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Adapting C2 to the 21st Century

**Establishing Fair Principles of Cooperation for Complex
Civil-Military Operations**

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Abstract

In today's complex security environment integrated operations involving military, civilian and non-governmental agencies are key to success. The challenge is to achieve unity of effort despite cultural differences and competing interests. To overcome these challenges new concepts, such as Civil-Military Cooperation and the Multinational Interagency Group, have been developed to establish connections between military and civilian organisations. While seeking to integrate efforts and build relationships, such concepts have placed emphasis on *coordination*, with less importance set on explicit mechanisms for achieving *cooperation*. Operational experience indicates that the level of cooperation achieved can be variable, particularly between the military and NGOs. The importance of achieving cohesion requires that a more considered approach be explored. Drawing on the idea of fairness as developed in John Rawls *Theory of Justice*, this paper introduces the concept of establishing fair principles of cooperation to govern the allocation of responsibilities and shape command arrangements. Augmenting the strategic planning process, the concept incorporates the application of structured bargaining between organisations as a means of establishing fair principles by agreement. By extending game theory approaches to fair social outcomes, consideration will be given to constructing bargaining situations supporting the emergence of fair and robust cooperative arrangements.

Introduction

Participation of military and civilian organisations in international crises and conflict is not new. Since Clausewitz [Clausewitz] it has been recognised that warfare is intimately connected with political policy[1], and that commanders must work cooperatively with national leaders and their bureaucracies in the formulation of strategy. Coalition operations have been an important aspect of conflict since antiquity[2], while humanitarian relief agencies have been a feature of both warfare and international assistance since the mid-twentieth century[3], at least.

Nevertheless, the demand for militaries to undertake roles beyond that of traditional war-fighting has broadened the need for cooperative interactions outside the military command structure. Since the end of the Cold War there has been a growing emphasis on these non-traditional military operations, often focussed on peace support or humanitarian intervention. Such operations can involve the participation of foreign governments and non-national political actors, as well as international and Non-Government Organisations (NGOs) [Alberts & Hayes, 1995]. The number, variety and differing motivations of these participants can significantly add to the problem of achieving unity of effort. This extends to the military itself, which need not be the lead agency. More recently, the growing emphasis on homeland security from potential terrorist threats has seen greater interaction between the military and domestic government agencies. While militaries have traditionally engaged with government, the multifaceted nature of the threat has seen this interaction widen, again placing pressure on traditional Command and Control (C2) concepts.

Contemporary concepts for civil-military interaction in complex operations emphasise the importance of coordination and the building of consensus through ongoing

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[1] This has been recognised even earlier than Clausewitz, see for example [Machiavelli].

[2] The repulse of the Persians by a coalition of Greek states at Marathon in 490BC is a case in point.

[3] For example, both OXFAM and the International Red Cross were active relief agencies operating in World War II [Davies, p1029].

constructive engagement in theatre. However, it is recognised that military and civilian organisations need to begin their collaboration before deployment. Moreover, the challenges of modern operations require that responsibilities be distributed amongst participating organisations, raising the importance of trust and accountability. To be effective, such relationships need to be based on clearly articulated and shared values guiding cooperative behaviour and organisational decisions. In this paper an approach to developing principles of cooperation as part of the strategic planning process is explored. Recognising the difficulty of devising a fixed set of regulations which will satisfy all participants and be applicable to fluid contingencies, emphasis is placed on the development of guiding principles rather than rules.

The paper is motivated by John Rawls theory of justice in social cooperation [Rawls], a work seen as *the most significant event in moral philosophy in the late twentieth century* [Grayling, p 224]. Rawls applied Social Contract theory to devising fair principles of cooperation underpinning specific arrangements of institutions, duties and rights in well formed societies. While significant, Rawls' approach ultimately relied upon assumptions of shared values amongst members of society, leaving the theory open to criticism [Binmore, Holmes].

A shared moral code need not, however, be the basis for honouring a Social Contract. Recognising that participating organisations in complex operations will have differing intentions and goals, consideration is given here to compacts which best satisfy each organisation's own self-interest. The Social Contract then becomes a means of coordinating the aspirations of those involved. Such an approach avoids *ad-hoc* ethical assumptions about the participants or presumptions on shared cultural norms. Instead, organisations are viewed as acting for their own benefit, akin to consumers in a competitive economy. In this way, analysis of social contract options becomes amenable to the machinery of Game Theory. This is the approach to the Social Contract employed by Binmore [Binmore] and, as interactions between organisations are less likely to be driven by ethical considerations than relations between people, applied in this paper.

The paper begins by reviewing the nature of civil-military operations, and the principal concepts currently employed to achieve coordination. Consideration is then given to the importance of cooperation and fairness in complex operations, leading to a discussion of the role of Social Contract theory. Drawing on these observations a new concept for establishing fair guiding principles of cooperation between civilian and military organisations is proposed, followed by a demonstration of the importance of structured bargaining to support cooperative outcomes. The paper is then concluded with a review of potential areas of further work.

Civil-Military Operations

Background

In recent decades the strategic environment has undergone significant change, driven, in part, by the forces of globalisation, technological development and geopolitical transformation. Conflict in this environment often obscures the line between war and peace, blurring military, economic, humanitarian and political boundaries [Mansager].

To be effective, military operations must now be integrated and coordinated with the activities of other departments, agencies and organisations contributing to crisis resolution [JP 3-08, page I-1 & I-4].

The establishment of networks of interdependence between contributing organisations necessarily compounds mission complexity, raising many challenges. That operations are often conducted under a difficult international mandate and continuous media scrutiny adds further complexity to these already fluid situations. Today's international crises thus demand that civil-military coordination be dynamic and flexible across a spectrum of potential missions. These extend well beyond traditional war-fighting to include humanitarian intervention, disaster relief, peace keeping, peace enforcement, support to nation building, and countering terrorism. Since the end of the Cold War the number of such operations has expanded significantly, with record numbers of peace operations and complex contingencies being undertaken by the UN and other organisations [JP 3-08, page I-4].

Participants in Civil-Military Operations

The challenge of civil-military operations is reflected in the diversity of prospective partner organisations. This may include foreign military forces, own and other government departments, non-government and international organisations and donor agencies. An indication of the large range of potential partner organisations is provided in Table 1.

Organisation Type	Examples
Foreign military	• As lead or coalition partner
Own Government Departments	• Embassy • Treasury & Finance • Foreign Affairs • Federal Police
Other Government Departments	• Embassies & Consulates • Host Nation Government Departments • Local Police & Security
International Organisations	• United Nations • Organisation of African Unity • Organisation of American States • Organisation for Security and Cooperation in Europe • North Atlantic Treaty Organisation
Private International Organisations	• International Committee of the Red Cross • Red Crescent Societies
Donor Agencies	• Australian Agency for International Development (AUSAID) • U.S. Agency for International Development (USAID) • European Community Humanitarian Organisation (ECHO) • World Bank • Organisation for Economic Cooperation & Development (OECD)
Non-Government Organisations	• World Vision • Oxford Famine Relief (OXFAM) • Medicin sans Frontiers
Private Companies	• Private Security Companies

Table 1. Example partner organisations

Such a broad array of possible partner organisations represents a wide spectrum of cultures, available resources, capabilities, in-country experience and access to technology [Davidson, Hayes & Landon, page 2]. The actual number of organisations participating in civil-military operations can also be very large. As an example, 169 NGOs were operating during the UN mission to Rwanda [Dallaire, page 43] and an estimated 3000 in Afghanistan [Alberts & Hayes, 2006-1, page 46].

Mission Complexity

Establishing cohesion amongst diverse participants in multi-agency operations is complicated by the variety of competing agendas and strategies of the different groups, who will continuously manoeuvre to protect their core values and institutional interests [JP 3-08, page I-8]. For instance, many Non-Government Organisations will staunchly maintain their commitment to operate independently of governments [Davidson et al, page 10], acting independently of the military plan and without consultation [Dallaire, page 37]. Military forces can also introduce complexities, being unlikely to cut ties to their national command structure and domestic political agenda, resulting in national forces which maintain multiple chains of command [Alberts & Hayes, 1995, page 13]. Coalition forces can also be beset by problems of interoperability, exacerbated by differing doctrine, capabilities and language.

As they control a substantial part of the funding for humanitarian and development activities, donor organisations have an important role in civil-military operations [JDP 3-90, page 2-3]. However, the participation of donor organisations can be complicated by the existence of multiple development policy objectives, institutional barriers and political pressures [Grimm & Warrener].

Other factors can also contribute to mission complexity. Belligerents may not understand the ethos of impartiality maintained by NGOs, leading to accusations of aiding and abetting enemy forces [Dallaire, page 44]. For the military there can be difficulties interpreting complex Rules of Engagement (ROE) [Dallaire, pages 30-31], while a worsening situation of the ground can limit the collection and dissemination of accurate situational awareness [Everts, page 70]. Bureaucratic and legal constraints also play a role, such as the limiting of an Ambassador's authority to their country of accreditation whereas a Joint Force Commander may have interests across neighbouring countries, requiring coordination with multiple country teams [Mansager]. Importantly, moral and ethical dilemmas, germane to complex operations and conflict resolution situations, are often unanticipated [Dallaire, pages 39-40]. This range of contributing factors is by no means exhaustive.

Principal Concepts for Civil-Military Planning & Coordination

Lessons learnt from Iraq, Somalia, Haiti, Rwanda [Davidson et al, page 14], Afghanistan [Mansager] and the Australian lead assistance mission to the Solomon Islands [Hutcheson] have pointed to the importance of closer coordination and planning between civilian organisations and the military. Recognising that the institutional and organisational arrangements necessary to coordinate complex civil-military operations are broader than can be encompassed by standard Command & Control (C2) approaches [Alberts & Hayes 1995, page 5] a requirement for new C2 concepts has emerged. In particular, the unique circumstances of each operation

require a flexible response mechanism for planning and implementation of strategy [Davidson et al, page 12]. Such planning needs to be built on consensus and a sense of ownership, underpinned by consultative relationships which focus on Unity of Effort rather than Unity of Command.

A U.S. concept for achieving greater coordination with civilian government agencies, first applied by CENTCOM in Afghanistan and Iraq [Bogdanos], is the Joint Interagency Coordination Group, (JIACG). The role of the JIACG is to enable the military commander to collaborate, at the operational level, with other US government agencies and departments [JP 3-08, page xii]. The JIACG consists of a cell of military and civilian experts attached to the combatant commander's staff, supporting planning and advising on civilian agency capabilities [USJFCOM]. Civil-Military coordination has also been pursued in the U. S. through the use of *ad-hoc* C2 structures known as Civil-Military Operations Centres (CMOC) [JP 3-57, page xii]. The main function of a CMOC is to coordinate humanitarian efforts with local government, NGOs and international organisations [Arnas, Barry & Oakley]. A system of different CMOCs may be established in the area of operations. Employed at both the operational and tactical level, CMOCs often exhibit inherent limitations which restrict their utility [JP 3-57, page IV-7].

The Multinational Interagency Group (MNIG) is a new concept which extends the JIACG model to coordination between coalition military and relevant civilian agencies or departments of contributing governments. The MNIG role is seen to also include establishment of connections with relevant international organisations and NGOs. Experimentation to fully develop the MNIG concept is ongoing with a number of partner countries [USJFCOM].

Reflecting its broad approach to security [JP 3-57, page IV-17], NATO doctrine employs the concept of Civil-Military Cooperation (CIMIC), defined as: *The coordination and cooperation, in support of the mission, between the NATO Commander and civil actors, including the national population and local authorities, as well as international, national and non-governmental organisations and agencies* [AJP-9, page 1-1]. As with CMOCs, CIMIC centres are established in theatre at the operational and tactical level, but may be engaged in a greater variety of activities [JP 3-57, page IV-17]. CIMIC centres are normally aligned with a NATO land component command [JP 3-57, page IV-18]. The UK has adopted the NATO definition of CIMIC, but places greater stress on the need for a long term and comprehensive view [AJP-9, page 1-2].

Consistent with its charter, the UN approach to civil-military coordination emphasises humanitarian principles [AJP-9, page 1-2], realised in a practical way through the establishment of an On-Site Coordination Centre (OSOCC) in areas of need. When employed, the OSOCC is provided as a support organisation to an Humanitarian Operations Centre (HOC) [JP 3-57, page xii]. A HOC is normally established by the host nation requiring humanitarian assistance, if it is able to do so [JP 3-57, page IV-9], with the aim of transitioning responsibility for the relief effort to the host nation, UN and NGOs [JP 3-57, page IV-10].

While complementing strategic level coordination, these concepts focus on civil-military interaction at the operational and tactical level. The importance of

strategic level planning and coordination is, however, not wholly overlooked. In the context of foreign humanitarian assistance missions, U. S. doctrine discusses the role of the Humanitarian Assistance Coordination Centre (HACC), a temporary organisation operating in support of strategic planning and coordination with civilian organisations. Reflecting its strategic role, the HACC declines in importance following establishment of a CMOC or HOC [JP 3-57, page IV-10]. Strategic considerations are otherwise largely constrained to interagency management in national contexts[4] [JP 3-57, page III-35]. Executive Steering Groups (ESG), comprised of principals from participating organisations, may be established to disseminate guidance on national strategic policies, as well as facilitating high level exchange of information on operational issues [JP 3-08, page III-16].

The Importance of Cooperation and Fairness

Current concepts for civil-military engagement frequently place the burden and central focus of activities on the efforts of military staff, fostering an emphasis on coordination around the military presence. Cooperation, an essential prerequisite to coordination, is seen to arise dynamically through engagement between civilian organisations and the military over the course of an operation[5]. In many ways, this reflects the constraints under which civil-military operations are conducted. For instance, NGOs will often lack the staff resources to engage effectively in strategic level planning [JP 3-08, page xiv], necessitating a learning approach to consensus building.

While interactions between the military and civilian organisations may be pleasant, as occurred between Dutchbat troops and civilian organisations in the former Yugoslavia [Everts, page 71], conflicting objectives and perspectives will more often than not complicate engagement. Interactions, particularly with NGOs concerned about their neutrality, may be shaped more by suspicion than a drive to consensus [Hayes & Weatley, page 18]. Dynamic consensus building thus requires a delicate balance to be maintained between participants.

The importance of collaboration and cooperation in modern C2 is not always appreciated [Alberts & Hayes 2006-2, page 185], although its need is often highlighted. As an example, the Brahimi report on UN peace operations [Brahimi] addresses the need for cooperation within the UN system, recommending sweeping changes. More generally it has been observed that, *Conflict resolution requires a unified approach, with comprehensive coordination encompassing all plans – security, humanitarian, economic, and political – in ways that prove mutually supportive* [Dallaire, page 43]. This need for unified planning is broadly recognised, planning processes normally being too close-hold, with civilian organisations often asked to participate infrequently or too late [Davidson et al, page 22]. The need for cooperation is clearly encompassed, with *supportive* a synonym for cooperative, while *mutual support* highlights that cooperation can be consistent with the aims and self interests of the participants.

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[4] As described in the U. S. context by Presidential Decision Directive 56, Managing Complex Contingency Operations.
[5] Long term relationships are also fostered through informal contact groups [JDP 3-90, page 3-3].

Greater cooperation necessarily spreads the responsibility for planning, decision making and implementation across civil and military participants. Such responsibility is intimately linked with the development of trust, as more responsibility will be devolved if based on trusted relationships [Penrose, pages 152-157]. However, empowerment also entails that participants be accountable for their actions and activities. Civilian organisations, such as NGOs, are unlikely to yield to the arbitration and judgements of the military, indeed, *excessive independent action on the part of some NGOs……..are best resolved through direct military contact………..rather than attempting to correct the offending NGOs* [JP 3-57, page IV-7]. For collaboration to be effective a sense of *mutual* accountability must be fostered, requiring the standards against which actions are to be measured to be open, fair and balanced.

The complexity of interactions amongst military and civilian organisations makes it difficult to create and apply a single set of rules to govern their relations [Davidson, page 13]. While dynamic consensus building will remain an important element in civil-military operations, achieving a firmer foundation for cooperation and mutual accountability requires that a different perspective be adopted.

The Social Contract

Social Interactions

The aim of cooperative interaction is to collectively achieve outcomes difficult or impossible to realise individually. Such interactions are necessarily networked and social. As with other social relations the viability of lasting bonds will at times demand that concessions be made to other parties in return for collective benefits. Interestingly, the observation that civilian organisations *may have to surrender some authority in return for greater security and efficacy* [Last], and that *Some compromise that limits the freedom of individual agencies may be required to gain consensus* [JP 3-08, page I-9], highlights that social bargaining is indeed an important element in civil-military interactions.

The fundamental C2 question is how to achieve unity of effort and "win-win" outcomes in the absence of direct authority. The social nature of the civil-military interaction and the need to establish agreement on benefits and compromises suggests that insight may be gained from the political concept of the Social Contract.

The Theory of the Social Contract

As citizens in society we live in essentially artificial communities based on common conventions, defined institutions and agreed laws. Through participation in such societies individuals receive the means to advance to a higher level of achievement than can be realised alone [Cole]. The question naturally arises as to what is the best arrangement of laws and institutions for a society which would also meet the consent of its members. The Social Contract is one approach to addressing this question.

Social Contract theory has been remarkably persistent, dating back to the Greek sophists [Cole], and has been used to argue a range of political positions [McClelland]. At its heart the Social Contract is an agreement among individuals previously in a 'state of nature' through which laws and constitutions are established

to regulate their relations [Cole]. The 'state of nature' is the condition individuals would find themselves in prior to, or in the absence of, a regulating society. The Social Contract is the agreement, freely adopted, by individuals in such a state and so forms an alternative to life in such a condition. The resulting Social Contract is thus strongly dependent on what this 'state of nature' actually is or how it is assumed to be. The plurality of outcomes which this can engender is exemplified by the two most famous proponents of traditional Social Contract theory: Thomas Hobbes and Jean-Jacques Rousseau. For Hobbes (1558-1679), having experienced the horrors and dislocations of the English civil war, the state of nature was characterised as a *war of all against all* in which existence is *solitary, poor, nasty, brutish and short* [Hobbes, Binmore]. In contrast, for Rousseau (1712-1778) civil society, that is the Social Contract as currently practised, has enslaved people to the laws of others, when in the state of nature they were free: *Man was born free and everywhere he is in chains* [Rousseau]. For Rousseau the Social Contract needs to be renegotiated.

The persistence of Social Contract theory extends to the present day, the Republican "Contract with America" being an example of the resilience of social contract thinking. Its development as a theory has also continued, spurred by *one of the major philosophical works of the century* [Holmes], John Rawls *A Theory of Justice* [Rawls].

Rawls and Fairness

Rawls sought to understand the role of justice in social cooperation by carrying to a higher level of abstraction the traditional theory of the Social Contract [Rawls, page 3]. Recognising that society is marked by both conflict and alignment of interests, Rawls sought to present a conception of justice which would set the foundation charter, that is the set of principles, which would regulate further agreements. In applying Rawls' idea of the Social Contract *we are not to think of the original contract as one to enter a particular society or to set up a particular form of government. Rather, the guiding idea is that the principles of justice for the basic structure of society are the object of the original agreement. They are the principles which free and rational persons concerned to further their own interests would accept in an initial position of equality as defining the fundamental terms of their association* [Rawls, page 11]. The focus is thus on the principles which shape the laws, institutions and distribution of benefits and burdens in society, not on a specific social structure.

For Rawls the 'original position' replaces the traditional concept of the 'state of nature'. The original position is an imaginary choice situation where individuals are deprived of information about the structure of society, including their status, commitments to creeds and loyalties to particular groups [Holmes]. The choice of a Social Contract is thus done behind a 'veil of ignorance'. Participants are to imagine that their roles will be randomly assigned under the new social order. Since all individuals behind the 'veil of ignorance' have equal status, the principles of justice which emerge will be seen to be the result of a fair agreement or bargain [Rawls, page 12]. It has been noted that [Holmes], *There is nothing unfamiliar or particularly unstable about such abstractions.* Nevertheless, deciding how the original position is to be constituted ultimately relies upon acceptance of certain shared values which left

the theory open to the criticism of cultural bias. This compelled Rawls to retreat from his original ambitious philosophical position [Holmes].

An approach which maintains the scope of Rawls work but takes a more pragmatic bent was taken up by Binmore [Binmore]. Unlike Rawls, Binmore's original position is identified with society's current situation, or status quo. Behind the 'veil of ignorance' individuals are not required to discard their history, only information on their status and role in society as currently constituted. This approach *dispenses with ad hoc ethical assumptions about behaviour in the state of nature* [Binmore, p 14]. The problem is then one of seeking a new social contact to which society can be moved by mutual consent. That is, emphasis is placed on reform rather than transformation. In the imaginary choice position, the veil of ignorance cloaks a citizen's current role in society, not the current state of society. Such an approach does not seek to normalise cultural biases to a presumed absolute standard.

Emphasis in Binmore's approach is placed on binding arrangements which are self-policing through the mechanism of self interest. Compliance is then not dependent on self-respect as a means of taking up the strains of commitment. Furthermore, appeals can be made to the device of the 'original position' at any time. A Social Contract will be stable if it is in all individual's self interest to comply and no further appeals to the original position are required. Such considerations lead naturally to the application of ideas from Game Theory to the evaluation of Social Contract options.

A New Concept: Fair Cooperative Principals from Partial Ignorance

The Partial Veil of Ignorance

Notwithstanding that Rawls original position is seen as an imaginary choice situation, the element of fairness which it encapsulates is something which can have practical application. As an example, it is known that the incentive to behave in ways antithetical to the group are reduced if procedures can be agreed to by participants before it is known what specific issues will be faced. That is, participants act behind a *partial veil of ignorance*, uncertain as to how their specific interests will emerge in the future. Partial ignorance is especially likely to impede acting for short term gains when participants meet repeatedly and have interests which change over time [Garret]. Ensuring that decisions are open and public also regulates non-cooperative behaviour. As compared with Rawls original position, partial ignorance does not demand that individuals try simultaneously to imagine themselves ignorant of their roles in society while actually knowing their social status.

Principles Bargaining & Strategic Planning

As with dynamic consensus building, partial ignorance will certainly play a role in fostering cooperative outcomes in civil-military operations. However, in complex operations it is not always possible for the different military and civilian organisations to meet face-to-face to develop the necessary consensus and shared understandings. Often contact may be only sporadic or intermittent. To overcome these difficulties some form of shared *a priori* understanding and agreement is needed.

Drawing on the Social Contract tradition, it is proposed that development of a Memorandum Of Understanding (MOU) between contributing civilian and military organisations be incorporated into the strategic planning process. The purpose of the MOU would be to articulate the agreed principles of cooperation underpinning the activities of participating organisations in complex operations. This would be achieved through the participation of representatives from relevant organisations in structured bargaining prior to undertaking the mission. The aim of such bargaining would be to establish common agreed understandings on the values to be upheld during the course of the operation. Such shared values would seek to provide the context in which specific decisions are to be made and structures established, acknowledging that a strongly defined set of rules to govern relations is unlikely to be useful.

To be effective, the agreed guiding principles must be seen to be fair. Fairness can be achieved when specific self interests are obscured behind some form of veil of ignorance. For practical situations, such as civil-military operations, it is unlikely that organisational interests will be ignored by those representatives chosen to stand for them. Instead, some form of explicit partial ignorance is called for as a realistic alternative. It has been noted that judges can successfully ignore information related to specific affiliations [Holmes]. By introducing additional participants into the bargaining process, such as judges, who play the role of those behind a veil of ignorance, a Rawlsian notion of fairness can be introduced. Specifically, while representatives from civilian and military organisations retain full knowledge of their roles and responsibilities, additional players, possibly judges able to perform the required abstractions, also participate in the bargaining process but behind the veil of ignorance. These additional players undertake negotiations as if they could be randomly assigned to work with any of the military or civilian participants upon completion of the bargaining process.

The application of additional players, such as judges, extends the already well established role played by negotiators and arbitrators in disputes. The extension is that these additional players do not just mediate bargaining, they are active participants in the bargaining process. It would be expected that the intrinsic uncertainties of complex civil-military operations would introduce an additional partial veil of ignorance to all participants which would help reduce short-term interest based behaviour.

Recognising the fluid nature of complex operations, appeal can be made to reconstitute this bargaining forum at a later time by participants. Furthermore, as the civilian and military organisations are represented by staff fully cognisant of their roles and interests, bargaining outcomes will reflect the longer term interest of those involved. The principles of cooperation are thus not based on altruism but rather strategies which support their goals. Compliance will be based on mutual enforcement and persuasion, such as with an industry code of conduct, rather than coercion. Those who choose not to cooperate do not share in the benefits of mutual cooperation.

It has been noted that civil-military operations can involve large numbers of different organisations, particularly NGOs. Incorporating all participants in the strategic planning process may prove to be impractical. This could be overcome by restricting attendance to key NGOs [Davidson et al, page 27], or use of representatives from

NGO umbrella organisations such as InterAction, a coalition of more than 160 private agencies [JP 3-08, page II-26], or the Geneva based International Committee of Voluntary Organisations (ICVO). Alternatively, civilian participation could be restricted to donor organisations [Davidson et al, page 27], to lead agencies [AJP-9, page 8-3], or to those participating in the Executive Steering Group. Striking the right balance of participation by NGOs will be facilitated by better education on the part of military and government planners about the NGO community [Davidson et al, page 28]

While it would seem that achieving agreement on principles amongst disparate groups is hopelessly complicated, it is well to remember that cooperative agreements have previously been achieved. As a contemporary example, the Kyoto Protocol involves over 140 countries, with some notable exceptions, acting together to realise long term benefits while sacrificing short term gains.

Principles

One of the principles which emerged from Rawls theory of justice was *that economic inequalities are justifiable only if they work to the greatest benefit of the least advantaged members of society* [Holmes]. Such a principle would certainly act to shape the development of future government policy. Through bargaining under partial ignorance similar principles could emerge to shape interactions in civil-military operations. Prima facie, areas requiring such guiding principles include: information sharing; the independence of organisations; engagement with ongoing activities; participation in briefings and planning; authority and support; assigning of geographic and functional responsibilities and transparency of plans and activities.

Benefits of Strategic Planning on Principles

As has been noted in U. S. doctrine, joint planning should include key participants from the outset [JP 3-08, page III-1]. Developing an MOU on cooperative principles as part of the strategic planning process provides a constructive framework in which to engage such participants. It also recognises the difficulty of applying detailed rules to complex situations, while not interfering in each organisations own organisational planning.

The legal basis for the participation of civilian organisations in operations is not always clear, being determined by the nature of the conflict and the existence or not of a functioning government [JDP 3-90, page 3-1]. In complex operations other legal boundaries may also be obscure, requiring that balance be maintained between many difficult dilemmas [Dallaire, page 37]. Being open and public, the principles agreed to through strategic planning in a partial veil of ignorance would provide an important objective point of reference helping to guide the behaviour of participants, whether military or civilian.

Risks of Strategic Planning on Principles

As with any negotiation process, application of bargaining as part of strategic planning runs the risk that deliberations will be drawn out or non-conclusive. Furthermore, the ability to appeal to the bargaining process at a later time risks some

participants using this as a bureaucratic devise to slow or obfuscate activities. To mitigate these risks consideration must be given to how the strategic bargaining situation is to be structured.

The Role of Structured Bargaining

Games and Bargaining

As has been noted, the interest in determining outcomes which are both stable and satisfy the interests of participants naturally leads to the application of Game Theory. A Game is a situation where players recognise that their actions influence each other. Formally a Game is represented by a set of possible strategies and payoffs for each participant. The actual payoff received by player is dependent on both their own and their opponents choice of strategy. A choice of strategies amongst players is stable if no one player has a unilateral incentive to change their strategy choice.

Bargaining is normally represented in Game Theory through a repeated game, where participants play each other many times. The interest is in determining strategies which yield cooperative outcomes amongst the players. An often employed game to investigate bargaining is the Prisoner's Dilemma. In this two-player game participants can choose to either cooperate or not cooperate, that is defect. Defection always results in a worse outcome for the other player. This game situation is represented in matrix form in Figure 1. The values in the matrix represent the payoffs to players 1 and 2 respectively when cooperating or defecting. The payoff received by each player is dependent on the strategy choices made by both participants.

Player 2

	Cooperate	Defect
Cooperate	1, 1	-1, 2
Defect	2, -1	0, 0

Player 1 (row label)

Figure 1. Representation of the Prisoner's Dilemma game.

This game is a dilemma because each player would benefit from mutual cooperation. However, if played only once, cooperating is not a stable strategy for this game since each player is faced with an incentive to defect i.e. a player can go from a payoff of 1 to 2 by choosing unilaterally to defect. As a consequence, mutual defection results and each player is worse off.

This situation alters if the game is repeated many times. For repeated games more elaborate strategies are possible which incorporate memory of previous decisions. As

demonstrated by Axelrod [Axelrod], the strategy Tit-for-Tat, where a player starts by choosing to cooperate and subsequently mimics the strategy choice of the opponent on the previous play, can result in the emergence of mutually cooperative outcomes.

Multi-player Games and Spatial Structure

Extending to bargaining situations involving many players can radically change the dynamics of how game outcomes develop. However, it also allows for investigation of the way that strategies evolve through a population. For example, in a Prisoner's Dilemma type situation, ignoring more elaborate multi-play moves such as Tit-for-Tat, players have the choice to either cooperate or defect. Taking the cue from biological systems, successful strategies receive a greater pay-off and so are viewed as increasing their fitness, leading to more offspring who will behave similarly [Maynard Smith] or to imitation by others [Ohtsuki, Hauert, Lieberman & Nowak]. Through such mechanisms successful strategies can ultimately dominate a population. For unstructured populations, where all individuals interact with each other, it is found that defectors ultimately drive co-operators to extinction [Ohtsuki et al].

The dominance of defection for initial mixed populations of co-operators and defectors need no longer hold true if players are interacting on a network. It is known that, in reality, interactions between individuals tend to occur through social networks. By varying the network topology investigation can be made of network types which promote cooperative outcomes for different forms of evolutionary replication. Such networks would form the template for potential bargaining situations which foster mutual cooperation.

An Illustrative Example: Selection Amplification with Fairness

Networks which act as selection amplifiers have indeed been investigated [Lieberman, Hauert & Nowak]. A selection amplifier is a network which promotes the reproduction of a new strategy introduced to a population playing a different strategy. Of the examples investigated it was found that scale free networks with most of their structure clustered in a few vertices were among the networks which acted as selection amplifiers. It was further found that cooperative behaviour was promoted on networks with low connectivity [Ohtsuki et al]. Indeed a simple rule was devised. If players receive a benefit b from neighbouring co-operators and pay a cost c to neighbours for choosing to be a co-operator (that is cooperating involves a cost while defecting costs nothing); and the average connectivity of the graph is k, then imitation selection will favour cooperation if $b/c > k+2$ [Ohtsuki et al]. Imitation selection involves randomly selecting one player from the population and determining the total fitness of co-operators and defectors connected to that player in the network, including the player in question. The selected player will change strategy stochastically based on the relative fitness of co-operators and defectors.

The interest here is in devising bargaining situations which promote cooperation. The insights gained from the evolution of cooperation on certain networks suggest that consideration be given to bargaining situations which limit interactions between participants, but which maintain sufficient interaction to allow participation of all the players in the bargaining process. That is, the bargaining situation should be designed to deliberately increase social viscosity. This is not a radical suggestion, legislative

assemblies and parliaments deliberately introduce procedural complexity to slow the decision making process and so encourage greater deliberation. To promote fairness in the bargaining process partial ignorance must also be introduced to the behaviour of some of the players.

An illustrative example will be used to demonstrate how these elements can be brought together to promote cooperation and fairness. Consider a set of 20 participants in a bargaining situation. Two cases are considered. In the first bargaining arrangement participants are allowed to interact freely with each other, while in the second they are arranged in a star structure. In the star structure the central player takes the role of the 'judge' operating under the veil of ignorance. These cases are illustrated in Figure 2, with eight players represented for simplicity.
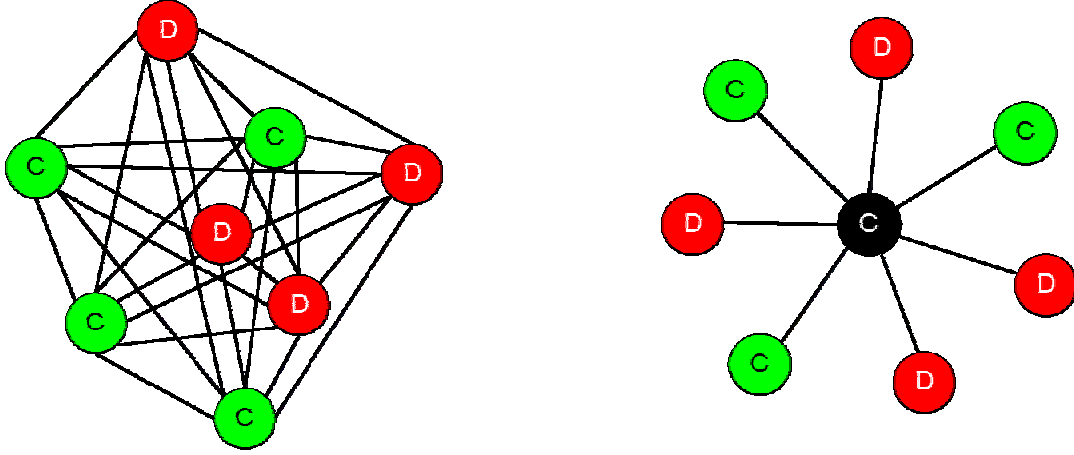

Figure 2: Two bargaining situations showing co-operators (C) and defectors (D) arranged on a complete and star network. The central player in the star structure represents the 'judge'.

Each player derives a payoff P from interaction with neighbouring individuals. For example, a co-operator connected with two other co-operators and a defector pays a cost $3c$ and receives a benefit of $2b$, so that $P=2b-3c$. The fitness of each player, that is the weight a player has in influencing the game, is given by $1-w-wP$, w measuring the intensity of selection [Ohtsuki et al]. This fitness structure recognises that fitness is not only derived from bargaining. For the purposes of illustration investigation was made for the case of weak selection with $w=0.01$. The average connectivity of the star structure with 20 players is 1.9. To satisfy the $b/c > k+2$, b was set to 4.5 and c to 1.0.

Consideration must be given to how the 'judge' will play behind the veil of ignorance. In this informational state of ignorance the 'judge' does not know initially whether it will be assigned at the end of play to a participant currently cooperating or defecting. To determine how the 'judge' will play consideration will be restricted to a two player game, as done by Binmore [Binmore]. Not knowing whether it will be a co-operator or a defector the judge is presumed to take a utilitarian approach and seek to maximise the sum of the available payoffs[6] [Binmore, page 47]. This leads to the two player game shown in Figure 3.

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[6] Binmore in fact rejects this approach, although it is the more traditional one used.

Other Player

Cooperate   Defect

		Cooperate	Defect
Judge	Cooperate	**2(b-c), b-c**	**b-c, b**
	Defect	**b-c, -c**	**0, 0**

Figure 3. Two player game for the judge against another player.

For the 'judge', cooperation is a dominant strategy. The 'judge' is thus initially set to be a co-operator, although it is free to change this position as the game progresses.

Figure 4 shows the results of simulation runs for the homogenous case (all players interacting with each other), the star structure without a judge, and the star structure with a judge placed at the centre of the star and initially cooperating. The simulations were initiated with 1, 6, 11 or 16 co-operators, chosen randomly except for the 'judge', and measured the proportion of times that the network fixated on complete cooperation. In each case data was gathered from 10^4 runs, with each run consisting of 10^4 repetitions of the game. As expected, the star structure significantly enhances the probability that full cooperation will be achieved. Interestingly, placing the 'judge' behind the veil of ignorance and initiating it as a co-operator enhances the probability of cooperative fixation.

Probability of Cooperative Fixation for Different Bargaining Arrangements
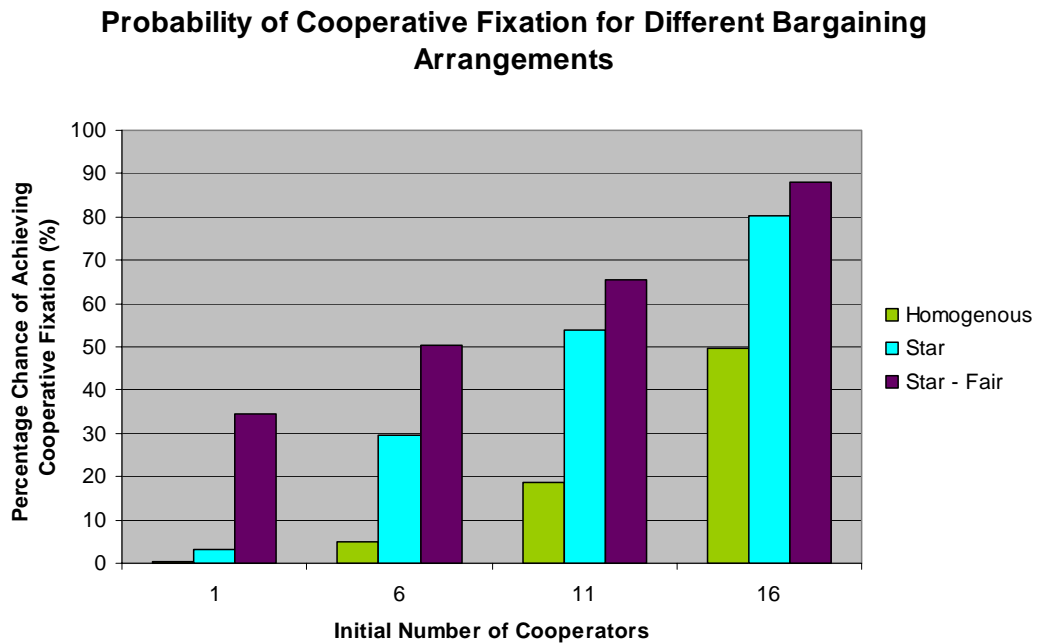

Figure 4. Probability of cooperative fixation for different networks

Real bargaining situations will require constructs far more elaborate than the star network. Nevertheless, there are precedents suggesting that structured bargaining can have practical application; the formal structure of the UN security Council with its distribution of membership and voting rights being an example. The potential to employ structured bargaining which also achieves fair outcomes certainly deserves further investigation, and may minimise risk in the strategic planning process.

Conclusion

It has been noted that *Research into how best to organise and use collaboration is one of the areas where future research......and experimentation should focus* [Alberts & Hayes 2006-2, page 186]. This paper has proposed a new approach to engaging civilian and military organisations in strategic planning, focusing on the development of guiding principles of cooperation to shape ongoing engagement in the field. Such an approach provides a framework in which to engage participants early in the planning process while recognising that development of a fixed set of rules is not practical for fluid contingencies. Through mutual agreement, these guiding principles form the basis for accountable action by participants. Bargaining on the best set of principles should be undertaken through structured arrangements which seek to promote cooperation and employ the partial veil of ignorance to ensure fairness. Those not willing to cooperate are excluded from the benefits of mutual action.

Further work is required to develop the concept. In particular, investigation of more realistic bargaining situations is needed, with greater sophistication added to the network structure and attributes of the players, including reputation, bluff and signalling. Outcomes of such analysis would form natural targets for a program of experimentation.

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