

# A Holistic Examination of Coaches' Learning Needs from Athletes' Perspective in Youth Sport

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## Abstract

The aim of this work was to assess the youth gymnasts' perceived sport outcomes regarding sport competence, confidence, connection and character in a competitive setting. The Gymnasts' developmental outcomes were examined based on their age groups and gender. A total of 45 gymnasts (22 girls, 23 boys) between 12 and 18 years and their coaches ( $n = 9$ ) participated in this study. The adapted and validated versions of a toolkit that measures the abovementioned athlete outcomes were utilized. The findings indicated the decreasing trend in the gymnasts' developmental sport outcomes as they age. Regarding gender, boys scored higher in competence score, whereas girls had higher scores in character and connection ( $p < .05$ ). The results of this study were discussed with the relevant athlete development and coach development literature and related suggestions were made regarding coaches' professional development.

## 1. Introduction

Young people who involve in sports can improve their physical, psychosocial, and motor skills in physical and psychosocial areas (Côté and Fraser-Thomas, 2007). But, just playing a sport is not enough for reaching intended outcomes (Fraser-Thomas, Côté, & Deakin, 2005), despite widespread belief to the contrary (Coakley, 2016). According to extensive research (e.g., Côté and Hancock, 2016), organized sports activities can offer young people possibilities for involvement, performance, and personal growth

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all within the context of a sport program. When performance, participation, and personal development can be achieved in sport environments, young athletes can improve their health, acquire crucial life skills, and learn basic motor abilities (Côté and Fraser-Thomas, 2007). Unfortunately, most sports programming places a singular focus on one result at the expense of others and forces participants to favor that result over others.

Adults, especially coaches, are prone to change a young people's sport experiences in order to reach athletic performance in a short amount of time. Although research shows that early specialization to reach top achievement is not necessary for many different sports (e.g., Côté and Lidor, 2013), the athletes are selected early and tend to put specialization pathway early in an effort to identify shortcuts to increase athletes' performance. Early athletic success-seeking interferes with addressing young people's developmental requirements, which has a harmful impact on their development in sport (Côté and Gilbert, 2009). Selecting athletes early is used in most coaching environments to achieve the goal of developing great athletes, despite research demonstrating its untrustworthiness, particularly when it is carried out before to or during puberty (Vaeyens, Lenoir, Williams, and Philipaerts, 2009). Focusing primarily on life skills can also pose issues because it may impede young athletes from developing sport-specific skills that will help them participate in sports in the future (Turnnidge, Côté, and Hancock, 2014).

The literature on sport development have shown relationships between sport involvement and athletes' positive development (Fraser-Thomas et al., 2005), but a significant amount of research has also shown relationships between sport involvement and adverse athlete involvements. Numerous detrimental effects of participating in sports are shown by research in the literature (Fraser-Thomas et al., 2005). The physiological effects included becoming unhealthy (Law, Côté, and Ericsson, 2007), wounds (Law et al., 2007), being injured specifically during maturing brought on by heavy training (Dalton, 1992), slower degree of puberty (Malina, 1994) and problematic food intake brought on by the esthetic focus of the sport, forcing coaches, and personality qualities (e.g., Anshel, 2004).

The psychological and social impact of youth sport involvement mostly described in the literature were athletes' perception of poor capacity that leads to disappointment and discouragement (Hill, 1988), vulnerability perception when being with teammates that results in decreased confidence (Martens, 1993), diminished satisfaction in sport involvement (Wall & Côté, 2007), one-dimensional self-concept (Coakley, 1992), burnout in

athletes (Smith, 1986; Coakley, 1992), and high levels of burnout-related weariness (Strachan, Côté, and Deakin, 2009). An undesirable outcome, such as violence or aggressiveness, may also result from the competitive aspect of sports (Colburn, 1986). According to the literature, young athletes, especially girls, are starting to worry about their looks at younger and younger ages (Davison, Earnest, & Birch, 2002).

The number of sports clubs has increased by twofold in Turkey over the past ten years (Turkish Directorate of Youth and Sports, 2017), but it appears that the country's number of active youth sport participants plateaus during adolescence and sharply declines as they get older. One registered athlete every six athletes were engaging in sport actively, according to data on sport involvement of youth (Turkish Directorate of Youth and Sports, 2017). Although there were more participants over the course of the ten years, there was no appreciable change in the proportion of active to passive registered athletes. This may show the fact that youth athlete dropout is a persistent issue (Pehlivan, 2013). In order to better comprehend the degree that coaches' training are suitable for young athletes' development, it is necessary to conduct a thorough examination of youths' developmental outcomes in sport.

A complete method to athlete outcomes that considers youth's psychosocial aspect as well as physical aspect was defined as the 4 Cs of athlete outcomes (Côté & Gilbert, 2009). These outcomes are competence, confidence, connection, and character. Competence is an athlete's ability in a particular sport; confidence is an athlete's internal sense of overall positive self-respect; connection is an athlete's ability to form meaningful connections with others inside and outside of sport; and character is an athlete's capability to show prosocial behaviors while avoiding antisocial ones. These developmental outcomes defined were the critical component in effective coaching (Côté & Gilbert, 2009, p. 316) in that they are the result of effective coaching practices. The "4 Cs framework" offers clear instructions for coaches to best promote athletes' development using sport. This model allows to evaluate coaches' practices and the value of sport programs (Côté & Gilbert, 2009).

Through utilizing the 4 Cs, Vierimaa, Erickson, Côté, and Gilbert (2012) provided a measuring methodology for evaluating coaching effectiveness from a comprehensive standpoint. According to the researchers, the recommended assessment method allows for evaluating the performance and psychological sport outcomes of young athletes, enabling the identification of the areas of coaches' needs. Additionally, the assessment technique can inadvertently offer context-based proof of how well sport programs support

athletes' overall development. In contemporary youth sport research, the 4 Cs framework and accompanying evaluation instrument have been employed more and more. (e.g., Vierimaa, Bruner, and Côté, 2018).

In the past, win-loss records and years of experience have been used as metrics to assess coaches' coaching effectiveness (Mallett and Côté, 2006; Côté and Gilbert, 2009). Few studies have examined the components of coaching effectiveness and expertise from a comprehensive standpoint (Côté and Gilbert, 2009). Investigating any variations of athletes' developmental outcomes may provide critical information on identifying coaches' learning needs as adolescence sport participation has fallen sharply.

A holistic approach to assessing coaching effectiveness will be introduced in this study. In the Turkish sports context, the application of a comprehensive perspective in evaluating coaches has not yet been done so far.

A research question was asked in line with the aforementioned issue in the environment of a competitive artistic gymnastics. The aim of this research was to investigate how gymnasts with different age and genders view their outcomes of the 4 Cs in youth artistic gymnastics context.

## **2. Methods**

### **2.1. Participants:**

Experienced coaches ( $M = 15$  years;  $SD = 5.02$ ) and their gymnasts (23 female and 22 male) aged from 12 to 17 years ( $M = 13.98$ ,  $SD = 1.50$ ) from the Turkish cities of Istanbul, Ankara, İzmir, Bolu, Mersin, and Bartın took part in this study. Two of the coaches were women (aged 32 and 45) and seven of the coaches were men ( $M_{age} = 35$ ;  $SD = 8.19$ ). The gymnasts' average sport experience was 9.18 years, with a training frequency of 5.84 days per week. According to competition lists from the Turkish Gymnastics Federation (2015), the average population of competing youth artistic gymnasts in this age range was around 90, the sample might represent approximately half of the total number of competitive young gymnasts at the time the data was collected. The study included 45 gymnasts from nine teams who fell within the target age range of 12 and 18 years. In Table 1, the gymnasts' demographic details are shown.

*Table 1*

Demographics of the gymnasts (n = 45)		
Characteristic	<i>n</i>	%
Gender		
Female	23	51
Male	22	49
Age Group		
12 – 13	21	47
15 – 17	24	43
Training (weekly)		
5 days	7	15.6
6 days	38	84.4

Gymnasts, coaches, and parents gave their approval before the data was collected. Prior to the data collection, all study protocols were approved by the Middle East Technical University's Research Ethics Committee. The information was gathered for each squad of gymnasts within a month over the first three months of the season. The first researcher visited the club settings to get the data. Each team's gymnasts finished the PYD toolset. In order to ensure the reliability of the responses, the data were independently gathered from the gymnasts and the coaches.

## 2.2. Data Collection

### 2.2.1. Measures

#### 2.2.1.1. PYD toolkit

In this study, the gymnasts' competence, confidence, connection, and character sport outcomes were measured. After being culturally adapted, the scales, which Vierimaa, which Vierimaa and colleagues (2012) suggested as PYD toolkit, were utilized to assess the gymnasts' views of their holistic outcomes in competitive context. The PYD toolkit includes four measures to investigate how youth athletes view their development in the defined outcomes.

The competence outcome was assessed by utilizing the Sport Competence Inventory. Technical, tactical, and physical skills are the three components of competence that the Sport Competence Inventory seeks to measure in young athletes. There are three versions of the measurement that offer a

three-way evaluation of competence from the athlete, his teammates, and his coach.

Using a Likert scale, (5 points) from “not at all competent” to “extremely competent” gymnasts, teammates, and coaches judged a gymnast’s competence using the appropriate versions of the inventory. At the conclusion, the gymnast’s competence was calculated as a single combined total score.

Trait confidence levels in youth athletes were assessed utilizing the modified Self-Confidence subscale of the Revised Competitive State Anxiety-2 (CSAI-2R; Vierimaa et al., 2012). This subscale comprises five items, such as “I am confident because I mentally picture myself reaching my goal,” and assesses athletes’ trait confidence. Gymnasts used a 4-point scale to rate themselves from “not at all” to “very much so.”

The research analysed the connection between coaches and athletes by employing the Coach-Athlete Relationship Questionnaire (CART-Q; Jowett & Ntoumanis, 2004). The CART-Q is an 11-item questionnaire that assesses the closeness (e.g. trust in coach), commitment (e.g. feeling connected to coach), and complementarity (e.g. feeling at ease) aspects of the coach-athlete relationship, from both the athlete and coach perspective. The evaluation is done through a scale with seven points ranging from 1 for ‘not at all’ to ‘extremely’.

The Prosocial and Antisocial Behaviour in Sport Scale (PABSS; Kavussanu & Boardley, 2009), adapted for the study participants, evaluated character. PABSS is a survey comprising 20 items with four sub-dimensions, evaluating athletes’ prosocial and antisocial conduct towards teammates and rivals. The gymnasts assessed their behaviour on a scale with five points stretching from “never” to “very often.” The overall point of the gymnasts was determined by deducting their scores on prosocial and antisocial dimensions as stated by Erickson and Côté (2016).

#### *2.2.1.2. Adaptation of PYD toolkit*

Three actions were taken in order to adapt the measures. In the beginning, a back-translation process has been used (Brislin, 1980). After that, with competitive young gymnasts, ‘cognitive interviews’ regarding the toolkit were conducted. Lastly, using data from young athletes participating in different individual and team sports, the psychometric features of the toolkit’s Turkish translation were examined. Additionally, this sample’s Cronbach’s alpha values for each dimension were presented.

## Back translation

First, two independent multilingual specialists translated the original scale forms into Turkish. The translations were then compared and contrasted, and a consensus was reached. Next, another translator translated the Turkish version of the scales to English, which was checked for consistency alongside the Turkish version. In order to continue with further adaptation processes, the scales representing the 4 Cs model were adapted to their Turkish form.

## Cognitive Interviews

Competitions in artistic gymnastics begin at age 7 in Turkey. Therefore, in order to assess the usefulness of the PYD toolkit with regard to its comprehension and contents, “cognitive interviews” with 12 competitive young gymnasts between the ages of 8 and 14 were conducted. Cognitive interviewing involves applying previous questionnaire questions while obtaining supplementing verbal information on the questionnaire replies, which is used to assess the quality of responses or to determine if the question is producing the intended information (Beatty & Willis, 2007). The extent that the verbal reports are valid based on the respondents’ cognitive process is assessed utilizing cognitive interviewing for pre-testing tools like questionnaires (Willis, 2015). According to Collins (2003), a crucial component of validity is that the participants and the measurement designers share a common understanding of the questions, and that the questions do not exclude or incorrectly interpret key concepts or leave out crucial elements of the phenomenon under study. The findings showed that the participants under the age of 12 had trouble understanding the PYD toolkit’s instructions and items and had trouble telling one notion from another (Kılıç & İnce, 2016). Additionally, it was determined that the PABSS’s some items needed to be modified in order to be used in competitive gymnastics. Research has indicated that the PYD toolkit can be utilized with 10-year-old athletes (Vierimaa et al., 2012). However, for Turkish sporting culture, it may be more suitable to begin utilizing the PYD measurement framework at the age of 12 (Kılıç & İnce, 2016).

### *2.2.1.3. Psychometric testing of the PYD toolkit*

The PYD toolkit underwent final revisions and was administered to participants aged 12 and above, with psychometric testing conducted to assess its efficacy in evaluating gymnasts’ outcomes. Prior to data collection, three items deemed irrelevant in the scale has been removed from it. These decisions were made based on the implications of expert opinion and the cognitive interviews conducted. Then, for each of the outcome, psychometric

examinations were conducted. For competence outcome, “Sport Competence Inventory’s psychometric examination with 392 competitive youth athletes from variety of sports revealed sound psychometric properties with the Cronbach’s alpha values ranging from .81 to .88 for the raters (Kılıç & İnce, 2017a).

For confidence outcome, the psychometric features of the Self-confidence Subscale of CSAI-2R (Vierimaa et al., 2012) was investigated by running Confirmatory Factor Analysis (CFA) with a data comprising a variety of competitive youth athletes (N = 382). The internal consistency coefficient for the current sample was .71 (Kılıç & İnce, 2017b).

For connection outcome, the psychometric features of the Turkish CART-Q version (Altıntaş, Çetinkalp, & Aşçı, 2012) were evaluated using a dataset comprising young athletes (n = 151) from individual sports and team sports accompanying with 71 coaches. Internal consistency coefficient values of the subscales of the CART-Q for coaches and athletes have been reported to range from .69 to .78. Gymnasts’ Cronbach’s alpha scores for the CART-Q subscales range from .70 to .78 for the current sample.

For character outcome, the majority of gymnasts who participated in cognitive interviews viewed the items “I deliberately fouled an opponent” and “I retaliated after a bad foul” as unacceptable and argued these items do not represent practice or competition situations. To reinforce the findings, the PABSS items were analyzed in detail with highly qualified coaches from both the national and international levels. They also deemed the “I tried to injure an opponent” as unrelated to the context as an item. Two sports science professionals with doctorates ultimately discussed the suitability of the PABSS for artistic gymnastics. Following a pre-testing approach, the three aforementioned items were removed from the measure prior to further examination.

Using a sample of 158 young athletes who compete in various individual sports, a CFA was conducted to assess the validity and reliability of the 17-item PABSS.

The value of item 20 “I physically intimidated an opponent” has been found less than .40 according to the results of the initial CFA analysis. As a result, before conducting additional investigation, this item was also removed off the scale. The model’s indices, which showed a satisfactory fit in the second run of CFA, with the Chronbach’s alpha of prosocial dimension was .55 and the antisocial dimension was .88. Because there were so few participants (N = 45), Cronbach’s alpha for the prosocial component was



relatively low. The goal of this research was to holistically view gymnasts' outcomes. As a result, for the current sample, each gymnast's overall character score was determined by subtracting their prosocial and antisocial dimension evaluations (Erickson and Côté, 2016).

### 2.3. Data Analysis

Descriptive statistics were computed for the participants' answers to the 4 Cs toolkit after data screening. The statistics were based on gaps in gender and age groups as well as overall responses to the 4 Cs. The scores of gymnasts were compared by gender and level of competition (i.e., age-group) in each dimension. The gymnasts were classified into two age groups depending on the level of competitiveness: Age-group 1 ( $n = 21$ ; 12-13 years old) and Age-group 2 ( $n = 24$ ; 15-17 years old). Statistical analyses were run by SPSS (Version 24). The Mann-Whitney test was employed in data analysis to compare the overall "C" score of each gymnast on the PYD toolkit across age group and gender.

### 3. Results

In this section, we report on the gymnasts' perception of their outcomes in the 4 Cs based on age and gender. To ensure data accuracy, we initially inspected the data for missing values, outliers, and violations of normality and variance homogeneity. We found no missing values and detected two univariate outliers that exceeded 3.29 standard deviations from the mean. The scores that were closest to the defined range were used as substitutes (Field, 2009; Tabachnick & Fidell, 2013).

The Shapiro-Wilk test for normality and Levene's test for homogeneity of variance revealed significant deviations in the scores of the 4 Cs outcomes for each gymnast, except for competence data, which followed a normal distribution. The Mann-Whitney U test (Mann & Whitney, 1947) was utilized to investigate gender and age-group differences in perceived outcomes (competence, confidence, connection, & character) among the gymnasts, due to violated normality assumptions (Field, 2009).

The following report presents the results in Table 2, which details the descriptive statistics, and Table 3, which provides a breakdown of participant data by gender and age.

**Table 2**

Descriptive Statistics of the 4 Cs scales

Measures	Mean	SD	Min	Max
Competence (1-5)	4.03	.40	2.91	4.69
Confidence (1-4)	3.39	.44	2.40	4.00
Connection (1-7)	6.10	.69	4.18	6.91
Character (1-5)	.71	.48	-.53	1.35

Note: Character score calculated by subtracting antisocial points from prosocial points.

**Table 3**

Descriptive Statistics of Gymnasts' Outcomes for Gender and Age-group

			Competence (out of 5)	Confidence (out of 4)	Connection (out of 7)	Character (out of 5)
Gender	Female	Mean	4.19	3.43	6.15	.88
		SD	.28	.50	.76	.33
		Min	3.64	2.40	4.36	-.06
		Max	4.69	4.00	6.91	1.35
	Male	Mean	3.86	3.35	6.05	.53
		SD	.45	.37	.63	.54
		Min	2.91	2.60	4.18	-.53
		Max	4.58	4.00	6.82	1.24
Age- group	1 (12-13)	Mean	4.14	3.58	6.43	.96
		SD	.28	.37	.68	.22
		Min	3.64	2.60	4.18	.53
		Max	3.69	4.00	6.91	1.35
	2 (15-17)	Mean	3.93	3.21	5.81	.49
		SD	.48	.43	.58	.54
		Min	2.91	2.40	4.36	-.53
		Max	4.67	4.00	6.73	1.29

Note: Character score calculated by subtracting antisocial points from prosocial points.

### 3.1. Group Comparison

Based on triangulated scores, the group comparison results for competence in gymnastics yielded no significant difference between age-group 1 gymnasts ( $Mdn = 25.98$ ) and age-group 2 gymnasts ( $Mdn = 20.40$ ), with a total competence score. The U value was 189.50, z was -1.42, and the result was not significant (ns),  $r = -.21$ . However, the competence scores of female gymnasts ( $Mdn = 27.50$ ) were significantly higher than those of their male counterparts ( $Mdn = 18.30$ ), with a U value of 149.50,  $z = -2.35$ ,  $p < .05$ , and  $r = -.35$ .

There were no significant differences in the confidence level between male ( $Mdn = 21.02$ ) and female ( $Mdn = 24.89$ ) gymnasts, as per this study. Nonetheless, according to this study, age-group 1 gymnasts ( $Mdn = 28.74$ ) had significantly higher self-confidence than age-group 2 gymnasts ( $Mdn = 17.98$ ) ( $U = 131.50$ ,  $z = -2.77$ ,  $p < .05$ ,  $r = -.41$ ).

There were no statistically significant differences found in the connection measure between male gymnasts ( $Mdn = 21.36$ ) and female gymnasts ( $Mdn = 24.57$ ),  $U = 217.00$ ,  $z = -.82$ , ns,  $r = -.12$ . However, age-group 1 gymnasts ( $Mdn = 29.38$ ) had significantly higher connection scores than age-group 2 gymnasts ( $Mdn = 17.42$ ),  $U = 118.00$ ,  $z = -3.06$ ,  $p < .05$ ,  $r = -.46$ .

In terms of character scores, female gymnasts ( $Mdn = 27.20$ ) outperformed their male counterparts ( $Mdn = 18.61$ ) with statistical significance ( $U = 156.50$ ,  $z = -2.2$ ,  $p < .05$ ,  $r = -.33$ ). Furthermore, age-group 1 gymnasts ( $Mdn = 29.43$ ) achieved significantly higher character scores than age-group 2 gymnasts ( $Mdn = 17.38$ ) ( $U = 117.00$ ,  $z = -3.07$ ,  $p < .05$ ,  $r = -.46$ ).

## 4. Discussion

The study analyzed age and gender-based differences in developmental outcomes among young gymnasts. The study employed preliminary descriptive analysis and the Mann-Whitney test to establish these differences. Findings revealed variations in scores among the gymnasts, with senior gymnasts (15-18 years old) performing worse than their younger counterparts (12-14 years old) in all sport outcomes except competence. Additionally, the analysis revealed gender differences in competence and character. Girls perceived higher levels of competence and character.

The study outcomes reveal a decrease in the gymnasts' self-confidence, connection, and character perception as they move from 12-14 years old to

15-18 years old. The competitive participation of athletes typically initiates in the age range of 15 to 18 years. As per the Developmental Model for Sport Participation (Côté & Fraser-Thomas, 2007), athletes should concentrate on a single sport and move from “train to train” stage to “train to compete” stage at 16 years old or above. Participating in multiple training sessions and competitions during this stage of development may pose psychological and social difficulties for gymnasts, potentially resulting in decreased confidence, social interactions, and character. It is noteworthy that gymnasts of various ages had comparable perceptions of their skills, highlighting the consistency of skill evaluation across different age groups. Significant disparities in competence and character scores were observed among male and female athletes, likely due to the effects of puberty and other psychosocial factors. Therefore, coaching practices and sport programming should consider addressing these factors.

The analysis of the scores of the gymnasts based on gender indicated that girls achieved higher levels of competence outcomes than boys. In Turkish artistic gymnastics, the age of competition starts at a significantly earlier age of seven to attain high sports performance before puberty. Physical maturation, which positively impacts physical competence in sports, may be a contributing factor to the increased sense of confidence. Thus, this result may be justified by the fact that girls start puberty earlier, which enables them to develop greater strength and potentially convey a more powerful perception of competence. (Behringer, Vom Heede, Yue, & Mester, 2010).

Studies on gender differences in moral development, moral reasoning, legitimacy judgments, and unsportsmanlike behavior among youth athletes (Bredemeier & Shields, 1986; Conroy et al., 2001; Kavussanu & Roberts, 2001) consistently report gender differences in accordance with the findings of this study. The research found that girls demonstrate higher levels of moral reasoning and maturity overall, have less favorable opinions of the legitimacy of antisocial behaviors (such as rule-breaking and harmful activities), and disapprove of unsportsmanlike conduct to a greater extent. On the other hand, males exhibit and accept physical aggression more frequently than females (Weiss & Bredemeier, 1990), implying that boys and girls tend to conform to gender-related cultural norms. A complete investigation of the positive relations between athletes and significant others could aid in understanding the underlying factors contributing to athletes' character differences. Recently, Herbison, Vierimaa, Côté and Martin (2018) revealed that positive relationships have a significant impact on the developmental outcomes of athletes, particularly with regards to their character. The

researchers discovered that athletes who were perceived as popular among their peers demonstrated a higher frequency of prosocial behaviors.

Overall, the current study provides crucial insights on the perception of the 4 Cs within the context of youth artistic gymnastics in Turkey. Limited research exists on how athletes perceive the 4 Cs (Côté & Gilbert, 2009), which has primarily focused on the coaches' perspective rather than the athletes' outcomes (Côté, Bruner, Erickson, Strachan, & Fraser-Thomas, 2010). With a focus on the age and gender of athletes, this study seeks to provide a conceptual understanding of how young athletes perceive their coaching practices. Côté et al. (2010) have pointed out that when evaluating coaching effectiveness, it is essential to take into account age and level of competitiveness. This study enhances our comprehension of how much coaches can positively impact the growth of their athletes. Additionally, it advances our understanding of how athletes perceive the 4 Cs, while taking into consideration gender and age-related developmental differences.

To promote comprehensive athlete development, analyzing the dynamic factors that contribute to the decline of youth athletes during their transition, such as personal involvement, high-quality relationships, and appropriate environments, would be informative.

The initial aspect to consider is coaches' approaches' alignment with the DMSP's description of athletes' developmental requirements. Additionally, it's essential to understand the nature of athletes' connections with significant others. Recent research examined the link between coaches' conduct and athletes' developmental outcomes (e.g., Erickson & Côté, 2016). The frequency with which athletes participate in sports is impacted by the relationships they have with family and peers (Côté, 1999; Scanlan & Lewthwaite, 1988). Parental support, parental involvement, and parenting styles were identified as helpful avenues through the literature, according to Nelson-Ferguson, Fraser-Thomas and Strachan's (2016) review. Thirdly, assessing the delivery of activities and program structure in youth sports programs is necessary. The features defined for youth's optimal development (Eccles & Gootman, 2002) can be used as a comprehensive framework since they indicate the extent to which sports programs are successful in ensuring the holistic development of athletes. In the context of youth sports, the eight setting aspects are increasingly utilized (Bean, Harlow, Mosher, Fraser-Thomas, & Forneris, 2018; Strachan, Côté, & Deakin, 2011).

From a program design perspective, formal coaching education opportunities do not appear to offer coaches the pertinent and necessary information (Kilic & Ince, 2015). The development of continuing,

supplementary education programs for coaches, which align with coaches' contextual needs and prioritize athletes' holistic outcomes, has become critically necessary (Gilbert, Gallimore, & Trudel, 2009). For programs to achieve success, their design must rely on measurable outcomes (Trudel, Gilbert, & Werthner, 2010).

The current study has a number of limitations that needs acknowledgement in the interpretation of the findings. To begin with, the data were collected exclusively through self-report questionnaires. Additionally, the sample was limited and only included athletes from six cities in Turkey, three of which were large and two were mid-sized. Finally, it should be noted that the results solely reflect athletes' perceptions, with the exception of competence. Due to the design of the competence assessment scale, the competence score takes into account the perceptions of the coaches and teammates. Additionally, due to environmental limitations, relationship between peers could not be explored.

In conclusion, this study provides a comprehensive evaluation of coaching effectiveness concerning young athletes, primarily based on participant perspectives utilizing the 4 Cs model. The research demonstrates gymnasts' competence, confidence, connection, and character development in the context of youth sports. Furthermore, the outcomes for gender and age highlight the areas that require improvement in coaching practices. The psychological and social developmental aspects of gymnasts seem to decline with age, and there may be significant gender-related differences in how young gymnasts perceive their developmental outcomes. This study provides insights into the declining tendency of youth sports participation rates in Turkish sports. Coaching professionals are advised to have access to tailored professional development programs developed based on their learning needs.

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