

SENIOR HONORS PROJECT: COMPETITIVE ATTITUDES OF CHILDREN AND  
ADOLESCENT ATHLETES

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## **Abstract**

Youth athletes undergo a significant number of physiological and psychological changes as they mature within their respective sports. They are often noted by coaches to transform from noncompetitive to very competitive as they grow. Trait competitiveness has been described in previous literature as Competing to Win/CW (competing to dominate others) and Competing to Excel/CE (competing to surpass personal goals) [6]. This study aims to determine if a change from competing to excel to competing to win occurs in association with age and gender. Three questionnaires (Hypercompetitive Attitude Scale, Personal Development Competitive Attitude Scale, and Goal Competitiveness subscale of the Competitiveness Questionnaire) were used to determine a scaled score for CW and CE. 29 athletes (13 male, 16 female, ages 8-17 years) completed the questionnaires. Results demonstrated that CE is maintained and CW is obtained around the age of 12 ( $p=0.036$ ). This finding will allow coaches, parents, and educators to use trait competitiveness in an advantageous manner to ensure less burnout, more involvement, and more happiness of youth and adolescents involved in athletics.

## **Review of Literature**

### ***Introduction***

Coaches of youth sports frequently observe athletes transform from psychologically and physiologically noncompetitive to very competitive. This study aims to determine whether or not the shift happens at similar ages for males and females, and if there is a single age group in which the shift takes place. Apparent physiological changes occur during puberty, but the precise age in which psychological changes take

place is unspecified in previous literature. The results of this study could potentially determine an optimal age to start pushing young athletes harder without causing them to burn out or quit their sport.

In order to establish whether trait competitiveness was more disadvantageous to males or females, Hibbard and colleagues classified trait competitiveness into two different types. Competing to win (CW) was defined as competing to dominate others, while competing to excel (CE) was defined as competing to surpass personal goals [6]. CW includes components of conflict, dominance, and aggression, while CE is a less extreme type of competitiveness that resembles achievement motivation [6]. The most profound difference between the two types of competitiveness is that CW focuses more on outperforming others while CE focuses on individual accomplishment [6]. The results of Hibbard's study showed that CW was strongly associated with males, but CE did not trend toward either gender [6]. The methods of the current study will largely be based off of Hibbard's methods.

### *Physiology of the child athlete*

Several factors contribute to competitive attitude of athletes. The physiology of the child athlete remains an important predictor of athletic aptitude, which in turn could affect psychological attitudes regarding competitiveness. Armstrong and Welsman studied the physiology of child athletes. Their essay discussed the changes that occur with puberty and how those changes may affect indicators of athletic prowess [1]. Biological clocks play an important role in the development of an athlete. Armstrong and Welsman state that boys who mature earlier are usually taller, that boys have a more

profound growth of muscle in adolescence that girls, and that girls who mature earlier are typically taller and heavier with broader hips and shorter legs [1]. In addition, a burst in peak oxygen uptake occurs as children enter adolescence [1]. The combinations of the physiological changes that take place with puberty contribute to an increase in strength, power, aerobic, and anaerobic fitness [1]. Alongside all of the physiological changes that occur during puberty, perhaps psychological changes occur as well, causing more CW trait competitiveness in athletes as they transition from children to adolescents.

#### *Previous research on runners and women*

Several previous studies explored competitive attitudes and race results of distance runners. In exploring distance running and gender differences, Deaner and colleagues used distance runners as subjects to argue that more men than women run fast in the U.S. [2]. They explain that the difference is due to men's greater training motivation, and go on to say that the trend has been stable for many decades [2]. From these findings, Deaner and colleagues concluded that distance running manifests a male disposition for competitiveness in distance running [2]. Deaner and colleagues elected to observe distance runners as their research participants because running is an accessible sport and manifests no gender bias in itself [2].

Frick and colleagues observed the competitiveness of professional distance runners [4]. They found that while women's races are indeed less competitive than men's races, those that offer large amounts of prize money or prestige show a relatively equal amount of competitiveness across genders [4]. Frick also discusses the decreasing gender gap in competitiveness that has occurred during a period of nearly forty years between

1973 and 2009 [4]. Based on Hibbard's competitiveness classifications, it is possible that women are classified as primarily CE athletes until money or prestige encourages them to develop more CW trait competitiveness.

Ecklund and colleagues also observed a population of distance runners. The results of their study stated that competitiveness and age are negatively related while competitiveness and personal best times in all race distances are positively related [3]. If competitiveness and age are negatively related, why do endurance athletes improve with age? Perhaps children become more competitive up to a certain age and then decline in competitiveness or shift from one type of trait competitiveness to another.

#### *Youth in sports and sportsmanship*

Previous studies investigate the competitive attitudes of youth participating in team sports. In a field study of 205 male soccer players aged 11-12 on 16 different teams, Scanlan and Passer utilized questionnaires before and after a soccer game in order to gauge how intrapersonal factors influence performance expectancies of the players [11]. Simple questions were asked such as "How good do you think *you* will play the game today?" and were scored on a Likert scale [11]. Pregame expectancies were assessed using intrapersonal factors, which included soccer ability, self-esteem, and competitive trait anxiety [11]. Self-esteem was defined as the assessment that an individual makes and maintains regarding oneself. It conveys an attitude of approval or disapproval, and indicates the how capable and successful the individual believes himself to be (Coopersmith, 1967, p. 4-5) [11]. Competitive trait anxiety was defined as the predisposition to view competitive sport situations as threatening to self-esteem (Martens,

1977) [11]. The results indicated that intrapersonal factors of ability and self-esteem relate to personal performance expectancies, but competitive trait anxiety does not [11]. When observed adjacent to Hibbard's study, Scanlan and Passer's results could be explained if the 11-12 year-old participants were primarily CE athletes. A higher prevalence of CW may correlate with the intrapersonal factor of competitive trait anxiety.

Ryska and colleagues used questionnaires such as the Sports Orientation Questionnaire (Gill & Deeter, 1988) to assess competitiveness, the Task and Ego Orientation in Sport Questionnaire (Duda & Nicholls, 1989) to assess motivational orientation, the Purpose of Sport Questionnaire (Duda, 1989a) to assess perceived purposes of sport, and the Multidimensional Sportsmanship Orientations Scale (Vallerand, Briere, Blanchard, & Provencher, 1997) to assess sportsmanship [10]. Ryska and colleagues concluded that participation goals become more extrinsically focused in nature as athletes become more competitive [10]. Intrinsic participation goals were defined as goals to increase self-esteem and task memory [10]. This parallels the definition of CE in Hibbard's study. Extrinsic participation goals were defined as goals to obtain social status and a career in the sport [10]. The description of CW in Hibbard's study parallels the definition of extrinsic participation goals. Intrinsic reasons for sports participation correlated with higher levels of sportsmanship, whereas extrinsic reasons correlated with lower levels of sportsmanship in the sample population [10]. High-level athletes who make their respective sports into careers are likely to be more CW and have more extrinsic participation goals, while lower-level athletes who are competing in athletics for enjoyment are more likely to be CE and manifest more intrinsic participation goals.

*Trait competitiveness and gender*

Earlier studies examined the relationship between trait competitiveness and gender. Hibbard utilized seventeen items from the Hypercompetitive Attitude Scale (Ryckman, 1990) to create a scaled score to assess CW [6]. CE was assessed using thirteen items from the Goal Competitiveness subscale of the Competitiveness Questionnaire (Griffin-Pierson, 1990) and the Personal Development Competitive Attitude Scale (Ryckman, 1996) [6]. Each questionnaire was scored on a Likert Scale, and the average score for all of the questions represented the scaled score.

The Hypercompetitive Attitude Scale (HCA) is based on neoanalyst Karen Horney's definition of hypercompetitiveness, which:

...Refers to an indiscriminate need by individuals to compete and win (and avoid losing) at any cost as a means of maintaining or enhancing feelings of self-worth, with an attendant orientation of manipulation, aggressiveness, exploitation and denigration of others across a myriad of situations. [8]

The HCA proved to be consistent internally, stable over long-term periods, and valid [8]. Ryckman also created the Personal Development Competitive Attitude Scale, which proved consistent internally and reliable upon retest [9]. Griffin-Pierson's Competitiveness Questionnaire utilizes two subscales: the Goal Competitiveness (GC) subscale, which addresses competing to achieve a goal, and the Interpersonal Competitiveness (IC) subscale, which addresses a focus on others during competition [5]. Though not as internally consistent as the PDCA, the GC subscale still showed statistical validity [5]. Hibbard and colleagues used both the PDCA and the GC in order to determine a scaled score for CE individuals [6]. Results from the longitudinal study of 110 adolescents from sixth through twelfth grades indicated that males were significantly

higher in CW than females, but CE scores did not differ with gender [6]. Higher CW scores were also associated with problems in social relationships only for females [6].

### ***Conclusion of Literature Review***

Clearly, a combination of CW and CE athletes of all ages exists and is addressed by previous literature. There may be a distinct age group in which CE athletes seeking self-esteem will become CW athletes who are seeking cash prizes, prestige, or careers in their respective sports. Both motor development and neuromuscular maturation occur during the transition into adolescence, as well as apparent skeletal and muscular maturity differences [7]. Athletes see changes and improvements rather rapidly between childhood and adolescence due to these factors, which could contribute to the desire and motivation to compete. Perhaps those athletes who continue to compete at a high level through adolescence and into adulthood are primarily CW athletes. Similar to the findings of Hibbard and colleagues, CW may be of higher prevalence in male athletes and CE may show no gender difference.

## **Purpose of Study**

This study aims to investigate whether athletes are competing to win or to excel, and if there is an age or gender relation to a shift from one category to another.

### *Hypotheses*

Congruent to Hibbard and colleagues' study, I predict that:

1. Males will exhibit a higher level of CW.
2. CE will not show a gender difference.
3. Athletes will shift from primarily CE to CW around puberty.

## **Methods**

### *Research Design*

This study will utilize three questionnaires to determine a scaled score for CW and CE. Seventeen items from the Hypercompetitive Attitude Scale will be used to determine CW. These are the same items that Hibbard and colleagues elected to use in their study, as they are less extreme but display a competitive attitude that emphasizes the importance of winning [6]. Items 1-4, 6-8, 11, 12, 15-18, 20, 21, and 25 were selected to determine CW. To assess CE, the Personal Development Competitive Attitude Scale and the Goal Competitiveness subscale of the Competitiveness Questionnaire were used. Each of these scales is scored on a Likert Scale from 1-5, and those scores are averaged to create a scaled score. Those scores were compared by gender and by age. Twelve years of age represented the defining line between children and adolescent athletes, with children being less than twelve years old and adolescents being twelve years or older.

This age range is consistent with the National Institutes of Health's definition of children and adolescents.

### *Participants*

Twenty-nine children and adolescent athletes (thirteen male, sixteen female) completed the three questionnaires. Ages of athletes fell in a range of eight years of age to seventeen years of age with a mean of 12.2 years ( $\pm 2.1$  years). Athletes were primarily Alpine skiers of the Steamboat Springs Winter Sports Club, though two were youth involved in soccer in Laramie, Wyoming.

### *Procedures*

After reading the informed consent and assent, each athlete completed the three questionnaires, which included age and gender. Each of the questionnaires were written at a college reading level but have been proven to be reliable and valid in previous research [5, 8, 9]. Thus, in order to avoid compromising the wording, the parents of children younger than fifteen years of age were asked to complete the questionnaires on the child's behalf. All of the completed surveys remained anonymous. A participant number was assigned to each completed questionnaire for scoring purposes. No names or contact information were collected.

Hard copies of the questionnaires and informed consent were distributed to coaches at the Steamboat Springs Winter Sports Club and to coaches of youth sports teams. Electronic copies were also made available via email. Those completed by email ( $n = 6$ ) were returned electronically to my University of Wyoming email address with the

subject “Completed Questionnaire.” Completed paper copies were collected every two weeks over the course of six weeks.

### *Scoring Protocol*

Each of the three questionnaires was scored on a Likert Scale. Regarding the HCA, 1 signified never true and 5 signified always true. The HCA is depicted in Table 1. The scores from each individual question were averaged to create a scaled score. The scaled scores that were closer to 5 signified a more hypercompetitive attitude or, in the context of this study, a stronger urge to compete to win. Both the PDCA and the CQ used a scale of strongly disagree (1) to strongly agree (5). Similar to the HCA, the individual questions were averaged to create a scaled score, with a score closer to 5 indicating a stronger desire to compete to excel. The PDCA is depicted in Table 2 and the Goal Orientation subscale of the CQ is shown in Table 3. Certain questions in every questionnaire were scored in reverse in order to prevent participants from completing the surveys based on a trend. The reverse-scored questions were 3, 6, 15, 16, 18, 20, and 25 for the HCA; 2, 4, 6, and 10 for the PDCA; and 3, 10 for the CQ.

Table 1: Hypercompetitive Attitude Scale

Place an X in the box that you most agree with.

	<b>Item</b>	<b>Never True</b>	<b>Usually Not True</b>	<b>Sometimes True</b>	<b>Usually True</b>	<b>Always True</b>
1	Winning in competition makes me feel more powerful as a person.					
2	I find myself being competitive even in situations which do not call for competition.					
3	I do not see my opponents in competition as my enemies.					
4	I compete with others even if they are not competing with me.					
6	Winning in competition does not give me a greater sense of worth.					
7	When my competitors receive rewards for their accomplishments, I feel envy.					
8	I find myself turning a friendly game or activity into a serious contest or conflict.					
9	It's a dog-eat-dog world. If you don't get the better of others, they will surely get the better of you.					
11	If I can disturb my opponent in some way in order to get the edge in competition, I will do so.					
12	I really feel down when I lose in athletic competition.					
15	I do not view my relationships in competitive terms.					
16	It does not bother me to be passed by someone while I am driving on the roads.					
17	I can't stand to lose an argument.					
18	In school, I do not feel superior whenever I do better on tests than other students.					

Table 2: Personal Development Competitive Attitude Scale

Place an X in the box you most agree with.

	Item	Strongly Disagree	Disagree	Neither Agree/Disagree	Agree	Strongly Agree
1	I enjoy competition because it gives me a chance to discover my abilities.					
2	Competition does not increase my awareness and understanding of myself and others.					
3	Competition can lead to the formation of friendship with others.					
4	Competition is not a means of motivating me to bring out the best in myself.					
5	I enjoy competition because it tends to bring out the best in me rather than as a means of feeling better than others.					
6	I do not find competition to be a very valuable means of learning about myself and others.					
7	I like competition because it teaches me a lot about myself.					
8	I value competition because it helps me to be the best I can be.					
9	I find competition enjoyable because it lets me express my own potentials and abilities during competition.					
10	Competition does not help me develop my abilities more.					
11	Without the challenge of competition I might never discover that I had certain potentials or abilities.					
12	I enjoy competition because it brings me and my competitors closer together as human beings.					

Table 3: Goal Competitiveness Subscale of the Competitiveness Questionnaire

Place an X in the box that you most agree with.

	Item	Strongly Disagree	Disagree	Neither Agree/Disagree	Usually Agree	Always Agree
1	I would want to get an A because that is the best grade a person can get.					
3	I do not care to be the best that I can be.					
4	When applying for an award I focus on my qualifications for the award and why I deserve it, not on how the other applicants compare to me.					
8	I am not disappointed if I do not reach a goal that I have set for myself.					
10	Achieving excellence is not important to me.					
13	I wish to excel in all that I do.					
15	I would rather work in an area in which I can excel, even if there are other areas that would be easier or would pay more money.					

### *Statistical Analyses*

All statistical analyses were performed using SPSS software, version 22 for Mac with a 5% significance level. The National Institutes of Health define a child as a person under twelve years of age, while an adolescent is twelve years of age or older. This study used the same definition for all statistics. Within the sample, differences between age groups and genders were analyzed using t-tests.

### **Results**

Table 4 shows descriptive statistics of the sample population. The CW form of trait competitiveness did not show a statistically significant gender difference between men and women. The CE form of trait competitiveness demonstrated no gender difference, as shown in Figure 1. CE is maintained and CW is obtained around the age of twelve, as depicted in Figure 1.

Table 4: Descriptive Statistics of Sample Population.

	<b>Total (n = 29)</b>	<b>Child (n = 14)</b>	<b>Adolescent (n = 15)</b>
Age in Years (Mean)	12.2	10.5	13.8
Score Win	2.3	2.1*	2.4*
Score Excel	4	3.9	4

\*Indicates statistical significance ( $p = 0.036$ )

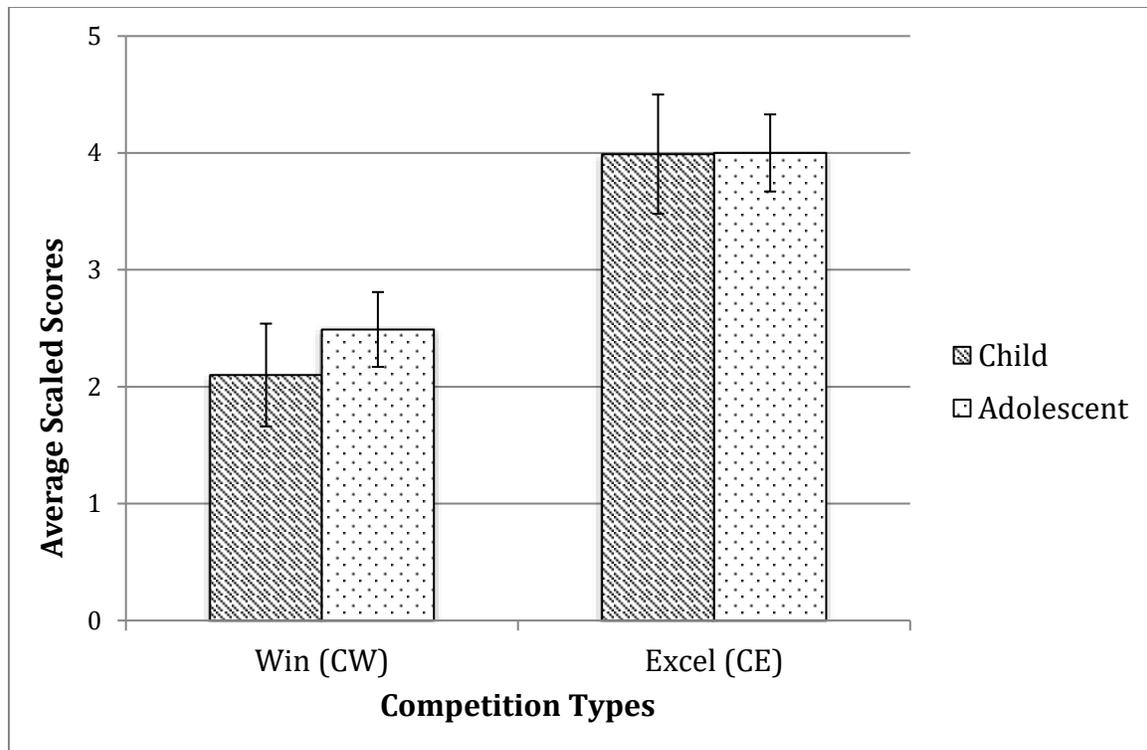


Figure 1: Scaled scores of competition types in children and adolescent athletes. Error bars represent standard deviations of each group.

Another notable finding addressed the prevalence of CE versus CW scores across the entire sample. Figure 2 depicts the average scaled scores for each type of competition without utilizing an age or gender split. In the entire sample, CE trait competitiveness showed considerably higher scaled scores than CW trait competitiveness.

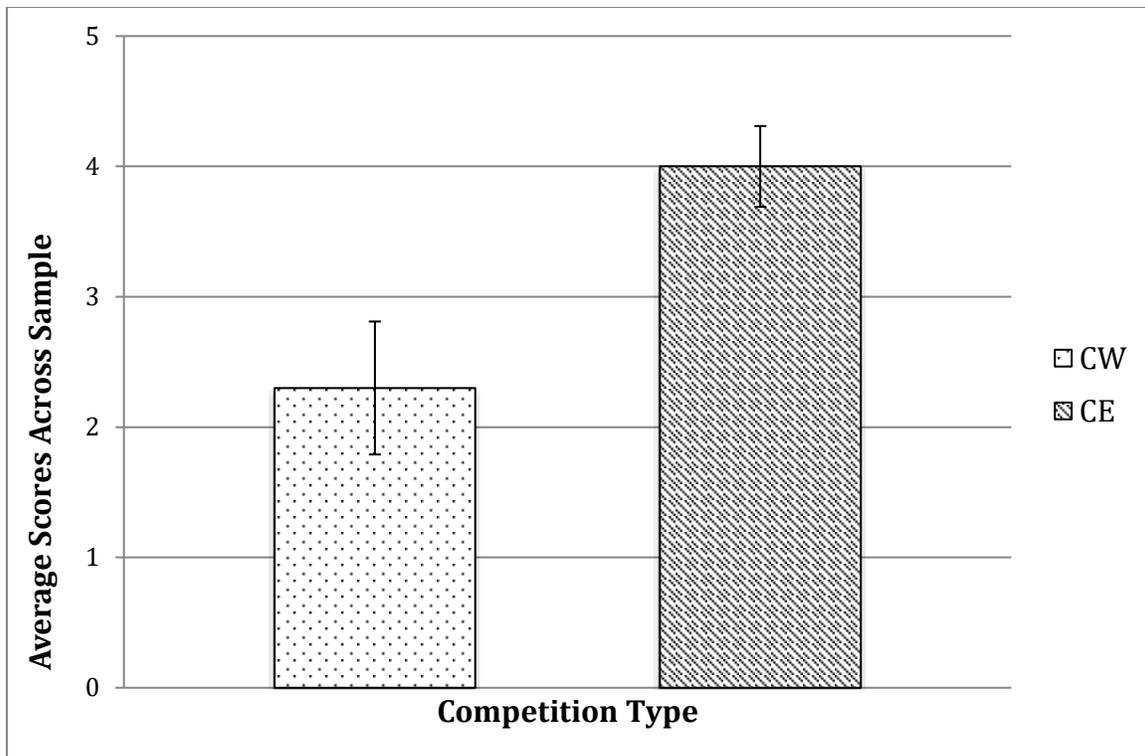


Figure 2: Average scaled scores for CW and CE across entire sample. Error bars represent standard deviations of each competition type.

### Discussion

The purpose of this study was to determine if there was an age or gender related difference in regards to trait competitiveness. Trait competitiveness was broken into two categories that were consistent with Hibbard's definitions. Competing to win was defined as competing to dominate others, while competing to excel was defined as competing to surpass personal goals [6].

Hypothesis 1 stated that males would exhibit a higher level of CW trait competitiveness. In the sample, CW did not show a statistically significant trend that favored men over women. The sample population may be too young to show this trend. Hypothesis 2 stated that CE would demonstrate no gender difference, which was correct.

The members of the SSWSC are coached in co-ed groups with the same core coaches, making this finding reasonable. Hypothesis 3 stated that athletes would change from CE to CW at puberty. Certain aspects of Hypothesis 3 were correct while others were incorrect. While there was no “shift” from CE to CW, the CW trait was acquired when athletes reached age twelve. Age twelve is consistent with the NIH definition of children (<12 years of age) and adolescents ( $\geq 12$  years of age). Regarding Hypothesis 3, a change does occur around the age of twelve, but age and puberty are not synonymous terms. For some children, the age of twelve could represent the onset of puberty, but because pubertal onset can occur in the span of several years, it is more precise to say that the change occurs at the age of twelve when observing a group of children. Age (in years) was used for all statistics.

Tables 1 – 3 show all of the questions participants were asked in the study. Table 1 is the Hypercompetitive Attitude Scale, Table 2 is the Personal Development Competitive Attitude Scale, and Table 3 is the Goal Orientation subscale of the Competitiveness Questionnaire [5, 8, 9]. Upon a closer look at the CQ in Table 3, readers notice that questions 3 and 10 should be scored in reverse, though Griffin-Pierson never mentioned them in her paper. Question 3 states: “I do not care to be the best that I can be.” If an athlete checks the box “Strongly Disagree,” he or she is saying that it is imperative to be the best he or she can be, which is a strong factor in competing to excel. Giving a score of 1 in the place of 5 would have skewed the scaled score for the athlete, so it was scored it in reverse – the box stating “Strongly Disagree” was scored as a 5 while the box stating “Strongly Agree” was scored as a 1. Similarly, question 10 states: “Achieving excellence is not important to me.” If an athlete strongly disagreed, he or she

would have received a score of 1. “Achieving excellence” is largely the definition of “excel,” so this question was scored in reverse as to prevent a skew of the scaled scores. Although Griffin-Pierson did not say to score these questions in reverse, doing so was important in the context of this particular study.

Another issue that arose with the use of the questionnaires was the reading level. All three of the questionnaires were written at a college reading level. This could be problematic because they were used on a sample of youth and adolescents in this study. Because all three of the surveys used were proven to be reliable and valid in previous literature, I did not want to compromise their validity by changing the wording to fit the audience [5, 8, 9]. In order to compensate, parents were asked to complete the questionnaires on behalf of their children if their child was less than 15 years of age.

As depicted in Figure 1, athlete age proved to be a significant factor in the manifestation of the CW trait. CE did not change with age or gender. Regarding age and the CE trait, the p value was too large to be significant ( $p = 0.921$ ). Age and the CW trait, however, had a p value of 0.036, meaning it was statistically significant. Athletes manifested more CW trait competitiveness around age 12, when they become adolescents. This could relate to Armstrong’s work [1]. Her article “Physiology of the Child Athlete,” addresses the physiological changes that occur upon the transition into adolescence, including the spurt in peak oxygen uptake and the increase in strength, power, aerobic and anaerobic fitness [1]. Along with the physiological changes, psychological changes occur, suggesting that the acquisition of the CW trait occurs simultaneously. Furthermore, participation rates in sports increase during childhood and decrease during the transition into adolescence, around twelve to thirteen years of age [7].

Because the participation rates decline once children transition into adolescents, those who remain involved in athletics are likely those who are succeeding in competitions. The remaining athletes are both competing to excel and competing to win, as opposed to the younger group who are merely competing to excel. This idea is demonstrated by the higher level of CW that occurs at age twelve in the current study.

Deaner and colleagues stated that there was a male disposition for tolerating competitiveness but children and adolescents do not show such a disposition [2]. This may be because they have not had enough time to develop as athletes on physiological, neuromuscular, and psychological levels. I expect CW to continue to increase as athletes become faster or better with their respective sports and are competing at a higher level.

One of the more interesting findings provided by this study is depicted in Figure 2. Regardless of age and gender, the scores for CE trait competitiveness were nearly 1.5 times those for CW trait competitiveness. I represent this idea with the pyramid schematic shown in Figure 3.



Figure 3: Pyramid Schematic of development of CW

In order to begin any sport, athletes must acquire a basic skill set. For the population of young skiers used in this study, this may consist of learning to ski, pole planting, and controlling speed. From a basic skill set, athletes may compete, but the vast majority is competing to excel. They want to improve their abilities and continue to have fun. Children and adolescents are rarely competing on a national or international stage in Alpine skiing, so the pressures of competition are less prevalent than those of a world-class competitor. From competing to excel, young athletes are able to refine their skills, provided they are enrolled in the proper programs, continue practicing, and have access to adequate coaching. Once skills are refined, athletes begin to realize their potential and begin competing to win. Competing to win and competing to excel are not mutually exclusive events as originally hypothesized. These data do not show a shift from competing to excel to competing to win. Rather, CW builds off of CE as shown in the

pyramid schematic in Figure 3. Athletes must compete to excel before they can successfully compete to win, which can be further explained by the high scaled scores of CE compared to the lower scaled scores of CW in the sample population. Despite age and gender, CE was consistent across the entire pool of participants. Because CW changed with age and CE remained constant with age, we can predict that CW trait competitiveness is an acquisition that stems from CE trait competitiveness.

### *Issues With the Chosen Sample*

The sample population that was used for this study is not conclusive and the results should not be generalized or projected onto other populations. Ninety paper copies of the questionnaires and informed consent were distributed to coaches of the Steamboat Springs Winter Sports Club and to coaches of youth hockey and soccer teams in Laramie, WY. Electronic copies were sent to high school athletic directors in both Steamboat Springs and Laramie as well. Despite the large number of questionnaires distributed, only twenty-nine (32%) were completed. Of those completed, twenty-seven of them (93%) were members of the Steamboat Springs Winter Sports Club. Two of the surveys included in the sample population were incomplete. The athlete or his/her parents completed the CW portion but not the CE portion. While the incomplete surveys were used to calculate averages and totals, they were excluded from the t-tests for statistical significance.

Alpine skiers completed all of the questionnaires from the SSWSC. This could be problematic because the study did not include an equal number of Nordic skiers, which would have provided perspective from both anaerobic and aerobic athletes. All of the

Alpine skiers completed the questionnaires in the months of February and March 2015. It is worth noting that these months comprise the end of the competition season for Alpine skiers.

### *Methods to Improve the Study*

The study could have been improved if more surveys had been completed and returned. The results would have been more inclusive if both anaerobic and aerobic athletes completed the questionnaires and if the sample population included athletes involved in a variety of sports instead of only skiing. Individual and team sports would both be included. Results from other geological regions in addition to Colorado and Wyoming would have provided a more complete perspective.

If the study was repeated, questionnaires should be distributed at both the beginning and end of the competition season to determine if a change occurs during the competition season, during the off-season, or during the training season. A longitudinal study complete with coach and parent reports would provide a better look into the individual mind of each athlete. It would also determine which athletes drop out of their sport and their reasons for quitting. A longitudinal study would allow a more holistic view of the athletes and the changes that are occurring both physiologically and psychologically.

### **Conclusion**

Children and adolescent athletes undoubtedly go through a series of physiological, neuromuscular, and psychological changes before they are able to compete

at a top level. This study aimed to explore a potential change in the motivation for competing as it related to age and gender. The two types of competition utilized in this study were competing to excel (CE), and competing to win (CW). The results suggest that young athletes thrive on competing to excel until they reach the age of twelve. At this time, athletes build upon the CE foundation and begin competing to win. The competition types were not associated with gender differences.

Results are mainly indicative of the young Alpine skiers of the Steamboat Springs Winter Sports Club, and they should not be generalized across all populations. Significant results indicate that there is an optimal time for coaches to start pushing younger athletes harder to achieve athletic success without causing them to quit or burn out of their respective sport.

As depicted by this study, young athletes change psychologically with age, with a key change occurring around the age of twelve years in both males and females. This discovery will allow coaches, parents, and educators to use trait competitiveness in an advantageous manner in order to foster the love of athletics and competition among youth and adolescents.

## References

1. Armstrong, N. & Welsman, J. Essay: Physiology of the child athlete. *The Lancet* **366**, **Supplement 1**, S44–S45 (2005).
2. Deaner, R. O. Distance Running as an Ideal Domain for Showing a Sex Difference in Competitiveness. *Archives of Sexual Behavior* **42**, 413–28 (2013).
3. Eklund, R., Martin, J. & Smith, A. The Relationships Among Competitiveness, Age and Ability In Distance Runners. *Kinesiology, Health and Sport Studies* (1994). at [http://digitalcommons.wayne.edu/coe\\_khs/37](http://digitalcommons.wayne.edu/coe_khs/37)
4. Frick, B. Gender differences in competitiveness: Empirical evidence from professional distance running. *Labour Economics* **18**, 389–398 (2011).
5. Griffin-Pierson, S. The competitiveness questionnaire: A measure of two... *Measurement & Evaluation in Counseling & Development (American Counseling Association)* **23**, 108 (1990).
6. Hibbard, D. R. & Buhrmester, D. Competitiveness, Gender, and Adjustment Among Adolescents. *Sex Roles* **63**, 412–424 (2010).
7. Malina, Robert M, Claude Bouchard, and Oded Bar-Or. *Growth, Maturation, and Physical Activity*. 2nd ed. Champaign: Sheridan, 2004. Print.
8. Ryckman, R. M., Hammer, M., Kaczor, L. M. & Gold, J. A. Construction of a Hypercompetitive Attitude Scale. *Journal of Personality Assessment* **55**, 630–639 (1990).

9. Ryckman, R. M., Hammer, M., Kaczor, L. M. & Gold, J. A. Construction of a Personal Development Competitive Attitude Scale. *Journal of Personality Assessment* **66**, 374 (1996).
10. Ryska, T. A. Sportsmanship in young athletes: The role of competitiveness, motivational orientation, and perceived purposes of sport. *The Journal of Psychology* **137**, 273–93 (2003).
11. Scanlan, T. K. & Passer, M. W. Determinants of competitive performance expectancies of young male athletes. *Journal of Personality* **49**, 60 (1981).