

Testing and automating human interactions in Peace and Stabilisation Operations

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Abstract

Confrontation and Collaboration Analysis (CCA) is based on a theory of human interaction. It describes and predicts how parties will react in situations where they have potentially or actually conflicting objectives. It can be used by Commanders involved in Peace or Stabilisation Operations (P/SO).

A key part of the theory underlying CCA is the role of emotion. Emotional responses provoke rationalizations that are the means by which parties' preferences, values and beliefs are altered as they attempt to pursue their objectives.

Over the past three years, the authors have undertaken mathematical and experimental research to test the theoretical assumptions underpinning CCA. Mathematically, a number of basic theorems extending the scope of CCA have been proved. In the experimental program, a range of networked 'Confrontation and Collaboration' simulators have been developed, allowing the collection of data on how decision makers (such as P/SO commanders and the Non-Compliant Parties they deal with) respond to situations where they must change the intent of another party to achieve their objectives.

Preliminary findings from this program have been presented in previous years. In this paper, we briefly review the results of the entire program and discuss the consequences of our findings.

Highlights of the research include: experimental evidence supporting the predictive capabilities of CCA; the ubiquity of CCA concepts in human interactions; fundamental issues in the use of automata in simulated environments.

Descriptions will be given of both the experimental design and the simulators. The simulators may be of interest to others involved in military decision making research.

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Introduction

Since the end of the Cold War, the military have been required to take on a new mix of tasks. Peace operations, such as those in the Balkans, have become increasingly important. The military have become involved in changing hearts and minds. Increasingly, all levels of command have had to understand and pursue political objectives rather than purely military ones. There is a consequent need to broaden our concept of the military task. Recently, the demands of post-conflict stabilisation in Afghanistan and Iraq have brought out the need for well-organized C2CC (Command and Control of Confronting and Collaborating). In particular, it has become clearer than ever that warriors often face the challenge of having to deal effectively with *emotional* situations in which it cannot be assumed that the other side will react rationally to the sticks and carrots we hold out to them.

The reason for this *irrational* behaviour is made clear by game-theoretic and drama-theoretic analysis, which shows that often it may be ‘rational to be irrational’. Basically, this is because irrationality can be used to make incredible threats, and promises, credible. My irrationality, for example, can make you believe that I will carry out a threat even if it harms me. Drama Theory (reference 1) proposes the general hypothesis that positive emotion, and the irrationality that accompanies it, has the function of making credible promises that would otherwise be incredible, while negative emotion has the function of giving credibility to incredible threats.

The techniques of Confrontation and Collaboration Analysis (CCA) are based upon drama theory (which was already being developed prior to 9/11) as the basis for a C2CC system to be used in Peace or Stabilisation Operations (references 2 and 3). The approach is to analyse the threats and promises parties need to make when interacting with each other, and deduce from them the pressure they are under to behave irrationally and, in the end, to change their beliefs and preferences—indeed, their whole value systems—in order to make those threats and promises credible.

As a formal modelling approach, CCA offers an explicit, complete, replicable and communicable way of developing plans to bring non-compliant parties into compliance. This objective—bringing parties into compliance—is the main effort of a commander in a theatre where a Peace or Stabilisation Operation (P/SO) is being conducted, such as Afghanistan or Iraq or, earlier, in Bosnia and Kosovo. War-fighting remains important as a threat to be executed where and when it becomes necessary at tactical level. At operational level and for most of the time at tactical level also, the emphasis is on confronting and collaborating. Just as a War-fighting campaign is won by conducting sequences of engagements, so a P/SO is won (i.e., compliance is achieved) by conducting sequences of confrontations and collaborations.

CCA’s basis in mathematics gives it the consistency and structure needed for the development of a computer-based C2CC system. At the same time, CCA is based on a theory—drama theory—that needs to be tested to ensure that it can be relied upon in operations. Mathematical development is also needed to ensure the reliability of extensions and developments of the underlying theory.

To meet these needs, tests of the theory and mathematical development of it have gone on for three years in a series of projects conducted by QinetiQ (references 4 and 5). Here we also report, briefly, on this work.

We begin with a brief overview of the principles of drama theory and show, by an example, how it is applied to military decision making. Next, we review the first two years' work. Following this, we describe our work in the third year, in the course of which computer simulations of human behaviour in drama-theoretic interactions were developed.

CCA and Drama Theory in brief

CCA makes use of Drama Theory (DT) in order to focus on how a commander (at operational or tactical level) can change the values and beliefs of non-compliant parties in order to bring them into compliance.

A drama-theoretic '*moment of truth*' is the point when parties are under rational-emotional pressure to change their effective values and beliefs. Such a '*moment of truth*' is characterised by a set of '*positions*', one for each party; and a set of '*fallback strategies*' – or threats – again, one for each party. To display this graphically, we use a representation called an '*options board*' (see Figure 1). A moment of truth is arrived at when parties have succeeded in making their threats and promises sufficiently clear that this options board – and the positions and fallback strategies it sets out – represent their '*common reference frame*' – i.e., each believes that all their communications assume and refer to it.

At this point, according to DT, there are six dilemmas that can face a party (see references 1 and 3); and when no dilemmas remain, the issues between the parties have been resolved. DT therefore asserts that parties work toward a resolution of their confrontation by attempting to resolve these dilemmas in their favour – whether they do so consciously or otherwise. Dilemmas in CCA arise from the *structure* of the confrontation – i.e., from the parties' options and preferences as well as their positions and fallback strategies. *Dilemmas*, then, are *formal properties* of the confrontation and can be determined from the options board.

A dilemma can be resolved in various ways; all that DT asserts is that parties' behaviour and attitudes will reflect one or another way of resolving their dilemma(s). A dilemma is essentially a mathematical inequality, and may be overthrown by changing any of the terms or 'constants' on either side. One general way of overcoming a dilemma is to change one's position. If, however, parties do not change their positions then each particular dilemma, paired with each particular way of resolving it, is hypothesised to generate certain *typical emotions* and *rationalisations* – i.e., attempts to justify changes in values and beliefs that would change perceived options and preferences in a way that would eliminate the dilemma in question.

For a military example, consider the following case, based on a confrontation in Bosnia. A Bosniac (Muslim) village contains refugees that the International Community (IC) agrees should return to a village now dominated by Serbs. Muslim ethnic leaders are responsible for sending the refugees back. The issue is whether

they should be sent back without co-ordinating with the IC, who are trying to pressure the Serbs into peaceful acceptance of the returnees, or whether they should be sent back in a manner organised and approved by the IC. The IC believes that the Bosniac objective is to send back the returnees in an uncoordinated manner in order to disrupt the Serb administration and score propaganda points. The Bosniacs maintain that the IC is putting insufficient pressure on the Serb administration to accept the returnees peacefully. They agree to co-ordinate returns with the IC provided the IC increases their pressure on the Serbs.

An options board representing this confrontation is set out in Figure 1. Note that there are two parties involved – the IC and the Bosniac leaders – both of which are coalitions of a number of different parties with multiple, partly over-lapping objectives. The Serbs are, of course, an important party in the background; they are not involved in this confrontation directly. The two parties that are involved must decide their strategies and preferences by making assumptions, hopefully based on good information, about how the Serbs are likely to react to what they do. Meanwhile, there is a simultaneous confrontation going on between the IC and the Serbs, in which the present confrontation is a background factor. The IC therefore needs to co-ordinate its handling of two different, ongoing confrontations. This is typical, and is one of the reasons why there is a military need for a C2CC system in a P/SO theatre.

	pi	I	f	B
<u>IC</u>				
increase pressure on Serbs	●	●	●	<input type="checkbox"/>
forcibly prevent returns	●	●	<input type="checkbox"/>	●
<u>BOSNIAC LEADERS</u>				
coordinate returns with IC	●	<input type="checkbox"/>	●	<input type="checkbox"/> ?
send returnees back without coordination	●	●	<input type="checkbox"/>	●
<u>Legend</u>	No coordination	Coordination	Forcible prevention	Pressure + Coordination
<input type="checkbox"/> option is taken				
● = option not taken				
pi = present intentions of parties				
I = IC position				
f = fallback				
B = Bosniac position				

Figure 1: Options board of confrontation between IC and Bosniacs

In Figure 1, the future being created by parties' present intentions, set out in column pi, is 'No Co-ordination'. The Bosniac position, 'Pressure + Co-ordination' (column B), is that they will co-ordinate returns with the IC if the IC will increase pressure on the Serbs. This is the publicly stated Bosniac position. However, the IC considers that the Bosniacs' real objective is to cause trouble by uncoordinated returns. This is

indicated by the **question mark** placed on this square. The IC position ('Co-ordination', set out in column I) is that there should be co-ordination of returns with the IC, but no increased pressure by the IC. The column f shows each party's fallback strategy. The Bosniacs are saying that if the IC will not increase its pressure on the Serbs, they will continue to send returnees in an uncoordinated manner; the IC is saying that if they do so, the IC will have to forcibly prevent returns.

Having set out the problem in this way, we can analyse the dilemmas faced in it. These follow from certain assumptions about their preferences, as follows:

- The Bosniacs want to make trouble, hence prefer 'Forcible Prevention' (column f) to 'Co-ordination' (I). Consequently, the IC has a persuasion dilemma, having no leverage to induce the Bosniacs to accept its position.
- The IC fears adverse publicity if it forcibly prevents returns, hence prefers 'Co-ordination + Pressure' (column B) to 'Forcible Prevention' (f). Hence, the IC faces a rejection dilemma, being under pressure to accept the Bosniac position.
- The IC even prefers 'No Co-ordination' to 'Forcible Prevention'. Hence, it has a threat dilemma. Its threat is not believed.
- Bosniacs, because their aim is to make trouble, prefer 'No Co-ordination + Pressure' to 'Co-ordination + Pressure' (B). Hence, they have a co-operation dilemma. The IC is unwilling to accept their position as genuine.
- Bosniacs prefer 'No Co-ordination' (pi) to 'Co-ordination' (I). Hence, the IC faces a trust dilemma. Were the Bosniacs to accept the IC's position, they could not be trusted to implement it.

From this analysis of dilemmas, we can say, for example, that the IC has a need to resolve its rejection and persuasion dilemmas. It might do this in two different ways. Both are likely to be discussed by IC members. The first response is positive toward the Bosniacs. It would involve the IC in thinking how to change its position by re-thinking its policy toward the Serbs so as to find a rational, justified way of satisfying Bosniac demands for greater pressure. Such a response involves taking a sympathetic view of Bosniac demands, leading to acceptance of a suitably qualified version of the Bosniac position. Another, quite different way forward would be for the IC to take a stronger line against the Bosniacs, thinking up options (e.g., denial of aid or stronger military measures). That would eliminate the IC's persuasion dilemma and simultaneously give the Bosniacs a rejection dilemma by making the fallback worse for them than our position. This response is negative toward the Bosniacs. The emotion propelling it is anger or disgust with their policies and a search for rational ways of 'demonising' them – i.e., of justifying a tougher line against them.

The first two years' work

Our discussion will cover what was learned from both the mathematical and the experimental work. Full details of both have been reported at previous CCRTS meetings (references 3, 4 and 7).

Co-ordinated positions. In the first year of mathematical work, the fundamental theorems of DT were generalised to the case when a party's position need not be a

complete specification of its demands. Instead, its position may consist merely of specifying certain options it demands should be played, and certain others it demands should not be played, while in relation to other options, it may take no position. Previously, the theorems had only been proved for the case when each party takes a position in relation to each and every option.

This generalised definition of a party's position was called 'co-ordinated' because it was proved to be such that, if each party separately tried to implement such a position, its implementation would be guaranteed without further need for parties to co-ordinate their strategies. Various theorems were proved showing how, if a position was not co-ordinated in this sense, co-ordination could be achieved.

The fundamental theorems of DT that were re-proved for the general case of 'co-ordinated' positions tells us that if and only if all dilemmas are eliminated, the parties have found a common position that they trust each other to carry out. They have therefore solved their joint problem in a satisfactory manner. Various other theorems about 'general' positions were also proved, but these fundamental theorems are the most important.

The fundamental theorems can be interpreted to mean that if dilemmas exist, parties will be under psychological pressure to eliminate them—since each of them wants a satisfactory resolution that will satisfy its own objectives. This is the basis of DT as a theory of 'emotion & rationalisation' preference change.

Modification of the theory due to experimentation. Our experimental work in the first year led us to modify and re-formulate the DT hypotheses to take account of this process of change. The modification was made to make a clear distinction between *collaborative* interactions—in which parties have arrived at compatible positions, but are not necessarily able to trust each other to implement a common position—and *confrontational* interactions—in which their declared positions are incompatible. Figure 1 is an example of a confrontation. If the IC, in this example, were to find a way of satisfying Bosniac demands for greater pressure, this confrontation would be transformed into a collaboration—one in which each party would be mistrustful of the other, as indicated by the question marks in column B.

We found a big difference in behaviour between these two kinds of interactions—confrontational and collaborative. In a confrontation, overt statements by each party of their fallback strategies ('threats') are necessary, and there is a consequent tendency toward negative emotion, as each tries to make it credible that it prefers to carry out its threat rather than accept the other's position. This tendency was found in our experiments when subjects were put in the decision tree of Figure 2 and Red took B as its position and Left as its fallback strategy, while Blue took A as its position and Right as its fallback strategy.

By contrast, when subjects were put in the decision tree of Figure 3 and both took B as their position, they were in a collaborative interaction—but one where Red would find difficulty in trusting Blue to carry out their agreed position. In this situation, the parties' dilemmas of trust and co-operation do not depend on their having fallback strategies. Consequently, we found that Red subjects often resisted making overt statements as to what they would do if they did not trust Blue; they often claimed that

such statements were ‘not applicable’ on the grounds that they did trust Blue! Moreover, if a Red subject gave Right as its fallback strategy, Blue often reacted with negative feelings toward Red—contradicting the DT prediction that in a collaborative situation, parties that express feelings will express positive or apprehensive feelings toward each other, but not negative feelings.

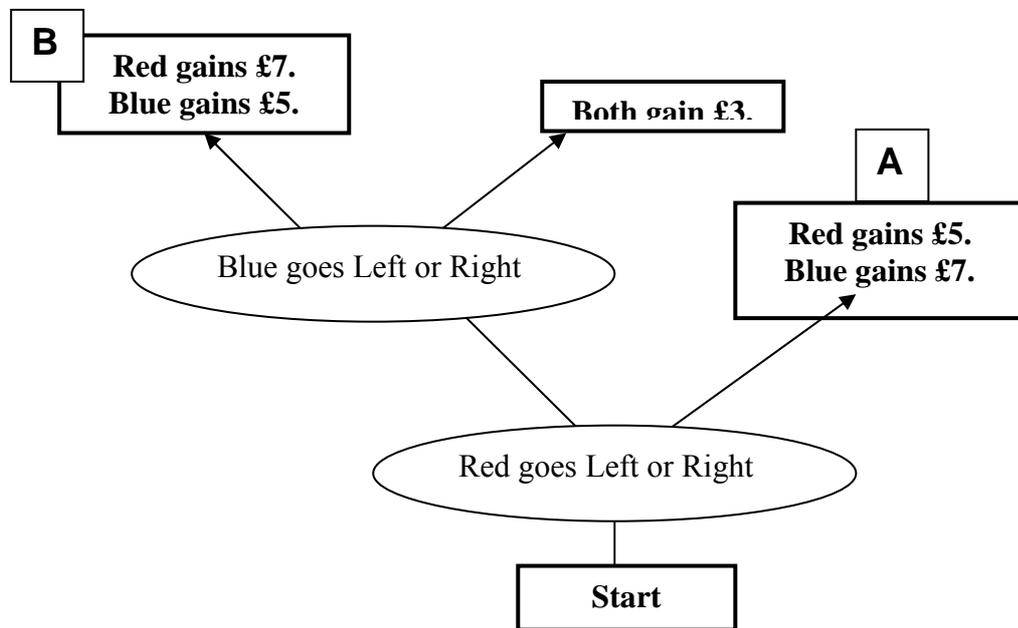


Figure 2: Confrontation between Red and Blue in first year’s experiments

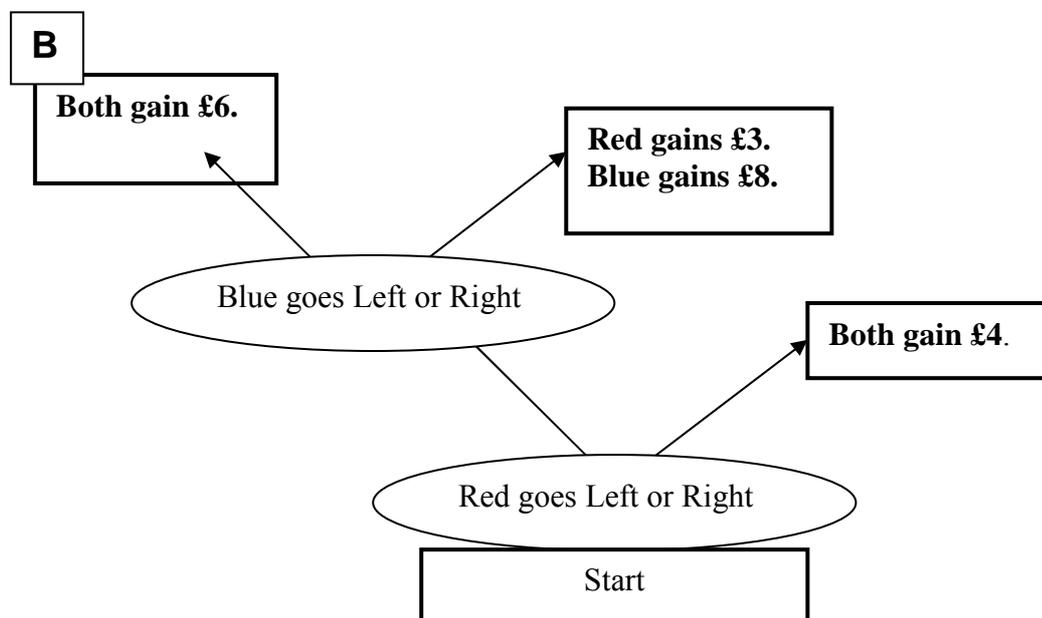


Figure 3: Collaborative interaction in the first year’s experiments

As a result, we modified our interpretation of the fundamental theorems of DT. Previously we had asserted that parties move into a confrontation and face dilemmas only when they adopt both positions and fallback strategies—implying that they adopt fallback strategies even when their positions agree. We now modified and improved the theory, asserting that the phases of conflict resolution are as in Figure 4—rather

than as described in reference 1, where the phases of confrontation and collaboration are shown as one single phase. The modified theory, as set out in Figure 4, asserts that if at the end of the build-up parties have adopted compatible positions, they do not state overt fallback strategies, but move into collaboration. Here, if fallback strategies are stated (i.e., if threats are made), this is taken as a sign that collaboration is breaking down due to failure to agree, hence they are moving from collaboration to confrontation. This would explain why Blue subjects expressed negative feelings when Red subjects stated Right as their fallback strategy. Blue interpreted Red's response as confrontational.

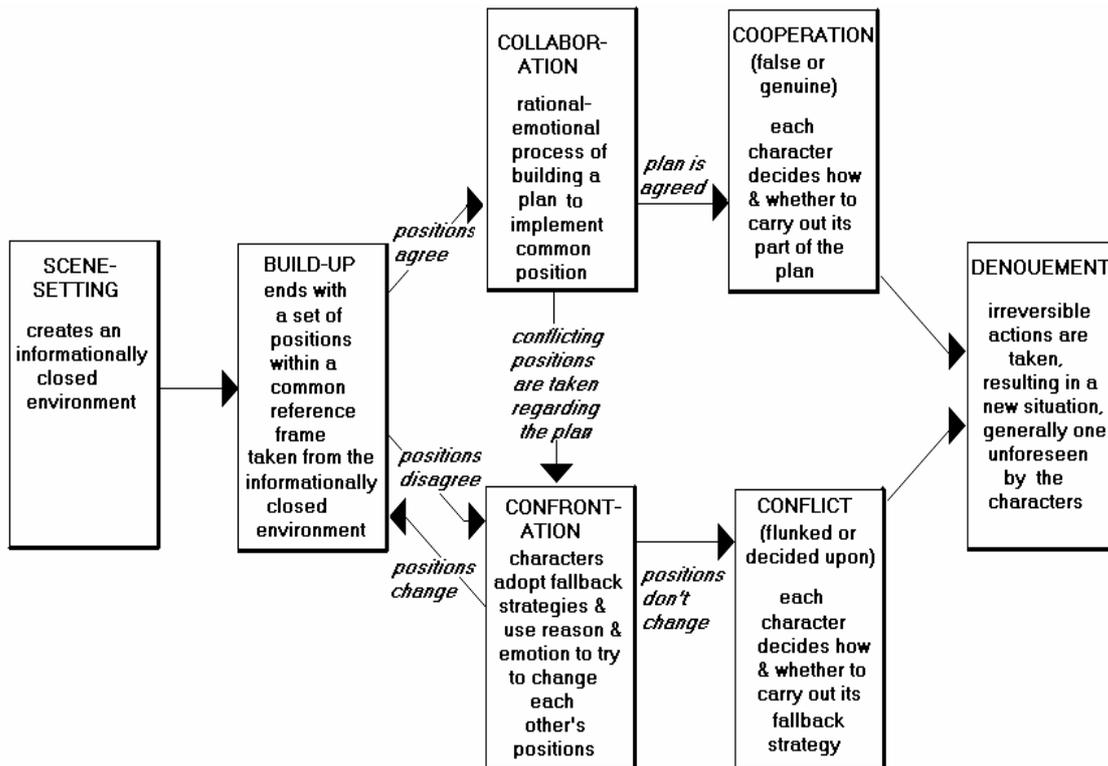


Figure 4: Phases of conflict resolution according to modified theory

When these and some other modifications were made, the experiments confirmed the modified theory. However, it was necessary to re-test the modified theory with new experiments, since otherwise the new theory would only have been tested on the data that gave rise to it. This was done in the second year, and the modified theory was re-confirmed.

Making experiments more realistic. In the second year, the experimental set-up was made more realistic—i.e., closer to the kind of scenarios met with in P/SO. The first year's experiments were deliberately abstract. Subjects saw a bare decision tree and were motivated by cash payments. They were not from the military, but were students from a 6th-form college. In the second year, we used scripts based on simulating P/SO interactions at tactical level. The population from which our subjects were drawn was also closer to the military. It consisted of students at the Royal Military College of Science, Shrivenham, UK.

The reason for these changes was not to improve our testing of the theory. If it is correct, DT must hold for any kind of human decision maker, from any society or age group. Of course, cultural differences are important. We aim to understand and cater for them within the basic DT framework, which itself should remain independent of cultural differences. For example, a party overcoming a persuasion dilemma may do so in a hard, aggressive manner by stressing the unpleasantness, to the other party, of the fallback future, or may behave in a soft, reassuring manner by stressing the benefits of the position the party itself is advocating. A particular culture may favour one such approach over another in particular kinds of interaction. In addition, different cultures may use different ways of sending the same message—e.g., to signal that what is being conveyed is a promise or a threat.

In our first year's experiment, much of the richness and variety that makes up cultural differences was left out of the experimental set-up in order to concentrate on testing DT predictions. In the second and third years, we sought to bring some of this richness in, aiming to develop a system that could be used for military training as well as for experimentation to explore cultural differences and to find effective policies for dealing with them.

Use of simple scenarios. The second-year experiments were run over a LAN (local area network), rather than using a paper messaging system as in the year one experiments. The scenarios used remained simple, being based on the same simple tree structures as in the first year. However, these abstract structures were now given real-life meaning with 'stories' about a P/SO commander interacting with a Bosnian mayor. Of course, real-life situations may require use of more variables than these models. At the same time, an important concept of CCA is that parties in interaction tend toward very simple subjective models of their interaction because they need to be sure they understand each other. Only when they have made their threats and promises extremely simple will they feel sure that each knows what each other means, and knows that each knows this, and knows that each knows that each knows this, etc. In addition, it was necessary in testing our modified theory to be sure that subjects understood the structure of rewards and penalties they were in.

After receiving briefings that gave them the 'stories' that motivated them, subjects were presented with a decision screen that allowed them to choose and re-choose positions and (if positions differed) fallback strategies. They could also express feelings toward each other by choosing adjectives from a drop-down menu and state their current preferences between outcomes—whether or not these were the same as their original preferences, given to them in their briefing. The final screens, filled in before they made their final decisions as to whether to choose Left or Right in the decision tree, were taken to represent their positions, fallback strategies, feelings and preferences at the moment of truth that followed the build-up in Figure 4. These confirmed the modified theory.

Problems with the experimental set-up. The experiments in years 1 and 2 were designed to encourage subjects to choose certain positions and fallback strategies. For example, in Figure 1, we expected Red subjects to adopt A as their position and Blue to adopt B. In Figure 2, we expected both subjects to adopt B as their position. Although subjects confirmed DT predictions when they chose the expected positions and fallback strategies, we found, in both years, a high rate of failure to meet our

expectations as to the positions and fallback strategies subjects would adopt. Thus, many experiments were ‘wasted’—i.e., DT predictions were not tested.

Why were subjects failing to confront each other in the way we would expect from the structure of their problem? Casual observation suggested that the main reason was frustration with the limited means of communication allowed. Unable to communicate except in a rather abstract manner, by choosing positions, fallback strategies, preference orderings and adjectives to express feelings, they seemed to use their choice of positions and fallback strategies to try to convey other meanings. For example, subjects might try to make a threat credible by stating that threat as their position, or try to motivate another to keep a promise by continual changes of position, perhaps in an attempt to send the message, “Look, there are all these possibilities, isn’t this the best one?” Their choice of ‘feelings’ adjectives to send each other might also be distorted by such attempts to communicate reasons.

Mathematical investigations in the second year confirmed our suspicion that this was the problem. These investigations focussed on modelling the transformations of the options board model that DT hypothesised would take place as parties responded to dilemmas. A set of transformations was defined that were plausible and capable of transforming any options board into any other. These transformations strongly suggested that the principal tool for re-defining a confrontational or collaborative interaction would be ‘rationalisation’. Simple emotion, such as expressed by subjects’ choice of adjectives, would be supplemented by *reasons* being given for any preference change. Reasons would also be given for other changes in the model, such as adding new options or re-defining the consequences of courses of action.

Rationalisations would depend on the real-world context of the model, as well as on structural characteristics of the model itself. Thus, motivating subjects by a realistic P/SO ‘story’, rather than by cash pay-offs was an important step. However, the fact that they were not given any way of communicating their rationalisations (that is, communications during the experiments were limited) was, we hypothesised, the reason for their attempts to use the options available to them in unexpected ways. We therefore decided that in subsequent experiments we would give subjects a choice of arguments having emotional overtones, with which they could indicate preference change (or other transformations) by giving reasons for the change, rather than simply stating the change together with a simple statement of their feelings.

Simulating human interactive behaviour in the third year

Aims of the third year’s work

In the first two years, we employed increasingly realistic simulations of the kind of interactions that a P/SO commander might be involved in, in order to confirm DT predictions about human behaviour. From this work, we could conclude that subjects do behave ‘irrationally’, in the sense of departing from or changing their assigned preferences, when and only when doing so *helps them* to solve mathematically defined drama-theoretic dilemmas. Moreover, this ‘irrational’ behaviour is accompanied by the projection of appropriate emotions.

In the third year, we set out to make our experiments even more realistic by allowing subjects to present arguments to each other, instead of being confined to projecting simple emotions. We also set out to achieve an additional objective, beyond further confirming DT.

We wanted to explore the possibility of constructing computer-programmed simulations of human behaviour in P/SO situations that might be used for training and experimentation to find the most effective ways (within the predictions of DT) to achieve military objectives—defined, in a P/SO situation, as changing the beliefs and values of non-compliant parties so as to make them compliant.

Such simulations seemed to promise great benefits for:

- P/SO training. Trainees would be able to interact with computer simulations of the kind of P/SO interactions they were likely to encounter in the field. These simulations could be based on expert research into the cultural characteristics and objectives of the parties a specific P/SO force was interacting with.
- P/SO experimentation. By simulating different kinds of behaviour on the part of P/SO commanders, the most effective methods of interacting with specific other parties could be found. Policy as to how to cope with these parties could be based on this evidence from experiments using simulations.

Development of CADET: a training and experimentation package

This has led to a key development of our work—the creation of a powerful software package called CADET (*Confrontation Analysis Development and Experimentation Tool*). CADET is a CBT (computer-based training) environment that allows players to explore co-operation and confrontation strategies in a stimulating and realistic manner.

A CADET session consists of a series of episodes. Each episode is a two-player game based around a narrative—the protagonists have a series of pre-defined choices to make. The progression of the story depends upon the players' behaviour. A player never knows his opponent's identity—sometimes he will be playing against another human and sometimes against a computer. This anonymity makes the game seem more realistic. It allows players to 'get into role' and follow their brief in a more emotionally involved manner.

As well as being a test-bed for conducting experiments, we see CADET as being of use as an instructor-led training tool. An instructor would lead the trainees through the game, possibly providing them with briefings. He could monitor the trainees' actions and then provide constructive feedback on their problem-solving approach. We envisage CADET being used along with other tools and media to provide a complete training package. For example, it could be used with a personality-profiling tool.

CADET is fully re-usable. A scenario designer can define any scripts he wishes and then link them together to form plausible stories. He can also construct computer agent players, with behaviour defined in terms of their internal belief state and the

actions of the human opponent. Computer agent players are programmed to adopt behaviour that is consistent with drama-theoretic principles. Within these principles, which (we have seen) allow for a variety of different kinds of behaviour, computer agents can be programmed to follow different interaction ‘policies’. For example, they can be a ‘tough cop’ or a ‘tender’ one. They can be sympathetic and understanding, neutral and objective, or mean and aggressive.

CADET is built along modern software engineering lines. Internally, it is fully object-oriented, so that it has a naturally extensible structure. The interaction between role players is purely event driven, so that processing takes place only following a user action. The rest of the time the system is idle. It is a network-based system and can operate over a variety of network types, including the ubiquitous TCP/IP.

Some further work is needed to turn CADET into a commercial quality tool. There are some missing supporting tools (e.g. a script consistency checker is needed to prevent the script designer building scripts that result in bad states such as player B waiting on an action from player A that A can never take). Even with these omissions, we believe we have something that can be used to refine drama theory and to demonstrate it to a wider audience in simple terms.

Experimental Design in year 3

The episodes followed each other in the order shown in Figure 5. Episode 1 came first, followed by 2, 3 or 4, depending on the result of 1. The third episode was 5 or 6, depending on the result of the second episode. In each episode, one of the subject took the role of commander of a tactical unit of the NATO force in Bosnia. The subject took this role in three episodes, interacting first with the Bosnian Serb mayor of a village, then with an aid worker, then once more with the mayor. Throughout these three episodes, the opposite role—first the mayor, then the aid worker, then the mayor once again—was played by another subject, playing opposite the first. Subjects were 21 undergraduate students at the Royal Military College of Science, Shrivenham, UK.

Subjects played their roles by choosing messages from a multiple-choice menu. To begin each episode, they received a briefing on the situation facing them. The briefings and the choices of messages put before the subjects are given in Appendix 1.

A general description of the episodes now follows.

First episode. The COM (commander of a NATO force at tactical level) confronts the Serbian Mayor of a village in Bosnia. He wants to release aid to the village, and wants the Mayor to use some of it to restore utilities to the housing of returning Muslim refugees. The Mayor would prefer to use it all for his own people.

Second episode. The COM wants a newly arrived aid worker to work with him on a coordinated policy toward the Mayor. The details of the coordination he wants depend on the previous episode, but the aid worker is disinclined to coordinate, being mistrustful of the military. The ‘carrot’ offered by the COM is the degree of logistical and other help he will give to the aid worker.

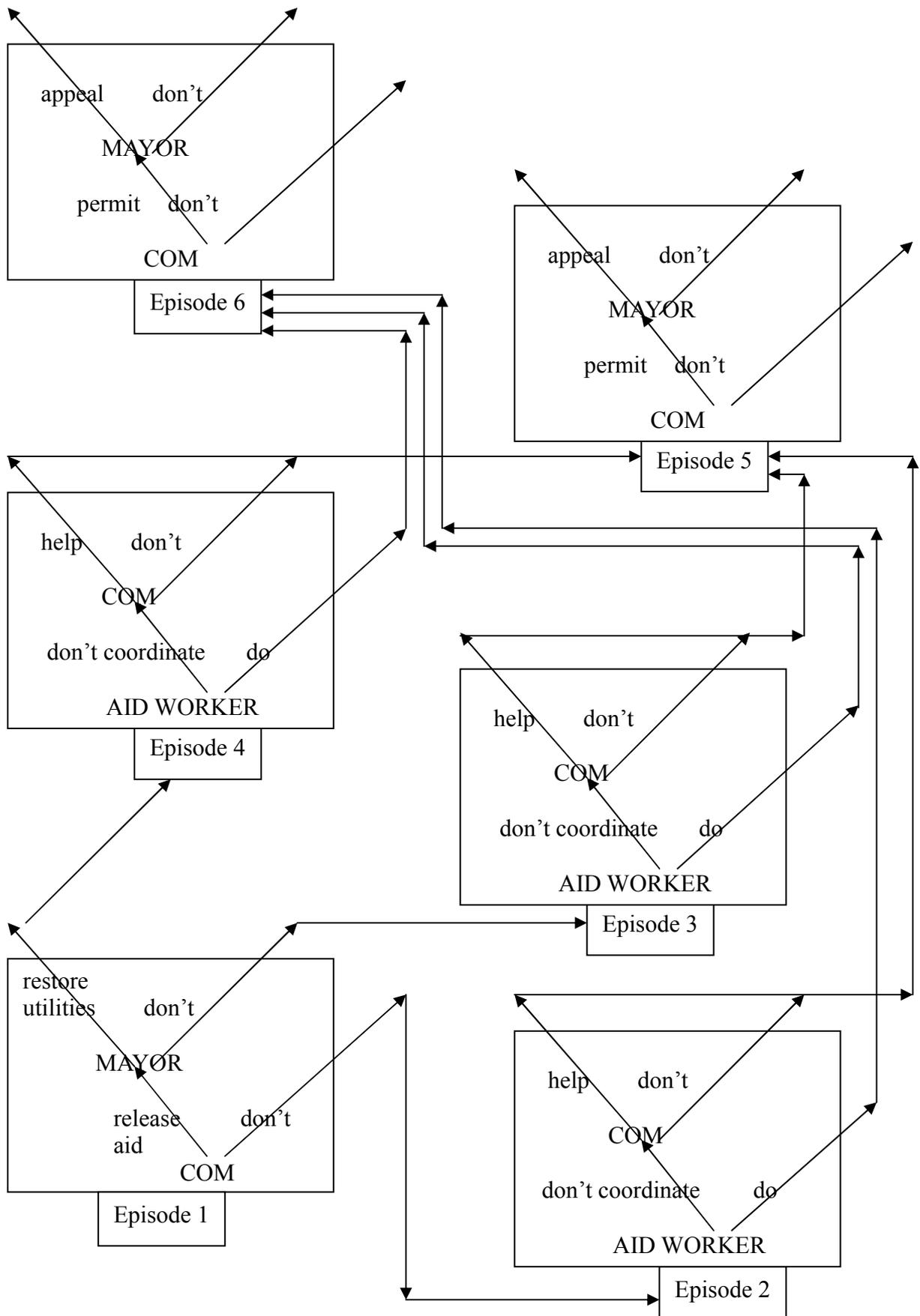


Figure 5: The succession of episodes

Third episode. Aid has been given to the village. There are plans for a ceremony at which a cheque will be handed to the Mayor. The COM has to decide whether the ceremony can go ahead or should be stopped on security grounds. He wants the Mayor to use the opportunity of the ceremony to speak out against anti-Muslim violence and warn the people that it could result in aid being stopped.

Design of the automaton. The role of Commander was automated in half the experiments. In the other half, human subjects were playing against human subjects.

The automaton that took the role of Commander is specified in Appendix 1 by annotations on the COM's decision sheet for each episode. These are as follows.

- When the choice of a COM decision by the automaton is unconditional, this choice is marked with a bracketed A. For example, the first choice made by the automaton in Episode 1 is to select the second of the two multiple-choice alternatives listed in block 1 — a choice that we denote as 1/2, meaning 'block 1/alternative 2'.
- When the other party (the Mayor or aid worker) communicates a choice to the automated COM, this causes an increase in a quantity CM, in the case of the Mayor, or CA, in the case of the aid worker. This quantity represents the COM's attitude toward, respectively, the Mayor or the aid worker. (A negative increase in this quantity denotes a decrease.) For example, if the Mayor's tone in block 5 of Episode 1 is 'warm and sympathetic' (choice 5/1), then CM increases by 1. If the Mayor's tone is 'cold and unsympathetic' (choice 5/3), then CM decreases by 1.
- What is the exact meaning of the quantity CM or CA? It is initially zero. When it goes up, it becomes more likely that the COM will make the decision the other party (Mayor or aid worker) wants. When it goes down, this decision becomes less likely. Thus the quantity represents the COM's evaluation as to whether he should collaborate with the Mayor or aid worker.
- When the COM decision selected by the automaton depends on the value of CM or CA, or on a previous decision made by either party, this dependency is stated. For example, the COM decision in block 11 is to release aid if CM is greater than 0 and not to release aid if CM is less than or equal to 0.

Three examples will show what we mean by saying that the automaton was programmed, within the principles of DT, to be 'sympathetic and collaborative'.

1. A prediction of DT is that a party trying to overcome a co-operation dilemma (i.e., trying to convince another that it prefers not to defect from a common agreement) will show positive or neutral feelings; it will not show negative feelings. The reason for this is that positive feelings signal a 'favourable' change of preferences—i.e., a change in favour of the preferences of the party receiving the signal. Hence, they send a signal that non-cooperative preferences are being overcome, since non-cooperative preferences will not be in favour of the other party. Now, given this, it might seem that we could predict that a party with a co-operation dilemma will always show positive feelings—never neutral ones. We cannot make this prediction, however, because positive feelings, by signalling a favourable change of preferences, simultaneously send the signal that present preferences are unfavourable.

Rather than send such a signal, a party may make a conscious or unconscious decision to pretend that its preferences do not need to change, as they are already favourable; hence it may communicate neutral feelings.

In programming our automaton, we made it send positive feelings when trying to overcome a co-operation or trust dilemma, rather than neutral ones. This was a particular choice in conformity with drama-theoretic predictions. Clearly, however, it was not the only possible choice.

2. In trying to overcome a threat dilemma, a party will try to make others believe that it will, if necessary, carry out a threat it prefers not to carry out. It may or may not actually change its preferences so that it prefers to carry out this threat.

In programming our automaton for the second episode, we made it change its preferences so that it would prefer to carry out its threat if the previous behaviour of the other party (the aid worker) had been aggressive and unpleasant. But if the other's behaviour, while somewhat obstructive, had not been aggressive, it preferred not to carry out its threat.

3. In trying to overcome a persuasion dilemma, a party may stress the unpleasantness of its fallback strategy to the other party, and also its inevitability if the other does not give in, or it may stress the attractiveness of its own position to the other party. The automaton was programmed to stress the attractiveness of its own position.

Measuring effectiveness. However, the statistical significance of this result depended on how effectiveness was measured, as the question of who did better (human or automaton) was not quite unambiguous. This is because DT predicts that emotion caused by an interaction in which a party pursues its goals may lead to the goals themselves being changed. This gives rise to the question: *should the measure of effectiveness be based on the P/SO commander's original goals or his/her drama-theoretically changed goals?*

This question, in our experiments, came down to the following: *is it preferable, from a military standpoint, for a commander to carry out a threat he/she has made, if challenged to do so, or to 'flunk' carrying it out?* Clearly, failure to carry out a threat when the time comes to do so sets a bad precedent and leads to loss of credibility. It might therefore be decided, as a matter of policy, that it is better for a threat to be carried out, if necessary, rather than 'flunked' (though of course it is best of all for the threat to succeed, so that it does not have to be carried out).

Now humans were better than the 'sympathetic' automaton in the second episode (thus confirming the DT prediction) at the 95% significance level, *if effectiveness is measured using changed preferences* (i.e., if it is considered better for threats to be carried out, rather than 'flunked'). If effectiveness is measured using original preferences (i.e., if it is considered better not to carry out an unpreferred threat), then humans were significantly better only at a 20% level of significance.

The reason for this is that humans, as compared to the sympathetic automaton, were both more effective in getting their way against the aid worker and also more likely to carry out their ‘irrational’ threat if they did not get their way.

Obviously, an automaton could be programmed to be as tough as humans. If this is done, our prediction is that they would be as effective.

Results of using computer simulations to test DT

At the same time as developing computer simulations, we also carried out further tests of DT predictions. In the first two years we had set out to test specific hypotheses—viz, the predictions of drama theory concerning emotions and preference change—using human subjects. In the third year, we tested DT in another way by comparing the behaviour of human subjects with that of automata built upon drama-theoretic principles.

Thus, human subjects in the third year were interacting sometimes with other human subjects, sometimes with an automaton. This was possible without subjects knowing whether they were interacting with a human or a an automaton because, using CADET, the interactions between subjects took place over a LAN and subjects’ responses to each other were made by choosing from a multiple-choice menu comprising various arguments they could put to each other. The automaton’s choices from this menu were based upon the principles of DT—though as said, this allows for a variety of different kinds of behaviour.

Either side—the P/SO commander or the other party—could have been simulated by an automaton. We decided, in these first experiments, to simulate the behaviour of the P/SO commander. This would enable us to compare the effectiveness of our DT automaton in achieving mission objectives with the effectiveness of human subjects.

As said, the principles of DT allow various kinds of behaviour; they do not determine behaviour exactly. We chose, in these first experiments, to program the automaton to behave ‘co-operatively’, in the manner often recommended by CIMIC officers when dealing with civilian agencies. This meant that the automaton expressed positive enthusiasm and willingness to believe in the other party’s expressed intentions to co-operate; it would express negative feelings and mention possible retaliatory action only if the other party openly refused to co-operate.

Note: that the same ‘sympathetic’ behaviour was used by the automaton regardless of whether the interaction structure was ‘confrontational’ (in that we would expect subjects to take opposing positions) or ‘collaborative’ (in that we would expect them to take the same position). Now DT would predict, in general, that sympathetic behaviour will be more effective in collaborative interactions than in confrontational ones. A prediction of DT that could be tested was therefore the following:

The automaton will be as effective as humans, or more so, in collaborative interactions. It will be less effective in confrontational interactions.

We then classified the episodes as either confrontational or collaborative, as follows:

- The first episode in the simulation was definitely collaborative—subjects were expected to, and did, take the same position. The P/SO commander’s problem was that he could not necessarily trust the other subject (a Bosnian Serb mayor) to implement their agreed position (to use reconstruction aid partly for the benefit of returning refugees).
- The second episode was confrontational. The commander needed to convince the other subject (an aid worker) that if he insisted on his position (refusal to co-operate with the military), the commander would ‘punish’ him by reducing the logistic and other support offered by the military.
- In the third episode, the commander again interacted with the Bosnian Serb mayor. It was similar to the first episode in inducing mainly collaborative behaviour. In fact, the structure of this episode became identical with the structure of the first episode *if* the commander’s preferences were changed in accordance with DT predictions (so that he would prefer to carry out his threat if the mayor refused to collaborate). Within this structure, the mayor usually promised to collaborate. The episode was therefore classified as collaborative.

When the episodes were classified in this way, the DT predictions were confirmed in that the humans and the ‘sympathetic’ automaton did not do significantly better or worse than each other in the first and third episodes. The humans did significantly better in the second episode.

Statistical analysis of the third year’s experiments

Drama theory provides two conjectures to test – namely

- (a) The automata will be at least as effective as humans in collaborative interactions;
- (b) The automata will be less effective than humans in confrontation interactions.

The aim of the experimental analysis was to test the truth of these experimental hypotheses. To that end, the difference between two populations (*viz.*, the results obtained by human subjects playing against humans and those obtained by the automaton playing against humans) was assessed on the basis of samples of size 14 drawn from each population.

Seven metrics were defined, encapsulating different aspects of the data. In our analysis, we used Student’s t test, a standard statistical test appropriate for testing differences between the means of small samples.

In a military environment it is arguably better to carry out threats than to backdown, even when this leads to a less favourable outcome, as only by doing so is the credibility of future threats maintained. Thus, in our analysis we considered both a

self-interest preference score and an adjusted score that encapsulates this credibility issue – by ranking threats carried out above compromises.

The seven metrics were as follows (results are shown in table 1)

1. The overall score (summed over all three episodes) obtained by human subjects and the automaton, scored by using original preferences and giving a score of 3 for Success, 2 for Second-Best and 1 for Failure.
2. Overall scores obtained in the same way after adjusting for preferences changed in accordance with DT predictions. This meant giving ‘Second-Best’ a score of 1 and ‘Failure’ a score of 2 in the second and third episodes. Episode 1 scores were unaffected.
3. Scores obtained by humans and the automaton in the first episode.
4. Scores obtained by humans and the automaton in the second episode, using original preferences.
5. Scores obtained by humans and the automaton in the second episode, using preferences adjusted in accordance with drama-theoretic predictions.
6. Scores obtained by humans and the automaton in the third episode, using original preferences.
7. Scores obtained by humans and the automaton in the third episode, using preferences adjusted in accordance with drama-theoretic predictions.

	1	2	3	4	5	6	7
	First episode	Second episode	Third episode	Total over three episodes	Second episode (scores adjusted)	Third episode (scores adjusted)	Total over three episodes (scores adjusted)
Mean human score	2.14	2.50	2.07	6.71	2.43	1.57	6.14
Mean automaton score	1.86	2.14	1.86	5.86	1.71	1.79	5.36
Difference between means	0.29	0.36	0.21	0.86	0.71	0.21	0.79
Probability assuming no population difference	0.41	0.20	0.42	0.12	0.04	0.50	0.21

Table 1: Results of statistical tests

The complete relationship between the null hypotheses and the truth or falsehood of the experimental conjectures is complicated. However, we can see that the results are indicative of both conjectures, if the null hypotheses hold in collaborative cases (episodes 1 and 3) and can confidently be rejected where the interaction was confrontational in nature (episode 2).

Discussion

The analysis was to a 95% confidence level – if the probability of an outcome occurring is less than 5% then we can conclude that its occurrence is significant and allows us to reject the relevant null hypothesis. Only one of the seven results reached that level – the difference between mean adjusted scores in the second episode (see column 5). Thus, the assumption must be that the hypothesis – *there is no significant difference in effectiveness between the automata and the human players* – is true in the other cases.

As we have already mentioned, the automaton that was used was programmed using a ‘sympathetic’ behaviour; regardless of whether the interaction structure was ‘confrontational’ or not. DT has predicted that this behaviour would have been less effective in confrontation, however this type of strategy was used because it conformed to US military doctrine.

The only other outcome even approaching statistical significance is the difference in unadjusted scores over three episodes, which has only a 12% probability of occurrence. That, however, appears to be due to differences in the second episode. The unadjusted scores in the first and third episodes have 41% and 42% probabilities of occurrence.

Conclusions

In conclusion we can say that the third-year experiments with a ‘sympathetic’ automaton confirmed DT predictions – the automaton was less effective than human beings in a ‘confrontational’ situation, while seeming to be equally effective in ‘collaborative’ situations. Also, following on the results of the first two years, we have thus achieved the aim of testing and improving Drama Theoretic predictions.

We see that there would be use for this tool in modelling non-war fighting behaviour, in particular when a ‘negotiations’ is required to achieve an objective.

Military benefits and DT in the Future

There has been significant progress this year in operational testing of the work and of mathematical underpinning the work¹. Our research has greatly improved Drama Theory in particular when dealing with collaborations and has enabled a range of P/SO tools to be implemented. In the future we envisage that soldiers would be able to:

- use the CCA C2 system to co-ordinate and develop clearer, more coherent negotiations strategies in the field;
- to use a P/SO suite of tools to help improve Peace Support negotiations before deployment in the field; and
- to act as a repository of previous ‘confrontations’ (and collaborations) and by studying these negotiations to improve on such strategies in the future (a

¹ Based on another MOD Corporate Research Programme project

‘lessons learnt’ toolkit). Moreover, cultural differences can also be explored to determine whether they affect negotiations strategies.

Along with the need to broaden our concept of the military task, there is a need to develop systems of command and control to implement the new concept. Use of a C2CC system based on DT principles has been given a limited trial in the Operational Planning Process (OPP) of a NATO military exercise conducted at RHQ AFNORTH. Further developments and plans for testing are being undertaken at the new Allied Command Transformation (formerly SACLANT) in Norfolk, VA. Research into the applicability of such a system has been undertaken in the field (in Bosnia) and, at tactical level, at a UK Army base at Catterick.

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Appendix 1: The last year's experiments in detail

Details are given of Episodes 1, 2 and 5. Episodes 3 and 4 were similar to 2. Episode 6 was similar to 5.

All briefings and interactions were conducted over the LAN. Each subject in each episode saw the briefing shown below, accompanied by the tree diagram of his/her problem shown in Figure 6. The subject then made choices according to the decision sheets shown.

The automaton's unconditional decisions are marked, in the COM's decision sheet, with an A. The mayor's (respectively, aid worker's) decisions are marked with a number showing the consequential increase in CM (respectively CA). This was a number, initially zero, that represented the COM's evaluation of the mayor (respectively, aid worker). When the automaton's decisions were conditional, they were determined by the current value of CM or CA in the manner shown.

Episode 1: COM'S BRIEFING

When you took command of your unit, your predecessor briefed you as follows:

“The Mayor of the local village—a Bosnian Serb—is going to demand that you release reconstruction aid to him. The UN and the aid agencies don't have people in this area, so the decision is really up to you. Our policy is that the Mayor should get the aid— which the village badly needs—provided he's made enough progress in allowing Muslim refugees back to Granica. The refugees can't return at present because their homes aren't supplied with water and electricity. The question is—if you release aid, will the Mayor spend some of it—about 1/3— restoring utilities to the returnees' houses, or will he take it all for his own people? You'll have to talk to him and decide. From my experience of him, he's an untrustworthy SOB who hates Muslims.”

After looking into this problem, you realise that you have to make the decision whether or not to release aid without knowing how the Mayor means to use it. If you release aid, will he restore utilities to the returnees' housing or use all the money on his own people?

On looking into your own priorities and the Mayor's, you rank the three possible outcomes as follows.

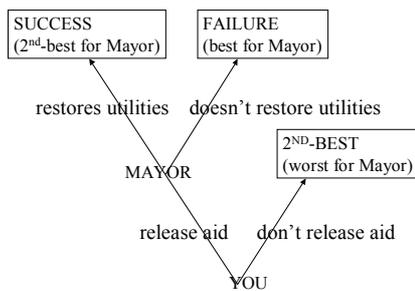
- Your best outcome—**Success** for you—would be ‘You release aid, he restores utilities.’ For the Mayor, this outcome would be **Second-Best**—neither Success nor Failure.
- Your worst outcome—**Failure** for you—would be ‘You release aid, he doesn't restore utilities.’ For the Mayor, this would be **Success**.
- Postponement—‘You don't release aid at this time.’ would be **Second-Best** for you—neither Success nor Failure. For the Mayor, it would be **Failure**.

You're aware that NATO intervention in this theatre is governed by a document called the General Framework Agreement For Peace (GFAP). Relevant parts of this are:

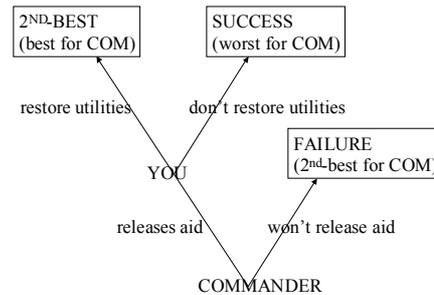
The Parties agree to grant refugees and displaced persons the right to safely return home and regain lost property...

...release of international reconstruction aid to local, regional and central government authorities shall be conditional on their adherence to this agreement...

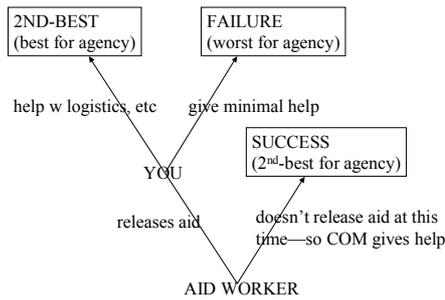
You decide you have to talk to the Mayor.



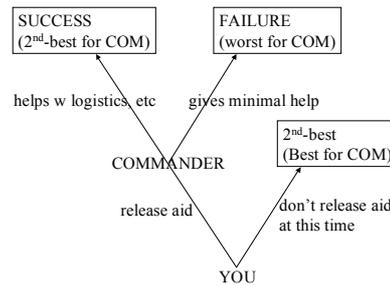
(a) COM's view of Episode 1



(b) Mayor's view of Episode 1



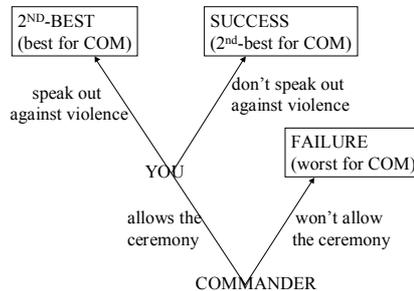
(a) COM's view of Episode 2



(b) Aid worker's view of Episode 2



(a) COM's view of Episode 5



(b) Mayor's view of Episode 5

Figure 6: Different views of Episodes 1, 2 and 5

Episode 1: COM'S DECISION SHEET

Your meeting begins with a long speech by the Mayor. He points out that the Muslims who want to return to the village are criminals. They conducted a massacre of Serbs when Muslims took the village. When Serb forces took over, these Muslim murderers were transported elsewhere for their own safety. If they had stayed, it would have been hard to stop Serbs taking revenge on them.

Despite all this, his village needs the aid that you are holding back, and if you will release it he agrees to restore utilities to the returnees' housing.

1. In reply, you say that / **you will tell him what you intend to do.** / (A)**you want to thank him for intending to co-operate with you, and hope he understands how important it is for you to be able to trust each other.** / **you understand the Serb position in this matter, and intend to make sure he gets aid.**
2. Concerning the Serb's feelings of discrimination, you tell him that / **it's not your concern, Serbs have committed as many crimes as Muslims.** / (A)**after he restores utilities, you will gladly help him bring any Muslim 'murderers' to justice.** / **NATO is impartial, you can't take sides between Serbs and Muslims.**
3. Your tone is: / (A) **warm and sympathetic.** / **neutral.** / **cold and unsympathetic.**
4. The Mayor then says / (0) **you should understand his position as a Serbian Mayor and the reasons his people have for mistrusting the Muslim returnees.** / (1) **his priority is to aid the Serbian people, but he is prepared to co-operate with you if necessary in order to achieve this.** / (2) **he wishes to co-operate fully with you, so that his people can receive the aid they are entitled to.**
5. His tone is: / (1) **warm and sympathetic.** / (0) **neutral.** / (-1)**cold and unsympathetic.**
6. You then say that your present intention is: / **to release aid because your job is to ensure delivery of aid** / **not to release aid** / (A) **to release aid if he provides guarantees (by using a separate bank account) that he will restore utilities** / **to release aid because you believe he will restore utilities.**
7. Your tone is / (A)**apprehensive.** / **confident.** / **neither apprehensive nor confident.**
8. At the same time, your tone is / (A) **friendly and co-operative** / **neutral** / **cold and hard.**
9. The Mayor now says / (2)**he will gladly provide guarantees (separation of bank accounts) that the aid will be used to restore utilities** / (0)**he will promise to restore utilities if you release the aid that the Serbs are entitled to/ (-2)says his priority is to aid the Serb people.**
10. His tone is / (-2) **hostile.** / (2) **co-operative.** / (0) **neutral.**
11. This ends the discussion. Later, you decide (A if CM>0) **to release aid** / (A if CM<=0) **not to release aid at this time.**
12. If 11/1: After he receives the aid, you find that the Mayor / **is spending slightly less than 1/3 on restoring utilities to returnees' housing.** / **has found ways to spend it all on his own Serb people.**

Episode 1: MAYOR'S BRIEFING

You are Mayor of the Bosnian Serb village of Granica. You are in communication with the local NATO commander. He is deciding whether to release reconstruction aid to you. He's demanding that this aid should benefit not only the Serb population but also a bunch of Muslim refugees who say they want to return to Granica.

These refugees were responsible for massacring Serbs and driving them from their homes. Afterwards they themselves were driven out by Bosnian Serb forces. Now the families of murdered people are being asked to welcome their murderers!

You and your people are willing to agree in order to get reconstruction aid. The first batch of returnees is due next month. Now the Commander has said that if he releases reconstruction aid, about 1/3 of the money must be spent on repairing homes for returning refugees.

Your people will be furious if this is done while they are in need. The Commander doesn't understand the background to this situation. He wants to reward war criminals and murderers. Fortunately, once the money has been released, it won't be possible for the Commander to take it back. You can spend it how you like.

You have a meeting with the Commander. To prepare yourself, you look at the three possible outcomes from your own viewpoint and that of the Commander.

- **Success** for you—a just outcome—would be 'He releases the aid money, you spend it all on your own Serb people'. This would be **Failure** for the Commander.
- **Second-Best** for you—neither Success nor Failure—would be 'He releases the aid money, you spend 1/3 of it on restoring utilities for the returnees'. This would be **Success** for the Commander.
- **Failure** for you—your worst outcome—would be 'He doesn't release the aid money.' This would be **Second-Best**—neither Success nor Failure—for the Commander.

Now you go into the meeting.

Episode 1: MAYOR'S DECISION SHEET

You start off the meeting by explaining the background to this situation, how the Muslims who now want to return to the village were responsible for the massacre of Serbs. You tell the NATO commander you understand his position. He has his orders, and the International Community is biased against the Serbs. But he must also understand how Serbs will resent money being spent on people who murdered members of their families.

Nevertheless, your village needs the aid. Consequently, you tell him that you will restore utilities to the Muslims' housing if he will release the aid.

1. In reply, the NATO Commander says / **he will tell you what he intends to do. /) he wants to thank you for intending to co-operate with him, and hopes you understand how important it is that you can trust each other. /he**

- understands the Serb position in this matter, and will insure that you get aid.**
2. Concerning the Serb's feelings of discrimination, he tells you that **/it's not his concern, Serbs have committed as many crimes as Muslims. /after you restore utilities, he will gladly help you bring Muslim murderers to justice. / NATO is impartial, he can't take the side of Serbs against Muslims.**
 3. His tone is: **/ warm and sympathetic. / neutral. / cold and unsympathetic.**
 4. You then say **/ he should understand your position as a Serbian Mayor and the reasons your people have for mistrusting the Muslim returnees. / your priority is to aid the Serbian people, but you are prepared to co-operate with him to achieve this. / you wish to co-operate fully with him, so that your people can receive the aid they are entitled to.**
 5. Your tone is: **/ warm and sympathetic. / neutral. / cold and unsympathetic.**
 6. He then says that his intention is: **/ to release aid because his job is to ensure delivery of aid / not to release aid / to release aid if you provide guarantees (by using a separate bank account) that you will restore utilities / to release aid because he believes you will restore utilities.** Note that if you provide guarantees, this will make it less preferable for you to use the aid just for your own people.
 7. His tone is **/ apprehensive. / confident. / neither apprehensive nor confident.**
 8. At the same time his tone is **/ friendly and co-operative / neutral / negative, cold and hard.**
 9. You now say you will **/ gladly provide guarantees (separation of bank accounts) that aid will be used to restore utilities / promise to restore utilities if he will release the aid the Serbs are entitled to / say that your priority is to aid the Serb people.** (Providing guarantees means setting up a separate bank account for aid money to restore utilities. It means that 'Not Restoring Utilities' no longer represents Success for you.)
 10. Your tone is **/ hostile / co-operative / neutral.**
 11. This ends the discussion. Later, you learn that the Commander has decided **/ to release aid / not to release aid at this time.**
 12. *If II/I:* When the aid arrives, you **/ do use some of it to restore utilities to returnees' housing. / find ways to spend all of it on your own people.**

Episode 2:COM'S BRIEFING

You informed the Mayor and the aid agency of your decision. Aid should not be released at this time to the Mayor. He cannot be trusted to use it for the benefit of all villagers.

To your surprise, you learn that the aid agency intends to ignore your decision, and release aid to the Mayor.

This must be prevented, or it will make you and NATO look foolish. It's important that the military and the aid agencies co-ordinate their policies, support one another and present a united front.

You also learn that the aid agency is placing an aid worker in the village to oversee reconstruction projects. The aid worker is due to move in next week. You have received a request to give him security and provide for his medical, transportation and communication needs.

You're due to meet with the aid worker. You need to discuss two things with him:

- your helping him with security, transportation, communication, etc.
- his agreeing not to release aid unconditionally.

Helping the agency is part of your job. The GFAP (General Framework Agreement for Peace) requires you 'to assist the UN agencies and other international organizations in movements and in other aspects of their humanitarian missions.' At the same time, you think the agency ought to co-ordinate policies with you. Thinking about this, you decide that

- Your best outcome—**Success** for you—would be 'You help the agency, they agree not to release aid at this time.' For the aid worker, this would be **Second-Best**—neither Success nor Failure.
- The **Second-Best** outcome for you—neither Success nor Failure—would be 'You help the agency, they do release aid.' For the aid worker, this would be **Success**.
- The worst outcome for both of you—**Failure**—would be 'You don't help the agency, they do release aid.'

[Note: the subject role-playing the COM has this information displayed in the tree shown in Figure 5a.]

You prepare to meet the aid worker.

Episode 2: COM'S DECISION SHEET

The meeting begins with the aid worker requesting you to help him with medical, transportation and communication needs. It's his understanding that it's normal procedure for him to request this kind of help.

As regards aid, he states that he must release the aid that's been promised. He points out that the Serbs are feeling discriminated against. They need to feel hope for the future. If they don't receive the aid they've been expecting, their attitude will get worse, not better. And aid can't be turned off and on like a tap. It has to be organised. Commitments are in place. Whatever you say about it, he intends to release the aid at once.

1. In reply, you / **say you're going to tell him what you intend to do. / thank him for coming to see you, and say it's your job to help civilian agencies in every way possible. / (A) hope he understands how much he relies upon the military, so it's important that you work together in making aid decisions.**
2. Your tone is: / **(A) negative, cold and hard. / neutral. / warm and sympathetic.**
3. Concerning the Serb's feelings of discrimination, you point out that the agreed policy is for the Serbs to receive no aid if they won't co-operate with refugee

- returns. You add that / **you aren't concerned with the Serbs' attitude, only with whether they co-operate with the International Community / (A)there's a wonderful future awaiting the Serbs if they co-operate with the International Community / the Serbs don't deserve aid if they won't co-operate with the International Community,**
4. The aid worker now says / **(-2) it's his job to make aid decisions, not yours. / (-1) he is prepared to work with you to the extent of informing you about his decisions. / (1) he is prepared to discuss with you how you can co-operate.**
 5. His tone is: / **(0) neutral. / (1) warm and sympathetic. / (-1) cold and unsympathetic.**
 6. You then speak about how you can work together. You first tell him about your discussions with the Mayor and suggest that to release aid now will make the International Community appear disunited and hinder refugee returns. You and he need to persuade the Mayor to spend some aid on restoring utilities. Your tone is: / **calm and neutral. / (A) enthusiastic, friendly and co-operative. / cold and unsympathetic.**
 7. You / **stress that you will help him with logistics, etc, regardless of whether you and he co-operate in dealing with the Mayor / say you have orders to help him with logistics, etc, so of course you will do so / (A) describe how much you can help him with logistics, etc., provided you and he work together in dealing with the Mayor.**
 8. You then say you need him to support you against the Mayor by not releasing aid at present. You say that: / **(if CA<0) if he refuses to support you against the Mayor, you will give him minimal help in future, except in emergencies. / (if CA>=0)if he supports you against the Mayor, you will give him the best of help in future./ You will of course give him the same amount of help in future, whether or not he supports you against the Mayor.**
 9. Your tone at the end is: / **(if CA>=0) friendly and co-operative / (if CA<0) cold and angry / neutral.**
 10. The aid worker now says he thanks you for your offer of help, / **(2)and he agrees not to release aid now, in view of what you've told the Mayor / (0)and he will inform you when he decides to release aid. / (-2) but he fully intends to release aid immediately.**
 11. Later, you discover that the aid worker /**did release aid immediately, despite what you told the Mayor / did not release aid immediately, pending guarantees from the Mayor that he would restore utilities.**
 12. If 11/1: You later/ **(if CA>=1) make sure he gets all the help and support he requires. / (if 1>CA>=-1) follow normal procedures in giving him help and support. / (if CA<-1) make sure he receives little or no help except in an emergency.**
 13. If 11/2: You later/ **(A) make sure he gets all the help and support he requires. / follow normal procedures in giving him help and support. / make sure he receives little or no help except in an emergency.**

Episode 2: AID WORKER'S BRIEFING

You have been sent to the village of Granica as US AID representative. US AID is heading a number of aid agencies in delivering a package of reconstruction aid to the

village. It has taken some time to put the package together, and you're keen to start delivering it.

First, however, you must establish yourself physically in the village. You know that NATO is supposed to help you with security, transport, communications, etc. You make an appointment to see the local NATO commander.

You're a bit tense about this meeting. You've heard that the NATO commander had a row with the Mayor over refugee returns, and told him he wouldn't be getting any aid. This is typical military behaviour. Threatening people is not a good idea, particularly not Serbs, who are a proud people. You yourself had a good meeting with the Mayor, and are sure you can manage your relationship with him without threatening to withdraw aid.

On the other hand, you need the NATO commander to help you set yourself up in the village. Without his help, administering the aid programme will be impossible.

You reckon that your and his priorities are as follows.

- **Success** for you—the best outcome—would be ‘He helps you, you release the aid money’. This would be **Second-Best** —neither Success nor Failure—for the Commander.
- **Second-Best** for you—neither Success nor Failure—would be ‘He helps you, you postpone releasing the aid money.’ This would be **Success** for the Commander.
- **Failure** for both of you—your and his worst outcome—would be ‘He doesn't help you, you release the aid money (but can't administer it properly).’

[Note: the subject role-playing the aid worker has this information displayed in the tree shown in Figure 5b.]

Now you go into the meeting.

Episode 2: AID WORKER'S DECISION SHEET

You begin by requesting the NATO commander to help you with medical, transportation and communication needs. You understand that this is normal procedure, mandated by the GFAP (General Framework Agreement for Peace).

You then attempt to explain your objectives for the aid project you are administering, and how much it means to the Serbs, who are definitely discriminated against in the allocation of aid. You believe that by giving them hope for the future, the release of aid will induce them to co-operate with the International Community over refugee returns and other matters. Without criticizing the Commander, you let him know that you don't believe in threats. Threats will make the Serbs' attitude worse, not better. In any case, aid can't be turned off and on like a tap. It has to be organised. Commitments are in place. You therefore intend to release the aid the Serbs have been expecting.

1. In reply, he / **says he'll tell you what he means to do. / thanks you for coming to see him, and says it is his job to help civilian agencies in every way possible. / hopes you understand how much you rely upon**

the military, so it's important that you work with him in making aid decisions.

2. His tone is: / **cold and unsympathetic.** / **neutral.** / **warm and sympathetic.**
3. Concerning the Serb's feelings of discrimination he says that the agreed policy is for the Serbs to receive no aid if they won't co-operate with refugee returns. He then, / **says he doesn't care about the Serbs' attitude, only whether they co-operate with the International Community / describes the wonderful future that awaits the Serbs if they co-operate with the International Community / says the Serbs don't deserve aid if they won't co-operate with the International Community.**
4. You now say / **it is your job to make aid decisions, not his / you are prepared to work with him, to the extent of informing him about your decisions / you are prepared to discuss with him how you can co-operate**
5. Your tone is: / **warm and sympathetic.** / **neutral.** / **cold and unsympathetic.**
6. He then says he wants to speak about how he and you can work together. His tone is: / **neutral.** / **enthusiastic, friendly and co-operative.** / **unsympathetic.** He tells you about his row with the Mayor and says that to release aid now will make the International Community seem disunited. He has been trying to persuade the Mayor to spend some aid on restoring utilities to the houses of returning refugees. He says you and he must find a way to convince the Mayor to spend some money on restoring utilities.
7. He / **stresses that he will help you with logistics, etc, regardless of whether he and you co-operate in dealing with the Mayor / says he has orders to help you with logistics, etc, so of course he will do so / describes how much he can help you with logistics, etc., provided you and he work together in dealing with the Mayor.**
8. He then says he needs you to support him against the Mayor by not releasing aid at present. He says that: /**if you refuse to support him against the Mayor, he will give you minimal help in future, except in emergencies.** / **if you support him against the Mayor, he will give you the best of help in future.** / **he will of course give you the same amount of help in future, whether or not you support him against the Mayor.**
9. His tone at the end is: / **friendly and co-operative / cold and angry / neutral.**
10. You now say thank you for his offer of help, / **and you agree not to release aid now, in view of what he's told the Mayor / and you will inform him when you decide to release aid. / but you fully intend to release aid immediately.**
11. Later, he / **makes sure you get all the help and support you require. / follows normal procedures in giving you help and support. / makes sure you receive little or no help except in an emergency.**
12. Later still you decide to / **release aid immediately, despite what the Commander told the Mayor / don't release aid immediately, pending guarantees from the Mayor that he will restore utilities.**

Episode 5: COM'S BRIEFING

Your problem is this. A bus-load of Muslim refugees is due to visit the village next week to decide if they want to return to their homes. There is a lot of feeling against them. You believe that the Serb majority in the village may turn violent. There may be riots, stone-throwing, etc.

Meanwhile, the aid programme is going ahead, and the village is benefiting from it. The Mayor wants to get the credit for the aid. So an out-door ceremony has been arranged for this week. The aid worker is to make a speech and hand a cheque to the Mayor. Then the Mayor will make a speech.

You have asked the Mayor to use this occasion to speak out against violence and warn the people that it could result in aid being stopped. But he has refused.

You have to decide whether to give permission for the cheque-giving ceremony to go ahead. You have arranged a meeting with the Mayor to ask him again to use his speech to warn against violence. You wanted the aid worker to come with you to meet the Mayor, so as to add his influence to the request. Unfortunately, the aid worker won't come with you. He prefers not to work with the military.

You could refuse permission for the cheque-giving ceremony, on security grounds. You don't want to do this. Stopping the ceremony would be a big disappointment for the Mayor.

Thinking about the meeting, you decide that if the Mayor says he'll make a speech against violence, you won't know whether to trust him. He might or might not keep his word.

You estimate that:

- Your best outcome—**Success** for you—would be 'You allow the ceremony, the Mayor warns against violence.' For the Mayor, this would be **Second-Best**—neither Success nor Failure.
- The **Second-Best** outcome for you—neither Success nor Failure—would be 'You allow the ceremony, the Mayor doesn't warn against violence.' For the Mayor, this would be **Success**.
- The worst outcome for both of you—**Failure**—would be 'You don't allow the ceremony.'

Episode 5: COM'S DECISION SHEET

The meeting begins with the Mayor requesting you to give permission for the cheque-giving ceremony. He is obviously looking forward to it. He seems pleased with himself.

He says he knows you want him, in his speech at the ceremony, to talk about the visit being planned by returning Muslim refugees. These people are responsible for murdering Serbs. Yet you want him to tell his people to remain calm and peaceful during this visit by murderers! He asks if you are threatening to stop the ceremony if he won't make this speech. Feeling in the village is very strong against these

murderers. For him to speak out on their behalf might cause uproar, chaos — and violence. With a grin, he notes that the aid worker isn't present at this meeting. Is it really true that future aid depends on him offending and upsetting his own people?

1. In reply, you say that / (A) **you will permit the ceremony if he will speak against violence, otherwise you can't permit it./ you're going to tell him what you intend to do. / of course you'll permit the ceremony. You aren't laying down conditions.**
2. Your tone is: / **neutral. / warm and co-operative. / (A) cold and unsympathetic.**
3. You then point out that / (A) **the village and its Mayor can have a prosperous future if the ceremony takes place and the visit is peaceful. / the International Community has decided that refugees should be allowed to return. / the whole village needs to forget the wrongs of the past and start to live peacefully.**
4. Answering what the Mayor has said about murderers, you tell him that / **NATO is impartial, and isn't on the side of Serbs against Muslims or Muslims against Serbs. / crimes have unfortunately been committed on all sides, and the only solution is to look to the future, not the past. / (A) you sympathise with his feelings. Murderers should be punished, and you will help in any war-crime investigations against returnees.**
5. Your tone at this point is: / (A) **friendly and co-operative. / cold and angry/ neutral**
6. *If 1/1 or 1/2:* The Mayor then asks you again to permit the ceremony.
7. *If 1/3:* The Mayor then smiles and thanks you for permitting the ceremony.
8. He says that / (2) **he promises you he will warn his people against violence / (0) perhaps he will say something about the returnees/ (-2) he cannot however ask his people to forgive murderers and rapists.**
9. His tone is: / (1) **warm and co-operative / (-1) not very co-operative / (0) neutral.**
10. *If 8/2 or 8/3:* You then say that if he won't speak out against violence, / **you will still permit the ceremony, as it will have a positive effect. / (A) you will not permit the ceremony, as peace and security are the first consideration. / you will permit the ceremony, but you won't be happy about it.**
11. *If 8/1:* You then: **say you are sure he will keep his promise./ (A) say that if he keeps his promise, he will not regret it./ warn him that he must keep his promise.**
12. Your tone is: / (A if 8/1) **friendly and co-operative / (A if 8/3) cold and unsympathetic / (A if 8/2) neutral.**
13. He now / (3) **agrees to speak out against violence / (-3) says he cannot agree to speak out against violence / (0) says he will think about what you have said.**
14. His tone is / (-2) **bitter and angry / (2) co-operative / (0) neutral.**
15. Later, you decide: to (A if $CM > 0$) **permit the ceremony / (A if $CM \leq 0$) not permit the ceremony.**
16. *If 15/1:* At the ceremony, the Mayor **/speaks out against anti-Muslim violence / does not speak out against anti-Muslim violence.**

Episode 5: MAYOR'S BRIEFING

Aid has been coming to the village, and the village has benefited.

To celebrate this, you and the aid worker have arranged a ceremony at which he will hand you a cheque for further aid. This ceremony will be an opportunity for you to show the villagers that you are responsible for getting aid to them.

You have to visit the NATO commander to get his permission for the ceremony to go ahead. The commander has asked you to make a speech at the ceremony about the Muslim refugees who want to return to the village. Apparently a bus-load of them is due to visit next week to decide whether or not to return. He wants you to appeal to your Serb people not to riot or demonstrate violently against them.

You have refused to do this. There is a lot of feeling against these Muslim returnees. Some of them are responsible for massacres committed against Serbs. Your people, the Serbs, argue that angry or violent demonstrations against them might be a good thing. Violence might persuade them not to try to come back. Then the village could be peaceful.

On the other hand, you don't want the Commander to cancel the cheque-giving ceremony.

Thinking about your meeting with the NATO commander, you estimate that:

- Your best outcome—**Success** for you—would be 'He allows the ceremony, you don't speak out against anti-Muslim violence.' For the Commander, this would be **Second-Best**—neither Success nor Failure.
- The **Second-Best** outcome for you—neither Success nor Failure—would be 'He allows the ceremony, you do speak out against anti-Muslim violence.' For the Commander, this would be **Success**.
- The worst outcome for both of you—**Failure**—would be 'He doesn't allow the ceremony.'

Now you go into the meeting.

Episode 5: MAYOR'S DECISION SHEET

You begin the meeting by requesting the Commander to give his permission for the cheque-giving ceremony.

He asks what you intend to say in your speech, and you explain to him again why it's impossible for you to speak up and ask your people to remain quiet during a visit by Muslim refugees who were responsible for murdering Serbs. As for the idea that aid might be stopped if there is violence against these Muslims, you ask him why the aid worker hasn't turned up to this meeting. The aid worker is responsible for decisions about aid, not NATO. As a matter of fact, for you to speak up on behalf of Muslim murderers who want to return to the village could cause uproar and chaos. It might even cause violence. You say you don't think this is a good idea.

1. In reply, he says / **he will permit the ceremony if you will speak against violence, otherwise he can't permit it. / he's going to tell you what he intends to do. / of course he'll permit the ceremony. He isn't laying down conditions.**
2. His tone is: / **neutral. / warm and co-operative. / cold and unsympathetic.**
3. He then says that / **the village and its Mayor can have a prosperous future if the ceremony takes place and the visit is peaceful. / the International Community has decided that refugees should be allowed to return. / the whole village needs to forget the wrongs of the past and start to live peacefully.**
4. Answering what you have said about murderers, he tells you that / **NATO can't take the side of Serbs against Muslims. / crimes have been committed on all sides, and the only solution is to look to the future, not the past. / he sympathises with your feelings. Murderers should be punished, and he will help in any war-crime investigations against returnees.**
5. His tone at this point is: / **friendly and co-operative. / cold and angry. / neutral.**
6. *If 1/1 or 1/2:* You then ask him again to permit the ceremony.
7. *If 1/3:* You then smile and thank him warmly for permitting the ceremony.
8. You say that / **you promise him you will warn your people against violence / perhaps you will say something about the returnees. / you cannot however ask your people to forgive murderers and rapists.**
9. Your tone is: / **warm and co-operative / not very co-operative / neutral.**
10. *If 8/2 or 8/3:* He then says that if you won't speak out against violence, / **he will still permit the ceremony, as it will have a positive effect. / he will not permit the ceremony, as peace and security are the first consideration. / he will permit the ceremony, but won't be happy about it.**
11. *If 8/1:* He then: **says you are sure you will keep your promise. / says that if you keep your promise, you will not regret it. / warns you that you must keep your promise.**
12. His tone is: / **friendly and co-operative / cold and unsympathetic / neutral.**
13. You then / **agree to speak out against violence / say you cannot agree to speak out against violence. / say you will think about what he has said.**
14. Your tone is / **bitter and angry / co-operative / neutral.**
15. Later, he decides to **permit the ceremony / not permit the ceremony.**
If 15/1: At the ceremony, you decide to / **speak out against anti-Muslim violence / not to speak out against anti-Muslim violence.**