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Through military lenses. Perception of security threats and jointness in the Italian Air Force

Abstract. The article explores Italian Air Force (ITAF) officers' perceptions of military transformation and of changes in the global security environment. While several studies have addressed the challenges faced by European armed forces in the last two decades, the methods used have been rather uniform, mostly relying on in-depth case studies through qualitative interviews and analysis of strategic documents and budgets. Using data from an original, and unique, survey conducted among ITAF captains (N=286), this article focuses on servicemen's attitudes towards the transformations of the global security environment and the changes occurring (and needed) within the Italian Air Force. After describing the "military view" on these topics, the article provides preliminary statistical evidence on the links between individual experiences, views, and change. The research aims to contribute to the broader debate on military transformation by adding a novel dimension of analysis and providing new insights on the micro-level aspects of learning.

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Introduction

What do military officers think about the evolution of the global security environment and military transformation? The debate on force transformation has been very lively in both military and academic circles in the past decade or so (Grissom 2006, Farrell, Rynning and Terriff 2013), partly due to the range and extent of military missions undertaken after the end of the Cold War, and in particular after 9/11 (Vennesson *et al.* 2009, Russel 2010, Foley *et al.* 2011, Catignani 2012, Haaland 2016). At the same time, a growing attention has been devoted by the literature to the military transformation in European countries, which should face an evolving scenario, from terrorist attacks to the military operations against the so-called Islamic State in Iraq and Syria (Meijer & Weiss, forthcoming). Yet, with a few important exceptions (Avant and Lebovic 2000, Caforio 2013; Mahnken and FitzSimonds 2003, Farrell 2008, Ruffa 2014), the analysis of what the armed forces themselves think about transformation has been largely absent. While studies based on the analysis of doctrine and strategic documents exist and constitute a significant first level of analysis, military perceptions of transformations and its drivers have rarely been studied by asking military officers. And yet, the extent of change occurred in particular within European armed forces in the last decades can't be fully described without taking into account the opinions of those most directly involved in the process of change.

The contribution of this article to the mentioned gap is twofold. First, the paper presents original information on officers of the Italian Air force (ITAF) and provides a detailed analysis of their security perceptions and views of how armed forces are evolving. This also allows a fresh perspective on the evolution of Italian defence to be presented, which is *per se* a rather neglected issue within the literature (Caforio 2000; Ruffa 2014, Coticchia and Moro 2015). Second, through multivariate analysis, the article attempts to explain the perceived drivers of a crucial dimension of military transformation: jointness. The analysis links the military views about jointness with officers' perceptions of the role of technology, previous deployment experience, and the threat environment. Although it is difficult to identify causal mechanisms, and we should always be careful to interpret survey data because of sample and other biases, the results clearly show that officers' views of technology have a significant impact on their views about military transformation. This work relies on a bottom-up approach that focuses on individual-level analysis through surveys, a method that is increasingly diffused in military studies (Soeters *et al.* 2014). Although the present research maximized internal validity at the expenses of external one, it also provides an original "pilot study" that can be then adapted and replicated for other services and other countries, thus expanding knowledge of military officers' perceptions and, their drivers. In sum, the added value of the paper to the current debate is related to the insights provided by the first comprehensive assessment of the Italian armed forces' perceptions on military transformation,

building on previous studies (Mahnken and FitzSimonds 2003, Farrell 2008) and proposing a way ahead to begin exploring significant correlations.

The article proceeds as follows. The next section provides a brief and updated literature review on military transformation and innovation, focusing in particular on NATO countries. The article then presents military transformation in the context of Italian Armed Forces. Hypotheses, data, and methods are reported in the following section. Then, the empirical section illustrates the main results of the survey through descriptive statistics and regression analyses. The last section summarizes the preliminary findings, and discusses avenues for further research.

Force transformation in comparative perspective

Military innovation studies represent “a natural port of call” (Norheim-Martisen 2016, p. 318) for investigating how military organizations change and transform.¹ Military innovation is defined as “change that forces one of the primary combat arms of a service to change its concepts of operation and its relation to other combat arms, and to abandon or downgrade traditional missions” (Rosen 1988, p. 134). “Military innovation is a dynamic process precisely because it involves the interplay of international drivers and national shaping factors” (Farrell 2008, 783).

Recent scholarship² has emphasized the relevance of bottom-up approaches, deeply criticizing the literature on military innovation because of the excessive attention devoted to the top-down processes. As remarked by Farrell (2008, 806), “bottom-up learning from operational experience” has been insufficiently recognized in the literature. For instance, Grissom (2006) has highlighted the need to better investigate the mechanisms of learning and adaptation and the cases where bottom-up drives have effectively led to innovation. The existing debate in the literature is still lively. Grissom’s study, focusing on bottom-up innovation, contributed to increase the significance of strategic culture and the peculiarities of institutional learning in military organizations. Griffin (2016) states that since the Grissom article, organizational and strategic culture has dominated the field of military innovation, fostering a sort of “cultural turn” in the field.³ The wars in Iraq and Afghanistan also contributed to a change of focus in the literature, often described exactly as a “shift

¹ The concept of ‘force transformation’ has emerged more recently as an attempt to describe the changes that armed forces should undergo in response to technological change (Farrell *et al.* 2013).

² For a comprehensive review of military innovation studies, which goes beyond the purpose of this article, see Norheim-Martisen (2016), Griffin (2016), and Grissom (2006).

³ Griffin (2016) criticizes such a cultural turn on the grounds of “theoretical conservatism” because culture has been rarely considered an independent driver of transformation.

from top-down to bottom-up adaptation or innovation” (Haaland 2016, p. 3). In fact, bottom-up approaches have emphasized identification of how military forces adapted and innovated in response to developments in those conflicts (Russell 2010, King 2010, Foley *et al.* 2011).

Different views emerged regarding operations performance, learning and adaptation (Farrell 2010, Terriff *et al.* 2010, Catignani 2012). For instance, diverse findings have been reported concerning emulation from NATO: Terriff (2010) explores challenges and opportunities “NATO Transformation” poses for France after Paris re-joined the alliance's integrated military structure, while Farrell (2008, p. 803) and Farrell and Rynning (2013) highlight the limited impact of NATO's transformation agenda on transformation at national level (for France and the UK). Coticchia and Moro (2016) reveal different results in the case of Italy because NATO has played a very significant role, both as preferred source of doctrinal innovation and as broad framework of emulation and ‘learning by doing together’.⁴ Also, Pannier and Schmitt (2014) illustrate the institutionalized cooperation and the emulation occurred in France, Germany and the UK due to the influence of NATO. Hardt (2017) focuses on the origins of institutional memory, investigating the role played by NATO elites.

The attention devoted to the institutionalization of lessons learnt increased in the literature. However, “although these studies also touch upon the complexity of the learning process, they do not discuss in detail how experiences, learning, and adaptation are connected – or not” (Haaland 2016, p. 4). This study aims at providing a contribution to the current debate, investigating the *perceived* effects of force transformation⁵. On the whole, a growing interest in survey of armed forces involved in military operations has emerged (Mahnken 2013). However, despite officer attitudes “may play an important role in the process of innovation, to date they have received little scrutiny” (Mahnken and FitzSimonds 2004, 59). As reported by Avant and Lebovic (2000), it is worth investigating the attitudes of armed forces concerning the post-Cold War missions in order to assess how they really support (or not) the operations undertaken after the end of the bipolar era.⁶

4 For instance, Caforio (2013) has stressed role played by NATO in shaping comprehensive and counter-insurgency approaches during the operation ISAF in Afghanistan.

⁵ For a review of theories on military attitudes see, among others: Avant and Lebovic (2000).

⁶ Also for this reason, other scholars focused specifically on the role played by learning and military education. According to Griffin, military education can be “incredibly revealing” (Griffin 2016, p. 17) about learning cultures of militaries because it can highlight crucial features, but we “still don't have empirical studies on bottom-up learning in peace”. Existing empirical analyses on military education are generally focused on the curriculum content (Foot 2002), the main outputs of the courses (Kennedy and Nielson 2002), the

In line with this view, this paper adopts a micro-level perspective through a survey that portrays views and perceptions of ITAF. Following Norheim-Martisen (2016), we believe that the current debate misses the micro-level perspective, which helps in understanding transformation as something far from being uniform. In other words, we should unpack the “conventional story” of the post-Cold War European military transformation (Luttwak 1996), when armed forces “have moved from standing armies designed to defend the European mainland from Soviet invasion, to a smaller, but qualitatively better, force geared towards out-of-area operations”⁷ (Norheim-Martisen 2016, p. 316). Therefore, the manuscript investigates the underrated case of the ITAF to provide a “pilot study” on military views, focusing on one of the most militarily engaged European services in operations abroad after the end of the Cold war (Ignazi *et al.* 2012).

Military transformation. The Italian case

Despite the significant contribution provided by Italian troops in several post-Cold War military operations, the overall interest on Italian armed forces has been limited. Only in recent years the literature has started to examine the Italian military transformation in comparative perspective (Coticchia and Moro 2015, 2016), the role played by Italian military and strategic culture (Ignazi *et al.* 2012, Ruffa 2014), the evolution of the whole national defence sector (Giacomello and Verbeek 2011), the relationship between Italian public opinion and post-Cold War military interventions (Battistelli *et al.* 2012).

However, as already stated, the perceptions of Italian officers regarding the Italian military transformation have been rarely, if ever, assessed⁸. Almost any comprehensive surveys on Italian military officers’ views regarding security issues and military transformation have been conducted in the post-Cold War era. Moreover, the (limited) analyses on Italian military missions have mainly focused on the operation on the ground carried out by the army (Ruffa 2014; Coticchia and Moro 2014), devoting limited attention to the other services. Therefore, the findings of this pilot-study could represent a base for further cross-time analyses on Italian armed forces.

The analysis of Italian official documents helps in revealing the crucial elements that need to be investigated in details in order to grasp the complex

group interactions, the educational environment. For a comprehensive and updated review on “professional military education” see Paget (2016).

⁷ For instance, all European states abandoned conscription, downsize their armies, investing in new technology. See Meijer & Weiss (forthcoming).

⁸ For an exception see Caforio (2000).

evolution of Italian post-Cold War defense. First, in a complex strategic scenario, after decades of military deployment, it would be crucial to better understand the officers' views on the main perceived threats to national security. The post-Cold War official documents have constantly stressed the multidimensional nature of the challenges Italy should address. The "New Defence Model" (1991) perceived the deployment of troops abroad as fundamental to deal with regional and global instability⁹. The *Libro Bianco 2002* (2002 White Paper)¹⁰ focused on the rise of asymmetric threats, such as transnational terrorism. Finally, the recent 2015 White Paper¹¹ provided (for the first time) a detailed list of threats, from demographic changes to scarcity of natural resources and state fragility. Thus, it would be important to examine the (potential) process of "translation" from official documents to officers' view concerning new threats and challenges in a transformed strategic context. ITAF, which have almost always been involved in regional and international crises, from "Desert Storm" (1991) to Libya (2011) and Iraq (2014-), represents an excellent case for analysis¹².

Second, a micro-level approach would allow investigating - from a different angle - the perceived level of adequateness of Italian equipment. The literature has recently pointed out the role of technological innovation in Italian defense, stressing the growing digitalization of forces.¹³ Also official documents, such as the *Chief of the Italian Defence Staff Strategic Concept* (2005)¹⁴ or *Investire in Sicurezza* (Investing in Security, 2005)¹⁵, have clearly conceived the technological advantage over the adversary as a force multiplier and a vital factor in missions abroad. More recently, the Network Centric Warfare (NCW) emerged at the center of national strategic debates (and concern)¹⁶. Because of its nature, Air Force is the most technological

⁹ Ministero della Difesa, *Modello di difesa. Lineamenti di sviluppo delle FF.AA. negli anni '90* (Roma: Stato Maggiore della Difesa, 1991).

¹⁰ Ministero della Difesa, *Libro Bianco della Difesa* (Roma: Stato Maggiore della Difesa, 2002).

¹¹ Ministero della Difesa, *Libro Bianco della Difesa e della Sicurezza* (Roma: Stato Maggiore della Difesa, 2015).

¹² It is worth noticing how ITAF played a primary role in some of the most relevant post-Cold War Italian operations, such as "Desert Storm" (Iraq, 1991), "Allied Force" (Kosovo, 1999), and "Unified Protector" (Libya, 2011).

¹³ See, among others, Nones and Marrone (2011).

¹⁴ Ministero della Difesa, *Concetto Strategico del Capo di Stato Maggiore* (Roma: Stato Maggiore della Difesa, 2005).

¹⁵ Ministero della Difesa, *Investire in Sicurezza* (Roma: Stato Maggiore della Difesa, 2005).

¹⁶ See, for instance, Ministero della Difesa, *La Trasformazione Net-Centrica. Il Futuro dell'Interoperabilità Multinazionale e Interdisciplinare* (Roma: Stato Maggiore della Difesa, 2005).

advanced service in Italy and – therefore - officers' views would allow assessing a possible “technological skepticism” before generalizing to the other services.

Third, despite the considerable transformation of post-Cold War Italian defense, as well as the constant national involvement in a wide range of missions abroad, the “institutionalization” of lessons learned represents a relatively recent step for Italy, which just created new structures and institutions specifically devoted to that¹⁷. As recently highlighted by the literature (Hardt 2017), it is worth investigating what factors affect the sharing of knowledge and the institutional memory. For this reasons, the perceived factors that influence forces' process of learning and adaptation should be carefully examined, especially after years of tough operations in Afghanistan and in Middle East.

Furthermore, studies on Italy (Battisti 2012, Ignazi *et al.* 2012, Coticchia and Moro 2015) emphasised the centrality in official documents (and military operations undertaken abroad) of the notions of jointness and multinational interoperability.

Although military innovation studies have a rich history, they have “largely neglected to examine jointness” (Mukherjee 2016, p. 6).¹⁸ The concept of jointness, as “the effective integration of the different service branches of a nation’s armed forces” (Paget 2016, p. 44), has become ever more important in the contemporary security environment. The “need for and importance of interoperability between and among services, at joint force level, has increased steadily” (Woodall 2000, p. 310). Nevertheless, there is still “no commonly accepted definition for jointness” (Mukherjee 2016, p. 4). Thus, a brief clarification is required before examining jointness and interoperability¹⁹.

The literature on interoperability has historically focused on equipment, technology (Woodall 200), and – to a lesser extent – on human elements (Paget 2016). According to Hura *et al.* (2000, p. 4) “interoperability is a measure of the degree to which various organizations or individuals are able to operate together to achieve a common goal”. In “military terms”, interoperability could be defined as “the ability for the systems, units, or forces to provide services to and accept services from other systems, units, or forces and to use the services so exchanged to enable them to operate effectively together” (Woodall 2000, p. 310). On the other hand, jointness is generally labelled as “the ability of the Army, the Air Force and the Navy, to plan and operate in a mutually reinforcing manner” (Mukherjee 2016, p 1). In sum, the conceptual boundaries between the two terms are still blurred. Some authors

¹⁷ For a detailed analysis of the new institutions see Coticchia and Moro (2015).

¹⁸ A recent exception is Zapfe (2016).

¹⁹ For a broader analysis on interstate cooperation in defense see Pannier (2013).

even refer to “joint interoperability”.²⁰ For instance, Woodall conceives interoperability as the “glue” that holds together the so-called “joint systems” (which are defined as the systems that are designed to be employed by two or more of military services) in joint operations (Woodall 2000, p. 310).

Bearing in mind this debate, this paper conceives “jointness” as a synonym of the Italian “*interforzizzazione*”, which means national inter-services cooperation and integration. With “multinational interoperability” we define “combined” cooperation and integration among allies (which obviously can undertake also joint operations together).

Zooming to the Italian case, the official documents (for a review Locatelli et al. 2016) constantly emphasize jointness and multinational interoperability with allies as primary features of Italian Defence. The Italian White Paper (1985) introduced the concept of “joint operations”. But only the “New Defence Model (1991) started to consider a joint approach as vital to support the evolution of the military instrument. In that sense, several reforms were enacted from the 1990s. Law 25/1997 reformed the Chiefs of Staff (*Stato Maggiore della Difesa*) in order to enhance cooperation among forces and remove the separation that had constantly affected the navy, army and air force. Moreover, the Chairman of the Joint Chiefs of Staff increased his power, altering his previous status of a *primus inter pares*.²¹ The White Paper (2002) reviewed all these main reforms, stressing the need to develop joint integration and combined interoperability and interdisciplinary action (also among services and ministries). “*Investire in Sicurezza*” (Investing in Security), released in 2005, devoted specific attention to the creation of air, land, maritime and joint expeditionary task forces, such as the Joint Surveillance and Command System – JSCS (a joint network-centric system).

At the same time, military operations abroad also highlight a growing degree of jointness among the Italian armed forces at tactical and strategic levels (Ignazi et al. 2012). This requirement – already considered a precondition for commitment by the national and international doctrines – deeply affected Italian military engagement, improving joint capabilities especially regarding command and control. Finally, from an institutional perspective, the *Centro Innovazione Difesa* (CID, Centre for Defence Innovation) was created in 2009 within the *Stato Maggiore della Difesa (III Reparto)* to develop and update doctrine at the joint level. The *Comando Operativo*

²⁰ For instance: Woodwall (2000, p. 310). See Woodwall also regarding the main obstacles to “joint interoperability”.

²¹ However, several crucial aspects, such as personnel management, still remained in the hands of each service. The most recent White Paper aims specifically at addressing such problems. See Locatelli et al. (2016).

di Vertice Interforze (COI – Joint Operational Command), which was created in 1997, constitutes the framework in which operations have been managed.

Therefore, the *interforzizzazione* became a vital requirement for Italian defence, as well as a crucial feature of the armed forces. Also multinational interoperability, especially through joint operations on the ground represents an indispensable element to understand the whole transformation of the Italian military (Coticchia and Moro 2015). The operations in Afghanistan and Libya, for instance, reveal the importance of the multilateral context for Italian forces, from the political and military point of view. Military interventions imparted the main impetus for enhancement of multinational interoperability through shared military actions (also intense combat missions like those in Afghanistan), constant information sharing, and mutual procedures. Also in regard to the acquisition of new military assets, as well the overall shape of the force structure, the multinational dimension is of crucial importance. In sum, jointness and multinational interoperability represent the cornerstones of the Italian doctrine and military deployment and procurement in the post-Cold War era.

On the whole, the literature has widely recognized how jointness tends to be one of the most important aspects of the current wave of military of transformation, and has been variously associated with increased military effectiveness (Millet *et al.* 1986, Grissom 2008).²² While it is not easy to find a common ground in the debate on military innovation, there is a quite widespread agreement that jointness represents a particularly relevant dimension of transformation (Farrell *et al.* 2013). Several European countries have undergone institutional reforms to promote transformation “around the principles of jointness and interoperability” (Dyson 2011, p. 246). The advances of interoperability and synergy between services are “universally embraced” (Mukherjee 2016, p. 6)²³. Therefore, in line with the current literature (Grissom 2008, Farrell *et al.* 2013, Mukherjee 2016), we can consider jointness and multinational interoperability as proxies for force transformation. As showed by Mukherjee (2016, p. 7), jointness is generally conceived as something that “tends to enhance military effectiveness”. The literature (Asch and Hosek 2004, p. 34) has illustrated how (technical and cultural) change is inherently connected with jointness. As already stated, in the post-Cold War era, interoperability was widely considered as a crucial premise to properly manage also new joint technological systems (Woodall 2000). In other words, “jointness routinely requires disruptive innovation” (Dombrowski *et al.* 2002, p.128). Thus, we can use perceptions of jointness as a measure of how officers consider drivers of transformation.

²² For a critique, see, among others: Owens (1997).

²³ For a different perspective (e.g., on how jointness could also inhibit military innovation) see Feaver (2003) and Gholz and Sapolsky (2000).

However, jointness has been rarely studied as an “instance of military innovation”, maybe because it is a relatively recent phenomenon (Grissom 2008, Mukherjee 2016). Moreover, as already noted, the literature lacks of a comprehensive picture of the security perceptions expressed by Italian officers also regarding the other above-mentioned key-elements that have shaped Italian (and European) military transformation according to the current research²⁴.

Expectations and hypotheses

In the first part of the empirical section the paper investigates the perceptions revealed by ITAF officers concerning the existing threats to national security, the level of adequateness of Italian armed forces’ technological progress, the role played by deployment and military technology in fostering innovation and change, and the impact of jointness and multinational interoperability in the evolution of Italian defence. The lesson-learning process is another subject of analysis. Consistently with suggestions from recent research (Catignani 2012; Ucko 2008), we focus on how military officers have interiorized the lessons of more than a decade of continuous operational experience. In sum, the first goal is to illustrate – from a micro-level perspective – the “military lenses” through which Italian officers perceive military transformation.

The second aim of the paper is to explain the perceived drivers of jointness, which represents a crucial dimension of Italian military transformation.

While current analyses²⁵ tend to focus on civil-military relations as the primary explanatory variable for jointness, this paper specifically examines soldiers’ *perceptions* on the main drivers that have fostered jointness in the Italian case. We do not expect a causal relation between jointness and selected variables. Rather, the goal is to trace correlations between perceptions of the importance of jointness and perceptions of the importance of three potential drivers of “*interforzizzazione*”: technology, threats, and deployment. The rationale behind such selection is the following.

First, we would expect that involvement in military operations would be positively related to the importance of jointness. Deployment has been generally considered as the main driver of Italian military transformation. According to Ruffa, who has specifically examined the ways through which Italian soldiers perceived the operation UNIFIL in Lebanon, the increasing number of military operations abroad

²⁴ For a review see: Farrell, Rynning and Teriff (2013). For the case of Italy: Coticchia and Moro (2015).

²⁵ See, for instance: Mukherjee (2016).

(above all “peacekeeping missions”) represents “the main signal” (Ruffa 2014, p. 213) of post-Cold War Italian military change. In addition, according to the former Chief of Staff of the Italian Army, Lieutenant-General Claudio Graziano (2013, p.10), the operational dimension is the “centre of gravity of transformation”. As illustrated by official documents and lessons learnt collected across the last 25 years, an “expeditionary approach” requires expensive rapid and joint interventions at long distances. Therefore, in order to be effective, the Italian forces should integrate their capabilities, skills and knowledge. Analysis of past Italian operations (Ignazi *et al.* 2012, Coticchia and Moro 2015) reveals the crucial role played by jointness in contributing to positively reach the end state of the missions. Thus, we expect that officers who have participated in military interventions abroad strongly perceive the relevance of jointness.

Second, we would expect that the perception of the importance of military technology and the process of jointness would be positively correlated. In fact, military transformation is often grounded in the need to exploit new military technology (Hobson 2012). The debate on the RMA (Revolution in Military Affairs), starting in the Nineties, focused in particular on the impact of ICT and robotics of recent decades (Farrell 2008). The introduction of drones has been also heralded as having large transformational effects on war (Horowitz 2010). As in the case of US and UK doctrine (for a review, see respectively Mahnken and FitzSimonds 2003, Farrell 2008) Italian doctrine has constantly focused on the growing need for digitalization (Italian White Papers 2002, 2016). Military technology, which has been at the core of the reconfiguration of Italian forces, could be perceived as a driver for rising jointness. Indeed, a technological edge is widely viewed as crucial for contemporary armed forces, which are required to be integrated in order to exploit the technological advantages provided by new assets and systems (Farrell *et al.* 2013). For instance, integrated systems of command and control are fundamental assets for troops. The role of such brand-new equipment, especially with NEC, has significantly increased (Nones and Marrone 2011).

Third, one would also expect that the perception of the saliency of international threats would be related to the consideration on the importance of the process of jointness. In others words, the need to adequately address complex challenges would require a proper structure (Woodall 2000) and approaches. In fact, the Western armed forces that emerged from the Cold War had to face radical change in the strategic context, primarily in the threats that they had been designed to face (Freedman 2006). Therefore, and in line with previous research (Avant and Lebovic 2000) a growing perceived importance of complex and multidimensional global threats to international security (Buzan and Hansen 2009) could be positively related to a relevant consideration attributed to integrated efforts and approaches to address them.

In sum, according to the above-mentioned drivers, three correlated hypotheses can be formulated:

H1: Participation in military operations abroad positively influences the perception of the importance of jointness;

H2: The perception of the importance of military technology (in contemporary and future warfare) and the process of jointness are positively correlated;

H3: The perception of the saliency of multidimensional global threats is positively related to consideration of the importance of the process of jointness.

Before testing these specific hypotheses (Section 6) the paper introduces data and methods (Section 4) and then it illustrates the overall picture on the perceptions expressed by Italian officers regarding the process of military transformation (Section 5).

Data and methods

The original data presented in this section was collected through a survey submitted to all Captains of ITAF attending the "Corso normale" and "Corso di perfezionamento"²⁶ in the academic years 2014/2015 and 2015/2016.²⁷ The total number of respondents is 286. Virtually all officers at the rank of Captain enter one of the two courses at some stage in their tenure, thus reducing sample selection biases.²⁸ Since the seminal work by Stouffer et al. (1949), surveys have evolved and become increasingly diffused in the military sectors (Kraut 1996). Results of surveys serve to inform leaders and policymakers for a variety of purposes, such as obtaining accurate information regarding need and preferences, evaluating use and effectiveness of programs, and determining what and how to improve organizations (Edwards et al. 1997).

²⁶ The "Corso normale" is a semester-long set of classes destined to officers who entered the ranks of ITAF through the Air Force *Accademia* (getting their Bachelor's Degree there), while "Corso di perfezionamento" is 12-week endeavour destined to officers who joined the services with high school or university degrees obtained elsewhere.

²⁷ As already mentioned, to assess the role played by technology we started by looking at the air force officers, given one would reasonably expect considerable importance to be attributed to technology by them. We made this choice in addition because the Italian air force, which has been rarely investigated by the literature in the post-Cold War era, has been affected by technological transformation "more than other services" (Locatelli 2014, p. 228). Thus, if the respondents do not attribute the expected relevance to technology, the role of this supposed driver of jointness could be reasonably excluded for all other services.

²⁸ See, for a use of exploratory survey with snowball sampling methods: Manhken and FitzSimonds (2013).

According to Mahnken and FitzSimonds (2004, p. 58), there are at several reasons “why it is important to understand officer attitudes toward transformation”. Indeed, the officers are the ultimate practitioners of the new ways of warfare, they are recognized “experts” on military affairs, and they can promote (especially when they rise to senior positions) new innovative ideas for the service. In line with that, also Rosen (1991) in his seminal work has emphasized the relevance of senior officers in sustaining who supports change.

In our case, the aim of the survey is to understand the process of transformation of the Italian armed forces that took place in the period 2001–2012. The survey examines, after a series of preliminary questions, the way in which the interaction between three basic dimensions (doctrine, budget, field operations) has influenced transformation of the forces, to understand the actual adaptability of forces, the mechanisms of learning and the level of consistency between the different dimensions. To maximize the prospective of knowledge accumulation, our survey heavily draws on similar research on military officers, designed by scholars such as Mahnken and FitzSimonds (2003) and Farrell (2008). The questions are intended to detect the perception of the changes occurred in the global security environment after the end of the Cold War and the response of the Italian armed forces from a bottom-up and micro-level perspective. The survey is composed of 26 questions and divided into five separate sections.²⁹ The empirical analysis below provides a brief illustration of each section and a series of descriptive statistics to show (at first glance) the composition of the sample and the military officers’ views on the main questions posed by the survey.

The perceptions of Italian Air Force Officers: An overview

First of all, in line with the survey designed by Mahnken and FitzSimonds (2003), we have gathered general information on age, gender, year of entry into service, academic degree and participation in international missions. The 286 ITAF members who took the survey have a mean age of 36.8 years and, considering their year of entry, have served in the army a mean of 17.1 years. Similar to Avant and Lebovic (2000), we believe that this age is particularly revealing of the prevailing attitudes within the organization because respondents “are senior enough to have internalized the mind-sets of their respective service branch, but not so senior that they might shed the constraints of the service perspective” (p. 40). The vast majority

²⁹ The five sections are: 1. General information; 2. The new international environment; 3. Technological change and armed forces; 4. Doctrinal evolution and learned lessons, and; 5. Adaptation and organizational change. The authors provide additional information on the survey as well as on the dataset codebook upon request.

of them (273) are male; only 13 are female;³⁰ 192 have a university degree (either bachelor or masters) while 94 have a high school diploma, and 106 had some formative experience abroad during their studies in contrast to 180 who did not. Figure 1 shows the respondents' record of missions abroad during their career.

Figure 1 shows data in participation in international missions. As can be seen, the vast majority of respondents has participated in the Afghan mission (134), accounting for roughly than three times the other scenarios with the next-highest participation, Libya (45) and Kosovo (43). This category includes all the Afghanistan missions, both before 2005³¹ and after. In other words, the similar context, nature of the mission, type of involvement, aims and tasks of these different missions allowed us to group them in a single category. Iraqi missions, on the other hand, were treated as separate categories due to their marked differences (traditional war against an official army vs. asymmetrical conflict against terrorist groups). On average, each respondent has participated in 1.15 missions; however, it has to be considered that a high number (101) of young air force members who took the survey had not yet been on any mission. If we calculate the mean value only for those who participated in at least one mission, the mean rises to 1.72. Figure 2 shows the distribution of the number of missions participated in; as can be seen the trend is clearly descending, with only 30 respondents having been to three or more international missions.

³⁰ Only one respondent did not answer to this question.

³¹ In 2005 Italy took the command of the Western Area of ISAF, with increasing tasks. However, a substantial continuity marked the role played by the Air Force within multinational operation(s) in Afghanistan.

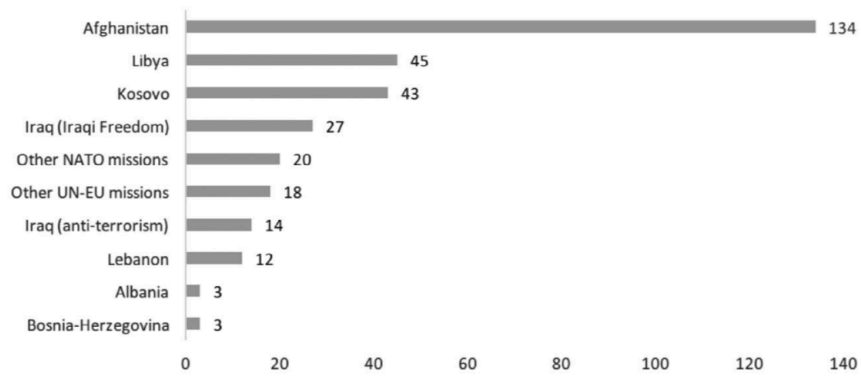


Figure 1. Participation in international missions. Afghanistan: Afghanistan, ISAF, 2001–2005 (May); Afghanistan, Nibbio, 2003; Afghanistan, ISAF, 2005 (June)– December 2014. Iraq, Iraqi Freedom, 2003–2006. Lebanon, UNIFIL, 2006 (August)–2014. Libya, Unified Protector, 2011. Iraq (August 2014, Inherent Resolve. NATO operations (e.g. such as joint exercises in Eastern or Northern Europe). EU operations (CSDP mission). Operations in the Balkans (such as Albania 1997 or Bosnia after 1996). Source: authors’ own compilation.

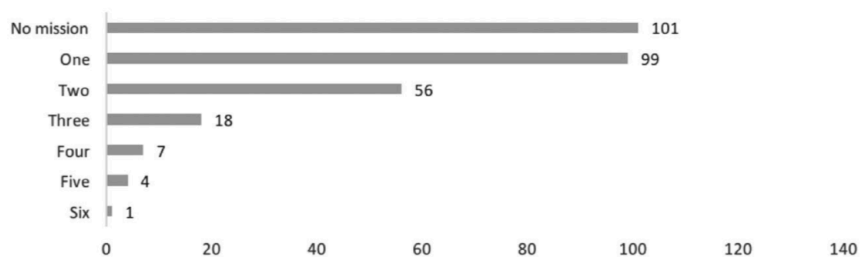


Figure 2. Number of international missions. Source: authors’ own compilation.

In the survey, then, three separate questions are asked in order to understand the military view on the threats posed by the new international environment.

There is, first of all, an almost unanimous consensus on the fact that the contemporary international environment poses greater threats to Italian national security in comparison to the Cold War era, in line with the mainstream theories of IR on the differences between bipolar and multi-polar power systems (For a review see Buzan and Hansen 2009). The vast majority of respondents, in fact, recognize that “the current international environment, in respect to that of the Cold War, poses greater threats to Italian national security” (229), while only a minority either disagrees (33) or has a neutral position (24). Also the most recent Italian strategic documents, such as the White Papers 2002 and 2015 adopt the same perspective regarding the growing challenges posed by the regional and international context (Locatelli *et al.* 2016).

Secondly, as shown by Figures 3a and 3b, in line with the previous inquiry, the answers to one of the subsequent questions of the survey show a clear trend on what is perceived as today’s biggest threats to international security.

Italian military doctrine has focused deeply on the main military and non-military threats posed to international and national security, which are considered to

be strongly interrelated. As already noted, and in line with NATO (2010) and EU (2003, 2008, 2016), the multidimensional nature of challenges (terrorism, organized crime, “failing states”, regional insecurity, piracy, etc.) has been frequently highlighted by the Italian doctrine, especially in the post-2001 documents (“Nuove Forze per un Nuovo Secolo” 2001 and White Papers 2002 and 2015).

Almost all officers, confirming what the literature on military attitudes has previously stressed (Avant and Lebovic 2000, 44), chose “terrorism” as one of the answers; the other “top choices” were “cyber warfare and electronic attacks” and “international crises and instability”, which have regularly played a primary role in post-1990 Italian doctrine as a main justification for the active defence policy through military operations abroad.

The least preferred answers are precisely those that refer to the typical Cold War global order threats, such as conventional attacks from other states, ballistic missiles and nuclear weapons proliferation.³² It is worth noticing the considerable figure related to cyber-attacks, in line with the increasing attention devoted by Italian defence to this issue.³³

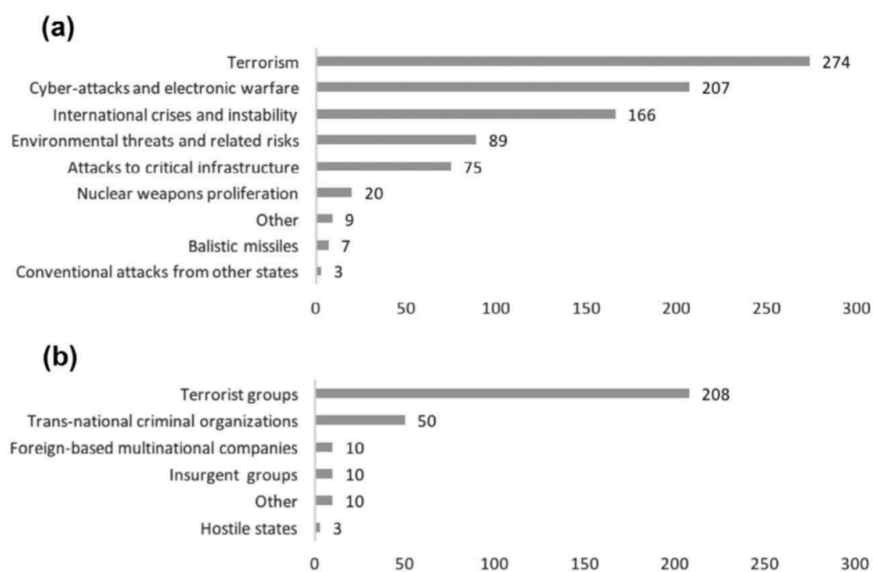


Figure 3. “Which are today’s greatest threats to international security?” Source: authors’ own compilation.
 (b) “Which are today’s greatest threats to Italian security?” Source: authors’ own compilation.

In terms of respondents’ perception of threats in respect to Italian national (rather than international) security, the answers are consistent with the previous one

³² For instance, the most recent Italian White Paper (2015) shares this perspective.

³³ See, for instance, the “National Strategic Framework for Cyberspace and Security”, Presidency of the Council of Ministers (2003), available at: https://www.enisa.europa.eu/topics/national-cyber-security-strategies/ncss-map/IT_NCSS.pdf

concerning the perception of the main threat (terrorist groups). This proves that the Italian military – in line with the official post-bipolar doctrine – perceives its own country to be well integrated in the international arena, therefore facing the same major menace.

Then, the survey aims at understanding how the military perceive the technological shift of armed forces in relation to different domains as well as the Italian armed forces' adequateness in comparison to other NATO members and in terms of “jointness” and forces protection. The two items that capture the respondents' view of technology, one of the crucial dimensions of our research question, can be found below. The first question focuses on the technological superiority of the state³⁴, the second on “jointness” and interoperability of forces.

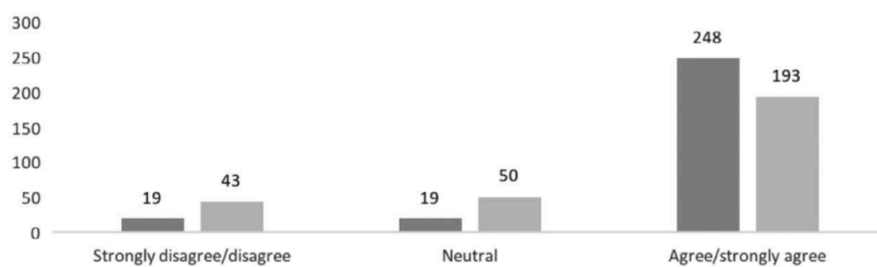


Figure 4. How much do you agree with the following statements: “technological superiority will always constitute an advantage for states that can benefit from it” (dark grey) and “Available technological instruments ensure “jointness” and interoperability of forces” (light grey) Source: authors' own compilation.

Figure 4 reveals a shared “faith” in the technological edge. This finding confirms the results reported both in Mahnken and FitzSimonds (2003, 18) and in Farrell (2008, pp. 789-790), who revealed the perceived relevance between UK officers regarding the role of information and communication technology in military operations. One would expect that the asymmetric nature of contemporary conflicts, from Iraq to Libya and Afghanistan, as well as the spread of civil wars and wars “among the people” (Smith 2006) would affect a different perception regarding technology. As already noted, we should consider that air forces have played very specific tasks in current military operations, developing technological capabilities to be more effective in the above mentioned strategic scenarios (e.g., through precision-guided ammunition, etc.). Figure 4 also illustrates the perceived fundamental role of technology in ensuring jointness and interoperability. Another interesting aspect that is worth highlighting is the comparison of the perception of the adequateness of the different assets that compose the Italian armed forces: Naval, air force, ground and cyber assets. As Figure 5 shows, all “traditional” assets

³⁴ The survey substantially replay the question posed by Mahnken and FitzSimonds (2003, 18, Fig.1): “Military forces employing information-age technology, doctrine, and organizations will enjoy a substantial edge over those that do not”.

show a similar trend, while cyber assets are the only ones with a trend skewed towards a negative perception. As stated above, cyber-threats are widely perceived as relevant threats, but only in relatively recent times the Italian defence has developed specific capabilities to address such challenge.³⁵

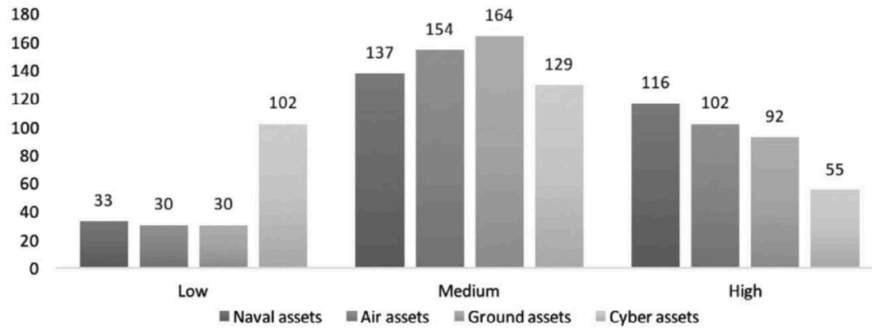


Figure 5. “How do you evaluate the level of adequateness of the Italian armed forces’ technological progress in respect to the challenges to be faced in the next twenty years?”. Source: authors’ own compilation.

Respondents, considering the previous figures, appear to be “technological enthusiasts”, and at the same time they believe that cyber assets – the most technologically advanced of all – are indeed those that the Italian armed forces still need to improve. Also such finding is in line with the results reported by Mahnken and FitzSimonds (2003, p.41), who illustrated how the vast majority of their respondents (US offers) consider information systems and networks as “highly vulnerable”.

The survey also investigates the military perception of doctrinal evolution and its drivers, as well as the main factors influencing the process of learning. An interesting element worth highlighting is, as shown by Figure 6, the clear perception of the main drivers of armed forces’ learning processes.

³⁵ See: <https://www.sicurezza nazionale.gov.it/sisr.nsf/wp-content/uploads/2014/02/italian-national-strategic-framework-for-cyberspace-security.pdf>

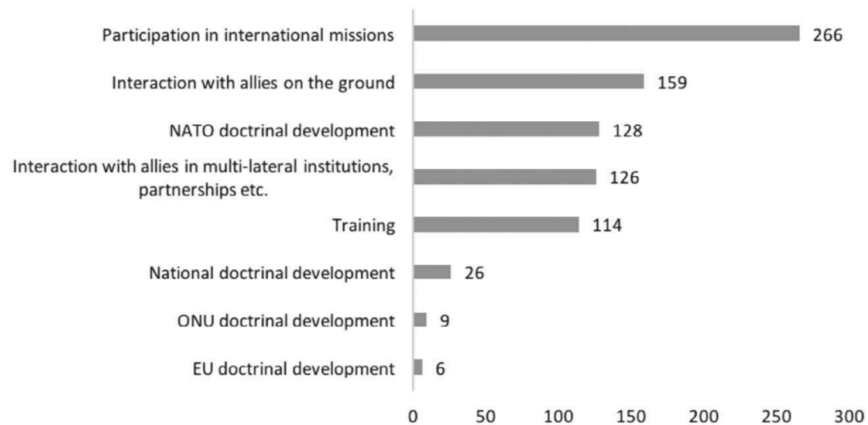


Figure 6. “Armed forces’ learning process has been influenced by several factors. Which are the most important?” Source: authors’ own compilation.

Similar to previous questions, respondents were asked to pick the three most important factors. The first point worth noting is that the most relevant factors that foster learning as mentioned by respondents are all elements that concern deployment: participation in international missions (266, which means that only 7% of the sample did not pick this answer) and interaction with allies on the ground (159). By contrast, doctrinal development is not considered as important, with a striking difference however. NATO doctrinal development is believed to be a factor influencing learning process at least by slightly less than half of the respondents (128), but EU (6), ONU (9) and National (26) doctrinal development is dismissed as practically irrelevant.

Those findings confirm the existing research on Italian military transformation (Ruffa 2014, Coticchia and Moro2015) that has emphasized the role of deployment as a driver of innovation as well as the wide process of emulation from NATO.

The four questions of the fifth and final section of the survey are focused on the element of jointness (“*interforzizzazione*”), the process of mutual integration of the different services of the armed forces. The questions aim at identifying the main elements that the military consider crucial for the future of Italian armed forces in this regard. Questions 23, 24 and 25 in particular focus on how this process will impact on assets, doctrines and organizational structures of armed forces³⁶. As shown by Figure 7, the perception of all three elements has a similar trend.

³⁶ Also in this case, the survey follows the design adopted by Mahnken and FitzSimonds (2003, 56), who investigated “new technology, operational concepts, and organizations”.

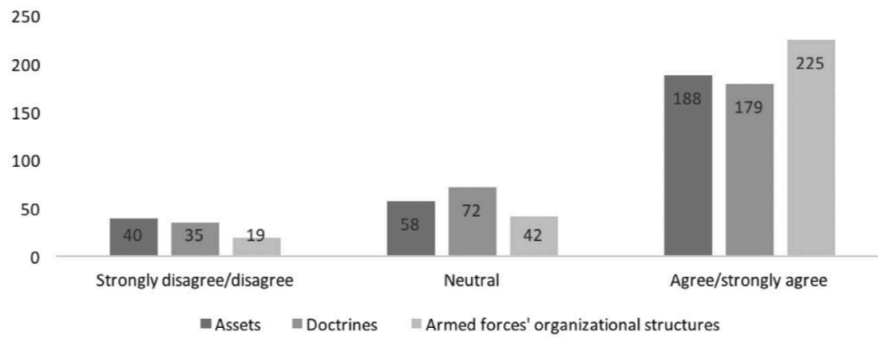


Figure 7. How much do you agree with the following statement: “in the next 20 years, the process of ‘interforzizzazione’ will lead to a progressive change of...” Source: authors’ own compilation.

Most respondents, in line with the findings reported by Mahnken and FitzSimonds (2003, p.76) on the US case, agree that the process of *interforzizzazione* will impact all three elements, particularly on organizational structures (225) more than assets (188) and doctrines (179). However, the trend is clear, with a few respondents disagreeing, a slightly higher number of respondents neither agreeing nor disagreeing, and the great majority of them agreeing.

In the next section we investigate how a set of independent variables influences the perception of *interforzizzazione*.

The drivers of transformation through officers’ opinions: a preliminary analysis

The purpose of this section is to test empirically the hypotheses presented above. According to our theoretical framework, we expect that the consideration of the importance of the process of *interforzizzazione* as a driver of military change is influenced by three factors: a) previous deployment, b) perception of international threats and c) consideration of the technological element of military forces. First of all, as described in the previous section, the survey included three separated questions that captured the respondents’ perception of jointness as a driver for future change in: a) assets, b) doctrines and c) organizational structures. As seen above, the trend is clear: on overall, respondents think that jointness, in all three dimensions, will be a relevant driver for *future change*.³⁷ A single dependent variable then has been constructed as the combination of the three above-mentioned

³⁷ As stated above, the survey is almost the first comprehensive assessment of Italian armed forces’ perceptions on security issues and military transformation. Thus, change is not assessed in comparison to former views and findings, but rather the paper aims at illustrating the perceived drivers of current and future transformation.

questions.³⁸

Three separate models are tested employing different groups of independent variables that refer separately to our three hypotheses, as well as a fourth comprehensive model comprising all independent variables.

The first group, testing H1, is composed of a series of dichotomous variables that captures the military's participation to a series of international missions. Consistent with what was argued before, we expect that participation in missions where force integration was crucial to positively influence the perception of the importance of jointness. The variable "Deployment" is a dichotomous variable that captures if the respondent has ever participated in an international mission. We also test if participation in different missions has effects on the respondents' perception of jointness.

The variable that tests our second hypothesis, "tech", corresponds to the 5-scale agreement with the following statement: "Technological supremacy will always constitute an advantage for those states that can benefit from it". Consistent with H2, we expect those who are more in agreement with this statement to be more prone to consider jointness as a driver for future change. Therefore, we expect this variable to be statistically significant and with a positive substantial effect on our dependent variable.

Third, we look at how respondents' perception of different threats affects their view on jointness. More specifically, we expect those who consider new, multi-dimensional threats as the main menaces for international security to be also inclined to attribute more importance to jointness. Therefore, we expect variables that capture these aspects (such as cyber threats and terrorism) to be significant and positively correlated with our dependent variable.

Two control variables are included in all models. The first is "Years_service", measuring the number of years the respondent has been enrolled in ITAF. The second is "Education", a dichotomous variable that scores 0 for those who possess a high school diploma and 1 for those who have obtained a higher education degree. The impact of these variables on the perception of jointness importance is tested through an OLS regression analysis. We also employ robust estimators to correct for standard errors. The results are shown in table 1.

³⁸ This variable, capturing the overall perception of the importance of "interforzizzazione", is therefore a discrete variable that ranges from 3 (a respondent strongly disagreeing to all three questions: $1+1+1 = 3$) to 15 (a respondent completely agreeing with all three statements: $5+5+5 = 15$). The results obtained by employing separately the three variables do not differ substantially across models and remain particularly stable regarding the key finding. This confirms that using the aggregated variable is a parsimonious choice that does not conceal any meaningful variance.

Table 1. Summary of OLS regression analysis for variables predicting perception of jointness ($N = 286$).

	Dependent variable: jointness perception (all models)			
	Model 1	Model 2	Model 3	Model 4
IVs:	Tech	Deployment	Threats	All variables
Tech	0.709*** (0.181)			0.690*** (0.176)
Years of service	0.0402 (0.0267)	0.0528* (0.0301)	0.0747** (0.0297)	0.0568** (0.0263)
Degree	0.108 (0.290)	-0.0815 (0.306)	-0.0839 (0.301)	0.139 (0.294)
Afghanistan		-0.455 (0.382)		-0.419 (0.371)
Iraq 2003		0.932** (0.410)		1.012** (0.414)
Iraq 2014		-0.480 (0.598)		-0.366 (0.757)
Lebanon		-0.165 (0.681)		-0.382 (0.660)
Libya		-0.317 (0.361)		-0.383 (0.377)
Balkans		-0.336 (0.427)		-0.365 (0.400)
Other EU missions		-0.102 (0.484)		0.00927 (0.474)
Other NATO missions		0.674 (0.579)		0.707 (0.502)
Deployment		-0.0447 (0.454)		0.0705 (0.438)
Traditional threats			0.777 (0.867)	0.710 (0.752)
Nuclear threats			0.871** (0.404)	0.857** (0.415)
Terrorism			1.325 (0.827)	1.127 (0.738)
Transnational instability			0.218 (0.309)	0.239 (0.304)
Cyber threats			0.797** (0.325)	0.711** (0.314)
Infrastructure			0.441 (0.325)	0.521* (0.312)
Environment			0.0748 (0.335)	0.104 (0.315)
_cons	7.677*** (0.902)	10.80*** (0.646)	7.977*** (0.335)	5.624*** (0.315)
r2	0.0813	0.0460	0.0544	0.150
chi2				
F	7.047	1.496	2.153	2.513
N	286	286	286	286

Notes: Standard errors in parentheses.
^{*} $p < 0.1$; ^{**} $p < 0.05$; ^{***} $p < 0.01$.

Deployment variables show interesting results. The dichotomous variable is not statistically significant, which means that there is no correlation between having mission experience at all and perception of jointness importance. This can be explained by considering that it is not mission experience in itself that impacts on jointness' consideration, but rather the participation in specific missions where jointness was particularly relevant.³⁹ In both model 1 and 4, in fact, the only

³⁹ It is worth observing that the current literature on post-Cold War Italian defence illustrates the relevance of jointness for *all* Italian military operations (for a review, Cotichia and Moro 2015).

statistically significant deployment variable is Iraq 2003 (95% c.i.). Officers who have participated to this mission tend to attribute more importance to the overall perception of jointness as a crucial element for the future development of military transformation, however with a relatively small substantive effect. In fact, the independent effect of being an Iraq veteran corresponds to a 10.9% increase on the overall perception of jointness importance. Given that this scenario was peculiar in terms of ITAF's participation to the mission (because of the *limited* jointness on the ground),⁴⁰ this result needs to be further addressed in a subsequent stage of research that should take into account in detail the specificity of the different nature of this mission. Farrell (2008), focusing on the British Army, comes to a broader conclusion: "hard lessons learned in war can be a catalyst for major change" (p. 30). The limited scope of our survey sample does not permit a generalization of this result, however this analysis suggests that more than overall experience it is the *type* of experience (the mission undertaken) that influences the perception of jointness importance.

Technology, instead, shows straightforward results. Consistent with the hypothesis presented, there is a strong correlation between the belief that technology constitutes a key element of armed forces superiority and the perception of the effects of jointness: variable "tech" is in both model 1 and 4 statistically significant at 99% confidence interval with a positive substantive effect. Those who consider technology an everlasting asset of warfare superiority, also tend to consider jointness a crucial element for the future development of armies. Officers completely agreeing with the statement on technological superiority, in respect to those completely disagreeing, show a 23.3% increase in the overall perception of jointness importance. Therefore, H2 is empirically corroborated, and constitutes the most solid result of our statistical analysis.

As for threat-related variables, captured by H3, we find some results in line with our expectations (cyber) while others show rather surprising results (nuclear). Both variables are statistically relevant at a 95% confidence interval with considerable substantive effects. In other terms, no clear-cut distinction between Cold-war era and new threats emerge from this model, in contrast to what that the previous descriptive part of the research showed.

Finally, the control variable "education" is not statistically significant in any model, while "years of service" is statistically significant at 95% c.i. and with very small substantive effects only in model 3 and 4, and 90% c.i. in model 1. In the comprehensive model, every additional year of service corresponds to a marginal 0.4% increase in the perception of jointness importance. It seems that it is not the level of education that impacts on our dependent variable, but rather (yet with a small effect) the number of years spent in the armed forces. This is compatible with

⁴⁰ See: Ignazi *et al.* (2012).

the findings of Mahnken and FitzSimonds (2003), who argue that within the US Army “the strongest base of support for transformation come from the senior ranks” (p. 177). Finally, the relatively low level of the R^2 of our comprehensive model (0.15) suggests that further analysis is needed in order to identify other potential elements that influence jointness perception.

Conclusions

Recent literature on military transformation highlighted the centrality of jointness as a key dimension of change. This study addressed the impact of jointness on military change through a novel approach based on a survey conducted among 286 military officers of the Italian air force. The objectives were twofold. First, we provided a detailed analysis of the security perceptions expressed by Italian Air Force officers. Descriptive statistics show that most military officers agree that the current international environment, in contrast to that of the Cold War, poses greater threats to Italian national security, that terrorism constitutes the key threat in the current international environment, and that change is needed in order to address this challenge. Second, we showed preliminary statistical evidence to explain the perceived drivers of a crucial dimension of Italian military transformation: jointness. In terms of previous deployment experience and perception of threats, our study shows results only partially consistent with our other hypotheses. For a theoretical perspective, it is worth noticing how the paper illustrated the limited changes occurred in service perceptions after deployment experiences. Multivariate analysis shows that the key element in driving the perception of jointness centrality is the belief in the importance of military technological superiority. Although we did not advance hypotheses on the specific causal mechanisms involved, this finding would be consistent with the idea that ITAF officers look at the drivers of change by choosing the “lenses” (technology) that would most favour the Air Force over other services. As it emerged from the survey conducted by Mahnjen and FitzSimonds (2003) “Air Force officers believed most strongly that new technology, operational concepts, and organizations will increase the importance of their branch relative to others in their service”.

Clearly, the study is only exploratory, as it is conducted on a single service, and its external validity is inherently limited. Further research could then develop our preliminary findings through a comparative perspective, by examining other services and/or other states. For instance, as expected for air force officers, technology plays a relevant role as a perceived driver of jointness. Thus, a broader analysis on the navy or army could generalize such a result, which has been confirmed by our empirical section. In line with Ruffa, the paper contributed to illustrating how security studies “would greatly benefit from a dialogue with military sociology” (2014, p. 218). An

interdisciplinary approach, which combines qualitative and quantitative methods, can pave the way to future research on military perceptions. More specifically, exploring other services and designing comparative cross-national research might enhance on the field.

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