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INFLUENCE OF NON-FINANCIAL REWARDS ON MULTIPLE COMMITMENTS IN THE PORTUGUESE ARMED FORCES

O IMPACTO DAS RECOMPENSAS NÃO FINANCEIRAS NOS MÚLTIPLOS COMPROMETIMENTOS, NO CONTEXTO DAS FORÇAS ARMADAS PORTUGUESAS

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Abstract

Faced with recruitment difficulties and the continuous outflow of personnel from their ranks, military institutions are challenged to develop human resources policies that enhance motivation and personnel retention.

This study analysed the influence of Non-Financial Rewards (NFR) on the multiple commitments of Portuguese Armed Forces personnel – specifically commitment to the supervisor, the military profession, and the organization – while considering the mediating role of organizational trust. The objective is to provide evidence that allows the Armed Forces to adjust their human resources policies in alignment with their strategic goals.

To this end, an electronic questionnaire was administered to 24,058 personnel from the three branches of the Armed Forces, resulting in a final sample of 545 valid responses (a response rate of approximately 2.27%).

The results confirm that NFR positively influence the different types of commitment, especially in their affective dimension, and that this influence is partially mediated by organizational trust. The tested structural model showed good fit indices and statistical stability; the calculative dimension of commitment was eliminated due to its weak statistical explanation and theoretical inadequacy within the military context.

Keywords: Commitment, Non-Financial Rewards, Organizational Trust, Portuguese Air Force, Portuguese Armed Forces.

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Resumo

Face às dificuldades de recrutamento e à saída contínua de militares das suas fileiras, as instituições militares enfrentam o desafio de desenvolver políticas de recursos humanos que potenciem a motivação e a retenção do efetivo.

Neste contexto, o presente estudo procurou analisar a influência das Recompensas Não Financeiras (RNF) nos múltiplos comprometimentos dos militares das Forças Armadas Portuguesas - nomeadamente o comprometimento com o superior hierárquico (CSH), com a profissão militar (CP) e com a organização (CO) -, considerando a mediação da confiança organizacional. O objetivo é fornecer evidência que permita às Forças Armadas ajustar as suas políticas de recursos humanos de acordo com os seus objetivos estratégicos.

Para tal, foi aplicado um questionário eletrónico a 24.058 militares dos três ramos das Forças Armadas, com uma amostra final de 545 respostas válidas (taxa de resposta de aproximadamente 2,27%).

Os resultados confirmam que as RNF influenciam positivamente os diferentes tipos de comprometimento, especialmente na sua dimensão afetiva, e que essa influência é parcialmente mediada pela confiança organizacional. O modelo estrutural testado apresentou bons índices de ajustamento e estabilidade estatística, tendo sido eliminada a dimensão calculativa do comprometimento, dada a sua fraca explicação estatística e inadequação teórica ao contexto militar.

Palavras-chave: *Comprometimento, Confiança Organizacional, Força Aérea Portuguesa, Forças Armadas Portuguesas, Recompensas Não Financeiras.*

1. Introduction

Recently, the Armed Forces have faced recruitment difficulties along with a continuous outflow of service members from their ranks, leading to a shortage of personnel (Decree-Law No. 64/2024, 2024). Military institutions are challenged to develop and implement human resources policies that enhance personnel motivation and retention (Rijo, Marreiros, Mairos, & Paquete, 2018; Pires, 2024).

Reward systems, both financial and non-financial, are a widely used human resource management practice (Beer, Boselie, & Brewster, 2015; Chiang & Birtch, 2006). Such systems are usually grounded in well-established theories of motivation, most notably those proposed by Maslow (1954), Herzberg (1966) and Ryan and Deci (2020), who highlight the role of intrinsic and extrinsic factors in employee motivation. The literature has also consistently supported the assumption that employee commitment can have multiple dimensions and that it is significantly influenced by people management practices (Becker, 1992; Meyer & Allen, 1997; Meyer & Smith, 2000; Meyer & Herscovitch, 2001; Klein, Molloy, & Cooper, 2009). It is also widely accepted that non-financial rewards play a key role in building organizational trust (Alcoba & Phinaitrup, 2023; Bouckaert, 2012; Miles & Mangold, 2012; Robbins, Judge, & Campbell, 2010).

In the public sector, financial rewards are subject to legal restrictions and are not awarded at the discretion of management. Therefore, this study will focus on the importance of extrinsic and intrinsic non-financial rewards (NFR) for members of the Armed Forces. In Meyer and Allen's (1997) model, NFR are considered antecedents for commitment. Studies such as Meyer et al. (2002), Colquitt et al. (2007) and Liu and Wang (2013) show that organizational trust is also an antecedent for commitment, and that it is influenced by whether employees perceive the organization's human resource management practices as fair and effective (Beer et al., 2015; Colquitt, LePine, & Wesson, 2007; Miles & Mangold, 2012; Robbins et al., 2010; Liu & Wang, 2013).

Employee commitment is especially important to military organizations because, as observed by Allen (2003), higher levels of commitment are associated with lower turnover. On the other hand, Becker et al. (2009) argue that employees may display commitment to other entities beyond the organization. When these multiple commitments are at odds with the organization's goals, this can lead to conflicts that compromise the organization's cohesion and performance.

However, not many studies examine non-financial rewards, trust and multiple commitments in the Armed Forces. This study aims to bridge this gap by analysing these dynamics in a workplace where hierarchy and employee retention are critical.

The study's objective is to assess the mediating effect of trust on the relationship between service members' satisfaction with their non-financial rewards and their level of commitment to their supervisor, their profession and their organization (in other words, to the Armed Forces).

2. Theoretical Framework

2.1. Non-Financial Rewards

Several studies (Kuvaas, 2006; Dikshit & Madan, 2018; Leitão et al., 2022; Batta, Bandameeda, & Parayitam, 2023; Qing & Teo, 2024) have shown that rewards are a human resource management practice that influences employee motivation. Other constructs, such as human resource management practices (which include reward systems), along with different types of work experiences and experiences outside work, have likewise been shown to be antecedents of commitment (Meyer & Allen, 1997; Meyer et al., 2002).

Reward systems include both financial and non-financial rewards (Deci & Ryan, 2000; Chiang & Birtch, 2006; Milkovich, Newman, & Gerhart, 2013; Armstrong, 2020). However, in the public sector (which includes the Armed Forces), financial rewards are subject to legal restrictions. Therefore, this study focuses on non-financial rewards (NFR), using the classification proposed by Chiang and Birtch (2006), which divides NFR into extrinsic or intrinsic. Extrinsic rewards come from external factors such as systems of social interaction (Chiang & Birtch, 2006; Deci & Ryan, 2000), whereas intrinsic rewards reflect an employee's own subjective evaluation of their work performance (Table 1). Extrinsic NFR are defined as tangible, task-specific, and are controlled and managed by the

organization. On the other hand, intrinsic NFR are intangible and reflect an employee's self-assessment of their performance (Chiang & Birtch, 2006).

Table 1 – Non-Financial Rewards

Extrinsic	Intrinsic
• Good working relationships with co-workers	• Challenging tasks
• Good working relationship with supervisor	• Opportunity to use skills
• Job security and stability	• Job variety
• Promotion opportunities (career advancement)	• Autonomy and responsibility
• Strong team spirit	• A sense of accomplishment
• Training and career development plans	• Job satisfaction
• Good work-life balance	
• Suitable tools to do the job	
• Performance and recognition (public praise, commendations, awards)	
• Work compatible with the time to do it	
• Healthy working environment	

Source: adapted from Chiang & Birtch, 2006.

A study by Martins (2016) assessed the value placed on NFR by Air Force personnel and found an unusually strong correlation (r=0.82) between extrinsic and intrinsic NFR, suggesting that these two constructs may be unidimensional. This study used a unidimensional construct to assess NFR, comprising 4 items: 3 for intrinsic NFR and 1 for extrinsic NFR (Table 2).

Table 2 – Non-Financial Rewards

Extrinsic
• Training and career development plans
• Challenging tasks
• Job satisfaction
• A sense of accomplishment

Source: Martins (2016).

Human resource practices that include NFR have been shown to be antecedents for different types of commitment, such as organizational commitment (which has been studied most extensively), commitment to the profession and commitment to supervisors (Armstrong, 2020; Becker, 2016; Klein et al., 2012; Meyer & Smith, 2000; Meyer et al., 2002). The following hypothesis was formulated: H1: Non-financial rewards (NFR) positively influence different types of commitment. The hypothesis can be subdivided into three specific hypotheses:

H1a. Non-financial rewards (NFR) positively influence commitment to supervisors (CS);
H1b. Non-financial rewards (NFR) positively influence commitment to the profession (CP);
H1c. Non-financial rewards (NFR) positively influence organizational commitment (OC).

2.2. Organizational trust

Mayer et al. (1995) define organizational trust as the willingness of a party (the trustor) to comply with the actions of another (the trustee), based on the expectation that the latter will act in a manner that will benefit them. Mayer et al. (1995) analysed trust from the perspective of both the trustor (their propensity to trust, i.e. the willingness to trust others) and the trustee (trustworthiness). They organized the characteristics of the trustee into dimensions such as ability (a set of skills and characteristics that give them influence in a specific domain), benevolence (the extent to which a person wants to do good for someone who places trust in them, without the expectation of personal gain) and integrity (the trustor believes that the trustee follows principles that they find acceptable).

This relationship-based approach differs from the traditional model based on the concept of 'side bets' proposed by Becker (1960), in which trust and commitment emerge from utilitarian considerations such as a cost/benefit analysis. While Becker's model bases turnover decisions on extrinsic investments and opportunity costs, Meyer et al. (1995) focus on the importance of values and ethics. This distinction is especially useful in military organizations because organizational trust is primarily an affective cognitive process by which people interpret their sensory impressions to give meaning to their environment (Robbins et al., 2010).

This interpretation is consistent with Miles and Mangold (2012), who identified a causal relationship between human resource management practices (specifically non-financial rewards) and organizational trust (Batta et al., 2023; Beer et al., 2015; Dikshit & Madan, 2018). This is the basis for the second hypothesis:

H2: Non-financial rewards (NFR) positively influence organizational trust (T).

As both NFR and T are unidimensional, this hypothesis is not subdivided into specific hypotheses.

Several studies have identified organizational trust as an antecedent for commitment (Meyer et al., 2002; Colquitt et al., 2007; Liu & Wang, 2013). Bjørnstad and Ulleberg (2021) examined how trust influences military organizations and found that trust between different levels of the chain of command leads to higher levels of mutual awareness of each party's duties and responsibilities. They also observed that trust improves communication and decision making, making it essential for organizations to perform efficiently and effectively.

This leads to the third hypothesis: H3: Organizational trust (C) positively influences various types of commitment.

As this hypothesis examines three types of commitment, it is broken down into three specific hypotheses:

H3a. Organizational trust (T) positively influences commitment to supervisors (CS);
H3b. Organizational trust (T) positively influences commitment to the profession (CP);
H3c. Organizational trust (T) positively influences organizational commitment (OC).

2.3. Commitment to multiple targets

The "Three-Component Model of Organizational Commitment" developed by Meyer and Allen (1991, 1997) has been used in numerous studies that analyse workplace commitment, particularly organizational commitment. In this model, organizational commitment is conceptualised as a bond between an employee and his/her organization that influences their decision to stay (Allen, 2016). This bond can be expressed by three types of commitment: affective commitment (the desire to stay in the organization), normative commitment (a sense of obligation to the organization) and continuance commitment (based on the perceived costs of leaving).

Although Meyer and Allen's (1991) three-dimensional model is widely accepted, authors such as Klein question whether it makes sense to subdivide commitment into individual components. Based on Solinger et al. (2008), Klein et al. (2012) proposed a concept of commitment as a unidimensional psychological bond that reflects a person's conscious dedication and responsibility for a target. Commitment is defined as a volitional bond that makes a person want to stay and accept responsibility, regardless of the target (Klein & Park, 2016; Klein, Brinsfield & Cooper, 2020; Klein, Solinger & Duflot, 2022).

Becker et al. (2009) argue that researchers should examine employee commitment to targets outside the organization. When these commitments are at odds with the organization's goals, conflicts are likely to occur. In other words, a commitment system with multiple commitments (Klein et al., 2009; Meyer, 2009) may provide insight into how different psychological bonds influence employee behaviour, based on Becker's 'side-bet' approach (Becker, 1960).

Becker's (1992) earlier research, which proposed that an individual may feel different types of commitment to different targets (organization, supervisor, work group, job, career), laid the groundwork for a new avenue of research that has been explored in several studies (Becker et al., 2009; Meyer, 2016). Allen (2003), Gade (2003), Klein et al. (2012) and Klein et al. (2020) argue that studies on commitment should analyse commitments to other targets than just the organization. Meyer et al. (1993) studied the relationship between commitment to organizations and professions and Cohen (2003) examined employee commitment to the organization, profession and work group. Figueira, Nascimento and Almeida (2014) analysed employee commitment to the profession and the organization in a Portuguese workplace. Meyer, Morin and Vandenberghe (2015) explored organizational commitment and commitment to supervisors. Finally, Stinglhamber, Bentein and Vandenberghe (2002), studied employee commitment to multiple targets (the organization, the profession, the work group, the supervisor and the customers).

Gade (2003) suggests that studying commitment in military organizations could provide valuable insights into multiple commitments, especially commitment to supervisors. Several studies (Allen, 2003; Chambel et al., 2015; Driskell et al., 2009; Fragoso et al., 2021a; Fragoso et al., 2021b; Rodrigues-Silveira et al., 2022) have shown that commitment in military environments can best be understood using a multifocal approach, as different types of commitment (to one's supervisor, profession and organization) influence service members' well-being and performance in different ways.

A study by Fachada (2015) conducted in the Portuguese Air Force found that military organizations should implement policies that foster a bond between service members and the organization as a whole, as well as with other targets or groups within the organization, including their fellow service members, commanders, service branch and unit, among others. Fachada (2015) found that commitment can be strengthened through processes that encourage bonding, such as collaborating on a project, task or mission as a group, receiving praise for group achievements, or through a more informal approach such as creating a patch or specific symbols for a group to wear on their uniforms.

Another study set in the Portuguese Air Force, Casimiro et al. (2017), investigates whether service members' commitment to their commander is an antecedent for their commitment to the organization, and whether service category (officer, sergeant or other ranks) moderates the relationship between commitment to commanders and to the organization. The findings reveal that commitment to supervisors, as a unidimensional model, has a positive correlation with the affective and normative components of organizational commitment.

This is in line with the findings of other studies, suggesting that when they are committed to their commanders, service members tend to be strongly motivated to act in the interests of the military organization. Fachada's study (2015) also demonstrated that integrating people (in this case, service members) into small niches or groups with others that they feel close to (their fellow service members, commanders, service branch, squadron and unit) has a positive effect on their satisfaction with, and commitment to, the organization as a whole.

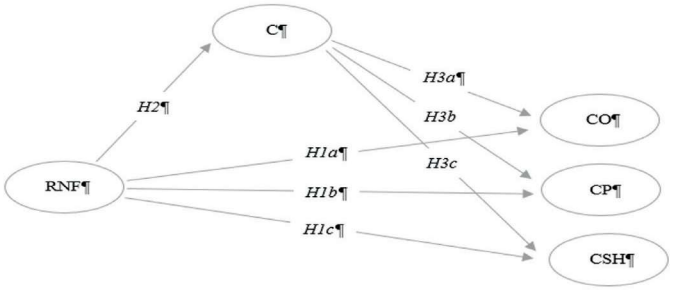
This study builds on the studies cited above and analyses commitment to supervisors (Stinglhamber & Vandenberghe, 2003; Meyer et al., 2015), the profession (Figueira et al., 2014; Meyer et al., 1993) and the organization (Meyer & Allen, 1991, 1997), as specified in H1 and H3.

The analytical model (Figure 1) is derived from the hypotheses and theoretical framework presented above. It can also include a fourth hypothesis that focuses on the role of organizational trust (T) as a mediator. This hypothesis is subdivided into the following specific hypotheses:

H4a: Organizational trust (T) mediates the relationship between non-financial rewards (NFR) and commitment to supervisors (CS);

H4b: Organizational trust (T) mediates the relationship between non-financial rewards (NFR) and commitment to the profession (CP);

H4c: Organizational trust (T) mediates the relationship between non-financial rewards (NFR) and organizational commitment (OC).



Note. **NFR: Non-Financial Rewards; T: Organisational trust; CS: Commitment to Supervisors; CP: Commitment to the Profession; OC: Organizational Commitment. [RNF = NFR; C =T; CO = OC; CP = CP; CSH = CS]**
Figure 1 – Analytical model

As in Klein et al. (2012) and Stinglhamber and Vandenberghe (2003), as well as Casimiro et al. (2017), CS was treated as a unidimensional construct. Meyer and Allen's (1991 and 1997) Three-Dimensional Model was used to measure PC and OC, which were subdivided into affective, normative and continuance components.

3. Methodology

3.1. Population and sample

The study population consists of career and contract personnel from the three branches of the Portuguese Armed Forces (Navy, Army and Air Force). A convenience sample was selected, which consisted of the service members who completed the questionnaire.

A total of 24,058 surveys were delivered, of which 545 were returned, resulting in a response rate of approximately 2.27%. While is a small sample size in relation to the population, it was considered acceptable given the nature of the study and the sample.

As stated above, the study aims to test and estimate a structured model in which the relationship between non-financial rewards and different types of commitment is mediated by trust. As the aim is not to extrapolate the findings to the study universe, a convenience sample was chosen instead of a probability sample. As a result, the sample might not be representative of the universe. Additionally, the stability of the final estimated model will also be assessed by testing factor invariance. If it is statistically small, the model can be considered stable for other samples, as "LISREL assumes by default that the models are identically the same over groups" (Jöreskog et al., 2016, p. 427).

The Sample Size Calculator on Calculator.Net recommends, for a confidence level of 95%, a margin of error of 5%, a population proportion of 50% and a population size of 24,058 respondents, a sample size of at least 379 subjects. Therefore, the sample size of 545 is within the recommended range, with a margin of error of 4.07%.

Hair et al. (2019) recommend samples of 300 to 500+ participants for complex models that use structural equation modelling and deal with seven or more constructs. As the sample

consists of 545 participants (above the maximum threshold), it is considered appropriate for this study.

However, even if the sample size is considered appropriate, response bias may be present, as the data was collected using the self-report method. Once the measurement models are validated for each construct, they will be tested for the presence of response bias (Podsakoff et al., 2003).

The sample consists of 82 (15%) female respondents and 463 (85%) male respondents. Regarding academic level, 18 respondents (3.3%) have completed primary education, 219 (40.2%) have completed secondary education and 308 (56.5%) have a university degree. As for service branch, 270 (49.5%) respondents belong to the Navy, 161 (29.5%) to the Army and 114 (21%) to the Air Force. The sample includes 500 (91.7%) respondents in the career staff and 45 (8.3%) contract personnel. As for category, 288 (52.8%) respondents are officers, 191 (35%) are sergeants and 66 (12.1%) are other ranks personnel, with ages between 20 and 64. The average age of the sample respondents is 41, with a standard deviation of 9.42 years.

3.2. Validating the model for the sample

The questionnaires were developed by different authors and have already been translated and adapted into Portuguese in earlier studies. The contents of the questionnaires were adjusted to the military setting. The adapted version was then validated by a group of 10 Armed Forces officers, including three lecturers from military academies (Army and Air Force). All suggested changes were integrated into the final version of the questionnaire.

The questionnaires used a 7-point Likert scale ranging from "1 – Strongly disagree" to "7 – Strongly agree".

The measurement models were validated through confirmatory factor analysis (CFA), using LISREL (Jöreskog & Sörbom, 1996; Jöreskog et al., 2016), and the initial model was respecified sequentially until the goodness of fit and reliability indices were acceptable (Hair et al., 2019; Jöreskog et al., 2016). These respecifications consisted of removing items with factor loadings below 0.5 and/or high modification indices (Hair et al., 2019; Jöreskog & Sörbom, 1996; Jöreskog et al., 2016).

The convergent validity of the nine latent variables in the proposed model was also assessed. To demonstrate convergent validity, the average variance extracted (AVE) of each latent variable should not be lower than 0.50 and the construct reliability (CR) should be 0.70 or higher (Hair et al., 2019).

3.2.1. Measurement Model for NFR

As stated above, the scale developed by Martins and Nascimento (2024) based on Chiang and Birtch's (2006) scale, adapted to a Portuguese military setting by Martins (2016), was used to measure the value respondents placed on the NFR practices employed by the organization. The first study by Martins (2016) found a correlation of 0.97 between extrinsic and intrinsic NFR. Based on Hair et al. (2019), this calls into question whether these are, in fact, two distinct variables or the same variable with different names. Furthermore, this correlation

suggests low discriminant validity. On the other hand, the two-dimension model for NFR presented an unacceptable goodness of fit (RMSEA=0.168; GFI=0.719; CFI=0.824), but the final unidimensional model showed an acceptable goodness of fit (RMSEA=0.072; GFI=0.978; CFI=0.987). In a follow-up study, Martins and Nascimento (2024) confirmed the goodness of fit (χ2=1.13; df=2; RMSEA=0.025; GFI=0.996; SRMR=0.0121; CFI=1.00; χ^2/df=0.57; AIC=748.427) and convergent validity (AVE=0.62 and CR=0.98) of the unidimensional measurement model. These findings reinforced the decision to use the unidimensional model to analyse NFR.

NFR were measured using four items (Table 3) and show acceptable model fit (χ^2=4.75; df=2; RMSEA=0.073; GFI=0.993; RMR=0.0149; CFI=0.997; RFI=0.987; χ^2/df=2.375; AIC=1124.184). The unidimensional model for NFR also showed strong convergent validity (AVE=0.62 and CR=0.87).

Table 3 – Final Measurement Model for Non-Financial Rewards

Item Code	Description	*Factor Loading*
NFR_1	My military organization provides training and career development opportunities	0.64
NFR_2	My job is challenging	0.76
NFR_3	I am satisfied with my job	0.87
NFR_4	I get a sense of accomplishment from my job	0.86

3.2.2. Measurement Model for Organizational Trust

Organizational trust (OT) was measured using Robinson's (1996) scale, which was translated and adapted into Portuguese by Fonseca (2017) and adapted for military settings. The final measurement model has four items (Table 4) and shows acceptable goodness of fit (χ2=2.91; df=2; RMSEA=0.044; GFI=0.996; RMR=0.0156; CFI=0.998; χ2/df=1.455; AIC=1597.131).

Table 4 – Final Model for Measuring Organizational Trust

Item Code	Description	*Factor Loading*
C_1	I can expect consistence and predictability from my military organization	0.61
C_2_I	My military organization is not always ethical and transparent	0.78
C_3	Generally speaking, I believe that my military organization has good intentions	0.63
C_4_I	I feel that my military organization does not treat me fairly	0.74

The AVE is 0.48 and the CR is 0.79, which indicates that the model has acceptable convergent validity.

3.2.3. Measurement Model for Commitment to Supervisors (CS)

Commitment to supervisors (CS) was measured using the scale developed by Casimiro et al. (2017) for their final model. The scale is a version of the "commitment to the profession"

scale, adjusted for assessing "commitment to supervisors" (Casimiro et al., 2017). It is a unidimensional scale based on emotional factors (affective and normative). This is in line with the conceptualisation of commitment proposed by Solinger et al. (2008) and Klein et al. (2012). The scale contains five items, after removing all items associated with continuance commitment, as recommended by Casimiro et al. (2017).

After the respecifications, the final model for measuring commitment to supervisors (CS) included three items (Table 5). As the number of degrees of freedom was 0, the goodness-of-fit indicators could not be calculated.

Table 5 – Final Measurement Model for Commitment to Supervisors

Item Code	Description	*Factor Loading*
CSHN_2	Even if it would benefit me, I feel it would be wrong to leave my supervisor at this time	0.83
CSHN_3	My supervisor deserves my loyalty	0.56
CSHN_4	I would not leave my supervisor at this time because I feel a personal duty to them	0.91

This model has an AVE of 0.61 and a CR of 0.82, evidence that its convergent validity can be considered acceptable.

3.2.4. Measurement Model for Commitment to the Profession (CP)

Commitment to the profession (CP) was measured using the scale from the final model developed by Figueira et al. (2014), which includes five items for affective commitment, six for normative commitment and four for continuance commitment. The scale was based on the scale by Meyer et al. (1993), in which "profession" was replaced by 'military profession".

The final measurement model for commitment to the profession (CP) consisted of four items for affective commitment to the profession (ACP), three for normative commitment to the profession (NCP) and two for continuance commitment to the profession (CCP) (Table 6). The model showed an acceptable goodness of fit ($\chi^2 = 28.63$; df=24; RMSEA=0.046; GFI=0.979; RMR=0.0323; CFI=0.998; RFI=0.984; χ^2/df=1.19; AIC=2328.771).

Table 6 – Final Measurement Model for Commitment to the Profession

Item Code	Description	*Factor Loading*
ACP_1_I	I don't enjoy being in the military	0.82
ACP_2	I am enthusiastic about the military	0.75
ACP_3_I	I don't identify with the military	0.91
ACP_5	I am proud of being in the military	0.89
NCP_8_I	I do not feel any obligation to stay in the military	0.74
NCP_10	I have a responsibility to the military that motivates me to stay	0.79
NCP_11	I stay in the military out of a sense of duty and loyalty	0.65

[Cont.]

CCP_12	It would not be financially viable for me to leave the military now, even if I could	0.83
CCP_14	Changing careers (leaving the military) right now would require a great deal of personal sacrifice	0.88

The three dimensions of CP showed acceptable convergent validity. ACP has an AVE of 0.71 and a CR of 0.91. NCP has an AVE of 0.53 and a CR of 0.77. Finally, CCP has an AVE of 0.77 and a CR of 0.85.

3.2.5. Measurement Model for Organizational Commitment (OC)

Organizational commitment was measured using the scale from the final model by Casimiro et al. (2017), which had already been adapted and validated for a military setting. The scale consists of three items measuring affective organizational commitment (AOC), three for normative organizational commitment (NOC) and four for continuance organizational commitment (COC). The scale was based on Meyer and Allen's (1997) model, which was adapted for Portugal by Nascimento et al. (2008) (Table 7). In this study, it shows acceptable goodness of fit ($\chi 2$=56.54; df=25; RMSEA=0.075; GFI=0.962; RMR=0.0636; CFI=0.987; RFI=0.967; $\chi 2$/df=2.26; AIC=2574.132), with factor loadings above 0.60 (Table 7).

Table 7 – Final Measurement Model for Organizational Commitment

Item Code	Description	*Factor Loading*
AOC_1_I	I don't feel an "emotional bond" with the military	0.86
AOC_2_I	I don't feel like I'm "part of the family" in the military	0.88
AOC_3_I	I don't feel like I'm part of the military	0.89
NOC_4	I wouldn't leave the military right now because I feel a personal obligation to the people who work there	0.78
NOC_5	Even if it would benefit me, I feel like it would be wrong to leave the military right now	0.89
NOC_6	I would feel guilty if I left the military right now	0.71
COC_7	It would be financially difficult for me to leave the military right now, even if I could	0.69
COC_8	One of the reasons I continue to work in the military is that leaving would require a great deal of personal sacrifice, as another organization might not provide all the benefits I have here	0.72
COC_9	A negative consequence of leaving the military would be the lack of job opportunities available to me	0.70

The three dimensions of OC show high convergent validity. AOC has an AVE of 0.77 and a CR of 0.91, NOC has an AVE of 0.63 and a CR of 0.84, and COC has an AVE of 0.49 and a CR of 0.75.

3.3. Common Method Variance (CMV) Error

When self-reported measures are used, the variance that can result in bias from using the same method should be assessed (Podsakoff et al., 2003). The Common Factor Test was performed using confirmatory factor analysis (CFA), as recommended by Podsakoff et al. (2003). Two models were compared: the first includes nine latent variables from the proposed model, measured by their respective items ($\chi 2$=758.68; df=341). The second model also includes a latent variable representing a common factor applicable to all items. This means that each item measures both the latent variable it was designed to assess and the common factor ($\chi 2$=546.50; df=312). The average variance extracted (AVE) for this common factor reflects the bias (Podsakoff et al., 2003).

The average variance explained by the common factor was 15%, which is within the 15% threshold and significantly below the 40.7% threshold used for measuring attitudes (Podsakoff et al., 2003, p. 880). This indicates that bias from using the same method is negligible and is unlikely to significantly influence the results of the model estimation.

4. Results

4.1. Descriptive statistics

In this study, all variables, except for the normative and continuance dimensions of commitment, had mean scores above the midpoint of the scale (Table 8). There is a correlation between the different types of commitment ($r_{(CS/CP)}$=0.494; $r_{(CS/OC)}$=0.561; $r_{(CP/OC)}$=0.832). A strong correlation was also found between the same dimensions of commitment to the profession and commitment to the organization (r(AOC/ACP)=0.756; r(NOC/NCP)=0.721; r(COC/CCP)=0.736), which is consistent with previous research (Becker et al., 2009; Casimiro et al., 2017; Figueira et al., 2014; Fonseca, 2017; Meyer et al., 1993; Meyer et al., 2015; Stinglhamber et al., 2002).

Table 8 – Descriptive statistics for the variables

		Mean	Standard Deviation	1.	2.	3.	4.	5.	6.	7.	8.	9.	CR	AVE
1.	NFR	4.41	1.507	(.851)									0.87	0.62
2.	T	3.75	1.385	.649**	(.747)								0.79	0.48
3.	CS	4.00	1.489	.474**	.421**	(.750)							0.82	0.61
4.	ACP	5.67	1.325	.639**	.556**	.454**	(.861)						0.91	0.71
5.	NCP	4.31	1.572	.553**	.453**	.499**	.545*	(.734)					0.77	0.53
6.	CCP	3.61	1.849	.139**	.144**	.169**	.095*	.244**	(.803)				0.85	0.77
7.	AOC	5.42	1.636	.680**	.627**	.458**	.756**	.537**	.116**	(.870)			0.91	0.77
8.	NOC	3.15	1.614	.494**	.474**	.604**	.443**	.721**	.325**	.469**	(.799)		0.84	0.63
9.	COC	3.30	1.557	.084*	.106**	.129**	.050	.188**	.736**	.077*	.237**	(.688)	0.75	0.49

Note. ** p<0.01; * p<0.05; Cronbach's alpha coefficient is shown in brackets; AVE: Average Variance Extracted; CR: Construct Reliability; NFR: Non-Financial Rewards; T: Organizational Trust; CS: Commitment to Supervisors; ACP: Affective Commitment to the (Military) Profession; NCP: Normative Commitment to the (Military) Profession; CCP: Continuance Commitment to the (Military) Profession; AOC: Affective Organizational Commitment; NOC: Normative Organizational Commitment; COC: Continuance Organizational Commitment.

Organizational trust is positively correlated with all commitment dimensions, which confirms the findings of previous studies (e.g., Colquitt et al., 2007; Liu and Wang, 2013). However, the correlation between trust and the continuance dimensions of commitment is weaker ($r_{(C/CCP)}$=0.144; $r_{(C/COC)}$=0.106) than with the affective and normative components.

Cronbach's alpha coefficient is above 0.7, indicating that all latent variables have good internal consistency, that is, they are internally reliable. The CR values are all acceptable (above 0.70) (Garver & Mentzer, 1999; Hair et al., 2019). The AVE scores are all equal or higher than 0.5, also considered good (Garver & Mentzer, 1999; Hair et al., 2019). This indicates that convergent validity is acceptable for all latent variables, as previously discussed.

According to the Fornell-Larcker criterion (Hair et al., 2019), all latent variables in the proposed model show acceptable discriminant validity (Table 9). On the other hand, the discriminant validity for the NCP variable was just within the acceptable range in relation to the NOC variable (AVE of 0.53 and a correlation coefficient of 0.52).

Table 9 – Fornell-Larcker Discriminant Validity

	NFR	T	CS	ACP	NCP	CCP	AOC	NOC	COC
NFR	**(0.62)**								
T	0.42	**(0.48)**							
CS	0.22	0.18	**(0.61)**						
ACP	0.41	0.31	0.21	**(0.71)**					
NCP	0.31	0.21	0.25	0.30	**(0.53)**				
CCP	0.02	0.02	0.03	0.01	0.06	**(0.77)**			
AOC	0.46	0.39	0.21	0.57	0.29	0.01	**(0.77)**		
NOC	0.24	0.22	0.36	0.20	0.52	0.11	0.22	**(0.63)**	
COC	0.01	0.01	0.02	0.00	0.04	0.54	0.01	0.06	**(0.49)**

Note. Shown in brackets and in bold: AVE; NFR: Non-Financial Rewards; T: Trust; CS: Commitment to Supervisors; ACP: Affective Commitment to the (Military) Profession; NCP: Normative Commitment to the (Military) Profession; CCP: Continuance Commitment to the (Military) Profession; AOC: Affective Organizational Commitment; NOC: Normative Organizational Commitment; COC: Continuance Organizational Commitment.

One of the requirements when using structural equation modelling is that the manifest variables (that is, the items) are normally distributed. However, LISREL uses "polychoric correlations and their asymptotic covariance matrix […] [to provide] standardised solutions" (Jöreskog et al., 2016, p. 323). Therefore, normality tests are not required because normality is ensured by standardising the manifest variables.

4.2. Estimation of the proposed model

The proposed model was estimated, maintaining all structural relationships, including relationships that were not statistically significant, as non-significant relationships are discarded when the proposed model is respecified. The estimated model shows acceptable goodness of fit (χ^2=757.29; df=341; RMSEA=0.074; GFI=0.862; RMR=0.0682; CFI=0.962;

RFI=0.921; χ^2/df=2.22; AIC=5212.335). The initial model was respecified iteratively by eliminating relationships with t-values below 1.96 (Hair et al., 2019; Jöreskog et al., 2016) (Table 10).

Table 10 – Statistically non-significant relationships

Relationship	Estimation	*T-Value*	Results
NFR —> CCP	0.01	0.09	Rejected relationship
NFR —> COC	-0.08	-0.61	Rejected relationship

Note. Table prepared by authors. NFR —> CCP: Influence of Non-Financial Rewards (NFR) on Continuance Commitment to the Profession (CCP); NFR —> COC: Influence of Non-Financial Rewards (NFR) on Continuance Organizational Commitment (COC).

These results are consistent with the correlations found, as these two pairs of variables showed the lowest correlations. This is in line with Solinger et al. (2008), who propose that commitment is a unidimensional construct and that continuance commitment reflects the consideration of utilitarian outcomes (see, for example, Klein et al., 2020 and Solinger, 2008). This supported the decision to remove the Continuance Commitment to the Profession (CCP) and Continuance Organizational Commitment (COC) variables from the proposed model, since these variables were not significantly correlated.

This process resulted in the final model (Figure 2), which also has an acceptable goodness of fit (χ^2=559.59; df=231; RMSEA=0.051; GFI=0.874; RMR=0.0706; CFI=0.965; RFI=0.931; χ^2/df=2.42; AIC=3981.565). The final model shows a better fit than the initial model, which included the CCP and COC variables. This is particularly noticeable in the RMSEA indices, which changed from 0.074 to 0.051, and the AIC score, which changed from 3981.565 to 3981.565.

The determination coefficient (R^2) of the dependent variables in the NFR is high. The two variables best explained by the proposed final model are Organizational Trust (C) and affective organizational commitment, with R^2 values of 0.687 (68.7%) and 0.660 (66.0%), respectively. Affective commitment to the profession (ACP) and normative commitment to the profession (NCP) have R^2 values of 0.599 (59.9%) and 0.501 (50.1%), respectively. Normative organizational commitment (NOC) has an R^2 of 0.381 (38.1%), whereas commitment to supervisors (CS) is the variable that is most poorly explained by this model (R^2 = 0.257; 25.7%).

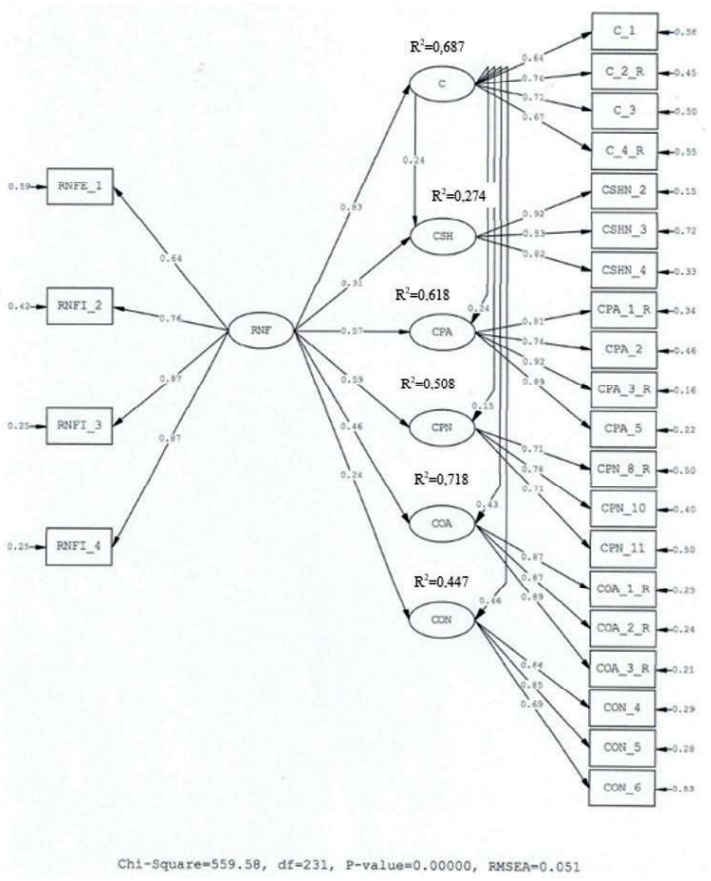


Figure 2 – Final model

[RNF = NFR; C =T; CSH = CS; CHSN = NCS; CPA = ACP; CPN = NCP; COA = AOC; CON = NOC]

The final model describes the possibility that the influence of non-financial rewards on the three types of commitment (specifically, CS, ACP, NCP, AOC and NOC) is partially mediated by trust. Five potential mediating relationships were tested using MacKinnon's Z', which sets the threshold for mediation at 0.96 for a significance level of 0.05 (MacKinnon et al., 2002, pp. 85 and 90) (Table 11).

Table 11 – Relationships Mediated by Trust (T)

Relationship	Z´	Result (Z´>0,96)
NFR —> T —> CS	1.88	Mediation not rejected
NFR —> T —> ACP	2.52	Mediation not rejected
NFR —> T —> NCP	1.25	Mediation not rejected
NFR —> T —> AOC	4.46	Mediation not rejected
NFR —> T —> NOC	3.86	Mediation not rejected

Nota. NFR: Non-Financial Rewards; T: Trust; CS: Commitment to Supervisors; ACP: Affective Commitment to the Profession; NCP: Normative Commitment to the Profession; AOC: Affective Organizational Commitment; NOC: Normative Organizational Commitment.

These results support the hypothesis that the relationship between non-financial rewards (NFR) and commitment to supervisors (CS), commitment to the military profession (ACP and NCP), and organizational commitment (AOC and NOC) is mediated by trust (T). These findings confirm that trust is crucial to helping military personnel form strong bonds with various aspects of the organizations in which they work and serve.

4.3. Invariance analysis of the final model

While the final proposed model shows acceptable goodness of fit, it may not be valid for other samples; that is, changes in structural relationships may occur when the model is applied to a different sample. This concern is especially relevant as the sample represents only 2.27% of the population and the results cannot be generalised to the Armed Force as a whole. An invariance analysis of the final model may help to assess its stability over different samples.

This assessment was done by performing a factor analysis to determine the model invariance. This analysis is based on the assumption that the value of each structural relationship is the same in two different samples, and that the model obtained for each sample is similar, with no significant differences, which indicates stability (Hair et al., 2019; Jöreskog et al., 2016). Multigroup analysis was performed to identify differences in the model between the two samples (Hair et al., 2019; Jöreskog et al., 2016).

The sample was randomised into two sub-samples: GR1, with 273 respondents, and GR2, with 272 respondents. Both sub-samples had a mean age of 41 years and a similar demographic profile (Table 12).

Table 12 – Description of the two sub-samples

Demographic Variable	Categories	GR1	GR2
Gender	Female	45	37
	Male	228	235
Education	Primary education	10	8
	Secondary education	116	103
	Higher education	147	161
Service Branch	Navy	140	130
	Army	81	80
	Air Force	52	62
Service Contract	Career personnel	255	18
	Contract personnel	18	27
Category	Officer	140	148
	Sergeant	97	94
	Other ranks	36	30
Special Forces	Yes	34	33
	No	239	239

First, the multigroup model was estimated with equality conditions applied to structural relationship coefficients[1], which implies that the coefficients are the same for the two samples. This model showed a χ^2 of 890.46 with df=473. Next, the multigroup model was estimated without equality conditions applied to the structural relationships; that is, the structural relationships of the two samples were estimated individually for each sample. This resulted in a χ^2 of 878.63 and df=462.

Finally, a chi-squared test was performed to identify similarities (structural relationships with no significant differences) and differences (structural relationships with significant differences) between the two models. As $\Delta\chi^2_{(\Delta df=11;\ \chi=0.05)}=11.83<19.675$, the null hypothesis that the two models are identical is not rejected. Based on these results, the final proposed model is considered invariant and demonstrates significant structural and explanatory stability.

5. Conclusions

As previously noted, the results and this conclusions section are applicable to the sample used in this study. Additional studies, specifically replication studies, will be needed to confirm and test these results and conclusions using different samples. Despite this limitation, the consistency of the final model made it possible to generalise the findings to the Armed Forces, even though they will have to be validated by further studies such as meta-analyses.

The findings confirm that NFR are a significant factor in predicting both T and different types and dimensions of commitment, specifically CS, ACP, NCP, AOC and NOC. The model

[1] Specifically, it was established that the gamma and beta matrices of group 2 are identical to those of group 1.

used in this study shows that both the dependent variables and the mediator variable have significant variance explained. The hypotheses that support these relationships were not rejected (H1 and H3).

It is also worth noting that CCP and COC are not relevant for this model. Continuance commitment refers to the costs and benefits of a given change, whether professional or within the organization, and, as the results show, is not influenced by NFR or T. These findings highlight the importance of NFR and T in developing an affective bond to the military, both as a profession and an organization. The model has little explanatory power for CCP and COC, which show weak correlations with other variables. These variables are also not applicable to the military profession, where individuals form affective, identity-based and normative bonds rather than utilitarian ones. This empirical evidence contradicts Becker's (1960) 'side bets' theory, suggesting that service members' decisions to stay and their loyalty to the Armed Forces are not driven by utilitarian considerations about costs/benefits, but by identity-based and normative bonds.

Contemporary studies from other countries have also shown that the continuance component is of limited usefulness. A study conducted in Norway by Saetersdal and Boe (2022) reveals that, in elite military units, extrinsic motivation (financial rewards) does not have a significant influence on long-term retention and that commitment is based on cohesion and a sense of mission. In the United Kingdom, a recent study by Squire et al. (2024) suggests that service members place more value on social meaning and purpose that on financial rewards, and that affective commitment is the main mediator of resilience, which supports this study's observation that continuance commitment is not especially relevant.

Furthermore, the relationship between NFR and the different types of commitments is mediated by organizational trust. Trust had an average score of 3.75 (on a scale of 1 to 7) in this study. This moderate value justifies the change from a calculative model of trust to one based on relationships and integrity. This mean score should not be seen as a sign of weakness, but rather as resilient trust: without Becker's "side bets", and given the restrictions on financial rewards in the public sector, the bond is sustained by the benevolence and integrity of supervisors.

Given the restrictions on financial rewards, strengthening the bond between leaders and subordinates is essential to the success of NFR. The importance of trust as a mediator is supported by Boe (2023) and Wood (2022), who assert that trust in leaders' integrity is a stronger antecedent for commitment than financial rewards.

The results also revealed the NFR that respondents value the most, that is, the ones that have the most influence on commitment: challenging work, job satisfaction, a sense of accomplishment, and training and career development plans. These findings confirm the relevance of Hackman and Oldham's (1980) model, which proposes that job characteristics have a significant influence on motivation and satisfaction. This model can also be applied in military settings.

The model proposed and evaluated here showed good predictive stability, demonstrating that it is structurally stable and that it can be generalised to the whole Armed Forces. This study's findings make significant contributions to both the theory of commitment and human resource management practices in military organizations. As a theoretical contribution, this study proposes an integrated model to analyse commitment, which demonstrates the mediating role of trust and suggests that continuance commitment is of limited usefulness when analysing commitment in military contexts.

As for practical contributions, this study highlights the need to adopt a human resources management model that promotes emotional commitment. To achieve this, the study proposes that "skills maps" should be developed, allowing supervisors to record their subordinates' training goals without any additional costs. In conjunction with this, the study recommends the adoption of transparent criteria and internal decision-making processes, such as the selection of personnel for training courses and missions, by creating a "Career Transparency Portal", in order to promote organizational fairness. Finally, developing an annual "Digital Trust Barometer" would make it possible to proactively assess cohesion and facilitate timely action by commanders, reducing the risk of staff turnover or low morale.

In addition to the replication studies and meta-analyses mentioned at the beginning of this Conclusions section, this model should be tested for other organizations, such as law enforcement and civil protection agencies, military health services or specific military units (e.g. Special Forces).

Additional longitudinal studies should be conducted to observe how commitment and trust change over time, particularly at critical milestones in military careers.

Another potential avenue of research would be to investigate the moderating effects of variables, particularly descriptive variables such as sociodemographic and socio-professional characteristics. Future studies could also examine differences between different levels of the chain of command, such as between junior and senior officers. Other studies could adopt a person-centred approach, focusing on profiles (such as commitment profiles).

Rather than providing definitive answers based on findings, this study aimed to raise questions that may lead to further research.

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