

Decision-making and game perception in soccer players

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ABSTRACT

This study examines the effectiveness of a Perceptual Tactical Training (ETP) intervention designed to enhance tactical perception and decision-making skills in professional soccer players aged 18–20 years. The ETP programme integrates psychocognitive components, including personality traits measured by the Big Five Inventory and cognitive abilities assessed using Raven's Progressive Matrices, providing a comprehensive profile that combines tactical, psychological, and cognitive dimensions. A pilot quasi-experimental design was implemented, with an experimental group completing the ETP programme and a control group maintaining regular training across five weeks. Pre- and post-intervention assessments used football-specific tasks to measure tactical perception and decision accuracy, alongside personality traits and cognitive abilities. Descriptively, the experimental group showed higher post-intervention scores on tactical perception and decision-making indicators, whereas the control group exhibited minimal change. Players reported high acceptance and perceived usefulness of the programme. Given the small sample size and exploratory nature of the study, these findings should be interpreted as preliminary but support the feasibility of the intervention and the relevance of integrating multiple dimensions to personalise training in football. This multidimensional approach offers promising insights for developing evidence-based, context-sensitive training strategies for player development and coaching practice.

KEYWORDS: tactical perception; decision-making; perceptual tactical training; football; personality; cognitive ability.

INTRODUCTION

Adolescence is a crucial transitional stage marked by rapid physical, cognitive, emotional, and social changes that shape personality and future behaviour (Sawyer et al., 2018). Current perspectives emphasise the heterogeneity of adolescent experiences, shaped by cultural, technological, and socio-economic factors, including globalisation and digital connectedness, that increase psychosocial demands (Patton et al., 2016). Building on Hall's recognition of adolescence as a distinct life stage (Hall, 1904), subsequent research has underscored the interdependence among biological maturation, identity formation, and evolving social relationships (Crocetti, 2017).

Identity construction is central to self-concept, emotional regulation, and behavioural patterns. Marcia's identity status paradigm highlights the roles of exploration and commitment, noting that incomplete identity consolidation heightens vulnerability to insecurity and dependence on external support

(Marcia, 1980; Xu, 2023). Adolescents frequently experience mental health difficulties and family, social, and academic pressures, with emotional states ranging from frustration to depression, often linked to risk behaviours such as substance use and conflicts, exacerbated by low self-esteem (Espinoza et al., 2022).

Participation in physical and sports activities is highlighted as a key protective factor for adolescents' physical, mental, and social health, yet most do not meet recommended activity levels, with important negative consequences (Wyszyńska et al., 2020). Research shows that organised sport is associated with better self-esteem, resilience, social inclusion, life satisfaction, and cognitive functioning, including in youths with chronic conditions (Sañudo et al., 2024). Moreover, sport psychology is presented as a key cultural agent that helps deconstruct gender and disability stereotypes by promoting more equitable participation and performance opportunities (Díaz-Rodríguez et al., 2025).

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Personality constitutes a pivotal construct in sports psychology, with trait-based models providing comprehensive frameworks to examine individual differences influencing motivation, behaviour, and performance. The Five-Factor Model (Big Five) is widely regarded for its empirical robustness and encompasses the dimensions of Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism, which consistently correlate with various facets of athletic performance and participation (Shuai et al., 2023). The functional relevance of specific traits such as conscientiousness—associated with discipline and goal-oriented behaviours—and extraversion—linked to sociability and motivation—has been well documented, though ongoing debates address the nuanced roles of subtrait facets and sport-specific variations (García-Naveira & Ruiz Barquín, 2013; Torreblanca Murillo, 2017).

Motivational processes are described as fundamental for sustaining sport participation and developing athletic expertise, with self-determination theory highlighting how fulfilling basic needs for autonomy, competence, and relatedness supports durable engagement (Gallant et al., 2024; Ryan & Deci, 2017). Goal orientation theory adds that task-oriented athletes, focused on mastery, and ego-oriented athletes, focused on outperforming others, show different patterns of well-being and performance over time (He et al., 2025).

The text then stresses that tactical decision-making and perceptual skills are crucial in dynamic team sports like football, requiring rapid information processing, anticipation, and adaptive responses, and is framed by cognitive flexibility and embodied decision-making models that integrate perception, action, and context (Maselli & Aglioti, 2025). The Perceptual Tactical Training (ETP) approach is presented as a multidimensional method that combines cognitive-perceptual tasks with personality and intelligence assessment to enhance decision-making, with prior validation in basketball showing improvements in tactical creativity and decision accuracy and supporting its adaptation to football (Díaz-Rodríguez & Pérez-Córdoba, 2024; Díaz-Rodríguez et al., 2024).

METHODS

The study proposes an intervention programme based on Perceptual Tactical Training (ETP) as the independent variable, designed to enhance tactical perception while also fostering autonomy, perceived competence, and peer relationships in young footballers (Díaz-Rodríguez et al., 2024). The main dependent variables are tactical perception quality and decision-making, assessed with football-specific

instruments, along with personality (Big Five Inventory) and general cognitive abilities (Raven's Progressive Matrices) (Díaz-Rodríguez & Pérez-Córdoba, 2024; Díaz-Rodríguez et al., 2026; Raven et al., 2003).

A quasi-experimental design with a control group is used, involving 20 players (10 experimental, 10 control; balanced by gender) from a professional club, all regularly active and highly intrinsically motivated, aged 18–20 years. Those who opted into the programme formed the experimental group, while non-participants who agreed to be evaluated formed the control group; inclusion and exclusion criteria relate to club membership, training volume, injury status, neurodevelopmental conditions, attendance, and consent. The intervention comprises 10 sessions over 5 weeks (two 45-minute sessions per week), with pre- and post-tests on all variables using the described personality, cognitive, and tactical perception/decision-making instruments.

RESULTS

Personality assessments using the Big Five Inventory showed that highly motivated participants displayed elevated extraversion ($M = 12.3$, $SD = 2.1$) and openness to experience ($M = 13.1$, $SD = 1.8$), together with moderate to low neuroticism ($M = 5.6$, $SD = 1.9$), with males reporting slightly higher extraversion and intrinsic motivation than females. The Perceptual Tactical Training (ETP) intervention produced a significant positive effect on the experimental group: Tactical Perception Accuracy increased from 72.5 ($SD = 4.2$) to 82.7 ($SD = 4.5$), an improvement of about 14%, whereas the control group showed only minimal change (73.1 ± 4.0 to 73.5 ± 4.1), yielding a large effect size, $t(18) = 4.15$, $p < .001$, $d = 1.85$. Decision-Making Effectiveness similarly improved in the experimental group from 65.0 ($SD = 5.5$) to 71.5 ($SD = 5.8$), an approximate 10% gain, compared with negligible change in the control group (65.5 ± 5.3 to 65.8 ± 5.4), with $t(18) = 3.20$, $p = .005$, $d = 1.43$. Cognitive ability, assessed via Raven's Progressive Matrices, was moderately and positively correlated with improvements in tactical perception ($r = 0.48$), and preliminary analyses suggest that psychocognitive factors such as psychoticism and abstract thinking may support these performance gains, while neuroticism and extraversion show weaker links to immediate change but may contribute to longer-term adaptation.

DISCUSSION

The preliminary pilot results demonstrate the feasibility and initial efficacy of the ETP intervention, with the

experimental group showing 14% improvement in tactical perception accuracy ($t(18) = 4.15, p < .001, d = 1.85$) and 10% in decision-making effectiveness ($t(18) = 3.20, p = .005, d = 1.43$) compared to negligible control changes.

These large effect sizes align with perceptual-cognitive training meta-analyses showing enhanced decision-making in team sports (Mann et al., 2007), validating ETP adaptation from basketball (Díaz-Rodríguez et al., 2024). Big Five personality patterns—elevated extraversion/openness in motivated players, moderate neuroticism—mirror sports psychology findings linking traits to performance/motivation (Díaz-Rodríguez et al., 2026). Raven's correlation ($r = 0.48$) with tactical gains underscores cognitive-perceptual links, while gender differences in extraversion suggest tailored applications.

This multidimensional integration (tactical + personality + cognition) overcomes prior studies' variable isolation (Díaz-Rodríguez & Pérez-Córdoba, 2024), with the Big Five superior to the Eysenck for comprehensive profiling. Limitations: small $N = 20$, non-random assignment, short 5-week duration, pilot scope preclude causality.

Future research requires larger randomised trials, longitudinal follow-up, mixed ANOVA/multilevel models, and gameplay transfer validation. Overall, ETP offers a promising framework for personalised youth football training optimising psychocognitive decision-making.

CONCLUSIONS

This pilot study indicates that Perceptual Tactical Training (ETP) is a feasible and initially effective multidimensional intervention for young football players, producing meaningful gains in tactical perception and decision-making relative to a control condition. The convergence of performance improvements with specific personality patterns and cognitive abilities supports the rationale for combining tactical, personality, and cognitive assessments to guide more personalised training designs. However, the small non-random sample ($N = 20$), short 5-week duration, and pilot nature of the study limit the generalisability of the findings and preclude strong causal conclusions. Future research should therefore employ larger randomised samples, longitudinal follow-up, more advanced statistical modelling, and on-field transfer measures to confirm these effects and refine the profiling of athletes most likely to benefit from ETP. In sum, ETP emerges as a promising framework for personalised psychocognitive training in youth football, with potential applications in both development and high-performance pathways.

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