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RELATIONSHIP BETWEEN ORGANIZATIONAL CULTURE AND LEADERSHIP IN THE TWO AIR FORCE SCHOOLS THAT TRAIN OFFICER-STUDENTS[1]

RELAÇÃO ENTRE A CULTURA ORGANIZACIONAL E A LIDERANÇA NOS ESTABELECIMENTOS DE ENSINO DOS OFICIAIS DA FORÇA AÉREA

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Abstract

The aim of this paper is to study organizational culture and leadership among officerstudents trained by the two Air Force Schools – the Air Force Academy (AFA) and the Air Force Military and Technical Training Centre (AFMTTC), and to discover if there are culture differences between the two schools that may reflect differences in leadership. The study analysed a sample of 173 military students (135 from the AFA and 38 from the AFMTTC) using quantitative methods of data collection. The study used the Multifactor Leadership Questionnaire (MLQ) and the Organizational Culture Assessment Instrument (OCAI). The research findings revealed significant differences in Organizational Culture: between the AFA and the AFMTTC only in the Market culture dimension; between different groups within the AFA (students from the Masters in Military Aeronautics and students from the Integration Course in the AFA's Health Technicians specialty). The study also found significant leadership differences between the AFA and the AFMTTC, however, unlike with culture, no significant differences within the AFA were observed. Finally, the findings demonstrate that there is a relationship between organizational

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culture and leadership in the educational establishments under analysis, which is in line with the existing literature.

Keywords: Organizational Culture, Leadership, Air Force Academy, Air Force Military and Technical Training Centre.

Resumo

A presente investigação tem como objetivo estudar a cultura organizacional e o estilo de liderança junto de oficiais-alunos formados pelas duas escolas da Força Aérea – Academia da Força Aérea (AFA) e Centro de Formação Militar e Técnica da Força Aérea (CFMTFA) –, e verificar da existência, ou não, de diferenças de cultura e de estilo de liderança. Neste âmbito, foi analisada uma amostra de 173 alunos-militares (135 da AFA e 38 do CFMTFA) e utilizada uma metodologia quantitativa de recolha de dados. Os instrumentos utilizados foram o Multifactor Leadership Questionnaire (MLQ) e o Organizational Culture Assessment Instrument (OCAI). Ao nível dos resultados, e no que respeita à Cultura Organizacional, foram encontradas diferenças significativas: entre a AFA e o CFMTFA apenas na dimensão cultura de Mercado; entre os vários grupos da AFA (alunos do Curso de Mestrado em Aeronáutica Militar e alunos do Curso de Integração nos Quadros Especiais de Técnicos de Saúde dentro da AFA). No caso da liderança, foram igualmente encontradas diferenças significativas entre a AFA e o CFMTFA, mas diferentemente da Cultura, não se observaram diferenças significativas intra-AFA. Por último, foi demonstrada a existência de uma relação entre a cultura organizacional e a liderança nos estabelecimentos de ensino estudados, indo assim ao encontro da literatura existente.

Palavras-chave: *Cultura Organizacional, Liderança, Academia da Força Aérea, Centro de Formação Militar e Técnica da Força Aérea.*

Introduction

Contemporary societies are based on the global economy and attuned resource management policies, especially concerning their human resources, and organizations must increasingly operate in dynamic environments marked by cutting-edge technologies, often with very short life cycles (Serrão, 2009).

Therefore, knowing the people, the organizational culture (that surrounds them) and the leadership processes (that guides them) is paramount for any institution that wishes to remain vibrant and become a benchmark (and perhaps even competitive) in its area of operation.

Due to the weight of its rather long existence and recognised value – as well as its resistance to frivolous change, among other factors –, the military in general, and specifically the Air Force, is not seen as an avant-garde, competitive, and innovative organization. Despite this, the fact that it strongly depends on effective and efficient action by its human resources, and that it operates admittedly complex and cutting-edge means (it operates people, which are the

richest resource for any organization, as well as last-generation aeronautics platforms) means that in certain aspects it resembles most organizations that have a solid presence in society (as a whole). For example, both the military and purely civilian organizations are invested in the search for (self-) knowledge in order to (self-) improve their operating procedures.

The above framework is the basis for this study, which aims to examine the *Relationship Between Organizational Culture And Leadership In The Two Air Force Schools That Train Officer-Students* by answering the question *What is the relationship between organizational culture and leadership in the Academy (AFA) and the Military and Technical Training Centre (AFMTTC)?* This will require achieving the following objectives:

- Studying the culture of AFA students (from three types of courses) and AFMTTC students (from the officers course) who will enter the Career Staff and Contract Service, respectively;
- Comparing organizational culture and leadership across the various years of study;
- Understanding the relationship between organizational culture and leadership style;
- Understanding the differences in culture and leadership across different roles.

1. Literature review

This section will analyse how the constructs *culture* and *leadership* are operationalized, as well as examine several models and how they apply to military contexts.

1.1. Culture

For Schein (2010) the culture construct is operationalized as a set of basic assumptions, which are developed through problem solving (external adaptation and internal integration), shared by all members of a group, and taught to newcomers.

Costa (n/d) identifies two types of authors: those that define culture by linking it to a set of values, beliefs, principles, practices, and behaviours that guide an organization's practices, and those that give more importance to employees' opinions about what works in an organization, or to how employees assign meaning to their experiences in that organization.

The concept of culture adopted in this article is naturally in line with the above description. However, perhaps because the research addresses the specific characteristics of the military milieu, a possible definition would be considerably closer to Schein's (2010), who argues that the culture of a group is a pattern of shared basic assumptions acquired by that group when adapting externally and internally.

1.1.1. Models

1.1.1.1. Hofstede's national culture model

For Hofstede (1997), culture is the collective programming of the mind that allows people to distinguish between the members of different groups or categories of people.

Hofstede (1997) and Bernardo (2011) propose that organizational culture differs from national culture insofar as the first, which is ruled by symbols, heroes, rites, and values

(i.e., the levels at which culture manifests; see Figure 1), is acquired in the first 10 years of a person's life, while the second, which is ruled by practices, is only acquired by socialising and interacting in the workplace.

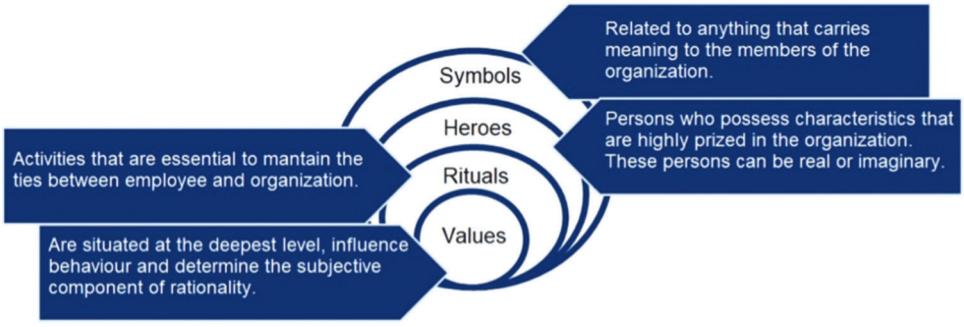

Figure 1 – Manifestations of culture at different levels

Source: Adapted from Hofstede (1997, p. 22).

In line with this, Hofstede (1997) identified five dimensions linked to the values that characterise national cultures, which tend to be emphasised in a country's organizations (Lopes, 2010): power distance; individualism / collectivism; masculinity / femininity; uncertainty avoidance; short / longterm orientation.

In addition, Hofstede (cited in Lopes, 2010, pp. 9-10) lists six practices in organizations, which, "because they are more superficial and easier to break down, [are] easier to manage than values", process oriented / results oriented; employee oriented / job oriented; corporatism / team spirit; open system / closed system; tight internal control / loose internal control; pragmatic / normative relationships.

1.1.1.2. Sainsaulieu's Model of Professional Culture

According to Lopes (2010, p. 10), Sainsaulieu's work *L'Identité au Travail*, was the first to address the "cultural dimensions at play in the workplace and the profession [and the various types of] identity processes in terms of the means that social actors use to play organizational games of influence and to guarantee their interests in workplace interactions, [formulating] four types of ideal conditions through which negotiating power (the structuring centre of organizational behaviour) is acquired". They are the culture of: retreat, fusion, negotiation, and selective affinities or meritocracy (Sainsaulieu, 1988).

Therefore, for its employees, the organization is a place of cultural learning where a set of perceptions and knowledge are created that shape its culture (Sainsaulieu, 1988) and allow newcomers to act as members of the organization (Fonseca, 2013).

1.1.1.3. Quinn's Model of organizational culture

The Competing Values Framework was based on the model of effectiveness devised by Quinn and Rohrbaugh in 1981 and 1983 (cited in Neves and Lopes, 2000), which was created to fulfil the need for a model that could validate leadership, improve the effectiveness of organizations (Cameron et al., 2006) and, essentially, serve as a kind of map that explained how the different areas of an organization are harmonised with each other (Neves, 2000).

The model hinges on the following axes (Figure 2):

– Flexibility / Focus, which links the versatility and pliability of an organization to consistency and durability (Cameron et al., 2006), distinguishing between communicative and expressive people and those who communicate rationally and process information methodically (Lawrence and Nohria, 2002).
– Internal / External, which distinguishes between an orientation towards internal capacity, integration, and unity of processes and an orientation towards external opportunities and competition with other organizations and individuals, differentiating people who learn by studying familiar information and who communicate in a strategic way from those who seek information on foreign elements and communicate in a confrontational way (Cameron et al., 2006).

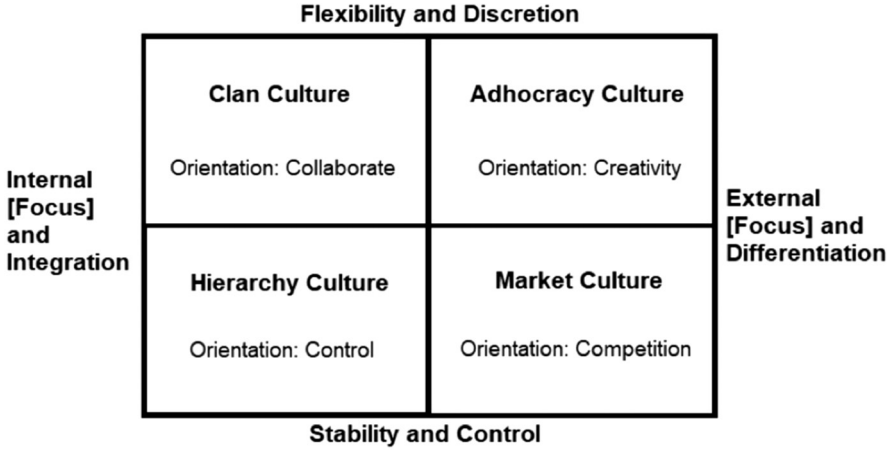

Figure 2 – Competing Values Framework
Source: Adapted from Quinn (1996, p. 184).

The four quadrants and their respective axes correspond to four types of culture (Quinn and Cameron, 2006, p. 36), namely:

– Clan Culture, which is defined as "[...] an extended family, a friendly place to work where people share a lot of themselves. It is typified by orientation towards cohesion, support, collaboration, individual development, and teamwork. Leaders are seen as mentors and perhaps even as parent figures. Success is defined in terms of internal

climate and concern for people" (Caseiro, 2012, p. 12). Its effectiveness criteria are equity and openness (Lopes, 2010);

- Adhocracy Culture, which is characterised by being dynamic, creative, and innovationoriented. It has a "visionary, [...] innovative and risk-oriented leadership. [And] success is measured by producing unique products and services" (Caseiro, 2012, p. 12). This culture also involves an ambiguous environment, therefore, "[...] adaptability and external support are the criteria for effectiveness" (Lopes, 2010, p. 14);
- Hierarchy Culture, which "focuses on the establishment of welldefined norms and rules, standardisation, centralisation, and orientation towards efficiency and effectiveness. Leadership is characterised by coordination, organization, and control and its goal is to ensure stability, security, and efficiency" (Caseiro, 2012, p. 12). It is based on bureaucracy, and the effectiveness criteria are stability and continuity (Lopes, 2010);
- Market Culture, which is linked to an orientation towards organizational results, productivity, and performance, and to a compatible leadership style. "Success is defined in terms of market share in relation to competitors" (Caseiro, 2012, p. 12). Efficiency and productivity are the effectiveness criteria (Lopes, 2010).

Organizations do not have a single type of culture, but rather a range of characteristics associated with different types of cultures (Sousa, 2015). However, it is the dominant cultural pattern that defines an organization's type of culture (Neves and Jesuíno, 1994).

Among other advantages, this model shows that an organization has multiple and simultaneous contrasting natures. For that reason, Neves and Lopes (2000) refer to it as a sound approach to the study of organizational culture.

1.1.1.4. Schein's model of organizational culture

Organizational culture is defined as a set of core values, norms, artifacts and behavioural patterns. It governs the way people behave within an organization (Neves and Lopes, 2000) and can be analysed at three different levels (Figure 3), which represent the degree at which the culture is perceived by an observer (Schein, 2010).

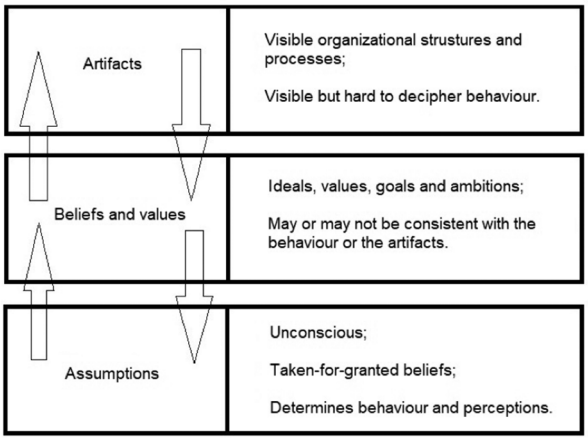

Figure 3 –Schein's model

Source: Adapted from Schein (2010, p. 24).

Schein (2010, pp. 23-32) further states that: artifacts can be verbal (myths, histories, etc.), behaviours (rituals, ceremonies, etc.), physical (clothing, technology, built social environment, etc.); that norms and values, with their normative function, respectively correspond to the unwritten rules that tell the people of a given culture what is expected of them and to the things that are important for the members of that culture; and that assumptions, because they are internalized to a large extent, are seldom discussed and represent unchallenged truths that are difficult to change and that act as ways to reduce uncertainty and anxiety.

1.1.1.5. Military Culture

Military culture is similar to the culture of any other organization inasmuch as it combines values, traditions, and habits. Nevertheless, it is also very different from the culture in civilian organizations (Sousa, 2015).

Although, to some extent, war shapes the values of the military culture of the Armed Forces, each Branch also creates "[...] its own culture, which helps shape its view of the world and approach to combat" (Sousa, 2015, p. 17). Therefore, the military tend to see themselves as members of a certain Branch and identify more closely with their specialty than to the Armed Forces in general (Sousa, 2015). This identification with small niches, which was observed, among other authors, by Fachada (2015, p. 156), means that "service members' satisfaction and commitment to their Branch as a whole and mid to long-term decreases in turnover and related situations are linked to an increase in the level of satisfaction and commitment to those (bodies and / or persons) that are closest to them".

Military culture also appears to be a strongly influential factor in the organization's ability to evolve technologically. As such, it is important that leaders cultivate a culture where new doctrines are accepted and that can keep up with the rest of the world's militaries (Siegl, 2008).

1.2. Leadership

In military literature, the concept of leadership has roots in the art of command, and this perception is largely responsible for the fact that early leadership studies focus on leaders rather than on the leadership process (Jesuíno, 2005).

On the other hand, there are "almost as many [definitions of leadership] as scholars who devoted themselves to the topic" (Rego et al., 2016, p. 260), and the large amount of studies that exist contributes to the perception that there are several contradicting definitions (Bilhim, 2005), which nevertheless tend to share broad common denominators (Jesuíno, 2005).

A widely accepted definition of leadership refers to it as a process by which leaders influence followers to accomplish a common goal (Northouse, 2004; Rego and Cunha, 2007), although the distinction between leader and follower is not always clear because a member of an organization can "rise" to a leadership position at any given time (Cunha et al., 2016).

In light of the above, this study approaches leadership as a (bidirectional) process of influence between leaders and their followers to achieve a common (institutional) end.

1.2.1. Models

1.2.1.1. Type I models – Universal leadership traits

The traits approach – "[...] defining the psychological traits of universal leaders [...]" (Jesuíno, 2005, p. 21) – was the first classic approach (Barreto et al., 2012; Bilhim, 2005). According to Borges (2017), it dates to the nineteenth century and to the work of Galton, and it was later reflected in the study of the qualities / traits of leaders. That is, the study of: psychological, social, physical, and intellectual traits (Bilhim, 2005); physical traits (stature, appearance, etc.), personality traits (selfesteem, emotional stability, etc.), and natural abilities (intelligence, verbal fluency, etc.) (Rego and Cunha, 2007); leadership skills (social, technical, etc.), the leader-follower relationship, and a leader's personal characteristics (emotional stability, courage, etc.) (Jesuino, 2005) and; the traits considered most relevant for sound leadership (energy, stress tolerance, selfconfidence, internal locus of control, emotional maturity, conscientiousness, honesty / integrity, motivation for success and for social power, etc.) (Cunha et al., 2016).

1.2.1.2 Type II models – Universal leadership behaviours

Stemming, in part, from the unsatisfactory results obtained by traitsbased theories, which focused on *what leaders are*, the behavioural approach led to theories that focus on *what leaders do*, which owe much to Kurt Lewin's pioneering studies (1938) and result from two major research lines linked to the universities of Michigan and Ohio (Jesuíno, 2005; Cunha et al., 2016).

Against this backdrop, three leadership styles were defined (Jesuino, 2005, pp. 5859): autocratic leaders, who define the group's policies, "[...] methods, and stages of execution successively and show favouritism in their compliments"; democratic leaders, who are "trained to encourage the members of the group to decide on their own policies, [giving them the freedom] to work with whomever they choose and [distribute] compliments and criticism [...] with objectivity"; *laissez-faire* leaders, who have a "[...] non-participatory, distant, and indifferent attitude, granting the group total freedom to proceed as it sees fit."

One example of how the universal model can be applied to leadership training is Blake and Mouton's Managerial Grid or Model 9.9 (1964, cited in Jesuíno, 2005), which combines two axes (concern for subordinates and concern for the task) that define four quadrants and five styles – accommodating (1.9), team / integrator (9.9), balanced / intermediate (5.5), task / impoverished (9.1), and weak / autocratic (1.1). This model identifies team / integrator and autocratic styles as more and less effective, respectively (Jesuino, 2005; Cunha et al., 2016).

1.2.1.3. Type III models – Contingency: Leadership traits and situations

These models bring the focus back to leadership traits (without, however, going back to Type I theories). Leaders are seen as the product of the situations in which they operate, which have an impact on them (Jesuíno, 2005).

One of these models is Fiedler's contingency theory, which postulates that the performance of followers depends on the interaction between the leadership style of the leader and on whether or not the situation is favourable to the leader, defining two leadership styles: taskoriented leaders, who are successful in both favourable and unfavourable situations; and relationshiporiented leaders, who are conceptually successful in intermediate situations (Jesuino, 2005).

1.2.1.4. Type IV models – Second-generation contingency

To bridge the gaps in Fiedler's model, other models examined the situational variables that influence leaders' behaviour, rather than focus on their personal characteristics (Jesuíno, 2005).

Hersey and Blanchard's situational theory is one such model, and may be seen in some respects as the contingent version of the Blake and Mouton Managerial Grid (Jesuíno, 2005). In this theory, to be more effective in influencing subordinates to accomplish the organization's goals, leaders must adapt their leadership style to the level of maturity of their followers and to the situation at hand (Teixeira, 1998; Bilhim, 2005; Jesuíno, 2005). This is, to a certain extent, a return to Blake and Mouton's "[...] one best way [...]", although the theory considers "that any style will be effective as long as it fits the situation, that is, the subordinates' level of maturity" (Jesuino, 2005, pp. 133-135).

1.2.1.5. Paradigm shift, emerging theories and the Bass and Avolio model

According to Bernardo (2011, p. 23), "one of the problems with contingency theories is that they ultimately seek to recover the ideal style myth [and narrow the study of leadership] to the transactional modality, that is, to the control of social systems, [to the detriment] of the study of transformational leadership, which results in qualitative leaps [both] at the level of groups, of organizations, and [also] of cultural systems".

Against this backdrop of multiple and diverse theories about leadership, some studies carried out over the last decades argue that there are two types of leaders: "transactional leaders, who guide or motivate their followers towards established goals, clarifying the requirements of the role and the task; transformational leaders, who inspire followers to transcend their interests for the good of the organization and make additional efforts to achieve its goals" (Billion, 2005, p. 56). Among other characteristics, these leaders are capable of self-sacrifice, focus on the development of their subordinates, encourage the expression of points of view different from their own, and act in an authentic, trustworthy, and respectful manner (Cunha and Rego, 2005).

Although some authors – Burns, for example (Bernardo, 2011) – view transactional and transformational leadership as opposites, others, like Bass, see them as complementary, the latter being an expansion / increment of the first, arguing that the most effective leaders have both a transactional and transformational effect, that is, an integrative effect (Rego and Cunha, 2007).

Quinn (1996) combines the transactional vs. transformational relationship with his contrasting values mindset to argue that leaders can perform four contrasting roles (Table 1).

Table 1 – The four competing roles of leaders

Role		Focus of action – examples
Transformational (focus on mutual commitment and on transforming followers into leaders)	Vision Setter	Innovation, long term, constantly up-to-date with trends/goals and open communication.
	Motivator	Emphasises company values, challenges followers with new targets/aspirations, creates a feeling of motivation.
Transactional (focus on coordinating different interests)	Analyser	Efficiency and effectiveness in operations, evaluates projects and integrates conflicting perspectives.
	Taskmaster	Attends to performance and results, influences low-level decisions.

Source: Adapted from Quinn (1996, p. 149).

Based on the above rationale, Bass and Avolio (1985, cited in Serrão, 2009) used the MLQ: *Multifactor Leadership Questionnaire* to identify four higher-order components / constructs in transformational leadership:

– Idealized influence or charisma. These leaders inspire others to follow their vision, exert a charismatic influence (Barreto et al., 2012), and share risks (Serrão, 2009), leading subordinates to identify, respect, and admire their leader(s) (Bass, 1985);
– Inspirational motivation. These leaders share their vision, making it appealing to subordinates (Serrão, 2009), leading to greater commitment on their part (Barreto et al., 2012);
– Intellectual stimulation. These leaders awaken new ideas in their followers so that they challenge themselves and the organization, leading to greater development (Barreto et al., 2012);
– Individual consideration. These leaders are able to develop skills, increase follower motivation, and improve the organization's effectiveness (Barreto et al., 2012), thereby promoting a climate of growth (Bass, 1985).

As for transactional leadership, Bass (1985) defines it as oriented towards: the task / process; the clarification of expected results / performance; rewarding effort.

1.2.2. Leadership in military contexts

The military institution is traditional by nature, and there is a clear power divide between hierarchical levels and the way leaders and subordinates interact (Wong et al., 2003).

Direct leadership – which is exercised up to the rank of Lieutenant Colonel and tends to become less and less direct as one rises up the hierarchical ladder – is the most studied type of leaderships in the military (Hunt, 1991) because it involves more people (Wong et al., 2003). It is perhaps due to this fact that sound leadership skills (e.g. Wong et al., 2003) must include a set of values and attributes such as loyalty, sense of mission, respect, honour, integrity, and courage, combined with mental, physical, and emotional excellence (FM-22, 1999). Ultimately, this requires more transformational forms of leadership (Wong et al., 2003), which, among other things, allow leaders to operate at their full potential. Bass et al. (2003) confirm this, stating that infantry units whose leaders have transformational styles tend to obtain better results in highly stressful situations.

Therefore, leadership in military contexts must be truly transformational, in light of "the requirements of the mission, the need to motivate and care for subordinates, and the constant [effort] to develop the organization" (Costa, 2015, p. 15).

Given the constantly changing environments that tend to characterise military missions, e.g. in operational theatres, it is crucial that military leaders are highly adaptable (Wong *et al.*, 2003).

In other words, "it is only through continued professional development that future military leaders will increase their self-confidence, fearlessness, openness, competence, foresight, and dedication, becoming inspiring leaders who know that they deserve the respect and confidence of their subordinates, and thus inspire obedience and respect" (Vieira, 2002, cited in Almeida, 2017, p. 6).

In the Portuguese Air Force, this could be achieved by including the Command and Leadership curricular unit in the basic training courses for future officers – career staff (CaS) and contract service personnel (CS). In the case of CaS, these courses will later be enhanced by specialisation activities (for example, by performing inter-student leadership roles within military career courses – such as the Basic Command Course and the Field Grade Officers Course) and can be complemented by attending the Joint Staff Course and the Flag Officers Course).

Fachada's study (2002, p. 1) aimed "[…] to contribute to the study and understanding of leadership sensitivities in the training [...] administered in the Portuguese Air Force, specifically at the [then] School of Military and Aeronautical Technologies (SMAT)". Prior to the entry into force of the Bologna system, this school was responsible for administering bachelor degrees to the future technical officers of the Air Force. Among other conclusions, it was found that there are effective differences "[...] in the way students [of these two] schools (AFA and SMAT) perceive leadership, and that those differences are also present between students from different years of study" (Fachada, 2002, p. 93).

More specifically, regarding the (leadership) training received by Air Force military personnel, Fachada (2002, p. 92) found "[...] evidence that training is a tool of self and heteroassessment that increases people's (in this case, the students') cognitive and evaluative / normative complexity. [An] effect that seems to explain the behaviour pattern of [preBologna degree students, who, for the most part,] had no prior military experience, [...] more than the behaviour of bachelor degree students. The latter were apparently more sensitive ("reactive") to changes in their routine and to the consistency of their frames of reference due to being emerged in a new reality".

1.3. Culture and Leadership

Although, depending on their leadership style, leaders adapt better to one culture to the detriment of another (House et al., 2004; Quinn and Cameron, 2006; Masood et al., 2006), they are expected to understand and develop the culture of the organization (Bass and Avolio, 1985, cited in Serrão, 2009).

Because leadership is an element that strengthens organizational culture (Schein, 2010), depending on the focus of their actions, leaders create and change the cultural norms of an organization – by strengthening organizational culture and by integrating subcultures, respectively, thereby mitigating conflict – and, as a result, influence its behaviour (Barreto et al., 2012).

Barreto et al. (2012) also note that the influence of leadership on culture tends to weaken with organizational distance, that is, the more hierarchical levels there are between leaders and followers, the weaker the influence of leadership culture will tend to be.

Specifically regarding the training administered at two Air Force schools with headquarters in the same location (i.e., the Academy, in Sintra), Fachada (2002, p. 92) found evidence that confirms the assumption "[…] that the existence of some degree of socialisation / acculturation

to the military does not seem to constitute an ab initio advantage (a facilitating factor) in the process of integrating students in a military higher education institution.

1.4. Hypotheses

Although the AFA and the AFMTTC belong to the same branch of the Armed Forces and are both educational establishments for future Air Force (AF) officers, it is also true that these two "schools" train officers for different roles: to enter the CaS (AFA) and CS (AFMTTC). This naturally results in different experiences, syllabi, curricula, etc.

For this reason, bearing in mind the above concerns regarding culture – which are to a certain extent, similar to the arguments made by Sousa (2015) (that different Branches have different types of culture) and by Costa (2014) (that the organizational culture of an organization is shaped and shared by its members) –, the following hypothesis was formulated (**H1**): *There are differences in organizational culture between the AFA and the AFMTTC*.

In the AFA, there are "1 + 2" broad types of students, who will be the future officers of the PrtAF. They either:

- Come mainly from civilian environments, and, after completing high school, enrol in the master's in military aeronautics (MMA) in the pilot, aeronautical administration, engineering (airfield, aeronautics, or power engineering), or medicine specialties;
- Have previous military experience or are currently in the military (officers, sergeants, or enlisted categories), have already completed basic training in the AFMTTC, and are currently attending a short training course to enter the CaS, which has a term of:
    - One year, in the case of the Technical and Military Traineeship (TMT);
    - One semester, in the case of the Integration Course in the Health Technicians Specialty (ICHTS).

Although these 1+2 groups are trained at the same location (AFA), they come from different military contexts, have different training periods, and attend the AFA for different lengths of time, among other aspects. Furthermore, Hofstede (1997) and Fachada (2002) found evidence that students with some military experience tended to be more sensitive to changes in routine, and that having some degree of socialization / acculturation to the PrtAF should not be considered an ab initio factor that provides significant advantages in the process of integrating students in a military higher education institution. In light of this, **H2** was formulated: *There are differences between the organizational cultures of the MMA, the TMT and the ICHTS*.

Schein (2010, p. 3) argues that the "[…] dynamic process of culture creation and management are the essence of leadership and make one realize that leadership and culture are two sides of the same coin".

Evans and Ward (2007) add that leadership has an impact on the culture of an organization, which in turn has an impact on leadership style, and that those with a strong knowledge of the culture are identified as capable leaders.

Therefore, it seems relevant to formulate **H3**: *There are differences between the leadership styles developed in the AFA and the AFMTTC*.

Based on the research by Fachada (2002, p. 93), which found differences in the perceptions of leadership between the students of two Air Force military higher education establishments (AFA and SMAT) – although they share the same location, some of the faculty, curricula, and military life routines (they stand together in parades and ceremonies, etc.) – **H4** was formulated: *There are differences between the leadership styles of the MMA, the TMT, and the ICHTS*.

Finally, Barreto et al. (2012) argue that there is a tendency in large organizations such as the PrtAF to form subcultures, which are defined, for example, by geographic location or by the type of work performed. This serves to address problems / situations that certain members encounter while performing their work. In light of this, as well as the fact that culture and leadership are "two sides of the same coin" (Schein, 2010, p. 3), as mentioned above, **H5** was formulated: *There are differences in culture and leadership among the different specialties*.

2. Methodology

2.1. Research design

This research uses a quantitative strategy and hypothetical-deductive reasoning (Sampieri et al., 2006).

2.2. Method

2.2.1. Respondents and Procedure

Respondents. The sample consisted of 173 military students (future PrtAF officers), the majority of whom were male (76%), who are receiving training at two educational establishments, the AFA (MMA + TMT + ICHTS; n = 135) and the AFMTTC (CFO; n = 38) (Figure 4).

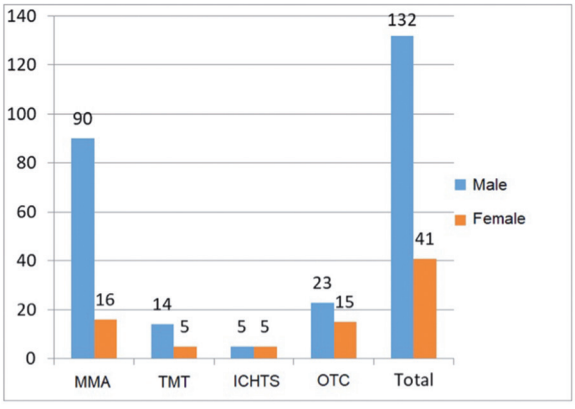

Figure 4 – Sample characterisation

The following specialties have the highest and lowest number of respondents (Table 2): PILAV (n = 53≅30.6% of the total sample) and MED (n = 3≅1.7%) in the AFA; Support (n = 21≅12.1%) and Maintenance (n = 3≅1,7%) in the AFMTTC.

Table 2 – Respondents / specialty area

		Respondents (n)	Percentage
MMA	**PILAV**	53	30.6%
	Engineering	34	19.7%
	ADMAER	16	9.3%
	MED	3	1.7%
TMT	**Support**	7	4.1%
	Maintenance	4	2.3%
	Operations	7	4.1%
ICHTS	**TS**	10	5.8%
CFO	**Support**	21	12.1%
	Maintenance	3	1.7%
	Operations	13	7.5%

Finally, at the date of completion of the questionnaire, the majority of respondents did not have any experience (past or present) in formal managerial positions (n=119;68.8%).

Procedure. Once the proper authorisation from military leadership had been obtained, the questionnaires were sent to potential respondents in digital format (via Google Forms) between 15JAN-24FEB2018. The period was purposely short to minimise potential extraneous variables associated with possible organizational changes, and the survey date was scheduled for a period after the students had already received some leadership training.

2.2.2. Measuring instruments

The questionnaire was divided into three parts: the first collected the respondents' sociodemographic data; the second and third contained questions concerning organizational culture and leadership style, respectively.

Organizational culture. The study used Machado's Portuguese version of Quinn and Cameron's 2006 Organizational Culture Assessment Instrument (OCAI), which consists of 24 questions that correspond to six organizational areas (Table 3).

Table 3 – The six organizational areas covered in the OCAI

Organizational area	Operationalisation	Questions
Dominant characteristics of the organization	People's perceptions about the workplace	1-4
Organizational leadership	People's perception about the leadership used in the organization (for example, whether it is people-oriented or results-oriented).	5-8
Management of employees	The management style in the organization (whether it is group-oriented or individual-oriented).	9-12
Team spirit [Organizational glue]	Group cohesion, trust, or rules and procedures	13-16
Future-oriented strategy [Strategic emphases]	-	17-20
Criteria of success	How the organization defines success, (human development or results achieved).	21-24

Source: Adapted from Machado (2002, pp. 62-63).

Using a different question group, the OCAI also identifies the four types of organizational culture analysed above, namely: Clan (1,5,9,13,17 and 23), Adhocracy (2,6,10,14,18 and 24), Hierarchy (4,8,12,16,20 and 26) and Market (3,7,11,15,19 and 25).

Each question is scored on a fivepoint Likert scale: (1) *Totally disagree* and (5) *Totally agree*, and the scores of each factor are calculated using the simple average of the items in the set. Machado's Portuguese adaptation of the questionnaire (2002) obtained the following reliability indices (*Cronbach's Alpha*): clan (α=0.74), adhocracy (α=0.79), hierarchy (α=0.71) and market (α=0.73).

Leadership. The research used a version of the Multifactor Leadership Questionnaire (MLQ Form 6S) by Bass and Avolio (1985, cited in Serrão, 2009), translated into Portuguese and validated for the Brazilian context by Marques et al. (2007), which consists of 21 questions that correspond to the leadership styles presented in Table 4. Marques et al. obtained the following reliability indices: idealized influence (α=0.75), inspirational motivation (α=0.54), intellectual stimulation (α=0.75), transactional leadership (α=0.73), and *Laissez-faire* leadership (α=0.67).

Table 4 – Leaderships styles assessed by the MLQ

Leadership styles		Operationalisation	Questions
Transformational	Idealized influence (II)	The leader holds followers' trust and respect.	1,8,15
	Inspirational motivation (IM)	The leader helps others focus on their work, using appropriate symbols and images, and makes others feel their work is significant.	2,9,16
	Intellectual stimulation (IS)	The leader encourages/motivates others to be creative and creates and environment that is tolerant of extreme positions.	3,10,17
	Individualized consideration (IC)	The leader shows interest in followers' well-being, assigns projects according to skill, and pays attention to those who are less involved.	4,11,18
Transactional	Contingent reward (CR)	The leader emphasises the rewards that can be obtained by the followers who accomplish the goals.	5,12,19
	Management-by-exception (MbE)	The leader tells others the job requirements and their degree of satisfaction with subordinates	6,13,20
Laissez-faire (LF)		The leader requires little of others, is content to stand back and let the work flow naturally without having to interfere.	7,14,21

Source: Adapted from Marques et al. (2007, p. 4-7).

Each question is scored on a five-point Likert scale: (1) *Totally disagree* and (5) *Totally agree*. The score of each factor is calculated using the simple average of the corresponding item set.

2.2.3. Data treatment techniques

The data were processed using version 22.0 of the Statistical Package for the Social Sciences (SPSS) software.

3. Analysis of Results

3.1. Psychometric Qualities of the Instruments

This section presents the reliability, factor, and sensitivity analyses of the measuring instruments for organizational culture and leadership.

3.1.1. Organizational Culture Assessment Instrument (OCAI)

Factor analysis. The factor analysis was conducted using the main component method with Varimax rotation, retaining seven factors (7F) that explain 66% of the total variance, revealing a KMO of 0.85, which is ≥classified as *Good* by Marôco (2014). The factor analysis was repeated and forced to 4F, as indicated in the original instrument, but the results obtained were not theoretically consistent (original factor groupings) and did not suggest that any items should be deleted, since all presented commonalities and factor loadings ≥ 0.4.

Therefore, for the purposes of this study, simple averages were calculated for the original factors proposed by Quinn and Cameron (2006).

Reliability analysis. Cronbach's Alpha analysis showed that, using the categorization proposed by Hill and Hill (2002) – reasonable coefficient at [0.7;0.8[; good, at [0.8 ; 0.9[; and excellent, if ≥0.9 –, the Clan Culture and Adhocracy Culture factors fall within the reasonable range (α=0.767 and α=0.775, respectively) and the rest fall somewhat below the reasonable range (Hierarchy Culture, α=0.651 and Market Culture, α=0.682). The item-total correlation analysis revealed that all items contribute significantly to the factors that were analysed, suggesting that no items should be deleted.

Sensitivity analysis. The Kolmogorov-Smirnov test obtained a *p-value*<0.05 in all 4F of organizational culture (Table 5), which indicates a non-normal distribution according to Marôco (2014): if *p-value*≥0.05, the distribution is normal; if *p-value* <0.05, the distribution is non-normal.

Table 5 – *Kolmogorov-Smirnov* test

	Clan	Adhocracy	Hierarchy	Market
Test statistics	0.094	0.104	0.124	0.107
Sig. (2 tails)	.001	.000	.000	.000

Since the distribution is non-normal, the asymmetry[2] and flatness[3] (kurtosis) coefficients must be analysed in the 4F.

As for the asymmetry coefficient, all types of culture obtained a value lower than -0.5, indicating a distribution with negative asymmetry (Clan=-3.57, Adhocracy=-2.59, Hierarchy=-3.89; Market=-3.77). The kurtosis coefficient is greater than 0.5 in all cultures (Clan=3.57, Hierarchy=10.13, Adhocracy=1.62, Market=1.96), indicating that the distribution of these 4F is tendentially leptokurtic.

[2] The asymmetry coefficient is: negative when <0; positive when > 0; symmetric when = 0 or near zero, (Marôco, 2014).

[3] When the flattening coefficient is: > 0, the distribution has a sharp shape which is called leptokurtic; when it is <0, the flattened form is called platykurtic; when it falls near zero (considering as near 0 the range of values between -0.5 and +0.5), the distribution describes an intermediate shape which is called mesokurtic (Marôco, 2014).

3.1.2. Multifactor Leadership Questionnaire (MLQ Form 6S)

Factor analysis. The factor analysis was conducted using the main component method with Varimax rotation, retaining 6F that explain 62% of the total variance, revealing a KMO of 0.86, which is classified as *Good* by Marôco (2014). The factor analysis was repeated and forced to 7F, as indicated in the original instrument, but the results obtained were not theoretically consistent (original factor groupings) and did not suggest that any items should be deleted, since all presented commonalities and factor loadings ≥ 0.4.

Therefore, for the purposes of this study, simple averages were calculated for the original factors proposed by Bass and Avolio (1985, cited in Serrão, 2009).

Reliability analysis. Of the three leadership scales (Table 6), only Transformational leadership falls within the desired range, α≥0.7, and the rest fall below that range. In the case of the factors, only c and Intellectual Stimulation fall within the desired range. The item-total correlation analysis revealed that all items contribute significantly to the factors that were analysed, suggesting that no items should be deleted.

Table 6 – Cronbach's Alpha of leadership factors and dimensions

Leadership	Factor	α
Transformational		0.864
	II	0.715
	IM	0.466
	IS	0.771
	IC	0.528
Transactional		0.649
	CR	0.487
	MbE	0.410
Laissez-faire		0.487

The Kolmogorov-Smirnov test obtained a *p-value*≥0.05 on the transformational leadership scale, and a *p-value*<0.05 on the other scales (Tables 7 and 8), indicating that the distribution is normal only in transformational leadership and non-normal in the other leadership styles.

Table 7 – *Kolmogorov-Smirnov* test (leadership styles)

	Transformational	Transactional	*Laissez-faire*
Test statistics	0.061	0.101	0.137
Sig. (2 tails)	.200	.000	.000

Table 8 – *Kolmogorov-Smirnov* test (factors)

	II	IM	IS	IC	CR	MbE
Test statistics	0.177	0.144	0.132	0.195	0.175	0.154
Sig. (2 tails)	.000	.000	.000	.000	.000	.000

The analysis of the asymmetry and kurtosis coefficients revealed that factors II, IM, IS, IC, and CR have a negative asymmetric distribution and that the remaining factors have a positive asymmetric distribution. As for the kurtosis coefficient, factors II, IM, IC, MbE, and Transactional have a platykurtic distribution, and the remaining factor has a leptokurtic distribution.

3.2. Descriptive analysis

The descriptive statistics for culture and leadership are presented below.

Organizational culture. Hierarchy Culture (Table 9) obtained the highest mean value (M=3.62, SD=0.50).

Table 9 – Descriptive statistics_culture

	Descriptive statistics				
	N	**Min.**	**Max.**	**Mean**	**Standard deviation**
Clan	173	1.00	5.00	3.56	0.62
Adhocracy	173	1.00	5.00	3.23	0.64
Hierarchy	173	1.00	5.00	3.62	0.50
Market	173	1.00	4.33	3.20	0.58

Leadership. Transactional Leadership obtained the highest mean value (M=3.85, SD=0.43) and, of all the factors, Idealized influence obtained the highest mean value (M=3.98, SD=0.52) (Table 10).

Table 10 – Descriptive statistics_leadership

	Descriptive statistics				
	N	**Min.**	**Max.**	**Mean**	**Standard deviation**
II	173	2.67	5.00	3.98	0.52
IM	173	2.33	5.00	3.69	0.50
IS	173	1.67	5.00	3.67	0.64
IC	173	2.67	5.00	3.97	0.52
CR	173	2.33	5.00	3.79	0.52
MbE	173	2.67	5.00	3.91	0.49
Laissez-faire	173	1.00	4.67	3.00	0.60
Transformational	173	2.50	5.00	3.83	0.45
Transactional	173	2.83	5.00	3.85	0.43

3.3. Tests For Differences Between Means

When analysing differences between means, the differences where *p-value*≤0.05 are considered significant (Marôco, 2014).

3.3.1. Organizational Culture

Student's t-analysis. The mean differences between the AFA and the CFMTFA with regard to Market culture (Table 11) were found to be significant (*p-value*≤0.05).

Table 11 – Student's t values for culture in the AFA and the CFMTFA

Place of training		N	Mean	Sig. (2 tails)
Clan	**AFA**	135	3.56	0.819
	AFMTTC	38	3.59	
Adhocracy	**AFA**	135	3.27	0.233
	AFMTTC	38	3.13	
Hierarchy	**AFA**	135	3.62	0.957
	AFMTTC	38	3.63	
Market**	**AFA**	135	3.29	0.000
	AFMTTC	38	2.89	

*≤0.05; **0.01.

Ancova Analysis. Considering that the AFMTTC has significantly higher numbers of female students than the MMA, the effect of gender was tested in terms of differences in Market Culture between the two educational establishments (Table 12), and the results obtained revealed that the male students have tendentially higher mean values in this type of culture than female students.

Table 12 – Mean values for Market Culture / Gender

Place of training	Gender	Mean	Standard deviation	N
AFA	Male	3.33	0.53	109
	Female	3.12	0.57	26
	Total	3.29	0.54	135
AFMTTC	Male	2.95	0.61	23
	Female	2.78	0.59	15
	Total	2.89	0.60	38
Total	Male	3.27	0.56	132
	Female	3.00	0.60	41
	Total	3.20	0.58	173

When testing the effect of the Gender covariate (Table 13), it was verified that the effect only significantly affects the mean values obtained in Market Culture for the AFMTTC (*p-value*≤0.05).

Table 13 – Effects of Gender on the Market Culture variable.

Parameters	B	t	Sig.
Intercept	3.44	25.81	0.00
[Place of training = AFA*Gender]	-0.13	-0.124	0.21
[Place of training = AFMTTC*Gender]	0.19	-3.571	0.00

ANOVA analysis and Tukey's HSD post-hoc test. The ANOVA revealed significant differences in the four types of culture (*p-value*≤0.05). The test for comparing multiple means (Tukey's HSD post-hoc test) showed significant mean differences (*p-value*≤0.05) in: Clan culture between the MMA-ICHTS[4], the TMT-ICHTS, and the CFO-ICHTS; Adhocracy culture between the MMA-ICHTS; Hierarchy culture between the MMA-ICHTS and the CFO-ICHTS; Market culture between the MMA-ICHTS and the MMA-CFO (Table 14).

Table 14 – Mean differences (Tukey's HSD post-hoc test) (intra-culture)

		Mean
Clan	**MMA**	**3.65**
	TMT	**3.50**
	ICHTS	**2.78**
	CFO	**3.59**
Adhocracy	**MMA**	**3.34**
	TMT	3.17
	ICHTS	**2.72**
	CFO	3.13
Hierarchy	**MMA**	**3.68**
	TMT	3.53
	CIQETS	**3.17**
	CFO	**3.63**
Market	**MMA**	**3.36**
	TMT	3.17
	ICHTS	**2.88**
	CFO	**2.89**

[4] This subgroup obtained a value of n<15, so it would be advisable to use a nonparametric test (Kruskall-Wallis). However, considering that only the CIQETS subgroup presents a value of n<5, and that non-parametric tests are not as potent, the research used parametric tests as advised by Marôco (2014, pp. 301-302), among others.

The intra-AFA analysis (Table 15) shows that in the MMA, with the exception of 5th year students, all types of culture tend to decrease as the length of stay in the AFA increases. Furthermore, significant mean differences (*p-value*≤0.05) were found in: Clan culture between the 1st-3rd year, the 4th year-ICHTS, the ICHTS and the 2nd, 3rd, and 5th years, and the ICHTS-ETM; Adhocracy culture between the 1st-3rd year, the 4th year-ICHTS, and the 2nd year-ICHTS; Hierarchy culture between the 1st-3rd year, and between the ICHTS and the 1st and 2nd years; Market culture between the 1st-3rd year, the 4th yearICHTS, the 2nd year3rd year, and the 4th year- ICHTS.

Table 15 – Mean differences (Tukey's HSD post-hoc test) (intra-AFA)

		Mean
Clan	1st year	**3.90**
	2nd year	**3.65**
	3rd year	**3.38**
	4th year	**3.39**
	5th year	**3.71**
	TMT	**3.5**
	ICHTS	**2.78**
Adhocracy	1st year	**3.64**
	2nd year	**3.41**
	3rd year	**3.04**
	4th year	**3.05**
	5th year	3.28
	TMT	3.17
	ICHTS	**2.72**
Hierarchy	1st year	**3.86**
	2nd year	**3.79**
	3rd year	**3.46**
	4th year	3.45
	5th year	3.67
	TMT	3.53
	ICHTS	**3.17**
Market	1st year	**3l56**
	2nd year	**3.53**
	3rd year	**3.04**
	4th year	**3.00**
	5th year	3.41
	TMT	3.17
	ICHTS	**2.88**

The differences between the specialties (Table 16) were found to be significant (p-$value \leq 0.05$): in Clan culture between TS and all other specialties; in Hierarchy culture between ADMAER-TS; in Market culture between PILAV-Support, ADMAER-TS, and Support-Operations.

Table 16 – Mean differences / specialty area (Tukey's HSD post-hoc test)

		Mean
Clan	PILAV	**3.68**
	Engineering	**3.58**
	ADMAER	**3.59**
	MED	**3.94**
	TS	**2.78**
	Support	**3.51**
	Maintenance	**3.71**
	Operations	**3.52**
Hierarchy	PILAV	3.62
	Engineering	3.64
	ADMAER	**3.87**
	MED	4.11
	TS	**3.16**
	Support	3.57
	Maintenance	3.69
	Operations	3.54
Market	PILAV	**3.34**
	Engineering	3.23
	ADMAER	**3.57**
	MED	3.83
	TS	**2.88**
	Support	**2.84**
	Maintenance	3.30
	Operations	**2.96**

3.3.2. Leadership

Student's t-analysis. The mean differences between the AFA-AFMTTC regarding IS and LF were found to be significant (*p-value*≤0.05), and the predominant leadership style is: Transactional in the AFA and Transformational in the AFMTTC (Table 17).

Table 17 – Mean differences (Student's t) between the AFA and the AFMTTC

	Place of training	Mean	Sig. (2 tails)
IS*	AFA	3.73	0.013
	AFMTTC	3.44	
Laissez-faire*	AFA	3.05	0.046
	AFMTTC	2.82	
Transformational	AFA	3.84	0.344
	AFMTTC	3.76	
Transactional	AFA	3.88	0.161
	AFMTTC	3.76	

*≤ 0.05; **0.01

ANOVA analysis and Tukey's HSD post-hoc test. The ANOVA revealed significant differences between different years of study intra-AFA only for the dimensions IC, CR, MbE and Transactional (*p-value*> 0.05). A comparison of multiple means was performed only for the above variables. Among the mean values presented (Table 18), the differences: in IC between the 1st-3rd year were significant (*p-value*≤0.05); in CR between the 1st, 3rd, and 4th year; MbE between the 1st year-TMT. Only the transactional leadership style presented significant differences between the 1st-3rd year and the TMT-1st year.

Table 18– Mean differences (Tukey's HSD post-hoc test) (intra-AFA)

		Mean
IC	1st year	**4.20**
	2nd year	4.07
	3rd year	**3.64**
	4th year	3.76
	5th year	3.98
	TMT	3.89
	ICHTS	3.96
CR	1st year	**4.04**
	2nd year	3.96
	3rd year	**3.59**
	4th year	**3.54**
	5th year	3.72
	TMT	3.68
	ICHTS	4.00
MbE	1st year	**4.13**
	2nd year	4.04
	3rd year	3.77
	4th year	3.92
	5th year	3.98
	TMT	**3.71**
	ICHTS	3.86
Transactional	1st year	**4.08**
	2nd year	4.00
	3rd year	**3.68**
	4th year	3.73
	5th year	3.85
	TMT	**3.70**
	ICHTS	3.93

Regarding the specialty areas, only the differences between ADMAER-Support in *Laissez-faire* (Table 19) were significant (p-*value*≤0.05). The prevalent leadership style in the PILAV, Engineering, ADMAER, TS, and Support specialties is Transactional leadership, and Transformational leadership is the predominant style in the other specialties.

Table 19 – Mean differences (Tukey's HSD post-hoc test) by specialty area

		Mean
Laissez-faire	PILAV	3.00
	Engineering	2.98
	ADMAER	**3.27**
	MED	2.88
	TS	3.3
	Support	**2.66**
	Maintenance	3.14
	Operations	3.03
	Total	2.99
Transformational	PILAV	3.92
	Engineering	3.75
	ADMAER	3.86
	MED	4.27
	TS	3.83
	Support	3.74
	Maintenance	3.66
	Operations	3.79
	Total	3.82
Transactional	PILAV	3.93
	Engineering	3.83
	ADMAER	3.94
	MED	4.05
	TS	3.93
	Support	3.73
	Maintenance	3.78
	Operations	3.70
	Total	3.85

3.4. Correlation Analysis

The analysis of Table 20 shows significant correlations between all the culture and leadership variables, the strongest relationships occurring between Laissez-faire leadership and Adhocracy Culture (r=0.405,p≤0.01) and between Transformational Leadership and Hierarchy Culture (r=0.398,p≤0.01).

Table 20 – Pearson correlation between organizational culture and leadership

	Clan	Adhocracy	Hierarchy	Market
II	0.339**	0.252**	0.354**	0.224**
IM	0.310**	0.253**	0.333**	0.184*
IS	0.186*	0.171*	0.273**	0.222**
IC	0.386**	0.248**	0.378**	0.215**
CR	0.301**	0.242**	0.387**	0.245**
MbE	0.211**	0.175*	0.209**	0.174*
Laissez-faire	0.272**	0.405**	0.295**	0.435**
Transformational	0.360**	0.273**	0.398**	0.255**
Transactional	0.298**	0.243**	0.350**	0.246**

** The correlation is significant at level 0.01 (2 tails).

* The correlation is significant at level 0.05 (2 tails).

4. Discussion of Results

This section focuses on addressing and analysing the five hypotheses.

H1, *There are differences in organizational culture between the AFA and the AFMTTC,* is confirmed because there is a significant difference in Market culture, which is a type of culture doctrinally described as goal-oriented, with the AFA obtaining significantly higher values than the AFMTTC. Furthermore, there were also significant inter-gender differences in Market culture (male students obtained higher values). This result is in line with the literature with regard to the fact that different cultures exist in different environments – despite the fact that these two educational establishments (AFA and AFMTTC) belong to the same Branch (PtAF).

H2, *There are differences between the organizational cultures of the MMA, the TMT and the ICHTS*, is confirmed because there are significant mean differences between the MMA-ICHTS, for all types of culture, as well as intra-MMA. This may be explained by the fact that: the students stay in the AFA for longer periods, which could help strengthen the bonds of friendship / camaraderie that are created over the course of days / weeks / years (Clan Culture), reinforce the rules and standards of conduct in force (Hierarchy Culture), and lead to greater acculturation (Market Culture); the course is more scientific and technological (Adhocracy Culture).

The first year obtained higher mean values in all types of culture, which can be explained by the fact that during the first year, the aspects linked to acculturation to a new reality are most frequently and intensely focused on, for example, by perpetuating traditions (studying the history of the Academy, the attribution of nicknames, etc.). The ICHTS group, on the other hand, obtained the lowest mean values in all types of culture, perhaps because, contrary to what occurs in the MMA, the shorter length of stay in the AFA does not facilitate the creation of ties as strong as the ones formed between MMA or even between TMT students.

The confirmation of this hypothesis is in line with the literature that states that service members' acculturation and level of culture varies according to the length of service (even within the MMA), which gives rise to different (sub)cultures within the AFA (Hofstede, 1997; Fachada, 2002).

H3, *There are differences between the leadership styles developed in the AFA and in the AFMTTC,* is partially confirmed because there were only significant differences between the AFA-AFMTTC in Intellectual Stimulation and Laissez-faire, which to some extent can to be linked to the fact there are some commonalities in the leadership training administered in both educational establishments. Although only partially, this is in line with Schein (2010) and Evans & Ward (2007), who argue that culture has an impact on leadership style, and that leadership is a dynamic process.

H4, *There are differences between the leadership styles of the MMA, the TMT, and the ICHTS,* is refuted, possibly because these three groups (intra-AFA) share the same commanders and instructors, and are influenced by the same leadership style. Although this apparently contradicts the findings of Fachada (2002) – who found significant differences in perceptions of leadership among students from two Air Force higher education establishments, the AFA and the SMAT –, it actually reinforces the potential explanation because, at the time of Fachada's study, there was little, if any sharing of the sources of influence / actors referred to above.

H5, *There are differences in culture and leadership among the different specialties,* is confirmed, which specifically reflects the significant differences between the PILAV-Support and Support-Operations specialties, in the case of Market Culture, and the fact that the TS specialty obtained the lowest mean values in all cultures. This could be related to the hospital environment where these military nurses conduct their daily activities and in which they acquire a very specific (sub)culture, which is crucial for their work but is naturally different from the (sub) cultures of the other specialties.

Conclusions

In response to the RQ, "What is the relationship between organizational culture and leadership in the AFA and the AFMTTC?", **it was concluded** that there are significant differences between the two institutions, confirming that culture and leadership vary even within the same organization. The greatest differences in organizational culture between the two institutions were found in Market and Adhocracy Culture. There were differences in leadership style between the AFA-AFMTTC but not within the AFA, where no significant differences were found between the three groups.

As regards the first objective of this study, *Studying the culture of students attending the MMA, the TMT, the ICHTS, and the CFO,* differences were found in all types of culture. The differences in Clan culture between the ICHTS and all other groups could be related to the specific roles performed by military nurses in clinical environments, who naturally have a

strong "caregiver" sense, i.e., concern for people's well-being. The differences in Adhocracy culture between the MMA-ICHTS could stem from the fact that the MMA courses tend to be scientific and research-oriented and prioritise innovation. Differences in Hierarchy culture were found between the MMA, the CFO, and the ICHTS – the values obtained by the MMA and the CFO were high (perhaps because these groups are in an earlier phase of their career and training), and the ICHTS obtained the lowest values (again, possibly due to the clinical environment in which students perform their roles before and after the course, which results in lower priority being given to the notion of hierarchy, as opposed to being a "caregiver"). Differences in Market culture were found between the MMA, the CFO, and the ICHTS, indicating that the MMA culture is more goal-oriented, possibly because it is a university degree.

As for the second objective, *Comparing organizational culture and leadership across the various years of study*, the 1st year obtained fairly high mean values in culture in all axes, possibly due to greater learning / acculturation requirements (because students are in a new environment, because they must progress at a rapid pace, because they have a whole set of traditions to acquire, etc.). In the remaining years, the mean values of culture declined as the length of stay increased, with the exception of the 5th year. This decrease could be explained by the fact that from the first year onwards students are not as closely and constantly / permanently monitored. The exception (the 5th year) could be related to the fact that these students are in a new phase of their academic life – which is characterised by fewer classes, the preparation of the master's thesis, etc. –, and thus are embedded in a (sub) culture of their own. The fact that the 4th year obtained the highest values in Clan Culture may be due to the fact that 4th year students are primarily responsible for monitoring the 1st year, and must work closely with and provide an example for the younger students. In the case of leadership, the only differences were found between the 3rd year and the remaining years of the MMA, with Transactional leadership as the dominant leadership style.

Regarding the third objective, *Understanding the relationship between organizational culture and leadership style*, there is a strong relationship between *Laissez-faire* leadership and Adhocracy Culture, and between Transformational leadership and Hierarchy Culture. This could be explained by the fact that Transformational leadership is currently the most popular style among commanders, as they must accomplish their mission and motivate / involve their subordinates in the organization's objectives.

Regarding the fourth and last objective, *Understanding the differences in culture and leadership across different roles*, differences were found in all types of culture, with the exception of Adhocracy culture. The differences in Clan Culture between the TS specialty and the remaining specialties could be related to the fact that these military students, compared to the rest, are only together in the AFA for a short period, and there are fewer opportunities for relationships to mature. As for leadership, the Transactional style was predominant, and only MED, Maintenance, and Operations obtained higher values in Transformational leadership.

The above demonstrates that this study – which clearly shows that there are differences in culture and leadership among the military students trained by the two schools that prepare

future Air Force officers (the AFA and the AFMTTC) – has the **practical implication** of providing the military leadership with a deeper understanding of this issue, so that they can take measures to maintain or standard these differences if / when they deem it appropriate. They may choose to maintain them if they consider that both schools train officers for different types of service (CaS in the AFA and CS in the AFMTTC), or standardise them if they consider that, despite having different types of contract, they will all be Air Force officers.

A possible **limitation** is the relatively small number of respondents, which nevertheless corresponded to almost the entire universe (which itself is not particularly large).

In **future studies**, it would be interesting to extend the study of differences in leadership style, and especially culture, to the Air Force as a whole. This would help understand if being integrated in different Units or even Services or Corps is an influencing factor, further validating the instruments' factorial structure. It could also be interesting to assess if / to what extent culture and leadership style change across different missions and / or across the events that are known to have an impact on service members' "life", such as: the Military Aptitude Test (AFA) or basic training (AFMTTC), i.e., the moment of selection of future military students, which entails intense, demanding training / the evaluation of military and physical subjects, etc.; the Survival, Evasion, Resistance, and Extraction Course, which consists of learning and training practices that allow service members, alone or in a group, to survive in a hostile environment and if they are captured; specific training for Theatres of Operations that are highly demanding / life-threatening, such as the UN MINUSCA mission in the Central African Republic. Regarding the methodology used, it would be equally interesting to further explore this theme through multilevel models capable of organizing the data hierarchically.

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