Cohesion, Team Potency, and Performance in Military Selection: Dynamics and Effectiveness

Coesão, Potência da Equipe e Desempenho na Seleção Militar: Dinâmica e Eficácia

Cohesión, Potencia del Equipo y Desempeño en la Selección Militar: Dinámica y Eficacia

Empirical Research Reports

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Abstract: This study investigates the influence of team process variables on team dynamics in military settings, using a sample of 196 candidates from the Portuguese Military Academy, organized into 28 teams. Assessments occurred at two time points, including self-reports on social and task cohesion, team potency, and viability, as well as external evaluations of leadership, self-control, and problem-solving. Results show that team potency strongly predicts leadership performance. Additionally, team viability partially mediates the relationship between potency and leadership, and fully mediates the link between task cohesion and problem-solving. Statistical analyses included Mann-Whitney tests and Structural Equation Modeling. Findings indicate increased team effectiveness over time, supported by improved communication and contextualized experience. The study underscores the importance of team cohesion and potency in developing military leadership and highlights team viability as a key mechanism for translating team dynamics into higher performance.
Keywords: collective efficacy, group potency, team effectiveness, personnel selection, workgroup cohesion.

Resumo: Este estudo investiga a influência de variáveis de processo de equipe na dinâmica grupal em contextos militares, com uma amostra de 196 candidatos à Academia Militar Portuguesa, organizados em 28 equipes. As avaliações ocorreram em dois momentos, incluindo auto-relatos sobre coesão social e de tarefas, potência e viabilidade da equipe, além de avaliações externas de liderança, autocontrole e resolução de problemas. Os resultados indicam que a potência da equipe é um forte preditor do desempenho em liderança. A viabilidade da equipe medeia parcialmente a relação entre potência e liderança, e medeia totalmente a relação entre coesão de tarefa e resolução de problemas. As análises incluíram testes de Mann-Whitney e Modelagem de Equações Estruturais. Os achados revelam um aumento da eficácia da equipe ao longo do tempo, impulsionado por uma comunicação mais eficaz e pela contextualização das experiências. O estudo destaca a viabilidade como fator-chave na conversão da dinâmica em desempenho.
Palavras-chave: eficácia coletiva, potência grupal, efetividade da equipe, seleção de pessoal, coesão do grupo de trabalho.

Resumen: Este estudio analiza la influencia de variables del proceso de equipo en la dinámica grupal en contextos militares, con una muestra de 196 candidatos a la Academia Militar Portuguesa, organizados en 28 equipos. Las evaluaciones se realizaron en dos momentos e incluyeron autoevaluaciones sobre cohesión social y de tareas, potencia y viabilidad del equipo, junto con evaluaciones externas de liderazgo, autocontrol y resolución de problemas. Los resultados indican que la potencia del equipo predice fuertemente el rendimiento en liderazgo. Además, la viabilidad del equipo media parcialmente la relación entre potencia y liderazgo, y completamente entre cohesión de tarea y resolución de problemas. El análisis incluyó pruebas de Modelado de Ecuaciones Estructurales. Los hallazgos revelan una mejora en la eficacia del equipo a lo largo del tiempo, impulsada por una comunicación eficaz y experiencias contextualizadas. El estudio resalta la viabilidad como mecanismo clave para traducir la dinámica grupal en mejor desempeño..
Palabras clave: eficacia colectiva, potencia grupal, efectividad del equipo, selección de personal, cohesión del grupo de trabajo.

Introduction

Team dynamics are crucial for organizational success, particularly in complex contexts like the military. Understanding how team dynamics influence effectiveness is vital for improving performance. Our study focuses on the selection of officer candidates at the Portuguese Military Academy, where a two-week immersive test evaluates military aptitude. This highlights the importance of examining teamwork training's impact on team dynamics and candidate performance.

Military contexts involve unique factors, including rigorous culture, socialization, and acculturation, which affect team cohesion and dynamics. Hackman's Theory of Team Effectiveness (1987) provides a model for analyzing team dynamics, identifying team composition, organizational context, and team processes as key criteria.

Team composition involves selecting members with diverse skills. In our study, teams are formed with individuals who often do not know each other, requiring them to blend technical and interpersonal skills to succeed. McEwan et al. (2017) found that newly formed teams benefit more from teamwork training, improving teamwork processes, while established teams show greater performance improvements.

The organizational context, with its rigid discipline and clear hierarchy, significantly influences team dynamics. The intense selection process fosters cohesion through shared challenges. Recent research (Johns, 2024) underscores the importance of considering context in leadership studies, revealing gaps in how environmental factors affect behavior and performance. Event-oriented approaches offer a richer understanding of leadership dynamics.

Effective team processes, including communication, leadership, and conflict resolution, are crucial for developing self-efficacy and team effectiveness. Training that enhances social support and conflict management can improve performance (Salas, et. al., 2018). Marks et al. (2001) and Rousseau et al. (2006) suggest that interpersonal processes underpin team effectiveness.

Porter et al. (2024) highlight the role of social support and conflict management in effective teamwork, emphasizing the need for research on how these processes affect team performance. Hackman's criteria for effectiveness, including meeting performance standards, are applied in our study through third-party assessments and self-reports.

While prior research has extensively examined the role of team cohesion, potency, and viability in various organizational settings, studies focusing on their specific impact within military selection contexts remain limited. Most existing studies have analyzed these variables in corporate or sports environments (e.g., Alper, Tjosvold, & Law, 2000), where team formation and dynamics differ significantly from structured, high-pressure military selection processes. Furthermore, while team potency has been established as a predictor of performance outcomes (Gully et al., 2002), there is insufficient empirical evidence regarding its development and influence during short-term, immersive military assessments. Our study bridges this gap by analyzing how teamwork training shapes social cohesion, task cohesion, and team potency during the officer selection process at the Portuguese Military Academy. Through a structured evaluation framework, we provide empirical insights into how these factors evolve in newly formed military teams and their subsequent impact on leadership performance.

The following sections will explore theoretical backgrounds, performance, self-efficacy, collective efficacy, and team potency, with a focus on social cohesion, task cohesion, and team effectiveness.

Team Performance

Gibson et al. (2000) argue that team efficiency hinges on meeting both internal criteria, related to processes and dynamics, and external criteria, tied to results, performance, and communication. Team performance is influenced by various factors, with team cohesion being a notably significant factor (Chiu et al., 2023; Majeed et al., 2023). Team cohesion refers to the tendency of team members to unite and work together towards common goals (Tekleab et al., 2009), encouraging collaboration and collective effort (Majeed et al., 2023). Cohesion, known to enhance teamwork, likely plays a major role in improving team performance, as supported by previous studies (Majeed et al., 2023; Wang et al., 2022). Cohesive teams also promote harmonious interpersonal relationships, facilitating mutual learning and overall better performance (Majeed et al., 2023). However, excessive cohesion can sometimes lead to performance issues (Park et al., 2017).

Interpersonal cohesion positively correlates with team performance (Davcheva & Gonzalez-Roma, 2022). Consistency in behavior, reflecting shared commitment, and consistency in cognition, indicating agreement on values, goals, and norms, are key factors (Wu, 2023; Chiu et al., 2023; Grossman et al., 2022). Team performance includes task performance, which is the actual output, and cooperation satisfaction, which measures the team's contentment with task completion and willingness to collaborate further (Wang et al., 2023). Both dimensions are influenced by team cohesion (Lee, 2022; Mariam et al., 2022).

Recent research by Wei et al. (2024) highlights strong connections between team performance (cooperation satisfaction and task performance) and team cohesion (consistency of affection and cognition). The positive correlation between cooperation satisfaction and task performance aligns with previous findings (Paganin et al., 2023). Effective teamwork leads to better performance

outcomes and higher satisfaction with the collaborative process, fostering confidence in future collaborations.

Self-Efficacy, Collective Efficacy and Potency in Work Teams

Bandura (1982) defined self-efficacy as an individual's belief in their capability to succeed in specific tasks and achieve desired outcomes. While knowledge, skills, and abilities are crucial, they alone are not enough; individuals must also have confidence in their ability to perform the task. Self-efficacy mediates the relationship between capability and action, as beliefs about one's abilities influence motivation and behavior.

Self-efficacy is an individual-level construct based on beliefs about one's performance, derived from four sources (Bandura, 1982): 1) Past successes; 2) Vicarious experiences; 3) Verbal persuasion; and 4) Psychophysiological states.

Potency, a concept related to team-level self-efficacy, refers to the collective belief within a team about their effectiveness in achieving tasks (Shea & Guzzo, 1987). This shared belief impacts team efficiency: a stronger belief in team effectiveness often leads to higher efficiency. Potency is shaped through social interactions and positive team relationships. Evaluating team effectiveness should consider productivity and social aspects, such as team members' well-being and satisfaction.

The sense of team potency is influenced by past experiences of success or failure, creating a cyclical relationship with team efficiency. Positive feedback enhances team potency, leading to improved performance (Jordan, et al., 2002). The belief that a team can work effectively correlates strongly with better performance outcomes.

Jung and Sosik (2003) highlight that feedback on team performance affects members' perceptions of their efficiency. A team's awareness of their task is linked to their collective sense of competence, dedication, and self-discipline. Positive feedback creates expectations of future success, boosting team confidence and performance. Teams receiving consistent positive feedback are likely to see improvements in their efficiency.

Based on the previously discussed information, it is possible to distinguish the concept of potency from the concept of efficacy along three dimensions: 1) Level of the Group: Potency is a construct at the group level, focusing on the collective belief in the team's effectiveness, while self-efficacy is an individual-level construct, pertaining to an individual's belief in their personal performance; 2) Level of Belief Sharing: Potency is a collective belief, as it relies on the existence of shared beliefs in collective efficacy among team members. In contrast, self-efficacy is an individual's exclusive belief regarding their ability to perform effectively; and 3) Scope of Belief: Potency pertains to a general belief in efficacy across various tasks within the work context. Self-efficacy, on the other hand, is a more specific belief, centered on an individual's belief in their ability to succeed in performing a particular task (Guzzo et al., 1993). These distinctions help clarify the nature and scope of these beliefs and how they operate at both the group and individual levels.

Diverse studies have explored the relationship between team potency and performance, highlighting its role in shaping collective efficacy and motivation. Research suggests that when teams share a strong belief in their effectiveness, they are more likely to engage in collaborative behaviors, seek feedback, and adapt to challenges, ultimately improving performance. Additionally, team potency has been linked to increased resilience in high-pressure environments, enabling teams to maintain productivity despite external stressors. This collective confidence fosters better communication, coordination, and decision-making, reinforcing the team's ability to achieve its goals. These findings have been consistently supported across multiple studies, demonstrating the relevance of team potency in diverse organizational contexts (Guzzo et al., 1993; Shea & Guzzo, 1987).

The findings of this study provide new evidence on the mediating role of team viability in leadership performance and problem-solving. The partial confirmation of Hypothesis 4 suggests that while task cohesion and team potency directly contribute to team viability, their influence on leadership performance is only partially mediated. This reinforces previous findings on the importance of collective confidence in organizational performance (Porter et al., 2024) but also indicates that other factors, such as candidates' prior experience and familiarity with the selection environment, may moderate this effect. Moreover, the lack of a significant direct effect of social cohesion on performance challenges previous studies (Barrick et al., 1998), suggesting that in high-pressure contexts, task-based cohesion may have a more immediate impact on team effectiveness than social bonds among members.

Kim et al. (2022) demonstrated that team potency is key to understanding how leader-member exchange (LMX) and peer mentoring affect performance. They argue that the combined impact of LMX and peer mentoring indirectly influences performance through team potency.

Pavez et al. (2021) showed that group potency moderates the adverse effects of time pressure on project progress. Teams with high potency maintain effective performance under stress, while those with low potency may struggle. This collective belief helps teams stay focused and efficient despite time constraints, fostering a culture of success and resilience that benefits long-term performance.

In summary, group potency is essential for project team performance. It boosts motivation, resilience, and collaboration, moderates the impact of time pressure, and supports ongoing success. Teams with high potency build a strong foundation for future achievements in challenging environments.

A recent study by Porter et al. (2024) explores collective efficacy as a mediator between shared leadership and team performance. Collective efficacy, or the shared belief in a team's ability to achieve goals, is crucial for performance as it drives engagement in coordinated action processes. Porter et al. (2024) build on previous research to demonstrate that collective efficacy, alongside team potency, is positively correlated with performance. Their study supports the notion that shared leadership enhances collective efficacy, which in turn improves team performance and accelerates learning. They emphasize that sustaining high collective efficacy within teams is vital for optimizing outcomes and effectiveness.

Based on these findings, it leads to the following hypothesis:

Hypothesis 1: The mean levels of team potency are positively correlated with various dimensions of team performance.

Social Cohesion and Task Cohesion

Tesluk and Mathieu (1999) describe cohesion as the sense of togetherness, connection, and bond among people, encompassing solidarity, harmony, and commitment. Social cohesion represents forces that drive members to desire group participation, reflecting their synergetic interactions and unity toward common goals.

For complex tasks requiring substantial coordination and adaptation, social cohesion is crucial. Tesluk and Mathieu's results suggest that higher motivation and commitment in such tasks foster cooperation and collaboration. Additionally, when managers grant teams autonomy and avoid overly prescriptive instructions, it enhances member commitment and strengthens relationships.

However, it's important to note that cohesion alone is not a guarantee of improved team performance, as emphasized by Robbins (2009, p. 198). For a team to be effective, its members must share high-performance standards and align their objectives with the organization's goals. Highly cohesive teams with members who are not committed to the organization's objectives can be highly ineffective. Thus, the impact of cohesion on a team's efficiency may vary depending on the team's work design and internal processes. Cohesion encompasses essential social dimensions related to the task. Task-related cohesion reflects the degree to which group members collaborate to achieve common goals. It is a dynamic process characterized by the group's tendency to unite and remain united in pursuit of common goals and objectives.

Barrick et al. (1998) have demonstrated a positive correlation between social cohesion and performance. In a study by McLaren and Spink (2020), it was found that individuals highly engaged in information exchange, as well as teams with higher levels of information exchange, collectively predict task cohesion beyond initial task cohesion perceptions in the sports context. This study possesses notable strengths that merit recognition. Firstly, the consideration of both individual and team levels of the communication network structure allowed for a more detailed analysis, revealing how structural properties uniquely influenced task cohesion and team performance. The discovery that communication network structure was differentially associated with task cohesion and team performance represents a novel finding in sports research, highlighting the need for further exploration in future studies. These findings lead to the following hypothesis:

Hypothesis 2: Mean levels of social cohesion are positively associated with different kinds of team performance.

Hypothesis 3: Mean levels of task cohesion are positively associated with different kinds of team performance.

Team Viability and Team Effectiveness

Mathieu et al. (2019) propose that team performance is part of a broader construct of team effectiveness, which includes team viability and member satisfaction. A high-performing team may still have members who view collaboration as a burden and do not wish to continue working together.

Effectiveness is often defined by tangible outcomes (Leyer, et al., 2023). Hackman (1987, 1990) outlines three criteria for team effectiveness: 1) Productive Output: Objective performance, such as products, services, or decisions produced by the team; 2) Perceived Team Viability: The team's potential to continue in the future, influenced by member interactions; 3) Member Satisfaction: Not assessed in this study.

This study focuses on Hackman’s first criterion, examining: 1) Leadership and Quality: Team leadership performance; 2) Self-Control: Team self-control performance; 3) Problem Solving: Quality and quantity of problem-solving contributions.

It also considers the second criterion, perceived team viability. Team prosocial motivation enhances effectiveness by building emotional bonds and improving attitudes towards the team. Prosocially motivated teams tend to have higher viability, as teams with strong emotional relationships show greater viability (Balkundi & Harrison, 2006).

Prosocial motivation influences team viability by fostering commitment to shared goals (De Dreu et al., 2000). Teams motivated to benefit others produce high-quality results and strengthen bonds, aligning with Hackman's theory (1987). Hu and Liden (2015) argue that teams driven by collective goals, not personal gains, are more collaborative and effective.

The findings suggest a positive relationship between social cohesion, task cohesion, and team potency with leadership performance and team effectiveness. However, while this aligns with previous literature (Gully et al., 2002; Salas et al., 2018), we acknowledge that these relationships should be further tested in future longitudinal studies to confirm their long-term predictive power. The proposed hypothesis is:

Hypothesis 4: Team viability mediates the effects of social cohesion, task cohesion, and team potency on team performance (e.g., team leadership performance, team self-control performance, and team problem-solving performance).

Method

Design of the study

A naturalistic research design was employed, as it involved a selection process for the Military Academy, where candidates participated in a two-week Military Aptitude Test, and it is an official and standardized selection process. Platoons and their respective groups were formed without manipulation, consisting of civilian candidates with no prior knowledge, where social cohesion and group potency can only be built over weeks and through exposure to military training. During the first week, the platoons and their groups shared the same military training and barracks life. Due to logistical reasons, the number of available psychologists, and tests, the first 14 teams were evaluated at the beginning of the second week and the remaining 14 teams at the end of the second week (Table 1).

Table 1*. Research design*

Military Aptitude Test – Selection Process				
Week 1	Beginning Week 2 14 Team		Final Week 2 14 teams	
Team formation	Moment 1 Self Assessment (Group Level)	Moment 2 External Assessment (Group Level)	Moment 1 Self Assessment (Group Level)	Moment 2 External Assessment (Group Level)
	Social Cohesion	Team Leadership Performance	Social Cohesion	Team Leadership Performance
	Task Cohesion	Team Self-Control Performance	Task Cohesion	Team Self-Control Performance
	Team Potency	Team Problem-Solving Performance	Team Potency	Team Problem-Solving Performance

This allowed for the control and comparison of the evaluation moments of the two groups. However, it was not possible to conduct a pre-test and post-test in order to avoid diminishing the training, learning, and novelty effects of the tests. To control for this aspect, we conducted a t-test (given that the data does not follow a normal distribution and the variances of the groups are different) to compare the equality of mean values to assess whether the temporal effect (evaluation at the beginning of the second week and evaluation at the end of the second week) leads to an increase in Social Cohesion, Task Cohesion, and Team Potency. To avoid a cause-and-effect relationship between the independent and dependent variables, the independent variables are self-assessed at the group level, and the dependent variables are evaluated by an external assessment panel composed of three independent assessors who assess the group.

Participants

T The sample consisted of 196 candidates who applied for the Portuguese Military Academy. Although the sample size is below 200 participants, it is appropriate for assessing the relationships between these constructs within a structured selection process. Given the study's focus on team dynamics in a naturalistic military setting, ecological validity is prioritized.

These candidates participated in the analysis during their Military Aptitude Test over two weeks, during which they were divided into 28 teams, each of equal size (ranging from 6 to 7 members) and representing various majors. The mean age of the participants was $\bar{x}$ = 19.2 years, with a standard deviation of σ = 1.6. All candidates had completed secondary school. Eleven percent of the participants were female. The candidates applied for courses in the Portuguese Army and Republican National Guard, including Infantry, Cavalry, Artillery, Administration, Engineering, and Medicine. They completed the survey as part of the Military Aptitude Test, assessing social cohesion, task cohesion, team potency, team viability, and maturity.

The scales used in this study were selected based on their psychometric robustness and extensive application in team effectiveness research. To measure social cohesion, task cohesion, team potency, and team viability, we employed validated scales from Nascimento Junior et al. (2012), Guzzo et al. (1993), and Lewis (2004). These scales were adapted to the military context, considering the specificity of the selection environment and the need to assess dynamic team processes over a short period.

In addition to self-assessments by candidates, an independent external evaluation was conducted by a panel composed of two military psychologists and a senior officer. To ensure standardized evaluation criteria, the judges underwent specific training before data collection, based on the Army's "Assessment in Selection Contexts" course. The reliability among evaluators was assessed using the Intraclass Correlation Coefficient (ICC), with values exceeding 0.75, indicating good to excellent agreement.

The following section describes the procedures adopted for scale application and data collection during the selection process.

Data Collection Procedures and Ethical Considerations

This research had two different moments of evaluation for each of the fourteen groups.

Moment 1 involved the self-administration of previously validated scales assessing Social Cohesion and Task Cohesion (Nascimento Junior et al., 2012; Carron et al., 1985), Team Potency (Guzzo et al., 1993), and Team Viability (Lewis, 2004; based on Hackman's work (1990) at the group level over a 2-week period during the Military Aptitude Test. These scales were selected based on their established psychometric validity and relevance to team dynamics research. The candidates were gathered in an auditorium for 60 minutes. During these meetings, the candidates were briefed about the research and its confidentiality.

The dataset used in this study is particularly suitable for testing the model due to its comprehensive assessment of key variables pertinent to team dynamics. The variables included—social cohesion, task cohesion, team potency, and team viability—are well-established in the literature as critical factors influencing team performance. These variables were selected based on their relevance to both military training contexts and general team effectiveness frameworks. Additionally, the naturalistic setting of the study, which involves real-world military training environments, enhances the ecological validity of the findings. The military context, characterized by its structured and immersive nature, provides a unique opportunity to observe the rapid development of team dynamics, making the dataset highly appropriate for evaluating the proposed model. The significant changes observed in team cohesion and performance metrics over the short intervention period further underscore the dataset's utility in capturing the temporal effects of teamwork training interventions.

Moment 2 involved the assessment of group dynamics through In-basket exercises and field physical/situational tasks. The evaluation panel consisted of two military psychologists and a senior officer.

In-basket exercise: Each team participated in an exercise conducted during the 2-week period. In this exercise, teams were tasked with solving a specific problem in a classroom setting. Initially, each team member formulated and presented an individual plan to address the problem. In the second phase, all team members engaged in a group discussion to decide on a collective plan for execution.

Physical/Situational task exercises: Each team engaged in two exercises that required them to perform physical tasks based on written scenarios. In each exercise, teams developed assumptions, devised a behavioral plan of action, and executed their plan.

The tasks were primarily physical, with some mental exercises, requiring teams to demonstrate leadership, self-control, and group problem-solving under time pressure. At the beginning of each exercise, the team received an oral description of the problem situation, including its parameters and available resources.

To ensure standardized application conditions, all participants completed the questionnaires in the auditorium of the Military Academy under the supervision of military psychologists. The total time allocated for completing the scales was 60 minutes, ensuring that all candidates had sufficient time to reflect on their responses without external pressures.

The evaluators responsible for performance analysis underwent structured training before the start of the study (*Assessment in Selection Contexts Course*). This training included methodological alignment sessions and the application of specific rubrics for assessing leadership, self-control, and problem-solving skills. The goal was to minimize subjectivity in score assignments and enhance inter-rater reliability.

This study adhered to ethical guidelines for research involving human participants. Participation was voluntary, with no harmful consequences for the individuals involved. Informed consent was obtained, ensuring anonymity, confidentiality, and the right to withdraw at any time. Data were securely stored and analyzed to prevent individual identification, following the principles set by the Committee on Publication Ethics (COPE).

Measures

To ensure the validity of the instruments used, all scales applied in this study were selected based on their extensive validation in the literature, with their original authors cited in the measurement instruments. The number of items per factor follows the structure of the original validated instruments, with internal consistency supported by the reliability analysis in Table 2.

Group Process Variables (Moment 1). The scales used in our questionnaire were adapted to fit the group level. Candidates responded on a 5-level Likert scale, ranging from 1 (completely disagree) to 5 (completely agree). In Table 2, we provide descriptions of the variables that make up the questionnaire, along with the alpha values for the reliability analysis of the original study, the adapted Portuguese version, and our study.

Table 2*. Variables description and the alpha value of the reliability analysis*

Variables	Autor	Description	items	Original study alpha	Our study alpha
Social Cohesion (Group Integration Social)	Nascimento Junior et al., 2012; Carron et al., 1985)	Synergistic interactions between team members, including positive communication, conflict resolution and effective workload sharing	5	.78	.81
Task Cohesion (Group Integration Task)	Nascimento Junior et al., 2012; Carron et al., 1985)	Task cohesion is the attraction or commitment of the group members to the task environment in which the group is working	4	.80	.87
Team Potency	Guzzo et al., 1993	Team potency is a belief that a team has about its general effectiveness performance across multiple tasks	7	.89	.82
Team Viability	Lewis (2004) based on Hackman's work (1990)	Desire of the team members to work together in the future	3	.92	.78

Social Cohesion

Social cohesion is defined as "synergistic interactions between team members, including positive communication, conflict resolution, and effective workload sharing" (Barrick et al., 1998, p. 382). We measured social cohesion (Group Integration Social - GI-S) using five items from the Portuguese version of the Group Environment Questionnaire (GEQ), which was adapted by Nascimento Junior et al. (2012) from the original Group Environment Questionnaire (Carron et al., 1985; Carron et al., 1988). The Cronbach's alpha for the GI-S dimension in the adapted version of the GEQ was α = 0.78, whereas in our study, it was α = .87. An example of a social cohesion item is, "The members of this platoon tend to get along with each other".

Task Cohesion

Task cohesion refers to the attraction or commitment of group members to the task environment in which the group is working (Mason & Griffin, 2003). To assess task cohesion (Group Integration Task - GI-T), the Portuguese version of the Group Environment Questionnaire (GEQ) was used, adapted by Nascimento Junior et al. (2012) from the original Group Environment Questionnaire (Carron et al., 1985; Carron et al., 1988). The Cronbach's alpha for the GI-T dimension in the adapted version of the GEQ was α = 0.80, whereas in our study, it was α = .87. Of the five original items, one had to be removed as it lowered the internal consistency of the scale, leaving four items to form the composite scale. A sample item is "Members of my platoon have conflicting personal aspirations for the group's performance.

Team Potency

Team potency is generally considered as the belief that a team holds regarding its overall performance effectiveness across multiple tasks (Guzzo et al., 1993). This construct is measured by eight items adapted from Guzzo et al. (1993); however, we removed one item due to low internal consistency indices. A high score on the group potency scale indicated that individuals believed the team could be effective across various tasks. An example of a group potency item is, "Our platoon has confidence in itself." The alpha for this scale in our study is α = 0.82.

Team Viability

Team viability reflects the desire of platoon members to work together in the future. Despite the short-term nature of the tasks in this study, team viability remains a measure of team effectiveness

worth researching. We measured this factor using three items from the team viability scale developed by Lewis (2004) based on Hackman's work (1990). An example item is, "This platoon would perform well together in the future." The alpha for this scale in our study is α = 0.78.

In-basket exercises (Moment 2). The evaluation team, consisting of 2 military psychologists and one military officer, assessed the teams' results in terms of their leadership, self-control, and team problem-solving, using an observation grid based on a Likert-type scale ranging from 1(Insufficient) to 5 (Excellent). To minimize evaluation bias, all responses were collected anonymously and under the same experimental conditions. Each year, evaluators undergo a specialized training program titled "Assessment in Selection Contexts" at the Army Center for Applied Psychology. This training ensures they follow a standardized protocol, promoting consistency in measurements. Additionally, an independent panel composed of two military psychologists and a senior officer conducted the external evaluation of the groups, ensuring impartiality in observations and score assignments.

Intraclass Correlation Coefficient (ICC) values above 0.75 indicate good to excellent agreement between the three panel raters, confirming the reliability of the evaluation process (Table 3).

Table 3. *Inter-Rater Reliability for Construct Assessments (Intraclass Correlation Coefficient - ICC)*

Construct	ICC (95% Confidence Interval)	Interpretation
Team and Leadership Performance	0.86 (0.81 – 0.90)	Excellent Agreement
Self-Control Performance	0.82 (0.76 – 0.88)	Excellent Agreement
Team Problem-Solving Performance	0.79 (0.72 – 0.85)	Good to Excellent Agreement

Team and Leadership Performance

This factor evaluates persuasion, communication skills, and the ability to work in a team.

Self-Control Performance

Self-control may be defined as the exercise of internal control over one's own actions. This exercise may take the form of mental regulation, emotional management, goal setting, self-monitoring, and making responsible choices. This aspect analyzes the capacity to plan and evaluate alternative actions.

Team Problem-Solving Performance

Involves the capability to interact positively with other team members to plan and present alternative solutions.

Table 4 presents the operationalization of the constructs Team and Leadership Performance, Self-Control Performance, and Team Problem-Solving Performance through key terms and their corresponding observational indicators. These indicators were designed to ensure objective and consistent assessment of each construct, providing clear criteria for evaluating candidates' performance in different team-based tasks.

Results

Table 5 presents the descriptive statistics for all variables. The independent variables — social cohesion, task cohesion, and team potency — were examined, yielding results above the theoretical midpoint of the scale.

Team potency received the highest score (Mean = 3.99, *SD* = 0.65). The mediating variable, team viability, was also examined, and the results for this variable are very similar (Mean = 3.23, *SD* = 0.73).

The dependent variables show values that range between 2.94 (team problem-solving performance) and 3.27 (team leadership). The lower performance scores demonstrate the need for further development and experience.

The correlation matrix for all variables is presented in Table 6. The correlations between the variables (social cohesion, task cohesion, and team potency) are positive and significant ($p < 0.01$). The results indicate that task cohesion is significantly related to social cohesion ($p < 0.01$). The data also demonstrate that the mediating variable, team viability, is significantly related to the independent variable's social cohesion, task cohesion, and team potency ($p < 0.01$).

The dependent variable, team leadership performance, shows a significant correlation at the 0.05 level with social cohesion and team viability. It also exhibits a correlation at the 0.01 level with task cohesion and team potency.

The correlations between the dependent variables are significantly related ($p < 0.01$), particularly the correlation between team self-control performance and team leadership performance, as well as the correlation between team problem-solving performance and team self-control performance.

Table 4. *Operationalization of Constructs through Key Terms and Observational Indicators*

Construct	Key Terms	Observational Indicators
Team and Leadership Performance	Persuasion	Presents logical arguments that lead others to agree.
	Communication	Clearly conveys ideas and actively listens to teammates.
	Coordination	Organizes tasks efficiently and aligns team efforts.
	Influence	Encourages others to take action through example or reasoning.
	Collaboration	Works cooperatively, valuing different perspectives.
Self-Control Performance	Emotional Regulation	Manages frustration and stress without disrupting the group.
	Goal Setting	Defines clear objectives and remains focused on achieving them.
	Self-Monitoring	Adjusts behavior based on feedback and situational demands.
	Impulse Control	Avoids hasty reactions and considers consequences before acting.
	Decision-Making	Makes thoughtful choices considering both logic and emotions.
Team Problem-Solving Performance	Analytical Thinking	Breaks down complex problems into manageable components.
	Adaptability	Adjusts strategies when facing unforeseen challenges.
	Creativity	Proposes innovative and unconventional solutions.
	Consensus Building	Facilitates agreement among team members through discussion.
	Strategic Planning	Develops structured action plans to address challenges.

Table 5. *Descriptive statistics of the independent, mediating and dependent variables*

Variable	Mean Value	Std. Deviation	Minimum	Maximum
Social Cohesion	3.84	0.58	2.40	5.00
Task Cohesion	3.66	0.72	1.75	5.00
Team Potency	3.99	0.65	1.57	5.00
Team Viability	3.23	0.73	1.00	5.00
Team Leadership Performance	3.27	0.72	2.00	5.00
Team Self-Control Performance	3.09	0.79	1.00	5.00
Team Problem-Solving Performance	2.94	0.95	1.00	5.00

Table 6. *Correlation matrix for all variables*

Variable	1	2	3	4	5	6	7
1- Social Cohesion	-						
2- Task Cohesion	.44**	-					
3- Team Potency	.51**	.70**	-				
4- Team Viability	.36**	.59**	.81**	-			
5- Team Leadership Performance	.21*	.33**	.45**	.25*	-		
6- Team Self-Control Performance	.07	.08	.03	.026	.35**	-	
7-Team Problem-Solving Performance	-.14	.10	.01	-.05	.19	0.45**	-

The results presented in Table 7 provide a comparative analysis of the variables Social Cohesion, Task Cohesion, Team Potency, Team Viability, Team Leadership Performance, Self-Control Performance, and Team Problem-Solving Performance across the two assessment points (beginning and end of the second week). Given that the data did not follow a normal distribution, the Mann-Whitney U test was applied to compare the two groups in a non-parametric framework.

The findings indicate statistically significant differences for all analyzed variables, suggesting that teamwork training and the passage of time during the selection process contributed positively to the development of team dynamics and leadership effectiveness. More specifically:

Social Cohesion and Task Cohesion showed a significant increase, reinforcing the idea that teams become more cohesive as they engage in shared tasks and interactions over time.

Team Potency and Team Viability also improved significantly, supporting the notion that early team experiences can shape collective efficacy and long-term sustainability in a structured selection process.

Team Leadership Performance, Self-Control Performance, and Team Problem-Solving Performance exhibited notable improvements, emphasizing the impact of teamwork training on leadership emergence, individual regulation, and collaborative problem-solving skills.

Overall, these results align with previous research highlighting the importance of team development and cohesion in high-pressure environments (Gully et al., 2002; Salas et al., 2018). The findings support the need for structured teamwork interventions in military selection processes, as they enhance key attributes essential for leadership roles.

These results reinforce the practical implications of teamwork training in military contexts, particularly in shaping adaptive leadership skills, resilience, and team effectiveness during early formation stages.

Table 7. *Mean differences between weeks*

Variable	Week	Mean	*SD*	*U* Test	Sig
Social Cohesion	Beginning week 2	3.18	.55	379.0	<.001
	Final week 2	4.35	.50		
Task Cohesion	Beginning week 2	3.37	.78	3100.0	<.001
	Final week 2	3.76	.78		
Team Potency	Beginning week 2	3.83	.66	2613.0	<.001
	Final week 2	4.43	.66		
Team Viability	Beginning week 2	3.57	.70	2357.0	<.001
	Final week 2	4.17	.71		
Team Leadership Performance	Beginning week 2	2.90	.66	2401.0	<.001
	Final week 2	3.50	.64		
Team Self-Control Performance	Beginning week 2	2.96	.77	3847.0	<.005
	Final week 2	3.16	.74		
Team Problem-Solving Performance	Beginning week 2	2.74	.99	4002.0	<.001
	Final week 2	3.14	.96		

Although a pre-test and post-test were not conducted due to the naturalistic nature of the research, it is possible to show that the temporal effect explains the results, regardless of the characteristics of the candidates. The military context, stemming from the specificity of military training, the boarding school regime, immersive in nature, where military culture exerts immense pressure, fosters socialization among the groups and their respective platoons, which is reflected in the construction of social cohesion, task cohesion, and team potency.

To examine the relationships between social cohesion, task cohesion, and team potency with team viability and team performance, we conducted a Path Analysis (Figure 1) using Structural Equation Modeling (SEM). The model fit was evaluated using commonly recommended indices (Hu & Bentler, 1999), which indicated an adequate fit to the data: Chi-square (χ^2) = 245.37, df = 120, $p < .001$; CFI (Comparative Fit Index) = 0.94; RMSEA (Root Mean Square Error of Approximation) = 0.06 (90% CI: 0.05 – 0.08); SRMR (Standardized Root Mean Square Residual) = 0.07. These results suggest that the proposed model provides a good representation of the data, supporting the hypothesized relationships.

Effects of social cohesion, task cohesion, and team potency on team viability: Only task cohesion and team potency have a significant positive effect on team viability (β=0.19, $p < 0.05$, and β = 0.72, $p < 0.01$), respectively.

Effects of team viability on its performance: Only team viability has a significant positive effect on team leadership performance (β = 0.41, $p < 0.01$) and team problem-solving performance (β = 0.23, $p < 0.05$), respectively.

Direct versus indirect effects of leadership: To determine whether the meditational or direct effects model better represents the data, we fitted a modified full model with direct paths from social cohesion, task cohesion, and team potency to team performance (e.g., team leadership performance, team self-control performance, and team problem-solving performance).

The parameter estimates for the direct paths from social cohesion, task cohesion, team potency variables to team performance was not significant, whereas the path from team potency to team leadership performance was significant (β= 0.31, $p < 0.01$).

Thus hypothesis 1 is partially confirmed, and hypotheses 2 and 3 are not confirmed. The team viability acts as a partial mediator variable between team potency and team leadership performance. Moreover, team viability is a mediator variable between task cohesion and team problem solving (β= 0.31, $p < 0.01$). Thus hypothesis 4 is partially confirmed.

Our findings provide further theoretical support for the role of team viability as a key mediating mechanism in team dynamics. The results indicate that team viability bridges the relationship between team potency and leadership performance, reinforcing previous research suggesting that a team's sustained willingness to collaborate is crucial for long-term effectiveness. This supports Hackman's (1987) conceptualization of team viability as a central factor in team effectiveness, particularly in high-pressure environments where sustained cooperation is essential.

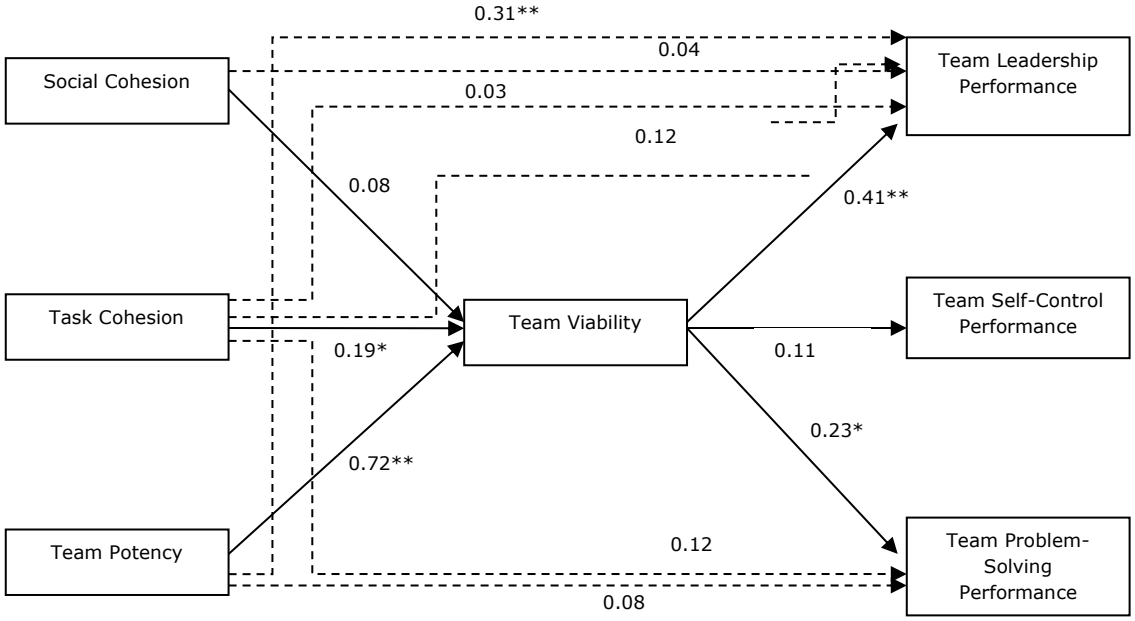

Figure 1. *Path Analysis of the Conceptual Model between Cohesion, Potency, and Performance*. Note: (*p<.05; **p < .01)

Furthermore, the mediation of team viability between task cohesion and team problem-solving performance highlights its importance in translating team cohesion into actionable performance improvements. This finding aligns with theories of collective efficacy, suggesting that teams with a higher sense of viability are more likely to maintain engagement and motivation in challenging tasks. It also extends previous research by demonstrating that team viability does not merely reflect members' future intentions to collaborate but actively facilitates performance outcomes.

These insights suggest that team viability should be more explicitly considered in team development models, particularly in structured selection processes where teams must quickly establish cohesion and potency. Future research could explore how interventions aimed at strengthening team viability—such as fostering shared goals and reinforcing positive team experiences—can enhance long-term team effectiveness and leadership emergence.

Discussion

The findings of this study provide critical insights into how team cohesion, team potency, and team viability influence team performance during a structured military selection process. The results highlight a progressive improvement in team dynamics, with significant increases in task cohesion, social cohesion, and team potency over time. These improvements directly impact team performance metrics, such as leadership effectiveness, problem-solving abilities, and self-control. This suggests that structured teamwork training fosters not only individual adaptability but also collective efficacy, reinforcing the importance of team processes in high-pressure environments.

Although candidates' attention levels were not directly measured, the observed increase in social cohesion (p < 0.001) and team viability (p < 0.001) between the first and second weeks suggests that team dynamics facilitated the adaptation of less attentive candidates. The selection process itself, characterized by shared challenges, structured interactions, and collective goal-setting, provided conditions that promoted social cohesion, task cohesion, and team viability, which are key to improving performance. The progressive nature of the training, combined with repeated exposure to problem-solving tasks, enabled less attentive candidates to engage more effectively with their teams, improving their contributions over time.

Implications for the Selection Process

The results have three main implications for military selection procedures: 1) The Temporal Effect on Performance – The observed improvement in performance over time suggests that familiarity with procedures positively influences candidate outcomes. This raises the question of whether later-assessed candidates have an advantage and whether standardizing exposure to selection tasks earlier in the process could enhance fairness; 2) Impact of Team Processes on Candidate Adaptation – The study reinforces that team cohesion and viability contribute to the integration of all candidates, particularly those who may initially struggle with attentional demands. The structured nature of the training process encourages shared responsibility, collaborative problem-solving, and mutual support, which facilitate the adaptation of less attentive candidates; and 3) Military Socialization and

Team Integration – The study underscores that early exposure to team-based problem-solving and shared experiences fosters military socialization. The structured nature of military training helps candidates quickly develop cohesion, align their goals, and strengthen their commitment to collective performance, which are essential attributes for military leadership.

The findings of this study provide critical insights into how time progression influences team cohesion and potency in structured selection environments. The significant increases in social and task cohesion over time indicate that shared experiences and structured collaboration opportunities enhance teamwork efficiency. This suggests that selection and training programs should integrate early-stage interventions that facilitate team bonding, such as guided problem-solving exercises and structured team feedback sessions.

Furthermore, the increase in team potency highlights the role of confidence-building mechanisms in team performance. As candidates progress through the selection process, their belief in collective effectiveness strengthens, reinforcing motivation and engagement. Organizations, particularly in military and high-pressure environments, should incorporate targeted strategies—such as leadership mentoring and progressive team-building challenges—to accelerate this development.

From a practical standpoint, these findings reinforce the importance of considering temporal effects in team assessment. Selection processes should account for the natural learning curve in team dynamics, ensuring that evaluations reflect not just initial performance but also adaptability and improvement over time. Implementing progressive assessment models can lead to more accurate evaluations of candidate potential, optimizing both selection and training methodologies.

Therefore, the consequences for the selection process may include considering a learning curve and the importance of evaluating not only initial performance but also the candidates' ability to adapt and improve over time. Additionally, the value of communication and teamwork may be an important criterion in the selection process, as effective collaboration among candidates can be an indicator of success in military contexts.

Theoretical Contributions Based on Hackman's Model

The study found that teams with high task cohesion performed significantly better in problem-solving tasks, aligning with Hackman's criterion of group output. Our results not only confirm the importance of task cohesion for performance but also suggest it as a crucial mediator between team training and problem-solving performance. This extends Hackman's model by highlighting that enhancing task cohesion through interventions can significantly improve team effectiveness.

Hackman defines team viability as the ability to work together sustainably and effectively over time. Our study found that social cohesion was a significant predictor of team viability, as measured by member satisfaction and their intention to remain in the team. This relationship was assessed using validated self-report measures, specifically the adapted Group Environment Questionnaire (GEQ) for social cohesion (Nascimento Junior et al., 2012) and the team viability scale (Lewis, 2004). The statistical analysis confirmed that teams with higher social cohesion scores at the beginning of the second week demonstrated significantly greater viability by the end of the second week ($p < 0.001$), supporting the predictive validity of the findings.

These results expand Hackman’s model by showing that social cohesion, in addition to being a factor of satisfaction, can directly influence members' intentions to stay in the team. This suggests that training programs promoting social cohesion can increase member retention in high-pressure teams by fostering commitment and cooperative behaviors.

The concept of team potency, or the collective belief in the team's ability to achieve goals, was validated in our study as a full mediator between task cohesion and performance. This result confirms the importance of team potency in Hackman's model. Our findings suggest that team potency might be the mechanism through which task cohesion affects team performance. This insight adds a new layer to Hackman's model, indicating that interventions that enhance team potency can amplify the positive effects of task cohesion on performance.

The study demonstrated that training interventions focused on improving social cohesion and conflict management were associated with increases in team effectiveness. This aligns with Hackman's emphasis on the importance of context and team processes for effectiveness. These results suggest that contextually adapted training is crucial for optimizing team effectiveness, especially in high-pressure environments like the military.

However, it is important to acknowledge that team effectiveness was assessed through structured observations by a trained panel, and the time frame did not allow for the inclusion of additional performance criteria, such as academic results or long-term professional performance. While the observed increases in social cohesion, task cohesion, and team viability ($p < 0.001$) support the effectiveness of these interventions in the short term, further research is needed to examine their impact on broader performance indicators over extended periods. Therefore, conclusions regarding long-term team efficiency should be made with caution, considering the scope and methodological constraints of the study.

Even within these limitations, the findings extend Hackman's theory by illustrating that tailored training interventions can enhance team cohesion and viability in structured selection environments,

reinforcing the importance of context-specific strategies in military training and leadership development.

Our findings provide empirical support for the role of team viability as a key mediating mechanism in team dynamics. The results indicate that team viability bridges the relationship between team potency and leadership performance, reinforcing previous research suggesting that a team's sustained willingness to collaborate is crucial for long-term effectiveness. This supports Hackman's (1987) conceptualization of team viability as a central factor in team effectiveness, particularly in high-pressure environments where sustained cooperation is essential.

However, while the results show statistically significant relationships ($p < 0.001$), it is important to acknowledge that the study does not present predictive strength scores or residual analyses. Future research should further explore these relationships using predictive modeling techniques and longitudinal data to assess their long-term stability and generalizability. Therefore, while this study contributes to the theoretical understanding of team dynamics, additional empirical validation is required to confirm its broader applicability.

Within these considerations, the findings offer meaningful insights into how social cohesion, task cohesion, and team viability interact within structured selection environments, providing a foundation for refining team development strategies in high-performance contexts.

Practical Implications

Individuals in platoons with high team potency and social cohesion achieved better individual performance and showed greater favorability toward joining the Portuguese Military Academy. This observation has several practical implications. Our research confirms that higher team potency and social cohesion positively influence individual performance, aligning with findings from Chiu et al. (2023) and Majeed et al. (2023). Team cohesion, marked by unity and collaboration (Tekleab et al., 2009), enhances performance, as observed in military platoons. This underscores the importance of fostering strong team dynamics to improve individual outcomes, reinforcing existing literature on team cohesion benefits. Additionally, the findings highlight the need to assess candidates' teamwork aptitude and adaptability beyond initial performance. Institutions like the Portuguese Military Academy should consider this holistic approach to ensure long-term success in high-performance environments (Park et al., 2017).

Our study reaffirms the significance of teamwork in military contexts. Strong interpersonal skills, effective communication, and a collective sense of efficacy drive superior performance (Marks et al., 2001). Addressing social support and conflict management is crucial for optimizing team performance. Rousseau et al. (2006) suggest that resolving these issues enhances team effectiveness, emphasizing the need for targeted interventions. Furthermore, improved performance over time highlights the learning curve. Familiarity with routines strengthens performance, reinforcing the value of experience and adaptation. Our findings emphasize the importance of interpersonal dynamics, as efforts to improve conflict management and social support significantly impact team outcomes.

The selection process should prioritize candidates' potential for growth and adaptability, rather than focusing solely on initial performance. Attributes like adaptability and commitment to improvement are essential for long-term success, particularly in structured training environments. However, as this study was conducted at the beginning of military training with a cross-sectional design, it does not allow for direct predictions of long-term professional performance. The findings highlight associations between teamwork processes and early adaptability indicators, but further longitudinal studies are needed to examine how these attributes evolve and contribute to sustained military career success.

The desire of platoon members to collaborate in the future mediates the effects of commitment levels on problem-solving. A team's belief in its effectiveness enhances persuasion, communication, and teamwork. Team viability, or the willingness to continue working together, mediates performance, aligning with Thomas et al. (2020). In high task interdependence contexts, liking teammates significantly influences team viability, while competence perceptions play a greater role in low interdependence situations. Team potency, or the collective belief in performance, shapes team dynamics and outcomes. This belief enhances persuasion and teamwork, supported by Thomas et al. (2020) and Griffith and Steelman (2004). Feedback also influences team efficacy and confidence (Jung & Sosik, 2003). Effective collaboration and positive interactions improve problem-solving abilities, and the mediating role of team viability highlights the complexity of group dynamics, suggesting that commitment fosters better problem-solving through future collaboration. Nurturing a positive team environment and shared beliefs is essential, particularly in contexts requiring collective problem-solving and effective teamwork.

Although the results indicate statistically significant differences between assessment moments, they should be interpreted with caution. Given that the sample does not follow a normal distribution, we opted for non-parametric analyses (Mann-Whitney U test) to compare groups, ensuring a more suitable methodological approach. However, this method has limitations, including lower statistical power compared to parametric tests, which may reduce sensitivity to smaller effects.

Additionally, the sample of 196 participants, divided into 28 teams, limits the generalizability of the findings. Variability within subgroups is expected in dynamic environments such as the military, where external factors can influence cohesion and team performance. Consequently, conclusions should be viewed as indicative trends rather than definitive causal relationships.

Furthermore, the naturalistic setting of the study did not allow for a pre-test, preventing direct pre- and post-intervention comparisons. Although the temporal effect was statistically controlled, the absence of baseline measurements restricts causal inferences. Future studies should consider larger samples and longitudinal designs to track the evolution of team dynamics over time. Additionally, exploring moderating variables, such as situational leadership and prior teamwork experience, could provide deeper insights. Alternative methodologies, including mixed method approaches, may also enhance the understanding of team cohesion and potency in high-pressure environments.

This study confirms that team viability is a crucial mediator between team potency and key dimensions of team performance, including leadership effectiveness and problem-solving. Higher team potency enhances performance by fostering collective confidence and encouraging collaboration. These findings highlight that, while leadership emergence is an important outcome, team effectiveness fundamentally depends on the synergy between cohesion, potency, and viability. Understanding these dynamics is essential for optimizing teamwork training in military selection contexts.

Effective communication and shared experiences contribute to overall team effectiveness. Although this study examined leadership performance, the specific role of shared leadership was not directly assessed. Future research should explore whether increased team viability and cohesion naturally promote more distributed leadership within teams.

In summary, team potency is the strongest predictor of leadership performance. Team viability mediates the relationship between team potency and leadership performance, as well as between task cohesion and problem-solving performance. However, the extent of this mediation varies. While team viability significantly mediates both relationships, task cohesion does not fully mediate problem-solving performance. These findings suggest that team viability plays a crucial role in enhancing team effectiveness but interacts with other contributing factors. This study underscores the importance of team dynamics, collective belief, and team viability in problem-solving and overall performance, offering valuable insights for team development and selection strategies in military contexts.

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Contribution:

António José Palma Esteves Rosinha: conceptualization, data curation, formal analysis, funding acquisition, investigation, methodology, project administration, resources, software, supervision, validation, visualization, writing – original draft, writing – review & editing.

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Research data are available upon request to the author.

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