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BACK TO THE FUTURE: AERIAL WARFARE IN LIBYA

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Abstract

A century after the first air bomb mission, a new intervention in the same geographic space has made evident the changes in Airpower. The Aerial Warfare in Libya has radically changed the civil war, complying with a UN mission to protect Libyan population, imposing a no-fly zone and an arms embargo. Therefore, Operation *Unified Protector* became one of the most successful campaigns in the history of NATO.

We aim to assess the operational efficiency of Airpower in the conflict in Libya, focusing on the challenges of a War essentially Aerial. Despite the military results and the fact that some political objectives were met, we can identify some concerning trends that, if not shifted, may negatively influence future NATO operations. We do not aim to draw general and universal conclusions on the strategic value of Airpower based on the analysis of a specific case. Above all, we focus on identifying some lessons which have influenced OUP operational efficiency. Thus, we must analyze some factors, such as the scope of objectives, the type of opposing action and aerial strategy used by the coalition and then focus on the challenges arising from the OUP..
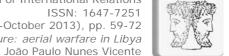
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Introduction

History repeats itself in a curious way. In October 2011, the first century of Aerial Warfare ended the same way and place it had begun - with military aircrafts bombing the desert of Libya.

On 15 October 1911, only eight years after the Wright brothers' first flight, nine aircrafts and 11 Italian pilots landed in Libya to support the conflict between the Italian and the Turkish Ottoman armies. On the first day of November, the young pilot Giulio Gavotti introduced the world to Aerial Warfare. The era of air bombing began, along with its horrors. In a letter to his father, Gavotti wrote:

> *"Two boxes with bombs arrived today. They expect us to drop them from the plane. It is rather strange that our superiors have not told us about this. So, we will take them on board very carefully. It will be very interesting to try them on the Turkish"* (Johnston, 2011).

Still using the first person, Gavotti describes this historic moment. "Next to the seat, inside a bag, I placed three small bombs weighing about a kilo and a half. In my jacket's pocket I placed another bomb. When I saw the target, some tents around an oasis, I placed the bombs on my lap, withdrew the safety pin and threw them out trying not to hit the plane's wing" (Idem). Seconds after having dropped the bombs, the pilot assessed the damages of the first air bombing in history. Despite the negligible destruction, Gavotti proved that the air missions were not limited to battlefield reconnaissance, mere observers of military forces in the field. Far from his imagination, though, was the destruction Aerial Warfare would cause in the next decades, the evolution of air capacity and that Airpower would become the leading instrument of military coercion.

A century after the first air bomb mission, a new intervention in the same geographic space, has undoubtedly revealed the changes in Airpower, thus leading the Secretary-General of the Alliance to declare [1] that "no air operation in history was as precise and careful to avoid civilian suffering" (Rasmussen, 2011a).

The last attack mission in Libya occurred in the city of Sirte, at 08:30 on 20 October 2011. The unmanned vehicle *Predator* on combat patrol, controlled in the United States of America (USA) via satellite, detected a convoy of 75 armed vehicles leaving the city.

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[1]   NATO - *North Atlantic Treaty Organization*.

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Hellfire missiles were launched from the *Predator* and the convoy was dispersed. Moments later, a pair of French Mirage F1CR and Mirage 2000 fighter-bombers flew to the place directed by an English E-3D AWACS command and control airship. The Mirage 2000D launched a GBU-12 bomb, which destroyed 10 vehicles. The isolation of the convoy allowed for Kaddafi to be captured and for the end of the conflict which had begun on 19 March of that year (NATO, 2011a).

The Aerial Warfare has radically changed the civil war, complying with a United Nations (UN) mission to protect the Libyan population, impose a no-fly zone and an arms embargo. Therefore, Operation *Unified Protector* (OUP) became one of the most successful campaigns in the history of NATO (Rasmussen, 2011b). After the operation, the use of Airpower re-emerged as a relevant instrument to coerce the opponent with reduced risk or cost, namely in terms of human casualties. This ability to dissuade and influence potential opponents, to directly affect their sources of power and will to fight without exclusively depending on direct combat, make this military option politically attractive.

We aim to assess the operational efficiency of Airpower in the conflict in Libya, focusing on the challenges of a War that was essentially Aerial. Despite the military results and the fact that some political objectives were met, we can identify some concerning trends that, if not shifted, may negatively influence future NATO operations. We do not aim to draw general and universal conclusions on the strategic value of Airpower based on the analysis of a specific case. Above all, we focus on identifying some lessons which have influenced OUP operational efficiency. Thus, we must analyze some factors, such as the scope of objectives, the type of opposing action and aerial strategy used by the coalition and then focus on the challenges arising from the OUP.

Airpower: vectors of a concept

If we consider Clausewitz's idea, that War is politics by other means, we can easily understand that any military campaign begins with a political decision about its desired outcome[2]. NATO classifies operations in terms of the predominant campaign themes[3], which require different military approaches and capacities. All themes require the same modes of military activities, though in different levels and usage - simultaneous or in sequence[4]. The predominance of certain modes over others determines the type of campaign. For example, a combat campaign consists of essentially offensive activities. On the other hand, a security campaign is a complex mix of four modes. In order to contribute to the different campaign themes, by means of several military activities, military components use the features and capacities of Airpower, including space, so that [5]lethal and non-lethal effects achieve their objectives[6] and thus attain the desired outcome.

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[2]   Political and/or military situation to be achieved at the end of an operation (AAP-6, 2010).
[3]   Combat; Security; Peace Operations; military involvement in peace (AJP 3(B), 2011: 1-3).
[4]   Offensive; Defensive; Stabilization and Facilitators AJP 3 (B), 2011: 1-3).
[5]   They are a physical state or behaviour of a system due to an action, a set of actions or any other effect (JP 5-0, 2011: xxi).
[6]   Objectives are important for the commander of the joint forces because they link the purpose of the operation with its desired end, thus leading campaign efforts to prioritize the use of available resources. Therefore, they assist in organizing tasks and effects in time and space.

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Since the first manned flight, theoricians of Airpower have advocated its efficiency. However, through history, extreme declarations on the crucial results of the use of Airpower have obscured the conceptual and real value of this instrument of Power. The conceptualization of Airpower as a instrument of distance fighting dates back to the original idea of overcoming the cruel ground fighting. Airpower, due to height, speed and range, has operational advantages over other military instruments and allows for a wider perspective of the battlefield, greater speed and distance travelled, as well as unrestricted three-dimensional movement, thus significantly changing conflict dynamics.

The flexibility of air capacity, expressed in geographical, operational and effect terms, allows it to meet multiple challenges (Sabin, 2010). The geographical flexibility results from its ability to avoid the opponents' armies and navy, to minimize the impact of geography and allow it to act in different war scenarios and rapidly go from one to the other, attacking targets without having to be in advantage on the ground. The operational flexibility results from its ability to operate in a transversal way in various types of conflicts while minimizing the risks of using military force. The weakness of aerial means, such as helicopters and unmanned vehicles, is compensated by the use of height and speed to avoid the range of possible threats. The flexibility of effects, due to enhanced awareness of the battlefield, survival and arms' precision, is expressed by the possibility of having a mass effect without having to use mass force and better adjust effects to the battlefield.

In this scope, we may see Airpower as a provider of political and military freedom of action (Dalton, 2010). At political level, it provides the air defense of territory, as well as strategic alternatives to the use of force, since it exerts increasing and sustainable global influence. At military level, it provides the ability of air control, a prerequisite for any modern deployable military operation. However, from the political point of view, War, in particular when a consequence of non vital interests, will always have restrictions and constraints which will influence the strategy and efficiency of Airpower. These restrictions and restraints to the use of force may include, among others, target restriction, reduction of collateral damages, conflict duration, the number of means used, the area of operations or the strict abidance to the Rules of Engagement (ROE).

Operational analysis of the use of Airpower in the War in Libya

One of the historic examples that synthesizes the efficiency of Airpower to coerce a change in the opponent's behavior was the attack to Libya in 1986. The Operation *El Dorado Canyon* had limited objectives, was used against a conventional opponent, attacked critical infrastructures and was integrated in other instruments of power. The political objectives aimed to punish Kaddafi for the attack against American forces in Berlin, as well as to dissuade the regime sponsoring terrorist actions. Though the political constraints imposed that the risk for American forces was reduced and collateral damages minimized, there was significant change in Kaddafi's behavior (Stanik, 2003: 151). Nevertheless, noteworthy is to remember that this change was short-lived, as two year later after the attack, Kaddafi's regime was responsible for the Lockerbie attack, hitting a commercial airplane and causing 270 casualties. However, this operation demonstrated that the use of Airpower, combined with economic and diplomatic measures, may influence and ease attaining foreign policy objectives, at

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least in the short run. Five years later, the lessons learned from this operation were applied in the war in the Persian Gulf.

Twenty-five years after the first attack, a new airborne operation against Kaddafi, also with limited objectives, had more decisive and long-lasting effects. When analysts discussed the end of interstate conflict, and after a decade in which two wars took place, with high number of casualties and costs, history repeats itself in the success of Airpower as a instrument of coercion. As in Kosovo, the recent operation in Libya confirmed the operational efficiency of Airpower. Though terrestrial warfare is viewed as expensive, with high number of casualties over a long period of time, the operation in Libya brought back the political interest in air campaigns.

Considering the Civil War in Libya and the paradigm of "responsibility to protect", the UN Security Council approved Resolution 1973 on 17 March 2011, authorizing the use of all measures necessary to protect civilians, yet excluding the occupation of territory. On 19 March 2011, a multinational coalition led by the USA[7] began a military intervention to implement the UN's mandate.

On 31 March, NATO took over the operations, extended the coalition to 18 countries[8], maintaining protection of civilians and populated areas under attack as the OUP's primary objective, ensuring the non-use of terrestrial means of warfare. The mission included a navy embargo, a no-fly zone and offensive actions to meet the objectives of the mandate. After 214 days of air operations by about 260 aircrafts, over 26,500 missions took place, 9,700 of which were attacks, having destroyed over 5,900 targets, including 400 artillery positions and *rocket* launchers and over 600 armored vehicles, the OUP ended on 31 October 2011, having become one of the most successful campaigns in the history of the Alliance (NATO, 2011b). Furthermore, during the air operations only three aircrafts were lost (one of which an unmanned helicopter) and the coalition suffered no casualties.

This conflict renewed the trend to organize military operations with reduced operational footprint, combining Special Forces in support of rebel forces and precise amounts of Airpower, similar to the success of the "Afghan Model" in the early stages of Operation *Enduring Freedom* in Afghanistan. In this operational model, Airpower once more eliminated efficiency of a regular army and provided an asymmetric and overwhelming capacity to a badly trained and equipped rebel group to defeat the forces loyal to the regime. In this sense, the restricted air campaign, resorting exclusively to precision ammunition, became the most accurate air operation in history (Rasmussen, 2011a).

However, to assess the operational efficiency of the use of Airpower and learn some lessons from this operation, we must study some of the essential factors, namely the nature of objectives, the type of opponent and air strategy.

 The UN's mandate defined the political objectives of the intervention. However, as the operation developed, so did the ambiguity of the political objectives. For the USA, the intervention in Libya fit the parameters of the Obama doctrine, according to which humanitarian interests justify military action, though very restricted, with no terrestrial forces involved and in a multilateral shared effort, including the leadership of

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operations (Biddle, 2011). From the point of view of foreign policy, Airpower is an irresistible option because it is more accurate, less expensive and would pose less political and operational risk. Perhaps that may help to explain the fact that only 10 days after the decision to intervene, the first missions in Libya took place[9].

Whereas this was a crucial fight for the Libyan rebels, for NATO, the OUP was another restricted operation, subject to different political interests and complying to a UN mandate that restricted the application of the most effective air strategy. The ambiguity, or better, the dyssynchrony of objectives lay in the difference in terms of NATO objectives and the political declarations of the participating countries. Some of the countries, such as England and France, included the removal of Kaddafi as an objective of the operation though they never stated it openly. The commander of the OUP himself, General Bouchard, pointed out these differences between NATO's strategic communication and the countries' public relations. According to him, the fact that the operation objectives did not frequently coincide with national interests, the short time to plan the operation (about three weeks to prepare the operation plans), as well as the reduced capacities on the ground and the chaos in the country added to the complexity of the planning and the implementation (Gomes, 2011).

As far as the opponent and its tactics are concerned, we may say that the Libyan military forces adopted a conventional position. The geography of the battlefield favored the use of aerial means and navy fires against conventional forces moving in open spaces, preventing their supply chain logistics and massification of forces. The Libyan army's gradual change to irregular tactics was a natural consequence of the air attacks. As a result of their copying rebel tactics, such as the use of civil vehicles, transporting armament and not wearing uniforms, air operations became even more complex. The use of captured material by the rebel forces also added to the "War fog", becoming one of the reasons behind an incident in which Libyan armored cars operated by rebels were attacked (Svendsen, 2011: 56).

As far as the coalition's air strategy is concerned and due to the several constraints, the use of Airpower was organized in a gradual approach and bearing in mind the minimizing of collateral damages. The initial attack, on 19 March, by French aircraft and against armored vehicles in the outskirts of Benghazi, led some observers to point out a shift in traditional air strategy. However, this was an isolated action, politically motivated and aimed at causing an immediate impact on the ground. That same night, 112 *Tomahawk* missiles were launched from American and British ships against critical elements in the Libyan air defense system, followed by B-2 bomber attacks to aerodromes (Anrig, 2011:91)[10]. An offensive aerial warfare campaign was in place, crucial to gain air control at the onset of any conflict. This mode of action confirmed one of the most obvious and timeless lessons taken from other conflicts, which is that success depends on establishing air control early. This occurred in the early moments of Operation *Odyssey Dawn* in which Libyan capacity in terms of air defense was rapidly destroyed, making it possible to establish a new no-fly zone.

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9   In comparison, 11 months went by between the approval of the UN's mandate and the intervention in Kosovo in 1999, more precisely the mission to implement a no-fly zone (Shanker, Schmitt, 2011).

10 In the first evening of the operation, 3 B-2 bombers took off from the USA, attacked 45 targets in a Libyan aerodrome and returned to base, thus confirming US capacity for global attack, as it had happened in Serbia in 1999, and in Afghanistan and Iraq (Tirpak, 2011:37).

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Once air control was established, the target selection process was altered. The initial strategy focused on attacking concentrated forces, communications, arms depots and key-points in Command and Control (C2) (Bouchard, 2012). In mid April, only 10% of daily missions attacked planned targets. The other 90% attacked dynamic targets (Anrig, 2011:99)[11]. In practice, airships patrolled certain areas, namely means of communication, so as to detect potential targets. This type of reconnaissance and coordination attack missions[12] provided the necessary support to initial fire against rebel forces when in contact with the Libyan forces. Therefore, the human factor became as important as technology in target selection, particularly in those air missions near friendly forces, when restrictions in lethal force were imposed so as to ensure minimum collateral damages (Baker, 2011).

Air operations (kinetics or not) aim to influence the Centers of Gravity (CoG)[13] established for the campaign (Bouchard, 2012). In practical terms, three CoGs were selected which were related with the main players in the conflict. Thus, Benghazi was selected as the rebel CoG, considering its importance as a symbol of the resistance. Tripoli was selected as the regime's CoG, as the Libyan power and its military forces were concentrated there. Finally, from NATO's point of view, the CoG was the coalition itself, whose integrity should be protected at all cost to maintain a united command and action.

Therefore, the fall of the regime was the ultimate and necessary effect to a political and/or military situation allowing for the conclusion of the OUP. This fact may lead some thinkers into considering the fall of the regime the desired end. However, the condition defined at the beginning of the operation aimed to attain a situation in which there were no hostilities, all major weapon systems had been removed from the concentration area and humanitarian aid could freely move in the territory (Bouchard, 2012).

Although the operation may be globally viewed as a military success, we may select some challenges the war brought about, especially in Africa. As in any conflict, opinions are not unanimous.

Critics focus on overestimating Airpower efficiency as a result of the operation being misinterpreted. Robert Farley (2011) identifies these gaps, namely the excess concentration on tactical targets rather than the classical option for strategic targets in the use of Airpower. After several months, there were still important stationary targets which had not yet been attacked. That was the case of C2 centers and state communications. In an ideal strategy, these targets would have been attacked in the early stages of the air campaign. From this point of view, the tactical campaigns, in which aerial means are given to commanders on the ground (in this case to Special

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[11] In modern complex conflicts, dynamic *targeting* (as opposed to deliberate targeting) is the name given to the process of identifying, selecting and attributing unforeseen targets, i.e., those targets which were identified too late to be included in the normal planning process. In accordance to NATO doctrine, a target is "a geographical area, an object, capacity, person or organization (including its will, understanding and behaviour) which may be influenced as part of military contribution to the final political state". The process of *Targeting* aims to determine the effects necessary to attain the objectives of the commander, identifying the necessary actions for the desired effects, bearing in mind the means available, the selection and prioritization of targets and synchronization of fires with other military capacities, and later assessing their efficiency (AJP-3.9, 2008: 1-1).

[12] *Strike Coordination and Reconnaissance* (SCAR).

[13] *Center of Gravity* - Characteristics, capacity or place from which a nation, an alliance, a military force or any other group built its freedom of action, physical strength or will to fight (AJP 01(D), 2010: 5A1).

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Forces and Libyan rebels), make Airpower a rather more expensive artillery and waste its real potential. However, the destruction of armored vehicles, of supply vehicles and entrenched forces, viewed by many as irrelevant and not endowed with the multiplying effect associated to strategic targets, as is the case of communication networks and command centers, have contributed to directly reduce the threat to civilians, in strict compliance with the UN's mandate. Furthermore, the strategic targets, essential to establishing a no-fly zone, were deeply affected in the early hours of the conflict.

Much criticism related to the inefficiency of the operation is based on the duration of the campaign, due to the inadequate air strategy and taking into account the asymmetry between Kaddafi and NATO's forces. Cenciotti (2011) emphasizes the coalition's delay in deciding to attack the regime's ability to supply its forces instead of attacking resources at the front, when they are to be used. The dispersion of attacks to innumerous arms depots, rather than concentrating on the most important, during the early stages of the conflict, may have allowed for the forces loyal to the regime having been able to continue fighting for more than seven months.

This criticism, however, confuses targets and effects, disregards the fact that the use of Airpower in a limited operation is subject to military and political restrictions and constraints. We must realize that in an Era of limited conflicts, in coalitions in which countries have different interests, severely restricted and submitted to limited ROEs to avoid collateral damages and breaches in the coalition, an air strategy under ideal conditions will rarely occur. In this case, the interpretation of the UN's mandate suggested the impossibility of attacking targets which did not directly threatened the population. This way, the imposition to avoid suffering and damages to civilians, as emphasized by Secretary-General of NATO, conditioned the process of target selection. Similarly, the *caveats* imposed by nations in terms of the attacks added to the complexity of the *targeting* process. For example, some nations only led attack missions when Kaddafi's forces were moving against rebel positions (Book, 2012: 69).

Besides this, implementing an adequate air strategy is directly associated to knowing the operational environment and the opponent. Therefore, the lack of means of surveillance and reconnaissance[14] in comparison with other recent conflicts may help to explain some of the shortcomings. For example, during the last decade of operations in Afghanistan, NATO usually had hundreds of ISR daily missions, as opposed to three daily ones in Libya, a territory which is three times larger (Tillyard, 2012: 23). This forced a prioritization in the operational use of dedicated means as well as caused differences in the analysis as to how most adequately affect the Libyan regime.

On the other hand, the contribution of Airpower to field operations can only be maximized, in particular in activities of fire support, if it is integrated in the ground forces. As the conflict developed, the requirements and complexity of air support imposed a closer integration and a faster response. However, the difficulties in integrating air-to-ground activities, namely in coordinating with the rebels, may have affected the pace and intensity in the use of Airpower.[15] This occurred because the rebel forces had operational limitations, they were badly equipped and prepared, were uncoordinated in terms of C2 and communications, which did not allow for detail

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[14] *Intelligence, Surveillance and Reconnaissance* – ISR.
[15] In comparison, in the 78 days of the air campaign in Serbia in 1999 there were 38,004 missions, 14,112 of which were attack missions (Cenciotti, 2011).

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coordination of operations and added to the complexity of the attack missions as well as heightened the probability of collateral damages. Nevertheless, even if the model of mass and overwhelming air attacks was not applied, as it had been in the Gulf Wars, it would still be impossible to explore its effects on the ground.

The nature of the dynamic process of target selection, together with the reduced persistence of manned aerial means, as well as the rigorous choice of moments for arms launching so as to avoid collateral damages, may greatly justify the fact that most attack missions did not use arms. As the operations developed, the use of foreign military and special forces counselors who were not part of NATO command structure so as to not compromise the UN's mandate, was essential in order to guide attack aircraft, to gather information and, above all, to transform the badly-equipped and trained rebel group into an organized force to capture Tripoli (Svendsen, 2011: 58)

Besides the already discussed factors, we may also identify additional lessons which separate the war in Libya from past conflicts but which, on the other hand, echo concerning trends.

First of all, England and France were at the forefront, having been responsible for most of the war effort. NATO's European Allies provided most of the fighting means; the USA assigned themselves a secondary role after the operation command was passed on to NATO. This means that, though the USA did most combat missions initially, once the operation command was assigned to NATO, the effort was divided among the allies. In fact, the remaining members did 90% of attack missions (Hebert, 2011: 4).

The complexity of coordinating air operations by 18 countries, from bases around Europe and the USA, with no casualties in the coalition, is further evidence of the success of the operation. In the initial phase, there were uncertainties in terms of command relation among the participants. On the one hand, from the American point of view, the African Command (AFRICOM) was in charge of coalition operations, whereas, from the European point of view, each nation was in charge of operations. This ambiguity led to Norway suspending its participation until C2 relations were clear (Anrig, 2011: 91). This only occurred when the command of the operation was taken over by NATO.

On the other hand, efficiency and, up to a point, the efficacy of air campaigns depends greatly on the closeness between aerial means and operational areas. Otherwise, the manned systems will be severely restricted in terms of operational area, which also implies an excessive use of airborne refueling capacities. The option to use aerial means initially covered this need but it was severely affected by the USA no longer carrying out attack missions and thus evidencing the historical importance of Airpower based on ships[16] as well as the fact that Europe lacks *aircraft carriers*.[17] Therefore, the

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[16] The aircraft carrier became an essential instrument for the success of military operations. Several examples emphasize the importance of these means for power projection, both long-distance and in areas where an aerodrome is of difficult implementation. The attack on Pearl Harbour or the dependency on aerial means on ships in the operations in Afghanistan and Iraq.

[17] In June, the Italians withdrew their aircraft carrier from the theatre of operations. Later, the aircraft carrier Charles de Gaulle left the area of operations. The English only had a helicopter cruiser, obviously insufficient for the size of the operation.

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use of Airpower on ships allowed for faster and more flexible response, as well as a decrease in the use of long-distance based resources[18].

Another lesson is that, despite the effort by some countries and the fact that the OUP was commanded by NATO, only half of the Allies contributed in terms military forces. This situation confirmed NATO's view of an "Alliance of those available"; because there is no overwhelming threat as during the Cold War, the differences among members in terms of their political agendas are made evident (UK Parliament, 2011). This became obvious as only 6 out of the 26 European countries in NATO contributed with attack capacities. In fact, the conflict in Libya increases the existing gaps in NATO, evidencing Europe's ambition in sharing operation theory and concepts with the Americans, as well as its incapacity in terms of war effort so as be able to apply the American warfare model. This paradigm was made evident in its inability to carry out missions essential to maintain limited air conflict, in particular airborne refueling suppliers and unmanned aircraft. This gap will be wider in conflicts geographically distant either without the mass support of the USA or against more able opponents.

The American attitude, to offer leadership and offensive power to European countries, has contributed to minimize the political debate and public scrutiny on yet another long intervention in a Muslim country. However, this secondary role did not correspond to a decrease in the importance of the USA in the campaign, considering that they had to supply what the coalition lacked within specific areas of the mission. As Robert Gates, the former American Secretary for the Defense (2011) stated, "the most advanced fighter airplanes are useless if the Allies do not have the means necessary to identify, process and attack targets as part of an integrated campaign". The dependency on American capacities was also obvious in airborne refueling and ISR (among which, the use of unmanned platforms), considering that 75% of ISR and airborne refueling missions were carried out by the USA (Hebert, 2011: 4).

Without these priceless means, the efficiency of the OUP would have been severely compromised. For example, missions from more distant European bases were eight hours' away and implied five airborne refueling activities for one hour on the objective (Tirpak, 2011: 36). Gates (2011), when referring to other difficulties, emphasized that the USA had to supply the majority of *targeting* analysts to ensure the Air Operations Centre. Besides this, the Operations Centre, prepared to manage 300 daily missions, struggled to manage 150 (about a third of the daily effort in Operation *Allied Force* in 1999).

This conflict also evidences the impact of austerity in the War; several countries struggle in defining the suitable capacities and, above all, at reasonable prices. Specialization in a specific type of capacity, assuming another member of the coalition makes available deficient capacities, implies risks because it cannot always be counted on. Though they have a reasonable attack capacity, European countries lack the means for an efficient operation, namely refueling systems, electronic war, ISR and human resources specialized in *targeting* and data analysis.

Besides the already mentioned needs, two months into the operation and there were already supply failures in guided ammunition (Gates, 2011). This occurred because the exclusive use of precision arms caused it to *run out* in some countries. For example,

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[18]   According to a study on the use of Airpower in OUP, the use of aircrafts based on land is six times more expensive when compared to similar effects caused by means stationed on ships (UK Parliament, 2011).

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Danish F-16 dropped more than 500 guided ammunition until the mid of June, thus creating a problem in logistics typical of this type of conflict, particularly in the case of smaller air forces (Anrig, 2011: 96) However, this does not reflect a direct relation between quantity of arms used and their effects. For example, Norway and Denmark supplied only 12% of the means for air attack but reached a third of their targets (Gates, 2011).

The theatre of operations in Libya allowed for test and operational assessment of the military capacities of the Alliance members. Besides, it was also an opportunity for economic, military and political *marketing* for the advocates of Navy and Airpower. The struggle in arms system exporting markets[19] pressures participants to show their scope of capacities and thus increase the complexity of their mode of action.[20] The advocates of Airpower are already capitalizing on this success, the success in Libya justifies higher investment in fighters, bombers, refueling systems and unmanned airships. Furthermore, the shift in American defense strategy for the Pacific increases the relevance of Airpower, more specifically of navy operation. As in previous conflicts, the lessons learned with the conflict in Libya will shape the power system and how the great powers will acquire new military capacities. Besides, these lessons will be the basis for future military interventions.

We can claim that the campaign in Libya is an example of success in terms of the use of Airpower to unbalance the balance of power and favoring a resistance movement against a superior force (Anrig, 2011: 104). Assessing its efficiency, considering its cost, shows that this operation represented a fraction of the costs in the conflicts in Afghanistan and Iraq[21]. However, more important than financial costs is the low number of friendly casualties and the collateral damages[22]. Though we believe the use of Airpower in this conflict could have been optimized, the truth is that it was an adequate political tool to abide to the UN resolution, meeting the political objectives established, at a substantially lower cost than the available military alternatives. And that, in itself, evidences the strategic usefulness of Airpower as a instrument of coercion. However, instead of considering Airpower decisive, we consider there is no doubt that victory was attained due to the contribution of Airpower.

Conclusion

When considering future wars, we must account for not all having such a low human and material cost. There will be conflicts in which long ground occupation and high human cost will be the only means to the desired end. However, the advocates of ground intervention in Libya, focusing on the operational advantages to speed regime

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[19] We must not forget that during that period, both the English *Typhon* as the French *Rafale* were included in a airship sales proposal to India and Brazil.

[20] For example, the use of *Tornado* airships equipped with *Storm Shadow* last generation missiles, in long distance missions from England, is an indicator of the English projection ability in the global market as well as validates this technology in future updating on the power system. Operational necessity, after 100 days of air campaign, to do eight-hour missions so as to use a €900,000 missile is difficult to understand (Cenciotti, 2011).

[21] The American contribution during seven months (about 1.1 billion dollars) was similar to the cost of one week's operation in Afghanistan (Schwartz, 2012).

[22] The conflicts in Afghanistan and Iraq caused, up to now, injuries in over 46,000 American military and over 6,200 casualties (US DoD, 2012: 7). The collateral damages are countless.

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capitulation, did not consider the adverse strategic effects of the occupation of another Muslim country by western forces, thus leading to a new irregular long conflict.

The criticism on the reduced efficiency of the use of Airpower, or even of a high cost-efficiency or value ratio, as a result of the increased cost of air weapons, may be refuted from a capacity and effect perspective. This means that technological progress has allowed for substantial increase in the capacities of current weapon systems and, consequently, a lower cost for desired effect, whether in the number of targets destroyed by the airship as in the increased awareness of the battlefield through the use of more developed sensors, often in the same platform. This multiplies the capacities of a power with a decreased number of weapon systems. Therefore, assessing the success of a campaign through the quantity of means involved does not seem adequate; the effects are the most important.

To sum up, despite the criticism, these analyses lack an assessment of the growing political restrictions imposed on the use of Airpower as well as of the more and more precise and strict use of air force. The legitimate imposition of political restraints and restrictions, together with the inherent limitations to the use of Airpower, and the omnipresent "fog and friction", do not allow for a simple solution for the phenomenon of War. However, to be effective, Airpower does not have to win wars. It only needs to supply flexible options to be used by political decision-makers when the use of force is required to coerce a change in the opponent's behavior. Thus, the efficiency of Airpower should be assessed taking into account its contribution to meeting the political objectives. This means that Airpower may have political effects through resorting to a wide scope of means, whether through dissuasion, long distance attacks, persistent ISR, special forces or air transport, intelligence operations, humanitarian aid, establishment of partnerships and economic development.

We must not, however, forget that contemporary conflict demonstrates the historical truth that Airpower, *per si*, is not a panacea to resolve armed conflict, thus evidencing that the use of this toll will necessarily have to be integrated with other military components and within a wider approach through coordination with other power tools. Therefore, despite the operational brilliancy of the OUP, it is still early to confirm the long-term strategic effects that ensure long-lasting peace. We can only claim that this supreme objective goes well beyond the potential of the military tool, requiring a wider approach to the phenomenon of hostile conflict. As in the past, this is still the challenge facing the future use of force.

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