conducted in other regions of the United States so comparisons may be made by region. The study was also limited to only NCCA D1 universities in the Midwest. Given the numerous amounts of conferences and divisions that young athletes can participate in, it would be helpful to evaluate these other levels to see if there is consistency.

Through the literature review and course of this research, it was noted that there is a gap in understanding an appropriate time to specialize and if it is necessary. As this study has demonstrated, specializing is not considered necessary before high school by

athletes that have already attained success in their sport. This aligns with the current recommendations to wait on specializing as long as possible and at least until puberty. With more and more research showing that athletes who specialize during high school are able to obtain the same success as those who specialize beforehand, it leaves researchers with more questions. The biggest gap now being a lack of understanding as to why athletes are specializing at all before high school. In prior studies, scholarship was cited as a common hypothesis explaining why some young athletes choose to specialize, but the data showed in both this study and the initial study there is no correlation between specialized and non-specialized groups in regard to attaining athletic scholarships. Future research should be aimed at discovering why specialize at all if it clearly holds no benefit to the athlete in short-term or long-term success. The data also showed that community size contributes to these training choices. This is an indication that further studies should be conducted evaluating how availability of options can influence athlete perceptions on training habits. As most parents and coaches are always looking for the best way to prepare athletes for collegiate training, it is imperative they have this information.

Conclusion

For this research study, athletes from an NCAA D1 mid-major Midwest university were surveyed to identify perceptions regarding single sport specialization and these research questions were asked. What are the perceptions of NCAA collegiate athletes at a mid-major D1 institution in the Midwest regarding specialization and do these athletes believe being a multisport or single sport athlete are more important to reach their level of success? It was hypothesized that specialization will not be perceived as necessary before high school to reach the NCAA collegiate level, but that

specialization will be necessary during high school in some form. The results were able to be replicated from an initial study that was completed in 2017. The hypothesis was confirmed that specialization was not perceived as important before high school. Some unintended but remarkable findings identified that community size and scholarship were factors that have potentially played roles in perception. Although the sample size was much smaller, the results from this study still add to the current knowledge on athletes' perceptions regarding specializing and offers future direction for research.

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Appendix A

Hi Jordyn -

Thanks for reaching out - I would be happy for you to use my survey instrument (or any part of it) or help in any other way. I think the reasons for specialization are so important to understand.

I'm attaching the survey instrument here. If you need anything else from me - feel free to reach out.

Good luck with your study.

Eric

10/18/2019

*If you need access to complete credentials, please contact the primary author of this thesis.

Appendix B**CONSENT TO PARTICIPATE IN RESEARCH****Perceptions of Early Single Sport Specialization in NCAA Collegiate Athletes**

You are invited to take part in a research study about your athletic careers, perceptions of your youth sport experiences, and what activities you believe are most beneficial for sport success. This study is being conducted by Jordyn Blood and Dr. Lee Ann Price, Professor in the Department of Kinesiology, Sport, and Recreation.

You have been asked to participate in this study because you are a current NCAA student athlete at your university.

Purpose of the Study

The purpose of our study is to evaluate the relationship between early-single sport specialization and its long-term effects on college athletes regarding feelings of burnout and injury rate. The planned study will provide parents, coaches, trainers, and medical professionals a better understanding on what training levels are appropriate in young athletes and how to manage feelings of burnout as they continue into their collegiate and professional careers.

Procedure

If you agree and volunteer to participate, I will ask for 10 to 15 minutes of your time to complete a self-administered, questionnaire (survey).

Once you complete this survey, your participation is concluded; there will be no follow-up surveys or other data collection activities. Please understand that no compensation or academic credit is being offered for your participation.

Potential Risk and Discomforts

Demographic items such as age, sport experiences, and gender will be collected in the survey. These items will be analyzed in aggregate and will be used to only describe the sample as a whole, thus minimizing any risk of re-identification. Your institution will also remain anonymous, again decreasing the risk for reidentification. Despite these potential discomforts, it is not anticipated that you will experience any lasting inconvenience or distress from completing this questionnaire; the only other discomfort may be the time it takes to answer the questions openly and honestly.

Potential Benefits to Volunteer Respondents

Your honest answers will help give researchers a better understanding of an athlete's perception on early single sport specialization. Our goal is to be able to better inform parents, coaches, trainers, and medical professionals on the importance of youth athletes' feelings in their own training habits and if specialization is necessary for collegiate success.

Confidentiality

Confidentiality can be maintained by not collecting any identifying information. Further, the questionnaire does not ask for you to provide any personally identifying information above typical social and demographic information such as gender, race, or age. Results will not report data for individuals, only for groups of respondents that possess commonalities such as sport, years of participation, and perceptions on training experience.

Participation and Withdrawal

Participation in this research study is voluntary and not a requirement or a condition for being the recipient of benefits or services from Eastern Illinois University or any other organization sponsoring the research project. If you volunteer to be in this study, you may withdraw at any time without consequences of any kind or loss of benefits or services to which you are otherwise entitled.

You may withdraw at any time by returning the survey incomplete. If you choose to withdraw, your information and responses will not be recorded and shredded to protect any information on the survey. There is no penalty if you withdraw from the study and you will not lose any benefits to which you are otherwise entitled.

Identification of the Investigator

Thank you for considering this invitation. If you have any questions or concerns about this study, please contact Jordyn Blood or Dr. Lee Ann Price at the e-mail addresses listed below.

Jordyn Blood, ATC; Graduate Student
Department of Kinesiology, Sports, and Recreation
Email address: jmblood@eiu.edu

Lee Ann Price, Ph.D., ATC; Professor
Department of Kinesiology, Sports, and Recreation
Email address: lprice@eiu.edu

Rights of Research Volunteer Respondents

If you have any questions or concerns about the treatment of human participants in this study, you may call or write:

Institutional Review Board

Eastern Illinois University

600 Lincoln Ave.

Charleston, IL 61920

Telephone: (217) 581-8576

E-mail: eiuirb@www.eiu.edu

You will be given the opportunity to discuss any questions about your rights as a research subject with a member of the IRB. The IRB is an independent committee composed of members of the University community, as well as lay members of the community not connected with EIU. The IRB has reviewed and approved this study.

You indicate your voluntary agreement to participate by completing and returning this survey.

You may withdraw at any time by returning the survey incomplete. If you choose to withdraw, your information and responses will not be recorded and shredded to protect any information on the survey. There is no penalty if you withdraw from the study and you will not lose any benefits to which you are otherwise entitled.

Demographic Information

Thank you for agreeing to participate in this survey. The insights you provide will be very helpful to us in understanding the path you have traveled to become an athlete at a DI university. All responses are confidential and no identifying information is collected to assure anonymity.

Directions: Please answer the following questions to the best of your knowledge by **circling the best response**.

Academic Grade:

Freshmen Sophomore Junior Senior 5th year Grad Student

Gender: Male Female

Race/ethnicity: ~~African American~~ ~~Asian~~ ~~Caucasian~~ ~~Hispanic~~
~~International~~ ~~Native American~~ ~~Other (please specify)~~ _____

~~What is your mother/female guardian's highest level of education? (Choose highest)~~

~~High School Some college Bachelors Degree Masters Degree (JD, Ph.D or M.D) Don't know~~

~~What is your father/male guardian's highest level of education? (Choose the highest)~~

~~High School Some college Bachelors Degree Masters Degree (JD, Ph.D or M.D) Don't know~~

Choose the option that best describes the community where you grew up

___ Small Town (Less than 10,000 people)

___ Large Town/Small City (Between 10,000 - 50,000 people)

___ Medium sized city (Between 50,000 - 250,000 people)

___ Large City (More than 250, 000 people)

Collegiate Sport Experience

Current collegiate varsity sport _____

Age when you first played this sport (organized/competitively) _____

What is your playing, or projected playing, status for this season?

Starter Playing sub Play very little Play None Redshirt

What is your current scholarship status?

Full Partial None

~~If given the opportunity would you like to play more than one sport in college?~~

~~Yes _____ No~~

Prior to college did you play year round in your current sport?

Yes No

Sport Experience

Directions: In the space provided below, please circle each level at which you played each sport. For example, if you played soccer during any part of your elementary school years, circle elementary. If you also played soccer during all or part of your years in middle school, but did not play high school, circle “Middle School” but not High school. An example is shown below. Skip the sport if you did not play it.

Example:

Soccer Elementary Middle School **Freshman** **Sophomore** **Junior** **Senior**

Baseball Elementary Middle School Freshman Sophomore Junior Senior

Basketball Elementary Middle School Freshman Sophomore Junior Senior

Bowling Elementary Middle School Freshman Sophomore Junior Senior

Cheer Elementary Middle School Freshman Sophomore Junior Senior

Cross Country Elementary Middle School Freshman Sophomore Junior Senior

Dance Team Elementary Middle School Freshman Sophomore Junior Senior

Figure Skating Elementary Middle School Freshman Sophomore Junior Senior

Field Hockey Elementary Middle School Freshman Sophomore Junior Senior

Football Elementary Middle School Freshman Sophomore Junior Senior

Golf Elementary Middle School Freshman Sophomore Junior Senior

Gymnastics Elementary Middle School Freshman Sophomore Junior Senior

Hockey Elementary Middle School Freshman Sophomore Junior Senior

Lacrosse Elementary Middle School Freshman Sophomore Junior Senior

Rowing Elementary Middle School Freshman Sophomore Junior Senior

Soccer Elementary Middle School Freshman Sophomore Junior Senior

Softball Elementary Middle School Freshman Sophomore Junior Senior

Swimming and Diving Elementary Middle School Freshman Sophomore Junior Senior

Tennis Elementary Middle School Freshman Sophomore Junior Senior

Track & Field Elementary Middle School Freshman Sophomore Junior Senior

Volleyball Elementary Middle School Freshman Sophomore Junior Senior

Water Polo Elementary Middle School Freshman Sophomore Junior Senior

Wrestling Elementary Middle School Freshman Sophomore Junior Senior

Other (Please List) _____
 Elementary Middle School Freshman Sophomore Junior Senior

Other (Please List) _____
 Elementary Middle School Freshman Sophomore Junior Senior

Accessibility to athletic options

Directions: Please indicate **how often you participated** in various activities for your primary sport.

If you did not participate in an activity because it was not available, please choose not available.

Activity	Not at all	Very little	Sometimes	Often	Very Often	Not Available
1. Travel Team/Club	0	1	2	3	4	N/A
2. School Team	0	1	2	3	4	N/A
3. Private Lessons	0	1	2	3	4	N/A
4. Participating in Multiple Sports	0	1	2	3	4	N/A
5. Community Recreation Center	0	1	2	3	4	N/A
6. Practicing on your own	0	1	2	3	4	N/A
7. Neighborhood Play	0	1	2	3	4	N/A
8. Pick-up Games/Play	0	1	2	3	4	N/A
9. Sport Specific Camps	0	1	2	3	4	N/A
10. Instructional Videos	0	1	2	3	4	N/A
11. Strength Training	0	1	2	3	4	N/A
12. Parent Instruction	0	1	2	3	4	N/A
13. Other Opportunities	0	1	2	3	4	N/A

Directions: Please tell us **how important you feel** the following activities are for today's youth to succeed in their chosen sport at the college level.

Activity	Not at all important	Less Important	Somewhat Important	More Important	Extremely Important
1. Travel Team/Club	1	2	3	4	5
2. School Team	1	2	3	4	5
3. Private Lessons	1	2	3	4	5
4. Participating in Multiple Sports	1	2	3	4	5
5. Community Recreation Center	1	2	3	4	5
6. Practicing on your own	1	2	3	4	5
7. Neighborhood Play	1	2	3	4	5
8. Pick-up Games/Play	1	2	3	4	5
9. Sport Specific Camps	1	2	3	4	5
10. Instructional Videos	1	2	3	4	5
11. Strength Training	1	2	3	4	5
12. Parent Instruction	1	2	3	4	5
13. Other Opportunities	1	2	3	4	5

Did you specialize, and play, in only one sport prior to college? Yes No

If yes, what sport? _____ If yes, at what age did you specialize? _____

Directions: Circle the response that best represents how you feel.

	Not at all Important	Less Important	Somewhat Important	More Important	Very Important				
1. To what extent do you think that specializing in a sport BEFORE FRESHMAN YEAR IN HIGH SCHOOL is necessary to become a DI athlete?	1	2	3	4	5	6	7	8	9
2. To what extent do you think specializing in a sport AT ANY TIME DURING HIGH SCHOOL is necessary to become a DI athlete?	1	2	3	4	5	6	7	8	9
3. How important was it to your PARENTS that you get an athletic scholarship?	Not at all Important	Less Important	Somewhat Important	More Important	Extremely Important				
4. How important is it to your PARENTS/FAMILY that you get a Bachelors degree before you leave college?	Not at all Important	Less Important	Somewhat Important	More Important	Extremely Important				
5. How important is it to YOU that you get a Bachelors degree before you leave college?	Not at all Important	Less Important	Somewhat Important	More Important	Extremely Important				
6. If you did not receive an athletic scholarship, how likely would it be that you would still be attending college?	Not at all Likely	Slightly Likely	Moderately Likely	Very Likely	Extremely Likely				

Use the space below to explain why you feel it is, or is not, important to specialize in order to be successful in sport.

Thank you for your participation!

Appendix C

Table C1

Additional Comments On Why Specializing Is Important

Comment On Why Specializing Is Important
I feel like you have to specialize in that sport because if your focus is on that sport you will be likely to be successful.
You have to specialize in a sport because all of your effort is going into leaving successful.
Kids start at young age and now it is important to try to be specific in one and put all effort in it.
Need more time practicing to become specialist.
It is important to specialize in a sport if you want to be good and play at a higher level. This brings you success because you have reached the highest level of the game.
Important to get better and more experience in that specific sport.
Specializing gives you more time for that one sport.
It is important to specialize late in high school, but until then there is no better way to train athleticism than by playing other sports. Also, the kids should have the choice on what they play, whenever they play it, without outside pressure to specialize.
It is important because you better yourself as a player to become the best at the sport.
Not important but often necessary because of time restraints, success equals lots of time and effort.
It is important to specialize because it gives you a chance to learn and become experienced.
If you don't practice your sport all the time you more then you likely will not be competitive enough to succeed at a high level.
It gives needed experience to become successful.
I feel like it is so you can focus on one thing and prevent injuries.
I think it is important, so you are more prepared for the amount of time/effort you put in at a college level.
It is important, but after a while however picking up a variety of activities to better yourself or help you relax may help.
Specializing can help someone be the best athlete the person can be in the sport.
It is important to be able to focus on one sport so you can be good.
It is important to specialize so you can be better.
At some point if an athlete truly wants to be successful, they need to live and breathe this sport. This level of focus is required before you become great in your sport.

Once you are in high school to get better.
In my case, I'm undersized for my position so I needed to specialize and become a super smart and strategic player to add to my skillset.
Specializing in a sport at a younger age is important because you'll learn them sooner and remember them more. They'll be more in your brain rather than being freshly learned.
Focus in on the sport to gain all knowledge.
You need to be focused and invest in one thing to have good results.
It's important to specialize because if you don't you're less likely to be recruited for college (if that's where you want to go).
To gain the experience of playing an intense sport and what it takes to play at college level.
I think it is important because it helps you find strengths and weaknesses and how much drive you have.
I feel it is important to specialize in the sport in order to be successful because the more repetition and the more effort the more likely you will reach the desired outcome. Hours and hours of play will make you better.
I think specializing in a single sport is important because it gives you the opportunity to reach your higher level.
I think it's important because if a kid really wants to succeed, he/she should use as much time as they have doing whatever they can to reach their goal.
It is important so you can only focus on getting better at that one sport but playing other sports will help with other things like coordination. The earlier you specialize the more range of learning you are going to have.
If you don't focus on what you want you won't be successful.
I think it is important because when you specialize it can help you get better at your sport sooner.
It is very important to specialize in order to be successful because you do not want to be way behind in college.
It is important because the more time you put in the better you'll do.
If you do the work and participate and are determined to be great one will be very successful in that sport.
I believe that it's very important because it keeps your focus.
To be perfect in one sport you need to focus on it and it alone.
It's important so that you can perfect your craft and perform at the best of your ability.
Specializing is important halfway through high school.

Focus on one thing or event can take you a long way.
To stick out and beat your opponents you should go on your own and reach out to others for extra training.
Specializing before you graduate is important so you can be great at that one sport in college.
It is important because you must train, you don't wake up with all the skills.
I believe it's very important, it allows one to perfect their skill.
Specialize means focus, if you have a goal and focus on it, if you sacrifice things, you'll achieve it.
If you don't devote all your time to it, others will and you won't be able to catch up. In college you don't have time to get much better so you already need to be specialized to do great.
Each sport has different techniques, strategies, and muscles to be used. They're all different. To excel, you need to practice one.
I feel as if it's very important to specialize in a sport at a young age to get really good.

Appendix D

Table D2

Additional Comments On Why Specializing Is Not Important

Comment On Why Specializing Is Not Important
Being able to specialize in other sports helps get free education and also money.
I don't believe it is important to specialize in order to be successful because all sports are interlinked. What you learn in one sport can prepare you better for another. Also, if you only do sport specific training then you're only specializing parts of your body. A well-rounded athlete has less potential for injury because they won't have muscular imbalances.
There comes a point in time where you do have to focus on your specific sport that you want to play in college. However, playing other sports is good to prevent burn out and produce more well-rounded athleticism.
Sports specialization is the worst thing a young athlete can do before they reach college. You miss out on various types of movements that could help in your primary sport.
I feel specializing is good in certain aspects, but it is better when you participate in many different sports. I think once you figure out what you're best at that should be what you want to stick to in order to get part of your education paid for. The age you figure that out is different for everyone.
I think at a younger age you need to play multiple sports to become an all-around athlete, then at some point in high school or going into college you should specialize to be successful.
It is not important to specialize in order to be successful in sport, the most successful are the best all-around athletes which results from playing multiple sports.
Other sports offer utilization of different muscle groups. I think playing other sports will help one succeed in their primary sport.
It is not important; kids are more prone to injury and don't learn time management skills either.
It is important to specialize late in high school, but until then there is no better way to train athleticism than by playing other sports. Also, the kids should have the choice on what they play, whenever they play it, without outside pressure to specialize.
I believe that it is not important to specialized in just one sport. Playing multiple sports allows you to become more versatile and athletic in which will allow you to become a better athlete in a certain sport that you wish to specialize in.
It is better to play multiple sports to improve your overall athleticism.
Playing multiple sports allows an athlete to practice and improve many physical and mental skills that specialization doesn't allow.
I do not think it is important to specialize because multiple sports train different athletic abilities.

Not important but often necessary because of time restraints, success equals lots of time and effort.
Nowadays coaches are looking at more multi-sport athletes so talent wise it could be important but not for scouting.
I feel youth should participate in as many and as often as they can to develop sport skills.
It isn't very important because playing multiple sports shows good athleticism which is important in sports.
I don't think it's necessary to specialize until junior year of high school because playing other sports helps to make you more athletic.
It is not important because you learn different abilities from different sports.
Important to be well rounded in all sports, not just one.
It is important after a while however picking up a variety of activities to better yourself or help you relax may help.
I didn't specialize in anything until I started swimming freshman year of high school. It just all depends on the person and their drive/motivation.
I did not specialize until high school and I am playing at D1 level. Playing other sports helps with main sport.
I find that being a multi-sport athlete is actually more beneficial to athletes than specializing in one sport. Principles in other sports often aid a player in another sport.
Because you will less likely get injured or have over-use injuries if participating in several sports. Also get a wider social network of friends, which is very important.
I feel that you don't have to specify in one sport until sophomore year of high school because some sports help with other sports.
I think it's important to participate in multiple sports. I feel like basketball helped me a lot with soccer. Other sports train different muscles and create new connections.
I feel it is important to specialize in multiple sports. This is because you will not get bored of one sport and will always stay active and fit for whatever season is ahead or next.
Specializing in a sport leads to burnout of that sport.
Youth is a time to practice many sports to see which one you like best.
If you don't specialize but play in multiple sports it gives you the ability to be a well-rounded athlete. Those who peak early eventually burnout and do not grow.
I think that before age of 14, you should not specialize because it leads to burnout.
I don't think it's smart to specialize because you are closing door early. Also, I believe playing multiple sports makes the person a better athlete and opens them up to more skills, opportunities, friends, etc..
There are many different things you can take from one sport and apply it to another. I still do other sports when I can.

I don't think it's important to specialize in one sport in order to be successful. I know people who play in more than two sports and are doing amazing. It's all about determination and dedication.
Being versatile is important. That is what got coaches attention for me.
I think you should participate in multiple sports until you find out which one works for you. Then, you could specialize in a specific sport. More than one sport can keep you in condition because most sports have an off season.
Being a well-rounded athlete will give you multiple opportunities to grow and discover what you are great at and enjoy. You'll learn many skills relatable to each sport/everyday life.
It is not important to specialize in order to be successful in a sport because the training of multiple sports typically benefits the sport you would like to specialize in.
I do not think it is very important to specialize in order to be successful. I think that playing many sports young is more important and keeps you interested rather than specializing. I do think later on in high school you should specialize so you're making a decision on what you want to do in college and focus on your craft.
I feel that it is not extremely important to specialize because many sports teach time management, discipline, and versatility.
It's important to play multiple sport to develop skills that are not specific to your primary sport.
I feel that different sports teach you different skills that can relate from sport to sport.
Playing more than one sport can help kids learn different things which can be a jump start. Also, playing multiple sports can help someone pick what they really want to do.
You have to be very well-rounded in every aspect of that specific sport to be good at it.
I believe that sport specialization is not necessarily as important as being a multi-sport athlete. Being involved in multiple sports can be extremely beneficial for learning and even carrying over certain habits learned from one sport, to another. When an athlete is involved in more than one sport they have the ability to learn even more and become even more athletic.
Playing multiple sports throughout high school helped me. I believe that it is important to play other sports to figure out what sport you are good at or the sport that you most passionate Bout. It also helped me playing other sports to not get "burnt out" on one specific sport by playing it all the time. Also, by playing other sports I believe it made me become a more well-rounded person.