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> To flourish and grow in a many-sided uncertain and ever changing world that surrounds us, suggests that we have to make intuitive within ourselves those many practices we need to meet the exigencies of that world. The contents that comprise this 'Discourse' unfold observations and ideas that contribute towards achieving or thwarting such an aim or purpose.
>
> John Boyd, *A Discourse*, p. 1

Introducing *A Discourse*

This book aims to provide a better understanding of the strategic thought developed by John Boyd. He has exerted a very substantial influence on recent military thinking in the western world, and continues to do so. On the other hand, his work has invited dismissive critique. Despite this situation, however, there is as of yet no comprehensive study concerning his ideas.

Most people associate Boyd with the so called 'OODA loop', where 'OODA' is generally understood to stand for observation, orientation, decision and action. The idea has gained currency that the OODA loop is the equivalent of a decision cycle. Subsequently, war can be construed of as a collision of organizations going their respective OODA loops, or decision cycles. In the popularized interpretation, the OODA loop suggests that success in war depends on the ability to out pace and out-think the opponent, or put differently, on the ability to go through the OODA cycle more rapidly than the opponent. In simplified form, it looks like Figure 1.1.

Few are familiar with the source of the OODA loop: *A Discourse on Winning and Losing*. *A Discourse* consists of four briefings and an essay. The set has also been labelled as *The Green Book*. It was completed in 1987, although subsequently frequently the specific wording on slides was revised. The essay 'Destruction and Creation' was written in 1976. It is a window to Boyd's mind, according to Robert Coram, one of his two biographers.[1] In it Boyd states that uncertainty is a fundamental and irresolvable characteristic of our lives, no matter how good our observations and theories for explanation are.

'Patterns of Conflict' forms the historical heart of the work. First draft completed in 1977, it has turned into the opus of Boyd's research on conflict and
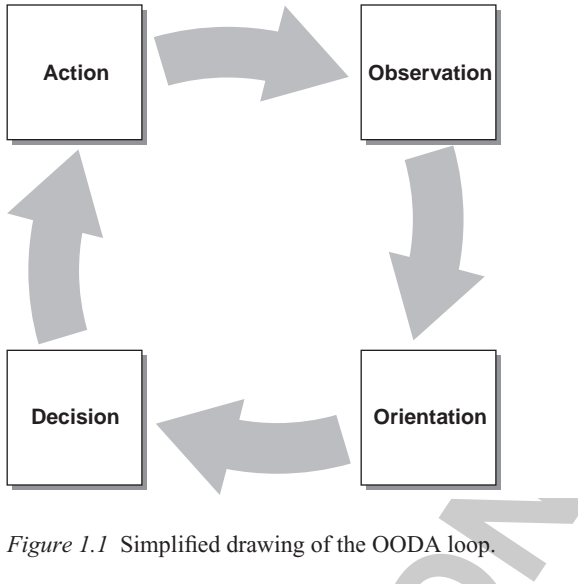
Figure 1.1 Simplified drawing of the OODA loop.

warfare, containing 193 slides. It is a historical analysis of warfare and theories for victory and represents, in Boyd's own words, 'a compendium of ideas and actions for winning and losing in a highly competitive world'.[2] It also contains an introduction to the OODA loop or the 'Boyd Cycle'.

In the presentations 'Organic Design for Command and Control' (first draft 1982) and the one intriguingly titled 'The Strategic Game Of ? and ?' (first draft 1986), he uses insights and conclusions from 'Patterns of Conflict' but now in abstract form. He employs these abstractions to develop arguments about leadership and about the essence of strategy, or in Boyd's own description: 'Organic Design for Command and Control' 'surfaces the implicit arrangements that permit cooperation in complex, competitive, fast moving situations', while 'The Strategic Game of ? and ?' emphasizes 'the mental twists and turns we undertake to surface appropriate schemes or designs for realizing our aims or purposes'.[3] The last very brief presentation, 'Revelation'. 'makes visible the metaphorical message that flows from this *Discourse*'.

In addition to these briefings he developed three pieces that need to be considered as well for a proper understanding of Boyd's work. While working his essay he also finished a presentation titled 'A New Conception of Air to Air Combat', showing a close relation with the essay and foreshadowing several ideas he was to explore in 'Patterns of Conflict'. It is the conceptual bridge between his fighter pilot background and his maturation as a strategic thinker. He also developed two other briefings that are not an integral part of *The Green Book* but are fully in line with, and an elaboration on previous arguments. 'The Conceptual Spiral' was completed in 1992. It is a different rendition of arguments, themes and insights he advanced earlier in 'Destruction and Creation' now employed to

explain how and why innovation occurs in science, engineering and technology. Boyd argues that the dynamics at play here hold universal validity for all types of organizations that strive to survive under conditions of fundamental and unavoidable uncertainty. The final briefing is titled 'The Essence of Winning and Losing', which is a very condensed rendering of Boyd's core ideas. Completed in 1995, only in this short presentation does Boyd offer a picture of the OODA loop, and in a much more elaborated rendition than shown in Figure 1.1.

'A towering figure'

Some regard Boyd as the most important strategist of the twentieth century, or even since Sun Tzu.[4] James Burton claims that 'A Discourse on Winning and Losing will go down in history as the twentieth century's most original thinking in the military arts. No one, not even Karl von Clausewitz, Henri de Jomini, Sun Tzu, or any of the past masters of military theory, shed as much light on the mental and moral aspects of conflict as Boyd.'[5] Colin Gray has ranked Boyd among the outstanding general theorists of strategy of the twentieth century, along with the likes of Bernard Brodie, Edward Luttwak, Basil Liddell Hart and John Wylie, stating that

> John Boyd deserves at least an honorable mention for his discovery of the 'OODA loop' ...allegedly comprising a universal logic of conflict. . . .Boyd's loop can apply to the operational, strategic, and political levels of war. . . .The OODA loop may appear too humble to merit categorization as grand theory, but that is what it is. It has an elegant simplicity, an extensive domain of applicability, and contains a high quality of insight about strategic essentials. . . .[6]

Boyd's influence first became apparent during the late 1970s and 1980s in the development of what later turned out to be the AirLand Battle concept.[7] Later, the US Marines Corps incorporated Boyd's ideas into their new fighting manuals. In the US Joint Chiefs of Staff Publication, JP 3–13.1, Joint doctrine for Command and Control Warfare (C2W) the OODA loop is included in Appendix A (without however mentioning Boyd's name anywhere). Outside the US too, his influence is demonstrable. For instance, the UK military doctrine description of the doctrinally preferred method of war fighting, 'the maneuvrist approach' is also pure Boyd (and fully in line with the US Marines doctrine):

> The maneuvrist approach to operations is one in which shattering the enemy's overall cohesion and will to fight, rather than his materiel is paramount [. . .] significant features are momentum and tempo, which in combination lead to shock and surprise. Emphasis is on the defeat and disruption of the enemy – by taking the initiative, and applying constant and unacceptable pressure at the times and places the enemy least expects – rather than attempting to seize and hold ground for its own sake. It calls for an attitude

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of mind in which doing the unexpected and seeking originality is combined with ruthless determination to succeed. A key characteristic of the maneuvrist approach is to attack the enemy commander's decision process by attempting to get inside his decision making cycle. This involves presenting him with the need to make decisions at a faster rate than he can cope with, so that he takes increasingly inappropriate action or none at all, thereby paralyzing his capability to react. Clearly any degradation of the overall command system which can be achieved by physical or other means will hasten the onset of paralysis.[8]

His influence extends into weapon systems and recent military operations. The 1991 Gulf War air campaign employed F-16, F-18 and F-15 aircraft, fighters that Boyd helped create during the 1960s and 1970s. The war itself is by some considered a validation of the innovation in operational theory and praxis that matured in AirLand Battle.[9] In fact, Boyd has been credited with directly influencing the design of the military ground campaign through his association with Dick Cheney, then US Secretary of Defense, a former member of the so-called Military Reform Group, who was well versed in Boyd's military thinking. In the May 6, 1991 issue of *US News & World Report* Boyd was mentioned, together with two officers who were directly influenced by Boyd, as the persons who determined the tactics employed during the Gulf War.[10]

In the aftermath of the terrorist attacks of 11 September 2001, US Secretary of State and former chairman of the US Joint Chiefs of Staff Colin Powell implicitly honoured Boyd by talking of a response involving multiple thrusts and getting inside the adversary's decision cycle.[11] In the 1990s his ideas were incorporated in various European military doctrines, while the concept of Network Centric Warfare, a key theme of US and NATO military transformation initiatives ongoing since the 2002, surfaces many themes central to Boyd's work. Looking back on the stunning victory of Operation Iraqi Freedom (2003) against substantial Iraqi armed forces, the commander of the coalition troops, General Tommy Franks also referred explicitly to Boyd's idea of getting inside the enemy's decision cycle.[12] This indicates that Boyd's concepts and terminology have become mainstream in the Western militaries, and will also be employed for the security challenges of the twenty-first century.[13]

And his fame has not been confined to military strategy. The OODA Loop has even been discussed in *Forbes* and *Harvard Business Review*.[14] In fact, Figure 1.1 and a discussion of the OODA loop appear in *Competing Against Time*, a book on management.[15] In addition, Tom Peters, author of *Thriving on Chaos*, a book that revolutionized management theories in America, talks of creating and exploiting chaos, of shaping the marketplace and of mutual trust. Peters admitted that his book had been shaped by Boyd's ideas. Since then Boyd's ideas have been applied by consultants and have been taught at business schools, with the active endorsement of Boyd, who considered this an affirmation of the fact that his intellectual legacy encompassed more than war fighting; his ideas were universal, timeless, and could be applied to any form of conflict.[16]

The tribute written two days after Boyd's death by General C.C. Krulak, then Commandant of the US Marine Corps, reflects the view shared by many that Boyd was

> a towering intellect who made unsurpassed contributions to the American art of war. Indeed, he was one of the central architects in the reform of military thought which swept the services, and in particular the Marine corps, in the 1980's. From John Boyd we learned about the competitive decision making on the battlefield – compressing time, using time as an ally. Thousands of officers in all of the services knew John Boyd by his work on what was to be known as the Boyd Cycle or OODA loop. His writings and his lectures had a fundamental impact on the curriculum of virtually every professional military education program in the United States – and many abroad [. . .] he was the quintessential soldier-scholar – a man whose jovial outgoing exterior belied the vastness of his knowledge and the power of his intellect.[17]

'Deeply flawed'

Controversy and misperception nevertheless surround Boyd's work. Like Clausewitz and Sun Tzu, his work is more heard of than read or understood. Very few people have actually worked their way through the presentations. Instead, the neat graphical depiction of the OODA loop has become the symbol of Boyd's entire work, indeed, it is often regarded as *the* concise representation of his ideas. One expert, for instance, asserts that 'Boyd's theory claims that the key advantage to success in conflict is to operate inside the opponent's decision cycle. Advantages in observation and orientation enable a tempo in decision making and execution that outpaces the ability of the foe to react effectively in time'.[18] And in 1996 this interpretation of the OODA loop was incorporated in, and elevated to, long-term US defense policy when the Joint Chiefs of Staff 1996 document Joint Vision 2010 stated that US Forces will gain 'OODA-loop dominance', being able to 'observe, orient, decide, and act much more quickly than our opponents'.[19]

This particular view on Boyd's work has inspired critique. To be sure, some offer assessments based on a somewhat wider appreciation of Boyd. Colin Gray regards the ideas of Boyd as constituting a general theory of conflict. Others discuss his ideas in particular within the framework of operational level doctrine of warfare, regarding his work as the conceptual foundation of maneuver warfare.[20] Some others dismiss Boyd's ideas on the grounds that they are rather underdeveloped and too theoretical, pointing to the fact that, unlike Baron de Jomini or, more recently, air-power theorist John Warden, Boyd's notions remain too vague to amount to anything other than a moving target of little use in structuring a debate or attempting to educate one's mind on the nature of war before arriving at the battlefield.[21]

But frequently, discussions concerning the merits of Boyd's work focus solely on the merits of the OODA cycle idea, with one school suggesting that

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cycling through the OODA loop faster than the opponent will result in a decisive advantage.[22] In contrast, in an article that critiques the US dogmatic belief in the value of speed, one author blames the idea that 'quicker decisions often led to victory', attributing this to Boyd's influence. He argues that this idea has permeated US military thinking, in particular the US Marines who hold that 'warfare is necessarily a function of decision making and, whoever can make and implement decisions consistently faster gains a tremendous, often decisive advantage. Decision making in execution thus becomes a time-competitive process, and timeliness of decisions becomes essential to generating tempo'.[23] Alternatively, commentators doubt the relevance of the rapid OODA loop idea for strategic and political level decision making, or for understanding command and control processes.[24] In addition, some point out that the enemy may not be interested in rapid OODA looping, on the contrary, as in the case of guerrilla warfare, prolonging a conflict and stretching out time may be quite rational. One author even denied that anything like an OODA loop exists, pointing the finger at the methodological error Boyd and his associates made in extrapolating from what holds true for fighter operations, from where Boyd derived his insight, to hold also true for command and control in general. As he states:

> The OODA Loop suggests that the process of observation, orientation, decision and action is a circular, iterative process. Military advantage accrues from being able to go around the loop faster than one's opponent. However, the OODA process is not circular. It apparently takes 24 hours to execute a divisional operation. Planning takes a minimum of 12 hours. Thus a divisional OODA loop would have to be at least 36 hours long. Yet the Gulf War and other recent operations show divisions reacting far faster. Military forces do not in practice wait to observe until they have acted. Observation, orientation and action are continuous processes, and decisions are made occasionally in consequences of them. There is no OODA loop. The idea of getting inside the enemy decision cycle is deeply flawed.[25]

Aim and argument

An obvious major factor that contributes to the variety of interpretations is the fact that his ideas have been conveyed through, and contained in, presentations he gave, instead of a coherent book-length study (a state of affairs comparable with the famous work of Sun Tzu). Frequently he changed these presentations when the discussions with the audience, or some new books he had read, had provided him with new or improved insights. Despite the fact that he gave some parts of his briefings about 1,500 times not many people outside the American military community have had the opportunity to attend his lectures, which sometimes lasted 14 to 18 hours.[26] And John Boyd died on 9 March 1997 at the age of seventy. There will be no more Boyd briefings. So if one wants to read Boyd's mind and study his work, this loose collection is all that is left to read. Moreover, his slides exist in different versions, for as recently as the summer of 1995,

Boyd made his last update of his presentations. The stack of slides is not really widely or easily available to the wider public, they have not been officially published, nor are they in themselves self-explanatory throughout. Indeed, his briefings are virtually impenetrable without explanation, Coram asserts.[27]

There is thus a need for a detailed account of his work that stays close to the original and offers a readable version. There are a number of short papers.[28] Most, if not all, deal almost exclusively with the OODA loop concept. Recently, two biographies have appeared, but neither contains an integral rendering of Boyd's work, nor does the educational experience contained within Boyd's slides, his unique use of words and the way he structures his arguments, receive sufficient attention.[29]

In light of the incomplete and contradicting interpretations, and the absence of an accepted authoritive and comprehensive account of Boyd's work, this study aims to develop a comprehensive interpretation of John Boyd's strategic theory. It argues that Boyd's OODA loop concept, as well as his entire work are more comprehensive, deeper and richer than the popular notion of 'rapid OODA looping' his work is generally equated with.

The general perception of what Boyd argues, laid out above, is not so much wrong as it is incomplete. First, the illustration of the OODA-loop included at the beginning of this chapter, which features in a host of publications, is actually a very simplified rendering of a much more complex and informative graphic Boyd developed and included in his work. This simplified version tends towards an exclusive focus on speed of decision making, while obscuring various other themes, theories and arguments that lie behind and are incorporated in it. Simply put, the OODA loop idea as advanced by Boyd says much more than 'just' going through the decision cycle more rapidly than one's opponent, and subsequent critique of Boyd's work should therefore be based not on the simplified model but on the comprehensive picture painted by Boyd himself, as well as through the discussions that preceded the birth of this complex picture.

Second, while acknowledging the relevance and originality of the OODA loop idea, it would be a loss if that were all that was remembered of his ideas, for Boyd's work shows a richness in ideas and a freshness in approach. *A Discourse* is not only about tactical and operational level war fighting. Not only does Boyd address a vision of the proper organizational culture for armed forces, *A Discourse* is also about organizational agility, about the creation of organizations in general, from tactical units, army corps, armed forces, guerrilla bands, businesses, to nation-states and societies, that are adaptive, that can survive and prosper.

Third, the value of Boyd's work lies in great measure in the way he constructs his argument, in the sources that he uses and in the argument he develops concerning the nature of strategic thinking. The value of Boyd's work lies as much in his slides as in the approach he followed in developing it. Ultimately his aim was not to convince people about the validity of this or that doctrine, but instead to create among his audience a way of thinking, a thought process.[30] Boyd would agree with the statement that the message, the relevant part of his

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ideas, is not only and exclusively in the final product, the OODA loop, but
equally resides in his approach to military thought, in the way that he came to
those insights that finally led to the OODA loop. Boyd's work thus contains a
strategic theory but equally the work, its structure, its sources and the thought
process that led to the content, constitute an argument about *strategic thinking*.
In fact, he states as much on page 2 of *A Discourse*:

> the theme that weaves its way through this 'Discourse on Winning and
> Losing' is not so much contained within each of the five sections, per se,
> that make up the 'Discourse'; rather, it is the kind of thinking that both lies
> behind and makes-up its very essence. For the interested, a careful examina-
> tion will reveal that the increasingly abstract discussion surfaces a process
> of reaching across many perspectives; pulling each and everyone apart
> (analysis), all the while intuitively looking for those parts of the disassem-
> bled perspectives which naturally interconnect with one another to form a
> higher order, more general elaboration (synthesis) of what is taking place.
> As a result, the process not only creates the 'Discourse' but it also repre-
> sents the key to evolve the tactics, strategies, goals, unifying themes, etc.
> that permit us to actively shape and adapt to the unfolding world we are a
> part of, live-in, and feed-upon.

Thus, any interpretation of Boyd's work must be informed by his methodol-
ogy. If we are not aware of the background of the theory, the conceptual soil
from which his concepts and the abstract theory sprang, it will remain just that, a
theory, if it deserves that label, and a set of hypotheses and propositions, a per-
suasive idea but an abstract and possibly a highly debatable one. And sub-
sequent claims concerning his status as a strategist remain uninformative. A
closer look at the material may reveal the logic and the strength of his argument,
as well as the extent of consistency and validity of it. A closer examination of
the conceptual roots will show the originality of his contribution as well as
Boyd's normative view concerning strategic thinking and strategic theory
formulation. For a proper understanding one needs to go beyond the OODA
loop and go through the same learning process that Boyd wanted his audience to
go through when they attended his presentations. We need to follow Boyd
through his slides step by step.

A note on strategy

A Discourse on Winning and Losing examines how organizations can 'survive
and prosper', and 'improve our ability to shape and adapt to unfolding circum-
stances, so that we (as individuals or as groups or as a culture or as a nation-
state) can survive on our own terms'.[31] Thus terms such as military theory,
operational art, doctrine, military strategy, strategic theory and thinking
strategically define the content of this study, and need some definition.

Military theory is the aggregate of theories, doctrines, and beliefs belonging

to a particular individual, community or period. It refers to the concepts, hypotheses, or principles developed by soldiers and civilians to solve military problems. This term is broad and not in common use, contrary to the term *operational art*, which has found its place in modern doctrine manuals of armed forces across the western world. Operational art is the body of knowledge dealing with the use and behavior of military forces in a military campaign aimed to achieve strategic or operational level military objectives. Campaigns are normally confined in time and geographical scope. *Doctrine* is the aggregate of fundamental methods of fighting, often tacit or implied. Ideally, doctrine provides the foundation for military training and education, as well as force structure and organization.[32]

These terms are here implicitly subsumed in the terms *strategy* and *strategic theory*, which are the preferred terms in this study, because those terms are more common, although not always properly defined in their use, and because using the term 'strategy' allows one a broader scope of activities as well as types and levels of organizations to be studied than war and armed forces. But above all, this choice is inspired by the nature of Boyd's work where strategic behavior is distinctly not confined to the military realm.

Strategy has several meanings, some narrowly defined, some broadly. Several apply to the nature of strategy and strategic theory here under investigation. The first set of interpretations of strategy and strategic theory that pertain to this study concerns the use of military force and war between political communities.[33] In the modern instrumentalist interpretation of strategy, strategy tells one how to conduct a war, or how to achieve political objectives, using the military instrument. Clausewitz famously stated that strategy is the use of engagements for the object of the war.[34] Freely translated, he tells us that strategy is the use of tacit and explicit threats, as well as of actual battles and campaigns, to advance political purposes. However, the strategy may not be (purely) military strategy, instead it may be grand strategy that uses 'engagements', meaning all of the relevant instruments of power as threats or in action, for the objectives of statecraft.[35]

Strategy thus provides the conceptual link between action and effect and between instrument and objective. It is an idea. Strategy is a plan of action designed in order to achieve some end; a purpose together with a system of measures for its accomplishment.[36] André Beaufre captured the interactive nature, the dueling character of strategic behavior when he states that strategy is the art of the dialectic of two opposing wills using force to resolve their dispute.[37] A recently posited definition emphasizes the dynamic nature of this process, and of strategy, stating that strategy is a process, a constant adaptation to shifting conditions and circumstances in a world where chance, uncertainty and ambiguity dominate, a view that is very much in line with Boyd's idea.[38]

Strategy has also widespread application beyond the military sphere. Since World War II civil institutions – businesses, corporations, non-military government departments, universities – have come to develop strategies, by which they usually mean policy planning of any kind.[39] But here too there are various

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opinions of what strategy is and does'.[40] The following viewpoints enjoy agreement among experts:[41]

- Strategy concerns both organization and environment: the organization uses strategy to deal with changing environments;
- Strategy affects overall welfare of the organization: strategic decisions are considered important enough to affect the overall welfare of the organization;
- Strategy involves issues of both content and process: the study of strategy includes both the actions taken, or the content of strategy, and the processes by which actions are decided and implemented;
- Strategies exist on different levels: firms have corporate strategy (what business shall we be in?) and business strategy (how shall we compete in each business?);
- Strategy involves various thought processes: strategy involves conceptual as well as analytical exercises.

Generally speaking then, in organization and management theory strategy refers to the various ways an organization tries to maintain a strategic fit between an organization's goals, its internal make up and the dynamic environment.

Strategy matters. Strategy has both extrinsic and intrinsic value. The extrinsic merit in strategy lies in its utility for keeping the military assets of a particular security community roughly in balance with the demands and opportunities that flow as stimuli from the outside world, or in organization theoretical terms, in its utility to maintain organizational fitness. The intrinsic merit in strategy resides in its role as conductor of the orchestra of military and other assets so that they can be applied economically to serve political objectives. Strategy transforms tactical performance into strategic effect for strategic performance in the service of policy.[42]

To neglect strategy in defense planning or the conduct of war would be like trying to play chess without kings on the board.[43] Strategy is the essential ingredient for making war either politically effective or morally tenable. Without strategy there is no rationale for how force will achieve purposes worth the price in blood and treasure. Without strategy, power is a loose cannon and war is mindless. Mindless killing can only be criminal. Politicians and soldiers may debate which strategic choice is best, but only pacifists can doubt that strategy is necessary.[44] Flawed strategy will bring the most expert and battle-hardened forces down,[45] while the absence of a strategy does not means no strategic effects will result from tactical actions. Strategy abhors a vacuum: if the strategic function is lacking, strategic effect will be generated by the casual, if perhaps unguided and unwanted accumulation of tactical and operational outcomes.[46]

A note on strategic theory

The importance of good strategy implies strategic theory to be highly relevant, but like the development of good strategy, developing a good strategic theory is a highly problematic and daunting endeavor, and any study attempting to describe, interpret and appreciate a theory should do so based on an appreciation of the peculiarities of strategic theory. Strategic theory is a strange animal indeed, and as theory it deviates in some important respects from what is generally considered 'proper' scientific theory. Strategic theory concerns thoughts about making effective strategy and about the proper use of force. The strategic theorist speculates about the effect of particular military instruments upon the course of history.[47]

There is no single, all-embracing formula explaining, describing and predicting strategy and its outcome. Instead, it belongs to the domain of social science, in which parsimony is only occasionally appropriate.[48] The phenomena of social science are so complex, with many different influences or 'causes' operating on a particular event, and our knowledge of these complex phenomena is still so imperfect, that few laws have been established. At best the social scientist can give not more than a probability that a particular action will be followed by the desired result.[49] Indeed, Clausewitz pointed out that a positive doctrine for warfare is simply not possible.[50] Theory need not be a positive doctrine, a sort of manual for action,[51] because 'in war everything is uncertain, and calculations have to be made with variable quantities. They direct the inquiry exclusively towards physical quantities, whereas all military action is intertwined with psychological forces and effects. They consider only unilateral action, whereas war consists of a continuous interaction of opposites'.[52] War is too complex. Moreover it is filled with danger, chance, uncertainty, emotions and differential talents of commanders. Subsequently, as Garnett remarks, some of the most useful theories do not in any way meet the strict requirements of 'scientific' theory. If 'scientific' is associated with a predictive capacity of theory, indeed, most strategic theories fail.

But strategic theory is valuable because of its explanatory value. Despite the fact that generalization and hypotheses may enjoy only limited validity, they sometimes throw a good deal of light on strategic behavior in particular conditions and at particular periods of time.[53] If a strategic theory offers better ways of explaining victories and losses it already has much utility for evaluation and policy making; if it can provide some measure of plausible conditional prediction that a certain mode of behavior will result in a higher probability of success, it is extremely useful. Theory assists in deciding whether and how to employ a particular strategy by offering an abstract conceptual model (or a quasi-deductive theory) of each strategy, and general knowledge of the conditions that favor the success of a strategy and conversely, the conditions that make its success unlikely.[54]

Not all strategic theories are equal. Gray distinguishes four levels to categorize strategic theories, and although each level has its merits, a general theory of

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war provides the most holistic approach and subsequently has the most value for
commanders who, in order to shape strategy for a particular war, must under-
stand how war in general, *qua* war, works:[55]

1   A level that transcends time, environment, political and social conditions
    and technology (for instance Clausewitz and Sun Tzu).
2   A level that explains how the geographical and functional complexities of
    war and strategy interact and complement each other. (Corbett and naval
    warfare).
3   A level that explains how a particular kind of use of military power
    strategically affects the course of conflict as a whole. (Mahan, Douhet,
    Schelling on the role of maritime power, air power and nuclear power
    respectively).
4   A level that explains the character of war in a particular period, keyed to
    explicit assumptions above the capabilities of different kinds of military
    power and their terms of effective engagement (the use of air power as a
    coercive tool).

    General strategic theory educates politicians and commanders broadly as to
the nature, structure, and dynamic workings of the instrument to which they
might have to resort. The chief utility of a general theory of war and strategy lies
in its ability not to point out lessons, but to isolate things that need thinking
about. It must provide insight and questions, not answers.[56] Although quite a few
military theorists have aimed to uncover the single principle governing war and
who aspired for the scientific capacity to predict and control,[57] the common
expectation of military strategic theory today, and the one employed here, is to
educate the mind by providing intellectual organization, defining terms, suggest-
ing connections among apparently disparate matters, and offering speculative
consequentialist postulates.[58]
    Boyd, too, was primarily interested in educating his audience. He attempted
not so much to instill verities but to impart a way of thinking about war and
strategy, like Mahan who was concerned with the creation of a 'disciplined yet
flexible sensibility that would be capable of quick and sound judgment in spite
of incomplete or misleading knowledge and risk of serious consequences in the
event of error'.[59] Theory, then, is important because it helps to educate and it
may shed new light on war. That, and not the aim of developing a general theory
which, like the Newtonian laws of physics, holds up for long periods of time, is
the purpose of strategic theory.
    The educational feature of strategic theory does not imply its value is confined to
the academic world. Strategic theory has a nasty feature in that it relates to matters
of life and death. 'The strategist's task is to formulate a 'theory' explaining how a
state can ensure its security and further other interests', Stephen Walt asserted.[60] It
therefore needs to perform in practice, just like medical science aims at deriving
insights, at understanding the dynamics and interrelationships of the various parts
of the human body, in order to achieve success in surgery and treatment.

Strategic theory often has an impact on the formulation of strategy in the real world.[61] Good theories provide relevant and useful conceptual frameworks by means of which to understand the general requirements of a strategy and the general logic associated with its effective employment. Such theoretical-conceptual knowledge is critical for policy making. All policy makers make use of some such theory and conceptual frameworks, whether consciously or not. In employing a strategy they rely on assumptions, often tacit, about the strategy's general requirements and logic.[62] Indeed wherever one looks in modern strategic history one finds testimony to the influence of ideas. There is always a strategic theoretical dimension to the making, execution and doing of strategy.[63] The messy world of defense policy and the use of force provides both the permanent reason why strategic theory is important.[64] The traffic between ideas and behavior in strategic affairs is continuous. As the intellectual history of strategy bears the stamp of particular perceptions and interpretations of strategic experience, so strategic behavior is shaped by the attitudes and ideas that we know as strategic culture. In the practical world of strategy, strategic ideas apply to experience, while strategic experience constitutes ideas in action.[65] Ideas help shape behavior, even as they are shaped in turn by behavior.[66]

Developing a strategic theory is difficult for several reasons. First, strategic theory needs to take into account the complex and multidimensional character of strategy and war. Good strategic theory must be holistic, paying due respect for the interdependency of the various elements and dimensions that give form to strategy.[67] The second problem facing strategic theorists is that the circumstance for which strategic theory is developed will be largely unknown and moreover unknowable much in advance of the moment of testing the strategic theory, though the uncertainty is itself a factor to be reckoned with in one's strategic doctrine.[68]

Moreover, witness the flurry of books on the nature of war since landmark events such as 9 November 1989 (end of the Cold War) or '9/11', strategic theory is evolutionary in the sense that theories are developed that take into account novel actors, such as states or terrorist groups, new technologies such as tanks, aircraft or nuclear weapons, or phenomena such as the impact of the industrial revolution or the rise of mass emotions in nationalistically and ideologically inspired wars.[69]

The contemporary social context determines what the actors, weapons, aims, norms, etc. are that are employed in a purposeful manner in war, and as this social context evolves, so does (or should) strategic theory. Strategists have had difficulty abstracting themselves from the features of a given war or period, and identifying the lasting characteristics that would apply to all contexts and all periods.[70] As a result their work generally reflects the war, or factors that affect it, as seen through the eyes of people living in their own time, imparting a contemporary color to their military thinking.

This affects the nature of theory development. The dynamic nature of strategy and war are not conducive to a steady growth of knowledge because the object – war, actors, weapons, rules – alters constantly and in fairly rapid tempo,

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at least in the past 200 years. Subsequently strategic theory development does not follow a clear cumulative growth path in which new theories built upon former ones, improving the older ones or expanding their range of application. The reader, then, is left with an expanding number of partial theories, each of which has a limited range of applicability, be it bound by geography (continental, maritime, urban, jungle), dimension (air, land, sea), weapon technology and combat method (nuclear, terrorism, counter-insurgency, guerrilla), etc.

   The paradoxical nature of strategy and strategic theory reinforces the problematic nature of strategic theory. Strategic theory is not neutral territory, but an arena of competition itself. It needs to account for the fact that it is concerned with people that react, learn and anticipate. Students of social science have recognized that the persons and organizations with which the social sciences deal may be influenced by the scientific generalizations themselves. Thus once such a generalization has been formulated and has become known to the persons whose behavior it attempts to predict, those persons may react in ways different from their past behavior, the observation of which justified the generalization. Such generalizations, therefore, cannot have the scientific character that their truth is independent of human beliefs, and the influence of science on human affairs is thus somewhat paradoxical.[71] Precisely because a strategy worked once, it will likely be emulated or at least learned from, and subsequently strategists must devise new constructs and hypothesis that provide a plausible expectation for success.[72] Strategic theories arise after clashes of old views, in a somewhat Darwinian fashion; when promising ideas and propositions have been tried in battle, they elicit counter ideas negating the validity of formerly successful propositions. For instance, the resort to terrorism by groups such as Hamas and Al Qaeda against nations with high-tech armed forces is explained by some through this dialectic dynamic.[73]

   These factors imply strategic theory is dynamic in a fundamental way, and this character affects the potential for making good and lasting theory concerning strategy. Indeed, what the discussion above reveals is that, in matters of war, even if an underlying pattern is discovered and some level of predictability established, the paradoxical nature of strategy guarantees that the pattern will be altered. If social theory differs from the model of theory posited by the natural sciences, strategic theory then may, in the eyes of some, not deserve that label at all, and really these theories are more sets of propositions, hypotheses and models. The activities of a strategic theorist can perhaps be likened to the one who attempts to build a house on the muddy bank of a fast flowing river. The patch of sand constantly changes form, depth, substance and location due to the turbulence of the river. Moreover, it shifts and deforms because of the construction activities. The very fact that one places a stone so as to construct a foundation alters the environment. With war and strategic behavior so fundamentally in flux, strategic theory cannot aspire for high standards of parsimony or general applicability and validity, nor one that holds out for a long period of time. Neither should one necessarily expect an all-embracing theory to develop from the various partial theories, nor a theory with a high level of predictive capability, the standard of 'hard science'.

The formative factors of strategic theory

Understanding the strategist's sources of influence helps understanding his theory. Like social theorists, strategic theorists are influenced by both intellectual and social factors, both internal to the discipline as well as external to the discipline. Internal intellectual factors include the influence of schools and traditions of thought on a theorist, including cognitive paradigms, changes in paradigms, and meta-theoretical tools. External intellectual factors include ideas borrowed from other disciplines. Internal social factors include the influence of social networks on a theorist's work. External social factors include the impact of historical change on the structure and institutions of the society being theorized.[74]

Mintzberg argues that, in addition to fields such as psychology of human cognition, political science of public policy making and military history of strategies in conflict, biology, systems theory, cybernetics, anthropology, economics, quantum mechanics and chaos theory also may provide insight into how organizations change and have indeed informed theories of strategic management.[75] The applied nature of strategic management requires a multidimensional view, incorporating diverse complexities, rationalities and strategies. Quincy Wright stated long ago that the discipline [of the theory of war or the art of war] extends into science, history and philosophy as well as practice. Insights for explanation and the formulation of advice may be sought in sociology, psychology, political science, economics, history and international law. All may assist in 'building of systems of thought which will guide the soldier, general, statesman, or citizen to appreciate the situation and to act so that victory may be won'.[76]

Recent studies into the formative factors of strategic theory suggest that the following factors shape and explain the development of a certain theory of conflict in a particular period, in a particular country or by a specific author.[77]

- the nature of war during successive periods;
- the specific strategic circumstances of the countries involved;
- the personal and professional experience of the particular thinker;
- the intellectual and cultural climate of the period in question.

The nature of war deeply affected the influential writers of the past two centuries. Clausewitz and Jomini where deeply affected by the drift towards total war, a process that had started during the French Revolution and continued during the Napoleonic wars, and their thinking is dominated by the role of the masses in war. The works of Liddell Hart, Fuller, Douhet and Mitchell reflect the trauma of World War I, the mechanization of the battlefield and the increasing and intensifying involvement of society in war, despite the fact that they develop different solutions to the problem of the vast destruction of modern war.[78] The theorists of nuclear war were, of course, influenced by the instantaneous destruction of Hiroshima and Nagasaki.

Specific strategic circumstances of the home country also affect the formation of strategic theory of an author. Clausewitz' work is distinctly continental,

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reflecting both his experience and the Prussian geo-strategic predicament. Douhet did not conceal the fact that the formulation of his ideas with regard to defeating the enemy through aerial bombing of the civilian population and the industrial infrastructure was influenced by the strategic position of Italy.[79] Even as recently as the 1990s, we can see how specific strategic circumstances can inspire strategic debate. The dilemmas of the ethnic wars in the Balkans during the 1990s produced a new search for the dynamics of coercive diplomacy and military strategies as part of that.

   Personal experience is particularly evident is the works of Clausewitz and Jomini, who both took part in battles during the Napoleonic wars, although that by itself does not explain the fundamental insights into the nature of war that Clausewitz in particular developed. The command experiences of Douhet and Mitchell and the didactic responsibilities of Corbett and Mahan have often been noted as important factors for explaining their work. Boyd's work flowed directly from his experience as a fighter pilot.

   All of these factors combine in Azar Gat's comparison of Clausewitz and Liddell Hart. Despite differences in character and style, there are striking similarities in their approach to strategy. According to Gat,

> both thinkers reacted to cataclysmic and epoch-making wars which had resulted in a national trauma and profound intellectual transformation. In both, their experiences produced a violent reaction against past military theory and practice, held to be responsible for the disaster. Both advanced a new model of military theory, which they held universally valid and which involved an unhistorical approach to the special conditions that had determined the pattern of the past. Both were not just 'idly theorizing' but developed and preached their ideas out of consuming commitment to their countries' future.[80]

This description could equally be applied to John Boyd. Boyd's work comprises a specific intellectual response to the military problems of the US armed forces in the immediate aftermath of the Vietnam War and his arguments are colored by this predicament in the sense that he aimed to change a specific mindset and a doctrine that, in his view, was dysfunctional.

   Dominant scientific currents, too, can, as part of a *Zeitgeist* (here used as a shorthand for the intellectual and cultural environment in a particular period), have a significant impact on the formulation of military theory. For instance, nineteenth century military thought was dominated by two contending conceptions of the nature of military theory, formulated during the age of Enlightenment and the Romantic period, in the eighteenth and early nineteenth century respectively. Broadly defined, they represent the two fundamental positions towards the study of man and human institutions, which emerged in the wake of the scientific revolution of the seventeenth century. One of these looked to the exact and natural sciences as a model to be adopted and applied. The other, by contrast, maintained that the humanities were different in nature from the sci-

ences and could never be studied by the same methods.[81] The ideal of Newtonian science excited the military thinkers of the enlightenment and gave rise to an ever-present yearning to infuse the study of war with the maximum mathematical precision and certainty possible, maintaining that the art of war was susceptible to the systematic formulation, based on rules and principles of universal validity, which had been revealed in the campaigns of the great military leaders of history.[82] Hence it was Jomini who won fame by updating the theoretical outlook of the Enlightenment to produce a striking schematization of Napoleon's aggressive rationale of operations.

In contrast, and in response, the Romantics stressed the complexity and diversity of human reality, which could not be reduced to abstract formulas and which was dominated by emotions, creativity, and the historic conditions of each period. This new outlook on the nature of military theory breached the hitherto absolute hegemony of the military school of the Enlightenment.[83] Clausewitz, for instance, was a 'Social Newtonian' in his methodology in the sense that to Newton 'phenomena are the data of experience',[84] and he deliberately inserted Newtonian, mechanistic metaphors in his work such as the concepts of friction and center of gravity. Yet he recognized that the social world differs from the natural world.[85] Hence Clausewitz' emphasis on the interactive nature of war, the influence of the dialectic of wills, the importance of experience, fear, emotion, intuition, etc.[86]

Thus it is important to look at the broad scientific climate, the prevailing scientific paradigm or the popular perception of new or 'fashionable' scientific insights and concepts of the day, as part of the *Zeitgeist*.[87] These provide metaphors for expression, new ideas and concepts for analysis and explanation, and sometimes novel insights for discovering new patterns of causality. Indeed, military theorists better take heed of their implicit scientific assumptions. For instance, implicit and explicit deterministic reasoning and analysis lay at heart of some of the strategic errors in practice and in theory that occurred in the latter half of the twentieth century, in particular in the field of strategic application of air power and nuclear warfare due to 'Laplacian determinism', construed as a dominant deterministic *Weltanschauung* adopted by physicists in the century following Newton's death.[88] During the planning and execution of the Combined Bomber Offensive (CBO) during World War II, American airmen have tended to be overzealous in their enthusiasm for pet formulas and engineering-type of calculations, ignoring historical contradictory facts and assuming a static opponent. Not only were the CBO plan's predictions concerning bombing effects offered with the quantitative precision of a physical science, they were expressly portrayed as effects that would occur if the requisite bombing forces were made available. The thinking behind the planning was mechanistic in the specific sense of not getting involved in the action–reaction typical of combat between land armies.[89]

Writing in the 1980s, Barry Watts asserted that military theory should instead be based on the assumption that uncertainty is inherent in the physical and social world, and unsolvable. He favored a more organic image of war in which human

nature and behavior in war forms the foundation for military theory.[90] The Clausewitzian concept of friction, which is infused with the notion of unpredictability and uncertainty stemming from the interactive nature of strategy and battle, and from the limits of human cognition, should be at the heart of it.[91] He bolsters his argument by referring to Albert Einstein, Werner Heisenberg, Kurt Gödel and Claude Shannon, who laid the physical and mathematical foundation for the philosophical insight that human knowledge is limited by definition.[92] All information is imperfect. There is no absolute knowledge, he quotes Jacob Bronowski, an author whose work Boyd too had studied.[93]

In similar vein, and with direct reference to the work of John Boyd, Pellegrini expects that the shift from the Newtonian framework of cause and effect determinism to the new science concept of probabilities and trends (as embedded in chaos and complexity theory), will change man's concept of the battlefield, emphasizing the capability for rapid observation and action.[94] While Newton's metaphor of the 'Majestic Clockwork' may have influenced military theory during large parts of the past 200 years, work in biology (especially DNA and the workings of the human brain), artificial intelligence and chaos and complexity theory now suggest that the world is composed of complex systems which interact with, and adapt to, each other, making it even more difficult to obtain knowledge about how the universe functions.[95] In that, Pellegrini nicely captured the essence of the scientific *Zeitgeist* during which Boyd developed his ideas.

Organization of this study

Informed by the concept of formative factors, the approach adopted to show what Boyd said and meant, to improve our understanding of Boyd's strategic theory, is in one sense an indirect one. Instead of starting with presenting *A Discourse* right away, Chapters 2, 3 and 4 discuss at some length the formative factors of Boyd's work, thereby providing a conceptual lens to read and interpret his work with. Considering the nature of and method applied in Boyd's work, understanding his work, and appreciating it, will require an examination from a variety of angles, taking insights from a number of disciplines and bodies of knowledge, in particular in light of the fact that one has only his presentations to rely on. In Boyd's case the following four factors can be discerned:

• His professional background;
• The strategic and defense–political context of the US in the period in which Boyd developed his ideas;
• His study of military theory and history;
• His keen and evolving interest in scientific developments and the scientific *Zeitgeist* during which he developed his ideas on military strategy.

Boyd's professional background includes his personal experiences, such as his tour as a fighter pilot during the Korean War and his experimentation in air combat afterwards. A second factor shaping his work lies in his views on the

Vietnam experience and the challenges facing the US military in the aftermath of that war, the time during which Boyd developed his work; and the audience to which he lectured. As is the case with many strategists, Boyd studied military history and strategic theories, and the influence of specific theories and insights permeate and color his work too. Chapter 2 therefore includes a discussion of a number of strategic theorists who exerted an obvious influence on Boyd through his study of strategic theory, such as Sun Tzu, Julian Corbett, T.E Lawrence, J.F.C. Fuller and Basil Liddell Hart. This will introduce ideas that found their place in Boyd's work, thus easing the path for understanding the slides in *A Discourse*. It will also facilitate positioning Boyd in the history of strategic theory as well as provide insights concerning the extent of his contribution to strategic theory.

A very interesting and equally influential formative factor is formed by his avid study of a variety of scientific fields. Chapters 3 and 4 focus on this aspect of Boyd's work. They show the scientific *Zeitgeist* during which Boyd formulated his theory, as well as the way and the extent to which it influenced his work. I argue that Boyd's work is rooted in this scientific *Zeitgeist* and cannot be properly understood without a level of familiarity with the debates and developments that took place in the period Boyd developed his theory.

Against this background, equipped with certain 'conceptual lenses', Chapters 5 and 6 offer a detailed account of Boyd's essay and all of his presentations. This somewhat elaborate examination will give an impression of Boyd's manner of reasoning and of his ideas on how one should think about military strategy. It will show how he constructed his argument and what is behind the popular OODA loop notion. It furthermore substantiates the conclusion laid out in Chapter 7, that his work contains many more arguments and insights concerning successful strategic behavior. Based in particular upon the themes, debates and insights featuring in the scientific *Zeitgeist* that color Boyd's work, and upon the pervasive presence of his ideas in military studies and doctrinal debates in what many analysts have described as the postmodern period of the 1980s and 1990s, I conclude also that Boyd may be considered the first postmodern strategist, in particular considering the conceptual similarities between Boyd and several post modern social theorists, an argument which, furthermore, underlines the importance of an awareness of the *Zeitgeist* for understanding strategic theory.