Managing Complexity in International Negotiations: Is there a role for treaty secretariats?[1]

Introduction

International negotiations whether over arms, trade, or the environment are becoming increasingly complex. This complexity poses two substantial challenges to states and their negotiators: managing vertical complexity and managing horizontal complexity. Vertical complexity refers to the interaction between domestic politics and international relations. Horizontal complexity refers to the increase in the number of parties. The greater the domestic and international interaction the greater the vertical complexity, and the more parties to the negotiations, from bilateral to multilateral, the greater the horizontal complexity. For the parties and those negotiating on their behalf, a failure to manage this complexity may result in a failure to reach agreement.

The increased complexity of international negotiations presents difficulties not just for negotiators and states, but also for the theorists seeking to develop models through which to understand negotiations and to predict or explain their outcomes. For theories, such as game theory and negotiation theory, the challenge is to move beyond single level games where the focus is either domestic or international (but not both), and to move beyond the traditional bargaining model, which assumes that the negotiations involve only two parties.

In this paper, I argue that understanding complexity management is an important dimension of analysing negotiations and one that helps to improve our understanding of the overall negotiation process (Crump and Zartman 2003). More concretely, I will consider whether theories of international negotiations could be enriched by better connecting with the real world complexities present in current international negotiations. In exploring the increase in vertical and horizontal complexity in international negotiations, I will suggest two new types of complexity that emerge: natural complexity and engineered complexity. Thinking about complexity in this way might also help us to consider the role of treaty secretariats in a new light.

In the first part of the paper, I will canvass the gap between the theoretical models and the 'real world' of international negotiations using the case of the climate change negotiations. In doing so, I will emphasise how the theoretical models of game theory and negotiation theory have developed to address the increase in vertical and horizontal complexity in international negotiations. In the second part of the paper, I will explain how natural complexity and engineered complexity emerge from the uncertainty that increases in vertical and horizontal complexity produce, and I will consider, albeit briefly, whether treaty secretariats could play a role in managing these types of complexity in international negotiations.

[1] Christian Downie, PhD Scholar, Regulatory Institutions Network, Australian National University.

Theoretical models: game theory and negotiation theory

Two theories have dominated explanations of international negotiations: game theory and negotiation theory. While negotiation theory has developed largely in response to the limits of game theory, both have evolved in their own unique way to incorporate greater vertical and horizontal complexity. The development of the two-level game in game theory in particular has gone a long way to improving our understanding of vertical complexity, while the recent focus on multilateral negotiations in negotiation theory has helped to explain the nature of horizontal complexity.

Before going on however, a word about vertical and horizontal complexity. In this paper, vertical and horizontal complexity are conceived rather simply. For example, it might not always be the case that an increase in horizontal complexity produces an increase in uncertainty. An increase in the number of parties could potentially reduce uncertainty if it provided greater information to existing parties about how other parties would behave. In other words, there could be a trade-off between complexity and uncertainty. In addition, complexity obviously does not come in only two forms. Rather, there are other ways of characterising it, such as political complexity, and especially in the case of climate change, scientific complexity. Nevertheless, in this paper the focus is limited to the uncertainty produced from vertical and horizontal complexity and the new types of complexity that emerge, rather than on the nature of vertical and horizontal complexity itself. Accordingly, the following discussion necessarily oversimplifies some aspects of these two concepts in order to highlight others.

Game theory

Game theory aims to understand rational behaviour in real conflict situations. Largely mathematical, it has developed sophisticated models for understanding how rational individuals will make decisions in various types of conflicts. The classic example is the prisoner's dilemma. In this game, two players (the prisoners) face a choice whether to cooperate and not speak to police, or to defect and provide evidence to police against the other prisoner in return for immunity. While both players will be better off if they cooperate, if each pursues his or her rational self-interest with no concern for the other player and defects, both players will be worse off.

With its capacity to provide full descriptions of the strategies that rational individuals can take, and to provide a description of the outcome when the strategies of players interact; Sebenius (1992:18) has stated that one 'might quite reasonably ask about the need for a new approach since the theory of games already provides a logically consistent framework for analysing negotiating situations'. However, as he and others have pointed out, there are limits to what game theory can explain as a descriptive or predictive theory when tested empirically.

Many of the limits are well known. For example, it unrealistic to assume that negotiators are highly sophisticated individuals who are completely rational and are able to make calculations based on infinite information no matter the complexity. And unlike the traditional prisoner's dilemma, which is a single-shot game, in reality most games are

repeated, which in itself is likely to produce very different outcomes. Not least, where players are concerned about their reputation there is a greater chance for cooperation than suggested in the prisoner's dilemma.[2]

However, in the context of international negotiations where domestic politics and international relations are becoming ever more entangled (i.e. where vertical complexity has increased) traditional game theory has been limited by its focus on single-level games (Gourevitch 2002), based on either the domestic level, or international level. Consequently, it is not very good at handling what happens when more than one level is in play, as occurs in international negotiations with domestic politics and international relations. This difficulty is increasingly well recognised and international relations scholars have long 'fretted over whether and how to integrate the domestic and international levels of analysis' (Fearon 1998:304). Yet influenced by the neorealist belief that the structural constraints of the international system are what matter, domestic politics has been largely neglected in international relations, notwithstanding the manifest inadequacy of this approach (Gourevitch 2002, Moravcsik 1993, Haas 1998).

A breakthrough was provided by Robert Putnam (1988) who, recognising the need to understand how domestic politics and international relations interact, developed the two-level game which sought to incorporate the vertical complexity present in international negotiations. Putnam argued that the politics of many international negotiations can be viewed in these terms. At the national level, domestic groups pressure their governments to adopt policies they support, while governments seek power by engineering coalitions among their national constituents. At the international level, governments want to satisfy domestic pressures, while limiting any negative consequences from foreign developments.

In this two-level game governments try to manipulate domestic and international politics simultaneously. At the international level (Level I) bargaining is between international negotiators who are attempting to reach a tentative agreement. They are accompanied by their advisors and diplomats at the table. At the national level (Level II) separate discussions are taking place within the various constituent groups about whether to ratify the tentative agreement at Level I. The same negotiators appear at this table, as well, but here they are accompanied by parliamentary figures, bureaucrats and interest group spokespeople.

The success or failure of the negotiations is determined by what occurs at both tables. As Putnam points out, the 'political complexities for the players in this two-level game are staggering' however, sometimes 'clever players will spot a move on one board that will trigger realignments on other boards, enabling them to achieve otherwise unattainable objectives (Putnam 1988:434).

For an agreement to be reached the tentative agreement at Level I must be 'ratified' by both parties at Level II. The term ratification is used generically to refer to any process

[2] For a discussion of these and other limits of game theory see, among others, (Siebe 1991, Sebenius 1991, Sebenius 1992, Axelrod 1984, Raiffa 1982, Jonsson 2002).

that is required to endorse the agreement, be it a referendum or public opinion. The key point is that at Level II each side has win-set: 'the set of all possible Level I agreements that would "win" – that is, gain the necessary majority among the constituents – when simply voted up or down' (Putnam 1988:437). Only when the tentative agreement reached at Level I falls within the Level II win-sets of both parties will an agreement be passed.

Accordingly, the larger the win-sets the greater possibility of an agreement because the more likely they are to overlap. However, a large win-set can also be a bargaining disadvantage. For example, if Player A's win-set is very large, Player B can push for more concessions because it knows that they will fall within the win-set of Player A. Further, given Level I negotiators have an incentive to understate their own win-set, they may try and capitalise on the uncertainty of the opposing negotiator by convincing them that their win-set is 'kinky'. That is, that the proposed deal is certain to be ratified, but that anything that is slightly more favourable to the other party is likely not be ratified.[3]

Negotiation theory

While the development of the two-level game in game theory has gone a long way to accounting for the vertical complexity of international negotiations, game theory has not been able to move beyond the two player bargaining model and fails to account for horizontal complexity. Although negotiation theory has been handicapped by the same focus, some scholars have begun to examine multilateral negotiations and the ways that parties to those negotiations manage complexity.

Negotiation theory begins from the premise that most explanations of how states reach agreement in negotiations and why they reach the agreements they do are only partial. For example, some, like international relations scholars, explain international agreements through an analysis of the international sphere and of external incentives to which states respond. Others, like political scientists, consider the domestic politics of nations to explain the formation of agreements.

Yet if external incentives explain international agreements, why are negotiation outcomes different even when the external incentives are identical? Equally, if domestic politics explain international agreements, why do states with the same domestic politics reach different agreements? In large part, the answer is that the negotiation process itself makes a meaningful difference to the negotiated outcome. That is not to say that the interstate distribution of power, international institutions, or markets, for example, do not affect the agreements reached; rather it is that these exogenous factors do not predetermine that

[3] Since Putnam's initial work, many scholars have sought to further different aspects of the two-level game. For example, some scholars have challenged Putnam's claim that negotiators with small Level II win-sets are in a stronger bargaining position (Caporaso 1997, Evans 1993, Lida 1993). Others have sought to elaborate on the nature of win-sets by considering the role of public opinion (Trumbore 1998), the use of synergistic strategies beyond those identified by Putnam (Schoppa 1993), and the role of the negotiator or statesman (Moravcsik 1993).

agreement. On the contrary, the negotiation process itself affects the agreements reached because it provides 'ample wiggle room for the creation, alteration and resolution of interests' (Singh 2006:80).

Negotiation theory, then, is focussed on the negotiation process itself. That is, the 'sequence of actions in which two or more governments address demands and proposals to each other for the ostensible purpose of reaching an agreement and changing the behaviour of at least one party' (Odell 2006:2). In analysing the negotiation process, scholars in this tradition relax some of the key assumptions of game theory. The game theory notion of a zero-sum game where one player wins at the expense of another is transformed into a positive-sum game. In other words, the negotiation process is conceived 'as one of doing better, not one of winning' (Zartman and Berman 1982:12). Similarly, the assumption that negotiators are fully rational is relaxed so that negotiators make decisions using bounded rationality. Although the players are rational, they are bounded by incomplete information and their ability to perform complex calculations.

As the horizontal complexity of international negotiations has increased negotiation theory has attempted to introduce some of the real world complexity of multilateral negotiations into their models. This is critical because, as Zartman (1994) has pointed out, multilateral negotiations are fundamentally different to bilateral negotiations because the initial position of the parties is not adversarial. In bilateral negotiations the process is structured by definition as between two opponents, whereas in multilateral negotiations it must be structured according to the parties and issues and the roles the parties play

Although the literature on multilateral negotiations is limited, one of the focuses of negotiation scholars has been on how parties to such negotiations manage complexity. As Crump and Zartman (2003) explain in their introduction to a special issue of *International Negotiation* on multilateral negotiations and the management of complexity, this work seeks to understand how negotiation dynamics can be understood when many sides, parties, issues and roles are involved.

In order to produce outcomes, parties to negotiations must find ways to manage their complexity. One of the chief ways parties manage horizontal complexity, and to some extent vertical complexity, is by building coalitions. A coalition can be defined as a 'set of governments that defend a common position in a negotiation by explicit coordination' (Odell 2006:13).[4] Coalitions can enable parties to reduce the information burden generated by the horizontal complexity of multilateral negotiations where it is almost impossible, especially for smaller less well-resourced states, to track the positions and preferences of all the parties on one or multiple issues. By sharing information and coordinating their actions, coalition building provides states with a means to navigate multilateral negotiations and thereby produce outcomes.

[4] Within coalitions, and negotiations generally, parties can play a number of roles. As Zartman (1994) has argued, they can drive, conduct, defend, brake or cruise. For example, drivers try to organise the participants to produce an agreement congruent with their interests whereas, defenders are concerned with the promotion of a single issue than with the overall success of the negotiations.

In summary, the developments in game theory and negotiation theory have gone some way to incorporating increased vertical and horizontal complexity into their theorising. However, as we shall see in the following section, the state of play in international negotiations, like the climate change negotiations, begs the question whether these theories need to go further and introduce greater 'real world' complexity.

The 'real world' complexity of the climate change negotiations

The complex nature of international negotiations was on show at the thirteenth Conference of the Parties (COP) to the UN Framework Convention on Climate Change (UNFCCC) and the third meeting of the parties to the Kyoto Protocol held in Bali in December 2007. As one commentator remarked 'never before had climate policy been so complex, involving such a multitude of actors and issues' (Ott et al. 2008:92). Present at the meeting were almost 10,000 people representing almost two hundred states and hundreds of non-governmental and media organisations.

Horizontal complexity

As the climate change negotiations in Bali highlighted, long gone are the days when international negotiations were characterised by two states that sat down in one forum to negotiate one issue. Rather than two states, as typically characterised in game theory and negotiation theory, there were 191 states present, as shown in Table 1. In addition, reflecting the growing role of non-governmental organisations (NGOs), there were 32 intergovernmental organisations and 338 non-governmental organisations. Putting aside media organisations, there was a total of 598 parties to the negotiations, up from 504 at the climate change negotiations in 2000 (UNFCCC 2007, UNFCCC 2000).

Table 1 Participation at COP 13

	States/Organisations	**Registered Participants**
Parties	188	3,264
Observer States	3	7
Total Parties and Observer States	**191**	**3271**
UN Secretariats units and bodies	20	188
Specialised agencies and related organisations	17	201
Intergovernmental Organisations	32	254
Non-governmental Organisations	338	4483

Total Observer Organisations	**407**	**5126**
Media	442	1265
Total Participation		**9662**

Source: UNFCCC (2007).

As discussed in negotiation theory, the parties to the climate change negotiations have established coalitions to attempt to address the complexity of the negotiations. However, with so many individual parties, there are still numerous formal coalitions and many more moving coalitions that have appeared and disappeared in the course of the climate change negotiations. Table 2 provides a summary of the principal formal coalitions.

Table 2 Principal Coalitions in the Climate Change Negotiations

Coalition	Description
EU	It comprises the 27 member states of the European Union. They normally meet in private to agree on a common negotiating position.
G77 + China	It comprises over 130 developing countries. Although it normally acts in negotiations as one entity because of the diversity within the group individual countries and sub-groups often intervene in debates.
AOSIS	The Association of Small Island States is a coalition of 43 low-lying small island countries that are particularly vulnerable to climate change. Most are members of the G77 + China.
LDCs	It comprises the 48 Least Developed Countries as defined by the United Nations.
African Group	It comprises 53 African countries and is the only UN regional group serving as an active negotiating coalition. A number of the members are also members of other coalitions. For example, Algeria and Nigeria are also members of OPEC.
Umbrella Group	It is a loose coalition of non-EU developed countries, which formed after the Kyoto Protocol and who often speak independently. They generally include Australia, Canada, Iceland, Japan, New Zealand, Norway, Russia, Ukraine and the US.

EIG	The Environmental Integrity Group is a recently formed coalition that comprises Mexico, the Republic of Korea and Switzerland.
OPEC	The Organization of the Petroleum Exporting Countries is a group of thirteen countries including, Iraq, Iran, Saudi Arabia and Venezuela. They have been hostile to the climate change agenda.
CG-11	The Central Group is a coalition of countries characterised as 'economies in transition' that are Annex 1 countries.
CACAM	The Central Asia, Caucasus, Albania and Moldovia are a group of countries that do not consider themselves developing, and which are not part of Annex I or G-77 + China.

Source: (UNFCCC 2002, Yamin and Depledge 2004: Ch 3).

Vertical complexity

While domestic politics and international relations invariably interact in most international negotiations, the extent to which this occurs in environmental negotiations has rarely been greater than in the course of the climate change negotiations. The vertical complexity reflects the nature of the problem, or what some scholars have called the 'problem structure' (Bauer et al. 2007, Busch 2006). This refers to the cost of public action to fix the problem and the political saliency of the problem in participating countries. While the costs of addressing climate change are often overstated, there is little doubt that it will require a fundamental restructuring of the economies of the world (Stern 2007). Likewise, responding to climate change involves higher political stakes for most nations than any other environmental challenge they have faced. The effect of policies to cut emissions is politically contentious and most countries face a difficult challenge to manage the tension between the issues and interests at the domestic level and the negotiations at the international level. In other words, to manage the two-level game.

A snapshot of the issues that are to be negotiated on the road to the COP in Copenhagen in 2009 provides an insight into the vertical complexity that parties must manage if the negotiations are to produce an outcome. First developed countries need to determine emission targets for 2050 and interim targets for 2020. This issue was highly contentious at the Bali negotiations where the EU and the US faced-off on whether a target range of 25-40 per cent emission cuts on 1990 levels for developed countries should be referenced in the negotiating text (Earth Negotiations Bulletin 2007). Second, and equally as contentious, is the responsibilities developing countries should have after 2012. Then there are additional issues surrounding financing for emissions reductions from deforestation, how to expand and spread the global market for low-carbon technology, financing adaptation for developing countries and so on (Stern 2008).

Although there are several means that parties can use to manage this type of complexity, such as issue sequencing, which involves negotiating each issue separately and sequentially, or issue linkage, which refers to combining issues and negotiating them as a

package (Jonsson 2002: 223), the breadth and depth of information that parties must manage in order to produce an outcome remains far beyond the conventional conceptualisations of game theory and negotiation theory. Indeed, despite the developments in both theories to account for the growth in horizontal and vertical complexity, there remains a large gap between the theoretical models of international negotiations and the real world complexity of negotiations as illustrated by the climate change negotiations.

Thinking about complexity: natural complexity and engineered complexity

It has been argued that managing complexity is basically a way of thinking about negotiations in order to achieve a better comprehension of the full process (Crump and Zartman 2003). Thinking about complexity, this section will consider how natural complexity and engineered complexity emerge from the uncertainty that increases in vertical and horizontal complexity produce. In particular, I will argue that when negotiations are characterised by natural and engineered complexity parties will find it considerably more difficult to find a zone of possible agreement and to reach an agreement within this zone. However, arguing that natural and engineered complexity is a problem for international negotiations is one thing, showing how they could be managed is another altogether. In this section, I will focus on the first, less ambitious task. The case made here, I hope, will motivate others to engage with the second, and far more demanding challenge.

Horizontal complexity

As the number of parties increases so too does the difficulty of digesting and processing the necessary information to find a zone of possible agreement and to successfully negotiate an outcome within this zone. In other words, it is not certain that the negotiation process will be able to act as the melting pot that allows the parties to meld their varying interests into a negotiated agreement.

If the varying interests of the parties are to be resolved parties must be able to identify strategies that allow them to navigate the 'negotiator's dilemma', which is the tension between when to create value and when to claim it, as opposed to the tension between when to cooperate and when to defect in the zero-sum prisoners dilemma. Broadly speaking, parties can employ a host of negotiating strategies ranging from purely distributive strategies that include opening with high demands, refusing all concessions, exaggerating one's bottom line position and making threats, and purely integrative strategies that include sharing information, suggesting an exchange of concessions without demanding compensation, or reframing the issue to make agreement easier (Odell 2006, Odell and Mena 2004). Accordingly, creating value involves cultivating shared interests, exploiting economies of scale and dovetailing differences. In contrast, claiming value involves taking strong positions, manipulating concessions and misleading the other parties, among other tactics (Sebenius 1991, Sebenius 1992). In short, creating value entails integrative tactics whereas claiming value entails distributive tactics.

In horizontally complex negotiations where there is considerable uncertainty it could prove extremely difficult for parties to track state preferences and to know when to use strategies to create value and when to use strategies to claim value. This will be particularly so for smaller delegations that are often inadequately resourced and that lack the relevant substantive knowledge about the issues and the treaty process.

Vertical complexity

In negotiations where domestic politics and international relations are entangled Putnam's (1988) two-level game highlights how for an agreement to be reached, the win-sets of both parties must overlap. Yet although the larger the win-sets the greater the possibility for an agreement, Putnam also argued that a large win-set could be a bargaining disadvantage, because the other party knowing this could push for greater concessions. As a result, negotiators have an incentive to understate their own win-set.

[A] *utility maximising negotiator must seek to convince his opposite number that his own win-set is "kinky", that is, that the proposed deal is certain to be ratified, but that a deal slightly more favourable to the opponent is unlikely to be ratified* (Putnam 1988:453).

The point here is that parties have an incentive to pray on the uncertainty of the other party, that is, to exploit their limited knowledge of their domestic politics at Level II. Therefore, the greater the vertical complexity of the negotiations, the more likely that each party will face information deficits that encourage the opposing party to manipulate the other's uncertainty. Put differently, the greater the vertical complexity the less likely the parties will be able to find a zone of possible agreement where an outcome can be reached.

Natural complexity and engineered complexity

Horizontal complexity and vertical complexity increase the amount of information that parties must grapple with as they attempt to reach an agreement. Indeed, one could argue that there is little difference between these two conditions since both involve incomplete information. However, such an argument would gloss over a subtle but important difference. While it is true that both conditions are about a lack of information that result in uncertainty, the critical point is the different *types* of information problems that this uncertainty can produce.

First, horizontal complexity produces what I will term 'natural complexity'. Natural complexity creates uncertainty, which is produced organically as the number of parties to the negotiations increase. So the more states, IGOs and NGOs join the negotiations the greater the natural complexity. In essence, uncertainty is a by-product of natural complexity. The problem with natural complexity is that it increases the likelihood that negotiations will become mired in too much information.

Second, vertical complexity produces what I will term 'engineered complexity'. Engineered complexity is not about the mass of information but rather about the manipulation of uncertainty. That uncertainty (in the minds of the parties) is a product of natural complexity. But parties approach that complexity with bounded rationality, not

only do they have incomplete information but they are limited by their capacity to make complex calculations. When this uncertainty is manipulated by another party it produces engineered complexity. Engineered in so far it is not naturally occurring and must be actively created by one party that chooses to manipulate the uncertainty that another party may have about its win-set. For example, Party A may try to convince Party B that it cannot begin to reduce emissions until 2012 without threatening its electricity supply, even if internal feasibility studies have shown Party A that it can reduce emissions and maintain a secure a electricity supply from 2010 not 2012.

The critical point of this paper then, is that if successful outcomes are to be reached in international negotiations natural complexity and engineered complexity will have to be managed. Obviously, the first part of this process has been to identify or recognise that these types of complexity exist. It is beyond the scope of the paper to consider how these types of complexity might be managed (although it is hoped that it will motivate others to do so). However, the final section will engage in a tentative exploration of one aspect of this challenge by proffering some suggestions about the role treaty secretariats might be able to play in managing complexity.

Could treaty secretariats manage natural and engineered complexity?

The role of treaty secretariats has been largely overlooked in international negotiations. This is mainly because scholars have traditionally argued that states determine international relations and other actors are epiphenomenal. However, as scholars have moved away from this strict realist interpretation to focus on regimes and non-state actors, the role of treaty secretariats have received some, albeit limited, attention (Depledge 2005, Depledge 2007, Bauer 2006). While it remains true that international relations is determined largely by forces other than treaty secretariats, their unique place in international negotiations suggests that they could play a role in managing natural and engineered complexity.

Before turning to treaty secretariats however, it is necessary to mention briefly, the types of information states would require to manage natural and engineered complexity. Clearly, the management of natural complexity will require different information to that needed to manage engineered complexity.

First, because natural complexity refers to the uncertainty produced from too much information, parties are likely to require more relevant substantive knowledge about the issues being negotiated and the treaty process. Negotiation theorists have argued that one of the limits of game theory is that it assumes that parties to negotiations are rational with complete information, and that all parties are aware of all of the rules of the game, often referred to as the common knowledge assumption. However, as negotiation scholars and some game theorists have highlighted, these assumptions are rarely met. As a result, scholars of negotiations have relaxed these assumptions and have argued that negotiations take place in a world of bounded rationality where players have incomplete information and are limited in their capacity to make complex calculations.

If the complexity of the climate change negotiations is any guide, not all parties to the negotiations are likely to have the resources or the expertise to digest the hundreds of proposals and draft texts on dozens of issues under discussion. In addition, numerous parties are also likely to have difficulty navigating the rules and procedures of the negotiation process. The effect will be to reduce the potential for negotiations to produce an outcome. However, to the extent that the parties have access to relevant substantive knowledge about the issues being negotiated and to expertise regarding the treaty process, the more complete the information of parties, the more likely parties will be to identify a zone of possible agreement and to reach an agreement within that zone.

Second, managing engineered complexity is likely to be much more difficult than managing natural complexity because it results from the manipulation of uncertainty that derives from incomplete information, rather than simply from a lack of information. As Robert Putnam's (1988) two-level game showed, where domestic politics and international relations are entangled, negotiators at Level I have an incentive to understate their own win-set and to convince the other party that their win-set is 'kinky'. This is possible in complex international negotiations because both parties are likely to have only limited knowledge about the others' win-set, that is, its domestic politics at Level II. In this context, where engineered complexity is present, parties will be reluctant to reveal their true preferences and will often prefer to keep their cards close to the chest as they attempt to manipulate the uncertainty of the other party to gain a better deal for themselves. Yet the obvious ramification of this process is that finding a zone of possible agreement, or in Putnam's words, finding where the win-sets overlap, and reaching an agreement within this space will be very difficult.

Accordingly, to manage engineered complexity parties are likely to require information about the true preferences of the parties and the coalitions, rather than the preferences articulated in their public posturing. This information would enable the parties to find the 'actual' zone of agreement and to negotiate outcomes that would otherwise be eluded as parties go about manipulating the uncertainty of other parties by claiming that their win-set is 'kinky'.

To some extent, the parties themselves can play a role in managing natural and engineered complexity. For example, a state that can increase its substantive knowledge of the issues being negotiated and of the treaty process, by, among other things, improving the training of its negotiators and the relevant technical expertise at their disposal, will be better placed to manage natural complexity. However, for engineered complexity the possibility for a state is more limited. For example, the ideal way for a state to manage engineered complexity would be to refrain from creating it in the first place by manipulating the uncertainty produced from natural complexity. Yet this is unlikely to occur, much like it is unlikely for a sprinter in the 100 metre final to slow down over the last 10 metres to allow a rival to win the race.

Given the limits on what states can do because of their position in the negotiations, the question I want pose here is whether treaty secretariats could play a potential role in managing natural and engineered complexity. A treaty secretariat can be defined as 'an international organization established by the relevant parties to assist them in fulfilling

the goals(s) of the treaty' (Andresen and Skjaerseth 1999:2). As intergovernmental bureaucracies formally working under the auspices of a multilateral regime, but run by independent international civil servants, some scholars also refer to secretariats as public non-state actors. Public in so far as they represent a collective of governments, but non-state because they are simply not states (Biermann and Bauer 2005, Bauer 2006).

Although treaty secretariats are considered actors in their own right, the limited empirical work that has been done on secretariats indicates that they do not have any autonomous political influence (Bauer 2006, Bauer et al. 2007, Sandford 1994, Sandford 1996). This is largely because their formal mandate and financial resources do not extend beyond providing technical and administrative support to the parties that they are obligated to serve. For example, Sandford (Sandford 1994:19) has described secretariats 'as the administrative hub of the treaty system', while others have conceived of secretariats as technocratic bureaucracies (Bauer 2006).

This description of treaty secretariats is based on the unique position they occupy in international regimes. A treaty secretariat is required to serve 'two masters', the parties and the regime. It must be seen to balance the interests of each party or coalition and never to be seen to prejudice the views of one party. At the same time it must manage the tension between supporting the ultimate objectives of the regime in which it operates and the parties to that regime that may not, in some cases, support these objectives. In other words, tightrope walking must be a stock in trade for any successful secretariat.

The tension of serving 'two masters' is clearly present, as Depledge (2005:66) has argued about the climate secretariat:

Fundamentally, the secretariat is thus required to serve two masters: on the one hand, as the guardian of the climate change regime, it is obliged to support the ultimate objective of that regime and therefore both to address climate change in a meaningful way, and to achieve success in the ongoing negotiations. On the other hand, the secretariat is subservient to, and dependent on, the will of the parties, having been established to serve them. Given the presence of obstructionist parties in the regime, these two goals do not always coincide.

Despite the difficult position secretariats occupy, some claims from the few empirical works on treaty secretariats suggest that they could play a role in managing natural and engineered complexity. For example, in relation to the climate secretariat, Busch (2006) has claimed that it is capable of grasping what formulations look promising and could constitute the basis for a mutually acceptable agreement. And he points out, that at the requests of parties the secretariat identifies options and makes strategic proposals on the conduct of negotiations. Likewise Depledge (2005:73) has stated that the climate secretariat plays an extremely important role in putting forward ideas and draft language that might help reach a compromise.

Whether this evidence indicates that the climate secretariat has helped parties to reduce the capacity of other parties to manipulate uncertainty, that is, to manage engineered complexity, or whether it indicates that the secretariat has done nothing more than help

the flow of information that parties already had access to is not entirely clear. Yet given the limited capacity of states to manage natural and engineered complexity and the importance of managing these types of complexity if successful outcomes are to be reached, it would seem worthwhile, at the very least, to inquire further into the possible role treaty secretariats could play.

However, it may be overly optimistic to contend that treaty secretariats could play such a role, especially given the risks this would present in offending some parties. To manage natural and engineered complexity a treaty secretariat would have to possess the political will and nerve to take a more active role in the negotiations. Yet in the absence of empirical work the jury is still out on whether they could play this a role.

Conclusion

One conclusion to draw from this paper is that international negotiations are becoming ever more complex and that this complexity in and of itself makes negotiating outcomes more difficult. As the climate change negotiations illustrate, rather than two parties present, as is typically characterised in theoretical models of negotiations, there are literally hundreds, and these parties commonly have limited information and are only boundedly rational. As the real world of negotiations has become more complex the gap between the negotiations and the theories has grown as well.

Although this paper has not tried to bridge the gap between the theory and the real world, it has tried to think about managing complexity in international negotiations in an attempt to more fully comprehend the nature of the negotiation process and the challenges that confront it. It has identified two new types of complexity, natural and engineered complexity, which emerge from the uncertainty that is produced from increases in horizontal and vertical complexity, two of the most common trends in international negotiations. It has also highlighted that when these two types of complexity exist, parties are likely to find it considerably more difficult to find a zone of possible agreement and to reach an outcome within this zone.

However, arguing that natural and engineered complexity is a problem for international negotiations and showing how they could be managed are two different things. In this paper, I have attempted to offer some preliminary ideas about the possible role treaty secretariats could play in managing these types of complexity given their unique position in international regimes. Nevertheless, without further empirical evidence it is not clear whether their position will enable or constrain them from playing this role. But at the very least, the paper has demonstrated the value of exploring issues of complexity in the management of international negotiations in general, and of exploring the role of treaty secretariats in particular. Doing so would appear to be a necessary prerequisite to the better management of international negotiations.

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