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RELATIONSHIP BETWEEN SOCIAL INTELLIGENCE AND CRITICAL THINKING AMONG COLLEGE STUDENT-ATHLETES

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Abstract

Student-athletes face unique challenges that necessitate strong social and critical thinking skills. The present study examined the relationship between social intelligence and critical thinking skills among 207 college athletes (Males = 168; Females = 39) in Haripur, Pakistan. Social Intelligence was assessed as a predictor of critical thinking and measured in terms of social information processing, social awareness, and social skills. The survey included the Tromsø Social Intelligence Scale, the Critical Thinking Skills from the Academic Competence Evaluation Scale (ACES), and the informed consent and demographic information sheet. Participants had moderate social intelligence and a developing range of critical thinking skills. On average, scores on social information processing were higher than those on social awareness and social skills. Regression analysis showed that three aspects of social intelligence are positively associated with critical thinking among college athletes. Social awareness had a strong effect, social information processing had a moderate effect, and social skills had a low yet significant positive impact on critical thinking. Findings imply that one way to enhance critical thinking among students is to increase their social intelligence through integrated curricula, training, and mentorship. This study has potential implications for screening and improving the academic and sports performance of athletes to ensure their overall success and well-being.

Keywords: College Student-Athletes**;** Critical Thinking; Social Intelligence.

Introduction

College athletics offers a demanding yet rewarding environment. Student-athletes must balance academic and athletic commitments, navigating complex social

dynamics with teammates, coaches, and peers (Evans, 2017). Simultaneously, they need strong critical thinking skills to succeed academically and strategically (Carter & Williams, 2021). Studying the relationship between social intelligence and critical thinking among college student-athletes is a crucial area of investigation. It will provide a more nuanced understanding of the importance of social intelligence and critical thinking in the lives of college athletes. The findings will inform the level and strength of social intelligence and critical thinking skills that can aid in screening, prevention, and intervention of those needing support.

Social intelligence and critical thinking definitions still need to be discovered and overlap with homogenous constructs. Thorndike (1920) defined social intelligence as "the ability to understand and manage people – to act wisely in human relations." Goleman (2006) expanded on this by highlighting emotional and social intelligence competencies and mentioned that social intelligence encompasses interpersonal skills and the capacity to navigate social environments effectively. Goleman outlined two aspects of social intelligence: social awareness and social facility. Social Awareness is understanding and interpreting social cues, including empathy, attunement to others, and understanding social contexts. Social Facility is the skills needed to interact successfully with others, such as self-presentation, concern for others, and influence. Goleman's social intelligence theory suggests that social intelligence is distinct from academic intelligence or emotional intelligence and involves the ability to understand and manage people and social interactions (Boyatzis & Goleman, 2015).

Later, Silvera et al. (2001) factorized two new dimensions to the Social Information Processing (SIP) dimension. The Social Skills (SS) dimension assesses the ability to engage in effective and appropriate social behaviors. In contrast, the Social Awareness (SA) dimension measures the awareness of social situations and the understanding of social contexts. Social intelligence is required to build rapport and effective interpersonal interactions in athletic settings (Pimienta, 2023) because student-athletes often function in high-stress environments where effective communication and teamwork are crucial for success.

According to Facione's (1990) model, critical thinking is the ability to analyze information, evaluate arguments, and make informed decisions. Davies (2015) defined it

as "purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference as well as an explanation of the evidential, conceptual, methodological, criterion-logical or contextual considerations upon which that judgment was based (Davies, 2015, p. 48). He further developed this model by highlighting its importance in higher education and described it in terms of the skill of recognizing and constructing arguments. He mentioned its six aspects: skills, judgments, dispositions, actions, social relations, and critical being. Earlier, Richard Paul and Linda Elder (2006) proposed the Critical Thinking Framework, which characterizes systematic analysis of personal and others' thinking to develop better reasoning, problem-solving, and decision-making capabilities.

Critical thinking skills enable students to engage deeply in learning and class discussions. They can generate arguments and apply reasoning to solve everyday problems outside academia. Such a mindset facilitates self-regulated learning, reflection, and monitoring of academic performance among students. They can judge their educational growth and pace their learning experiences to align with their goals. In higher education, students regularly face situations where they need to apply critical thinking skills for decision-making and to refine their perspectives in the presence of multiple viewpoints. They debate with others and present their arguments orally or in writing (Davies, 2015). Another study found that athletes capable of critical thinking can independently solve problems and make sound decisions (Rogers et al., 2019). In the demanding environment of college athletics, critical thinking allows athletes to strategize effectively, adapt to changing situations during competition, and make sound health choices (Martens et al., 2024).

The Dual-Role Model is highly relevant for college student-athletes, as it addresses the dual roles of college student-athletes. They are both students and athletes, and their success depends on how well they integrate their academic and athletic commitments. Simons et al. (1999) study significantly advanced the understanding of the dual role model for college student-athletes. They found that because of the rigors of their academic and athletic demands, student-athletes frequently experience motivational challenges more than non-athletes. The conflict between their academic and athletic roles harms their academic performance and overall well-

being due to time constraints and physical fatigue.

This dual-role model highlights the importance of cognitive and social skills in balancing academic and athletic responsibilities (Simons et al., 1999). Davis et al. (2021) found that student-athletes possess better time and stress management skills and excel in social relationships and teamwork. The higher level of social intelligence enables them to balance the dual roles of academics and athletics.

Social intelligence and critical thinking are crucial for the success of college student-athletes and facilitate their ability to cope with stress and conflicting schedules. Zhang and Si (2020) found that college student-athletes with high social intelligence displayed greater empathy and teamwork skills, leading to better performance in both academic and athletic settings. A meta-analysis highlighted the role of social intelligence in fostering leadership, communication, and conflict resolution, reinforcing that these skills are crucial within sports teams (Fong & Krou, 2021). Likewise, critical thinking skills were positively correlated with improved athletic performance. Johnson and Durant (2019) examined the impact of critical thinking on sports performance and found that college student-athletes who regularly engaged in activities that enhanced critical thinking also showed marked improvements in their ability to strategize and execute plays, leading to better overall performance. Another study found that athletes with higher critical thinking skills were more adept at making quick, effective decisions in high-pressure situations (Kane & Reid, 2020). Critical thinking skills enable student-athletes to rapidly analyze and adapt, especially in team sports, leading to better athletic performance (Carter & Williams, 2021).

Several studies suggest a positive relationship between social intelligence and critical thinking. Davies (2015) reported that socially intelligent individuals were likelier to exhibit critical thinking behaviors, and student-athletes who excelled in social intelligence also exhibited strong critical thinking skills. The positive relationship between social intelligence and critical thinking suggests that these skills are interdependent and crucial for student-athletes. Investigating the social and academic impacts of athletic participation, Swanson et al. (2021) found that student-athletes who demonstrated high social intelligence and social and emotional learning were likelier to achieve higher academic outcomes. Another study supported

these findings, adding that student-athletes with higher social intelligence performed academically better due to improved communication and problem-solving skills (Kihl et al., 2019).

Confirming a significant link between emotional intelligence and academic performance among student-athletes, Zhang and Si (2020) reported that athletes who scored higher in emotional intelligence also tended to perform better academically. MacCann et al. (2020) emphasized the significant role of social and emotional competencies in cognitive performance. They reported that social intelligence contributes to better team dynamics and decision-making processes, which can enhance critical thinking. They extended that individuals who effectively manage their emotions and social interactions will likely perform better academically. Furthermore, Adams and Harris (2023) highlighted the role of social intelligence in enhancing leadership skills among student-athletes, which indirectly boosts their critical thinking abilities by promoting reflective and strategic thinking. The literature review suggests that enhancing social intelligence can significantly improve critical thinking skills among college student-athletes.

Some studies focus on coaches' roles in fostering critical thinking skills on the field. Rogers et al. (2019) examined the role of coaches and what strategies they employed to increase critical thinking skills among athletes. Findings show that coaches' active participation in promoting critical thinking among athletes positively correlates with athletes' performance. The most effective strategies were reflection, questioning, and performance feedback in a conducive training environment. They also found that coaches who received training in implementing strategies to enhance critical thinking skills for athlete development were better than those less trained or untrained (Rogers et al., 2019). Johnson and Durant (2019) highlighted a shortage of support programs for critical thinking skills among student-athletes. Such programs are poorly integrated into the academic curricula and target short-term goals. Another drawback is that little is known about how critical thinking skills can be integrated into academic programs or support systems for college athletes to benefit their long-term success beyond athletics (Carter & Williams, 2021).

College student-athletes are a unique and understudied population in Pakistan. While social intelligence and critical thinking

are important for college student-athletes (Larkin et al., 2018), research exploring the potential relationship between these constructs is limited in the Indigenous context. The competencies, academic and athletic performance (Shahan et al., 2023), and challenges (Noshaba et al., 2024) of college student-athletes are examined in Pakistan. Still, no study has been traced to the relationship between social intelligence and critical thinking for college student-athletes. Therefore, college athletes' social and cognitive development needs investigation. Understanding this interplay can inform targeted interventions promoting well-rounded individuals prepared to excel in academia, athletics, and life. The present study is aimed to investigate the relationship between social intelligence and critical thinking skills among college student-athletes. The following hypotheses are tested to meet this objective.

a. College student-athletes with higher social intelligence will exhibit better critical thinking skills.
b. College student-athletes with higher social skills will exhibit better critical thinking skills.
c. College student-athletes with higher social information processing will exhibit better critical thinking skills.
d. College student-athletes with higher social awareness will exhibit better critical thinking skills.

Materials & Methods

The present study employed a quantitative survey-based approach to collect data from full-time undergraduate student-athletes from various colleges and universities in District Haripur KPK, Pakistan. Participants were purposively selected across different sports and academic disciplines. Their age was between 20 and 40 years old. There were 166 males and 41 females, and 144 were enrolled in undergraduate and 63 in graduate programs. They belonged to the joint (n = 93) and nuclear (n = 114) families. Most student-athletes belonged to the middle socioeconomic status (n = 188). Only nine college student-athletes identified themselves as having low SES and ten with high SES.

Two questionnaires were administered, in addition to collecting demographic information about age, gender, level of education, and types of sports. Tromsø Social Intelligence Scale (TSIS) was used to assess three dimensions of social intelligence: social information processing, social skills, and social awareness. TSIS was developed by Silvera, Martinussen, and Dahl

(2001). The TSIS has 21 items that are responded to on a 7-point Likert scale. The options are "*Describes me very poorly*" (1) *to "Describes me very well*" (5). The example items include, "I am good at getting along with others" and "I am often aware of how others feel" (Silvera et al., 2001).

The Academic Competence Evaluation Scales (ACES) were developed by Stephen N. Elliott (2004) and colleagues to assess students' academic skills and behaviors contributing to school success. Specifically, the ACES-College form (ACES-CF) focuses on college students and comprises 73 items across two domains. The Critical Thinking Skills subscale has ten items and evaluates proficiency in critical thinking. Participants responded to the student self-report forms on a five-point Likert scale of "not at all" (1) to "Almost Always" (5). The cut-off score is 30 in the range of 10-50. Scores below 30 represent the developing range, scores between 30-40 represent the competing range, and scores between 40-50 represent the advanced range of critical thinking.

College student-athletes were contacted in person for data collection. However, the survey was electronically distributed to student-athletes at the participating institutions via Microsoft Forms. Survey participation was entirely voluntary, with no incentives offered to avoid bias. Data was collected anonymously to ensure confidentiality and encourage honest responses. Participants were informed about the study's purpose and their right to voluntary participation and withdrawal at any time. Data collected from the survey were analyzed using Statistical Package for Social Sciences version 23.

Ethical Considerations

Participation in the survey is entirely voluntary, with no incentives to avoid bias. The survey is anonymous, ensuring participants' privacy and encouraging truthful responses. To ensure broad representation, the sample includes student-athletes from various sports and academic majors. Participants understand the survey questions and respond honestly. The measures (TSIS and ACES) are valid and reliable for this population. There is a linear relationship between social intelligence and critical thinking.

Results

The survey results were analyzed to understand the relationship between social intelligence and critical thinking among college student-athletes.

The findings are presented through descriptive statistics and regression analysis in the following table.

Table 1. Descriptive Statistics and Psychometric Properties of the Study Variable (N=207)

Sub-Scales	**k**	**α**	**M (SD)**	**Min**	**Max**	**Skew**	**Kurt**
Social Info Processing	7	.78	32.57(11.37)	7	49	-.85	-.29
Social Awareness	7	.76	22.34(10.13)	7	49	.35	-.61
Social Skills	7	.77	23.70(10.30)	7	49	.24	-.80
Critical Thinking Skills	10	.81	29.51(7.21)	10	50	-.04	-.57

The descriptive statistics in Table 1 indicate that all sub-scales have acceptable internal consistency with Cronbach's alpha between .76-.81. The Critical Thinking Skills had the highest reliability. The mean score for Information Processing Skills (M = 32.57, SD = 11.37) was higher than the mean scores for Social Awareness (M = 22.34, SD = 10.13) and Social Skills (M = 23.70, SD = 10.30). However, these are in the average range of TSIS scores, showing moderate variability among participants. The mean scores of athletes on the ACES subscale of Critical Thinking (M = 29.51, SD = 7.21) were also in the developing range of 20-30, representing potential intervention targets.

The score distributions exhibited a moderate negative skew for Social Information Processing, while a slight positive skew for Social Awareness and Social Skills. Critical thinking showed a nearly symmetrical distribution. All sub-scales exhibit slightly platykurtic distributions, suggesting a flatter than normal distribution.

Table 2. Linear Regression for Subscales of Social Intelligence and Critical Thinking (n=207)

Sub-Scales	b	SE	B	T	P
Critical Thinking Skills	15.70	1.29		12.13	.00
Social Info Processing	.16	.04	.25	4.24	.00
Social Awareness	.28	.05	.40	5.75	.00
Social Skills	.10	.05	.13	1.93	.05

Table 2 presents the results of a regression analysis examining the effects of Social Intelligence on Critical Thinking Skills. The results show that the sub-scales of Social Intelligence were significant positive predictors of Critical Thinking Skills among

college student-athletes (R = .64; R^2=.41). Social Awareness was a stronger predictor, followed by social information processing. With each unit increase in Social Awareness, critical thinking skills increased by .28 units. These findings support the hypothesis that college student-athletes with higher social intelligence exhibit better critical thinking skills.

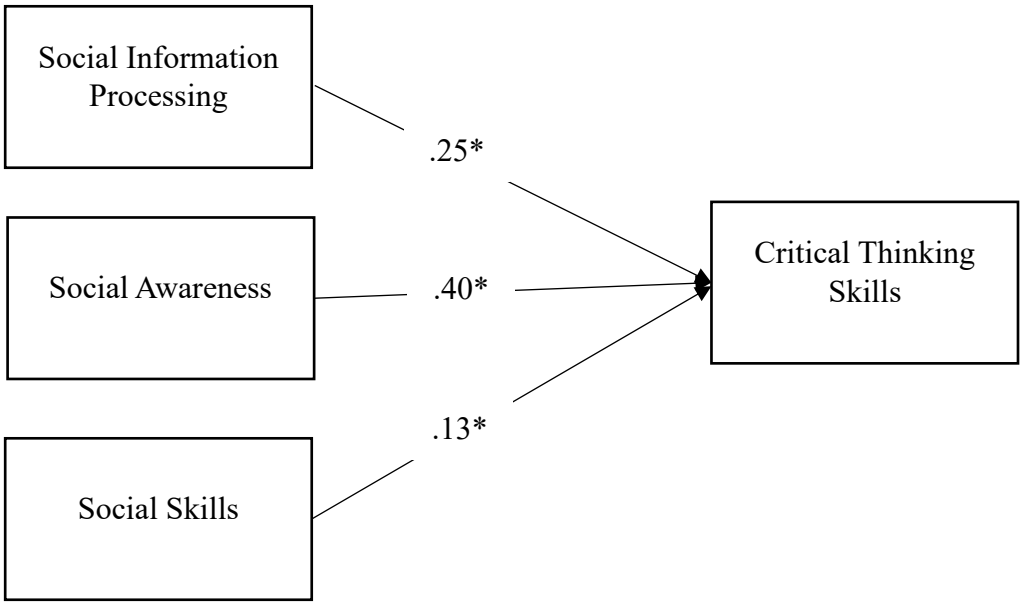

Figure 1. Social Intelligence as a Predictor of Critical Thinking Skills

Figure 1 demonstrates that Social Awareness (β = .40) had the highest standardized regression coefficient than Social Information Processing (β = .25) and Social Skills (β = .13). Social Information Processing had a moderate positive effect. In contrast, Social Skills had a smaller yet significant positive effect on Critical Thinking Skills. The findings support three sub-hypotheses for the positive impact of social information processing, skills, and awareness on critical thinking among student-athletes.

Discussion

This study investigated the relationship between social intelligence and critical thinking skills among college student-athletes. A survey-based design was employed using validated scales to assess social intelligence and critical thinking among college athletes from various sports teams. Social intelligence was used as a predictor of critical thinking skills. The

findings indicate a significant positive relationship between social intelligence and critical thinking among college student-athletes. Among subscales, social awareness was a stronger predictor of critical thinking skills with a large magnitude.

In contrast, social information processing and social skills had moderate and small magnitudes. Figure 1 demonstrates the strength of the relationship between subscales of social intelligence and critical thinking skills. Recent studies support the relationship between social intelligence and critical thinking. For instance, this empirical evidence aligns with MacCann et al. (2020), who found that social intelligence predicts critical thinking skills. Similarly, Newland et al. (2021) demonstrated that social intelligence training improves critical thinking skills, particularly in high-pressure environments like collegiate sports.

The variability in participants' mean scores on the study variables was examined. The descriptive statistics show that social information processing has higher mean scores, followed by social skills. The mean scores of social skills and social awareness were homogenous. These findings imply that college student-athletes process social information more frequently than engaging in effective social behaviors and being socially aware of their surroundings. The significance of effective interpersonal interactions cannot be denied in athletic settings due to the academic and athletic challenges in routine. College student-athletes must be capable of balancing their dual responsibilities to ensure academic success. The findings also indicate that college student-athletes had mean scores below the cut-off point of 30. They were in a developing range of critical thinking and had not acquired a competent and advanced level of thinking skills. The mean scores on social intelligence aligned with the critical thinking scores; both were in the low-to-moderate range.

Student-athletes are burdened to perform educational and sports activities simultaneously. The moderate scores of students on both constructs allude to the burden of academic and athletic demands, which support the dual-role model for college student-athletes. Academic success depends on integrating commitment and time management to perform both roles. College student-athletes face more conflicting schedules between academic and sports-related activities than non-athletes. The cognitive load to perform well in academics and sports demands persistent motivation. That is why having high social intelligence is essential to effectively manage social

interactions with peers, coaches, teachers, and teams. Contrarily, poor social relationships and non-satisfactory academic performance will harm the overall well-being of college student-athletes.

Critical thinking can ensure the academic success and well-being of college student-athletes, enabling students to make informed decisions after critically evaluating available information. As Davies (2015) extrapolated, applying reasoning to manage academic and non-academic problems in routine promotes critical thinking. It enables students to reflect, argue, analyze, and evaluate information effectively. Davies found critical thinking to be a significant positive outcome of social intelligence, and student-athletes with strong critical thinking skills were highly skilled in social intelligence. Kihl et al. (2019) reported that social intelligence correlated with better problem-solving ability and communication skills among student-athletes, and they showed higher academic performance than their counterparts.

Strengths and Limitations

It is an indigenous study that portrays the socio-cognitive development of college student-athletes, demonstrating that social intelligence promotes critical thinking skills that can bolster students' academic success. Lee et al. (2018) extrapolated that limited empirical evidence directly links social intelligence to critical thinking, specifically among college student-athletes. Most studies focus on the general student population or professional athletes. The present study addresses the gap in understanding how social skills interact with cognitive skills in the context of college sports. This knowledge can ultimately be used to develop support systems and intervention programs to foster the necessary skills in social intelligence and critical thinking. Educators, parents, coaches, and college administrators can offer services to at-risk student-athletes to optimize their academic success and overall well-being.

Despite the merits, the present study has certain limitations. The cross-sectional design limits the ability to determine the relationship direction, temporal precedence, and other variables that may influence both constructs. Second, the sample size needs to be increased to generalize the findings to all college student-athletes. Participants were predominantly from the Haripur district, limiting the applicability of the findings to student-athletes in other parts of the province or country. Lastly, using self-report measures for social intelligence and critical thinking may introduce biases such as social desirability and inaccurate self-assessment.

Participants may overestimate or underestimate their abilities, which can affect the reliability of the data.

Future Recommendations

Based on the study limitations, future researchers should conduct longitudinal studies to examine the developmental trajectories of social intelligence and critical thinking. This would provide insights into the temporal order of these variables and their overtime association. Conducting a large-scale study with a more significant sample chosen from various demographic areas will further expand knowledge about the strength of the relationship between study variables. It is also recommended that self-reports be complemented with other data collection reports about college student-athletes' social and cognitive skills to increase confidence in the data's reliability. Besides, future researchers can explore college athletes' interactions outside of athletics, ways to foster social intelligence and critical thinking skills, the effectiveness of interventions to enhance these skills, and the role of contextual factors such as coaching styles, team dynamics, institutional support, etc.

Implications

The current study's findings have theoretical and practical implications. Various theoretical frameworks in psychology and education support the present study findings. Namely, the findings empirically support three constructs in Goleman's Emotional and Social Intelligence Theory and integrate them with Paul-Elder's Critical Thinking approach. Results provide a holistic understanding of social competence as a predictor of cognitive competence and how increasing social intelligence can improve critical thinking skills among students. These findings can spark more research to promote an understanding of these theoretical approaches. On the practice side, the findings highlight the need to assess college student-athletes' social intelligence and critical thinking. This will assist in monitoring student-athletes' progress and identifying areas of improvement.

A notable finding of the present research is that one of the ways to improve critical thinking skills is to enhance social intelligence among college student-athletes. Higher education institutions have a significant role in developing curricula and integrating training programs for athletes and coaches to improve these skills systematically. This could be done through mentorship, professional development programs, workshops, seminars, and counseling services. Coaches can design and implement training programs with effective

strategies to improve social intelligence and critical thinking skills among student-athletes.

Conclusion

This study reveals a significant positive relationship between social intelligence and critical thinking among college student-athletes, suggesting that those with higher social intelligence are better equipped with critical thinking skills. Social awareness was a relatively stronger predictor of critical thinking skills than social information processing skills and social skills. These findings provide a comprehensive understanding and support the holistic development of student-athletes. Despite limitations such as sample size, self-report measures, and a cross-sectional design, the findings align with existing theories of Goleman's Emotional and Social Intelligence Theory and Paul-Elder's Critical Thinking and empirical research, underscoring the importance of integrating social intelligence training into educational and athletic programs.

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Authors' Contributions

Author 1 contributed toward finalizing the research idea, conducting the literature review, data collection, data entry, and manuscript writing. Author 2 was responsible for generating the research idea, writing the literature review and the manuscript, data analysis, and editing/formatting.

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