

## **Computer -Assisted International Negotiation: A Tool for Research and Practice**

### **Abstract**

This article describes a web-based computer-assisted tool for diagnosing progress in international negotiation. Following a discussion of the need for such a tool, we provide the research sources for its development, present the model on which it is based, describe how it works, and present the results of attempts to validate its diagnoses with case materials. Focusing on flexibility in negotiation, the program consists of questions divided into five categories: issues, parties, delegations, situation, and process. The questions track to variables shown in published studies to influence flexibility. Answers to the questions are processed according to algorithms that include weights derived from the results of a statistical meta-analysis of bargaining studies. An example of the question-answer format and computations leading to the diagnoses are provided. A help function that provides advice for resolving impasses is also described. Strong correspondences between diagnoses generated by the program and actual outcomes obtained in a number of cases attest to the validity of the approach. The article concludes with ideas for further development provided by the web-based version of the program.

**Key words:** computer-assisted negotiation, diagnosing negotiating flexibility, comparative analysis, computer projections vs. actual case outcomes, impasse resolution

## **Background**

Real-time bargaining advice to negotiators poses a challenge to scholars. Customarily, negotiators do not have the benefit of bargaining experts at their side during a negotiation. Furthermore, the negotiator, pressed for time, does not have the patience to read complex scientific articles. As a result, most negotiators rely upon their experience and intuition. No matter how many negotiations one has attended, there are inevitable limits to his or her experience. Thus, the academic community faces the challenge of finding a bridge that will translate empirical research and theory to the needs of the practicing negotiator.

In an effort to bridge the gap and also provide a pedagogic tool, the authors of this article report on their attempt to design a computer program that would help negotiators and researchers as well as assist educators in the classroom. The origins derive from the international negotiation experience of one of the authors, Bennett Ramberg. As a State Department representative on inter-agency task forces formulating U.S. government policy and strategy on arms control in the 1990s, he found that many of his colleagues, including ambassadors, were ill equipped to deal with the tactical challenges they confronted. For example, seeking to break an impasse in one negotiation, the ambassador and support bureaucracy relied on intuition and this proved inadequate. Given the pressure of time to come up with solutions, there was little opportunity to review “how-to” books or research studies; nor did the State Department catalogue lessons learned from prior negotiations.

Ramberg sought the advice of scholars participating in a monthly colloquium on negotiation held at the Johns Hopkins University School for Advanced International

Studies. These researchers had authored an impressive list of studies on negotiation and bargaining. However, they were unable to make many practical recommendations that addressed this challenge. Their difficulty in rapidly retrieving relevant knowledge made the task more difficult. In the end, U.S. government bargaining positions largely resulted from bureaucratic battles rather than from a thoughtful reflection of strategy or approach.

The problem is that neither the community, the negotiators or the academics, are sufficiently sensitive to the other's needs to contribute to improved negotiation. The negotiators largely ignore the wealth of academic research on bargaining found in the political science, social psychology, gaming, communications, law, and labor-management relations literatures. This research--along with lessons from case studies, were they accessible--would contribute valuable ideas that could expedite or at least allow for informed bargaining. Examples of relevant literature includes studies on positioning strategies at the outset of negotiation; different impacts of concessions which are contingent or non-contingent on adversary moves; forecasting impasses from trends in negotiators' styles of communication and strategies for resolving them; the importance of face-saving considerations and what do about them; how to take into account cultural and ideological differences on negotiating behavior.

The researchers make few attempts to translate theory (or empirical findings) into practice. Thus, the research literature has contributed more to general knowledge than to specific practices. Nor have "how-to" books written by academics proven to be particularly useful (e.g., Fisher and Ury, 1981; Fisher and Brown, 1988). They barely tap into the kind of empirical research noted above and fail to take into account the numerous perturbations in the process or permutations of tactics that must be considered during the

course of a particular negotiation. More significantly, the books do not allow the reader to interactively brainstorm to clarify options. In sum, there is a vacuum in relating theory and research to practice. Overcoming the "two cultures" problem--the dichotomy between the academic researcher and negotiators--is a matter that has been addressed in the literature (e.g., Druckman and Hopmann, 1989; George 1993).

Ramberg's State Department experience led us to explore whether negotiators would benefit from interacting with a computer program that is designed to help them implement various functions of negotiation. Curiously, the State Departments officials with whom we discussed this idea were reluctant to collaborate. Staff at the Foreign Service Institute – the Department's training office which provides courses on negotiation – expressed resistance. They argued that the combination of the case method and simulations provided sufficient learning experiences to prepare Foreign Service Officers to meet the challenges of inter-governmental decision-making and negotiation. The experience illustrated how an entrenched political culture erects barriers to innovation.

But, the problem is also due to shortcomings of extant computer programs and the literature that promotes and evaluates them. Computer-assisted decision making is not a new idea. Early efforts, consisting largely of electronic checklists leading to simple prescriptions based on unchanging interests (e.g., Shell, 1995), fueled skepticism about whether the computer's binary logic could capture the complex, value-laden milieu in which negotiations take place. Although some programs designed for other purposes – such as spreadsheets that encourage users to explore alternative ways of dividing assets and decision trees that permit litigants to anticipate the twists and turns of complex litigation – are promising (see Wheeler, 1995), they are not intended to capture the

complexity of international negotiation experienced by diplomats. Nor do they deal with the process of negotiating. Rather, they are applications of decision-theory concepts that emphasize issue definition and preferences (Raiffa, 1982). One application along these lines has been used in concert with ongoing negotiations, including a bilateral base-rights case (Ulvila, 1990) and a multilateral oil tanker negotiation (Ulvila and Snyder, 1980). By defining a bargaining frontier along which alternative agreement packages were situated, the application was useful in identifying optimal solutions for both cases. Missing from the application, however, was an analysis of the discussions between negotiators and the various factors that influence that process. An attempt is made to capture these processes and influences in the design of our computer aid.

The analyst's challenge is to reflect the complexity of negotiators' environments and then to provide tools that help them manage those environments. A few earlier efforts to design decision aids have understood this challenge. Emphasizing the development of trust through a process of joint analysis and modeling, Samarasan (1993) used computer-based tools to help negotiators discover and design solutions that resolve the "create and claim" framework of competitive bargaining. Emphasizing the value of understanding one's own assumptions and the other's viewpoint, Bonham (1993) developed an application of cognitive mapping for use in the kind of collective decision making that occurs in negotiation. Focusing on intercultural negotiation, Shakun (1999) shows how computer support tools can be used to facilitate the development of a shared (or situational) culture with regard to specific problems addressed in negotiation. This process may be similar to the way that common cultures emerge among professional negotiating representatives from different countries. Each of these applications is an

example of “how analytical methodologies can be engineered to assist international negotiators in a practical way, either to diagnose, plan and develop strategies independently or to bargain interactively (Spector, 1993: 178). To further develop the possibilities of collaborative efforts between methodologists and negotiators, we have developed software that monitors progress in terms of flexibility, projects possible outcomes based on that progress, and offers the user a means for theory testing, scenario generation, and brainstorming for impasse resolution.

The remainder of this article is organized into several sections. We begin with an overview of the computer tool followed by a discussion of the research that provides a knowledge base for its development. In the next section, the assumptions made about negotiating flexibility are expressed as a formal model which defines the information needed to estimate flexibility. Details about question coding and interpretation include a sensitivity analysis of relative contributions of the various questions to the estimates. The reader is then taken through a hypothetical run of the program, including how the diagnoses are made. Comparisons between actual outcomes of historical and projected outcomes from the computer provide evidence for validity of the diagnoses. The article concludes with ideas for further contributions to research and practice from the web-based feature of the program.

### **Overview of the Computer Program**

The program consists of suites of questions grouped into five categories: *parties*, *issues*, *delegation characteristics*, *situation*, and *process*. Some user responses prompt branching to new sets of questions and stages in the negotiation. From the answers to the

questions, we developed algorithms for ascertaining flexibility on the assumption that prospects for success are improved when parties are flexible, that is, when they are willing to move from initial positions or search and find new solutions to the issues that divide them. When all questions have been answered, the program generates a diagnostic grid which shows the results of the processing of responses in the form of flexibility estimates and projections of the possible outcome of the negotiation at the time that the diagnoses were made. This is primarily a tool that diagnoses the state of an international negotiation at a particular point in time. This “state” is ascertained by answers to questions about both past (e.g., How did your delegation prepare for the talks? How frequently did they make concessions?) and present (e.g., How complex is this issue?, To what extent are the negotiators influenced by public opinion?) activities. To the extent that negotiators are flexible, their chances for agreement are improved as indicated in the program’s projections. These diagnoses and projections have both theoretical and practical value. The professional negotiator can use the tool for planning and strategy development as well as for advice on breaking impasses as shown below. The analyst can use it to compare cases and alternative theories of negotiation also illustrated below.

When the projections indicate an impasse, the program provides a help window that includes suggestions for addressing and possibly resolving it. The suggestions are based on actual experiences in historical cases as well as on findings from experiments. They are indexed in terms of the five sections, for example, tactics for resolving impasses on issues, advice for addressing problems within delegations, in the process, or caused by the situation. A negotiator can use the advice to change his or her tactics or to alter those aspects of the situation that may be responsible for the stalemate. He or she can then

address the program's questions in the relevant section to ascertain whether the talks are now moving in a direction toward agreement. Examples of suggestions are provided in the discussion below on how the program works.

The program also provides an analytical function by allowing a user to compare approaches or "theories" of negotiation. Alternative diagnoses are generated from responses to the each of the five categories of questions. For example, theories that emphasize the importance of issues would focus on answers to questions in the first part of the survey; process theories of negotiation would emphasize the answers to questions asked in the final part of the survey. By comparing approaches in this way (e.g., issues vs. process), the user can diagnose the negotiation from different perspectives on the factors that are considered to be important: namely, a focus of the issues, the parties, delegation (or bureaucratic) activities, the negotiating situation, or the process itself. To validate the diagnostic feature of the program, we performed analyses that compare known outcomes obtained in several cases of completed international negotiations with the outcome projected by the program.<sup>i</sup> These are presented below in the section on validity of diagnoses.

### **The Knowledge Bases for the Program**

The five categories of questions are attempts to capture the factors that influence the course of a negotiation. A negotiator's willingness to compromise or problem-solve in order to reach an agreement is determined in large part by these factors. The specific questions asked derive from research evidence showing relationships between that aspect of the negotiation – parties, issues, delegation activities, situation, process -- and flexible

negotiating behavior. Examples of the studies that provide the evidence for each parcel of questions are presented in this section.

### *Parties*

Questions asked about the parties highlight concepts emphasized in the contemporary literature on conflict resolution: Relationships, power differences, approaches or negotiating styles.

In their book, *Getting Together*, Fisher and Brown (1988) emphasize the importance of building strong relationships in order to sustain agreements. They suggest that flexible responding in the form of "unconditional cooperation" or unilateral gestures foster strong relationships. The relationships, in turn, promote flexibility during the negotiation process. In a simulation study by Beriker and Druckman (1996) equal-power national representatives compromised more and attained more agreements than opponents who differed in power defined in terms of political or military resources. A number of experimental studies have shown that the way negotiators define the situation can influence progress. These include cooperative or competitive orientations toward the negotiating situation, ways of defining the issues, and ideological viewpoints. In general, the smaller these differences between negotiating opponents, the more willing they are to agree on solutions to their differences. (See Druckman, 1994, for a review of this evidence.).

The questions in this section address each of these aspects of parties. Another factor contributing to flexibility is the issues at stake.

### *Issues*

The questions asked about issues are based on experimental findings. The experiments demonstrated relationships between aspects of the issues dividing negotiators and their willingness to be flexible in the negotiation. Four aspects of issues, in particular, have been shown to impact on flexible negotiating behavior.

One aspect is *issue size*. Fisher (1964) suggested that by reducing the size of the issues, which he referred to as *fractionation*, negotiators should find it easier to reach an agreement. This was demonstrated in an experiment by Deutsch and his colleagues (1971): smaller issues produced faster resolutions. A second aspect is the extent to which *underlying value differences are made explicit*. Experiments conducted by Druckman and his colleagues (e.g., 1988) demonstrated that when the values underlying positions are made explicit, negotiators have more trouble reaching agreement than when the values remain implicit. A third aspect of issues is whether *a prominent outcome is evident*. Benton and Druckman (1973) demonstrated that prominent solutions, involving a split-the-difference outcome, encourage compromise by both parties. A fourth aspect is the extent of *within-team agreement* on their negotiating position. Results obtained in an experiments by Evan and MacDougall (1967), Druckman (1968), and Jacobson (1981) using simulated bargaining situations showed that the negotiators were less flexible when members of their teams agreed unanimously with the positions defended in the negotiation.

In this section we ask questions about each of these aspects of issues. The answers to these questions contribute to our estimates of flexibility. However, flexibility

is determined also by other factors. One of these is the internal processes of the negotiating delegations.

### *Delegation Activities*

The questions asked about delegation activities or processes include how they prepare for the negotiations, their alternatives to a negotiated settlement, the extent to which the head-of-state is interested in the negotiation, and the amount of latitude that negotiators have in making decisions.

The way that negotiators prepare for the talks has been shown in a number of experiments to influence their flexibility. The experiments conducted by Bass (1966), Druckman (1968), and Klimoski (1972) demonstrates that when negotiators prepare unilateral strategies in pre-negotiation sessions, they are considerably less flexible during the talks than when they study the issues in groups that include members from the opposing delegations. The well-known concept of a best-alternative-to-a-negotiated-agreement (BATNA), suggested by Fisher and Ury (1981) calls attention to the importance of having favorable alternatives to possible agreements worked out at the table; however, very attractive alternatives also induce inflexibility as parties hold out for a better deal (see also Pinckley et al., 1994).

In their case study of the Intermediate-range Nuclear Forces (INF) negotiations, Druckman, Husbands, and Johnston (1991) showed that strong interest in the talks by national leaders served to propel their respective bureaucracies to channel their efforts to getting an agreement. In a simulation study by Zechmeister and Druckman (1973), negotiators who had more latitude to develop their party's positions in pre-negotiation sessions, were more willing to compromise or offer a range of possible settlements

during the negotiation. When positions were developed "from above," the negotiators showed less flexibility.

These are some of the delegation processes asked about in this section of the program. Answers play a role in determining the extent to which negotiators are likely to be flexible. Among the other factors that influence flexibility are aspects of the negotiating situation itself.

### *The Negotiating Situation*

Among the many aspects of the negotiating situation likely to have an impact on flexibility are time pressures, visibility of the deliberations to outside audiences, events external to the talks, and third parties.

Strong time pressures in the form of fixed deadlines have been shown in many experiments to result in large compromises and relatively quick agreements. This is particularly true when the stakes are high and negotiators must forfeit valuable items if the negotiation ends in a stalemate. Flexibility is also influenced by whether a negotiation is visible to the outside world. In a series of experiments, Brown (1977) showed that when negotiators were asked to "perform" before an audience that creates strong face-saving pressures, they are less flexible than when the talks are conducted in private. Similarly, events external to the negotiation can have an effect on its progress. Hopmann and Walcott (1977) showed that developments in the international system can drive a negotiation toward or away from agreement as negotiators weigh the implications for their nation's interests. In their research, these investigators demonstrated that external events have at least as strong an impact on flexibility as do internal processes. A more complex set of relationships exist with regard to the role played by third parties. Their

impact on flexibility depends on their role and the way they exert influence over the process. In their review of the mediation literature, Wall and Lynn (1993) showed that the structure and timing of mediation make a difference. Influential mediation approaches can induce flexibility and encourage agreements.

The questions asked in this section probe the role played by third parties as well as the other aspects of the situation that have been shown to affect flexibility. Bargaining also is influenced by the way negotiators approach the negotiation and the tactics they use.

#### *The Process: Approaches and Tactics*

The way that a delegation approaches a negotiation and the tactics it uses to move the negotiation forward also have been shown to influence its progress. The questions in this section address approaches and tactics used by the negotiators.

A negotiator's orientation toward the bargaining task was shown in a meta-analysis of the bargaining literature to have the strongest influence (compared to nine other variables) on compromising behavior (Druckman, 1994). Negotiators were considerably more flexible when they approached the bargaining task as a problem-solving debate rather than as a strategic, competitive encounter. This may be due in large part to the moves and tactics that flow from these approaches. When a negotiator puts the burden of concession-making on the other party -- a tactic described by Schelling (1960) as casuistry -- negotiations are often stalled as the other rejects the "burden."

Similarly, efforts made to justify one's own position and to repeat that position throughout the discussion slows progress as does making threats, offering sham concessions, and feigning flexibility. These tactics are part of the "gamesman's" arsenal.

They differ from efforts to find a mutually satisfying solution to the conflict. Zartman and Berman (1982) illustrated some advantages to developing a formula that provides a framework for the bargaining over details. Focusing on issues of relationship, attempting to find creative solutions, appealing to a sense of justice and fairness, and arguing in terms of universal norms are rhetorical "devices" that demonstrate flexibility and move the talks toward settlements. So too can efforts to link the negotiation to progress elsewhere. Jensen (1979) showed that linking the issues to progress in other forums is a common tactic in international negotiations. It can be used to stall or promote progress depending on whether the linked negotiations have moved toward or away from agreement.

The questions asked in this section explore a variety of tactics used by both parties in the negotiation. Together with the other questions, they provide a basis for the diagnoses.

### **The Model**

The program is based on a *general linear* model that takes the following form:

$$(1) \quad Y_i = \beta_1 c_{i1} + \beta_2 c_{i2} + \cdots + \beta_j c_{ij} + \varepsilon_i \text{ where } Y_i \text{ are the negotiating delegation's } \textit{flexibility} \text{ (defined as } \textit{zero} \text{ for inflexible to } \textit{one} \text{ for maximum flexibility), the } c_{ij} \text{ are the known constants, i.e. the answers to the questions, the } \beta_j \text{ are unknown real parameters (weights), and the } \varepsilon_j \text{ are independent } N(0, \sigma^2) \text{ variables. The } c_{ij} \text{ can be zero due to}$$

*branching* questions which allow some questions to be omitted depending on the answers to the branching questions.

Two negotiating delegations are assumed and, hence, flexibility is estimated for both,  $Y_1$  and  $Y_2$ . The program could be extended to multilateral negotiations with  $n$  delegations using the same linear model. The  $\beta_j$  have been estimated for the initial version of the program with some of the estimates being derived from the literature and others estimated a priori (see note iv). Further experimental work needs to be done to validate or modify the  $\beta_j$  (referred to as *weights* in the program documentation). The fact that the program is accessible through the Internet will make such experiments fairly straightforward to implement.

The rationale for using a linear model is that within a certain range of variables, linear models are a good approximation to reality. It is recognized that in actual negotiations at times there will be non-linear response to changes in a delegation's position or strategy, for instance, when a powerful leader enters a negotiation in its later stages. Because of this program allows *branching* and *flipper* questions which can provide a mechanism for adjusting the flexibility response based upon a known multiplier effect (see below).

Further, it is recognized that experienced negotiator professionals may wish to modify the estimated question weights or change and add questions to the present program. To allow for this possibility, the questions are contained in a relational database using MySQL, a free software program available on the Internet for Unix, Linux, and Windows based systems. The database *table* containing questions, weights, and branching

or flipper question coding can be modified in an EXCEL or other spreadsheet and then reloaded into the database. This process is likely to be simple and straightforward for most researchers.

### **Question Scoring and Analysis**

For each of the five sections there are two types of questions – *general* questions that are asked once for both parties, and *party* questions that are asked twice, once for each negotiating party. Although there are 64 unique questions, the total number of questions across all sections is 103. The number of questions of each type is shown in Table 1.

Questions are either multiple choice with two or three choices or are open-ended, requesting a textual answer. The textual answers are not used to score flexibility but are used to provide more information and insight into the negotiation. The multiple-choice questions have a value of one to three for three-answer questions and one to two for two-answer questions. These values are multiplied by the weight for that question to result in a score that is added for each party to result in a total flexibility score,  $Y_i$  in equation (1).

Because the maximum and minimum possible score is different for each of the five sections, all scores are *normalized*, such that the score for each section goes from zero to one hundred percent of the range (maximum score – minimum score). Then, depending upon the number of questions in the section, each question will contribute some percent of the total possible score for that section. The number of questions in each

section and the frequency of the percent contribution to the total score in that section is shown in Table 1.

*Table 1. Summary of Questions*

Type of Question	Total Number of Questions			Frequency of Occurrences of Question Score (Ans x Wgt) for a Question Type				
	Gen'l	Party	Total	0-5%	6-10%	11-15%	16-20%	21-25%
Issue	6	4	10	2	1	4	0	3
Party	5	4	9	2	0	4	0	3
Delegation	0	26	26	12	6	0	8	0
Situation	14	6	20	9	9	2	0	0
Process	0	38	38	14	4	20	0	0
<b>Total</b>	<b>25</b>	<b>78</b>	<b>103</b>					

The analysis shown in Table 1 indicates the sensitivity of the diagnoses to the questions. The higher the percent of the section's range for the question, the larger its contribution to that section's diagnosis.<sup>ii</sup> The three questions that cover 21-25% of the range in the issues and party section make larger contributions to diagnoses (overall score) than the four questions that cover 11-15% of the range. Similarly for the other sections: the eight questions that cover 16-20% of the range in the delegation section, the two questions that cover 11-15% of the range in the situation section, and the 20

questions that cover 11-15% of the range in the process section contribute more to those diagnoses than questions that cover smaller ranges. For the issues section, the questions covering 25% of the range are the size of the difference between the parties on the issue (large, moderate, relatively small), and the extent to which values or ideologies are at stake (great extent, some extent, not appreciably) for each party. A question covering only 8% of the range is whether there is a salient outcome that could be agreed on. For the parties' section, examples of questions covering 23% of the range are the relationship between the parties (depicted as antagonistic, neutral, or friendly) and whether the parties differ in their approach to the talks (as large, modest, or virtually identical approaches). A question about whether the relationship between the delegations is the same or different as that between the parties or countries covers only 2% of the range. These sensitivities are based on the weights and number of choice alternatives. They were determined a priori by the authors as discussed above. They can, however, be altered by users to reflect particular case contexts or situations. Altering them would change the question sensitivities or the relative contributions of different questions to the diagnoses.

*Branching and flipper questions.* During the design phase of the project, the authors decided that a *branching* capability needed to be added to the program. This would take into account the need to address different types of negotiation processes. For example, the well-known distinction between distributive or strategic bargaining and integrative or problem-solving negotiations suggests questions relevant to each process. A first question establishes the type of process typical of a particular case, Subsequent questions branch from this response to address the relevant process. Questions only

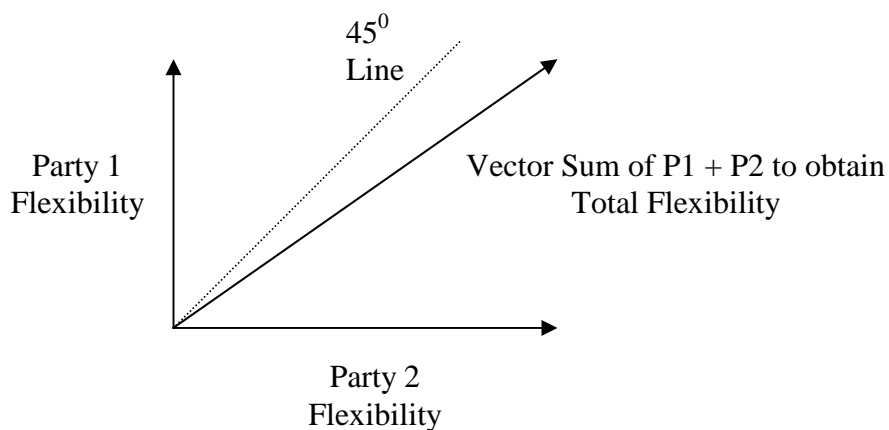
contribute to the overall score when they are relevant and this is determined by the answer to the first question in the section. (A question that determines a “branch” has only two possible answers.)

Another technical capability that seemed needed was the opportunity to “trump” an answer to a question, that is, to make the score higher or lower depending upon a follow-up question. This capability would address the need, mentioned above in the discussion of the model, for non-linear response concerning some aspects of a negotiation. The implementation chosen is a *flipper* question that establishes a high-medium-low response and then a following question that can multiply the effect of the response to the first question. For example, we ask a three answer multiple choice flipper question such as: “How involved is the President or Prime Minister in these negotiations?” and the following question, “Is it late in the negotiations?” Since involvement for the President late in the negotiations counts more than early, the second question is designed to take the answer of the previous “flipper” question and add to its score, thereby increasing its value in the overall score for that section of the program.

*Interpretation of flexibility scores.* The program plots the total score of each party on a two-dimensional graph with the y-axis representing the flexibility of party 1 and the x-axis representing the flexibility of party 2. Total scores are plotted for each section of questions so that there are five points plotted for the negotiation, each point with coordinates representing the flexibility of each party.

One way to interpret these results is to think of each point as a vector sum of the flexibility vectors of each party. This is analogous to plotting the course of a boat which

has a vector representing its forward speed added to the vector of the wind or current pushing it sideways. The boat's actual course is the vector sum of these component vectors. Similarly, we add together the flexibility vectors (using the law of parallelograms) and obtain the overall course (*total flexibility*) of the negotiation as shown in Figure 1.



*Figure 1. Vector Addition of Party Flexibility to Obtain Total Flexibility*

Another way of interpreting this vector addition of party flexibility is to note that any general question score affects both parties equally and is therefore on the 45° line shown in Figure 1. This suggests that perhaps the total flexibility could be a vector sum of the joint flexibility (along the 45° line) and the asymmetric flexibility (perpendicular to the 45° line). This interpretation is shown in Figure 2.

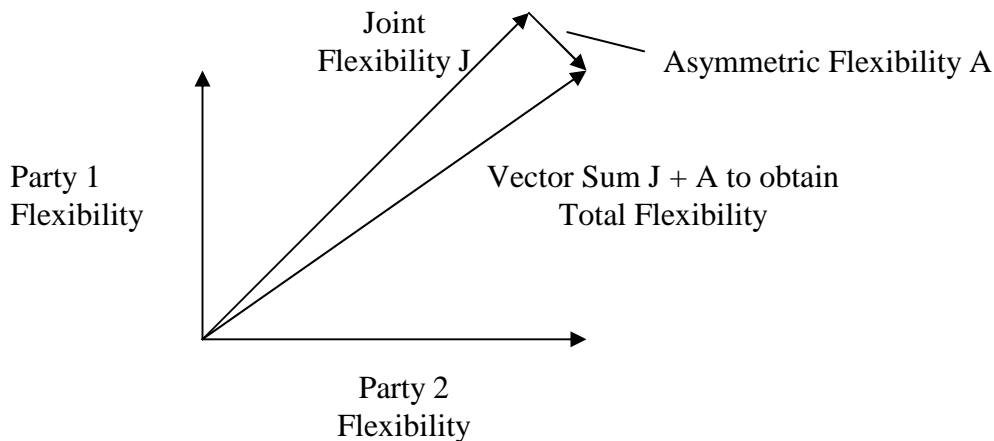
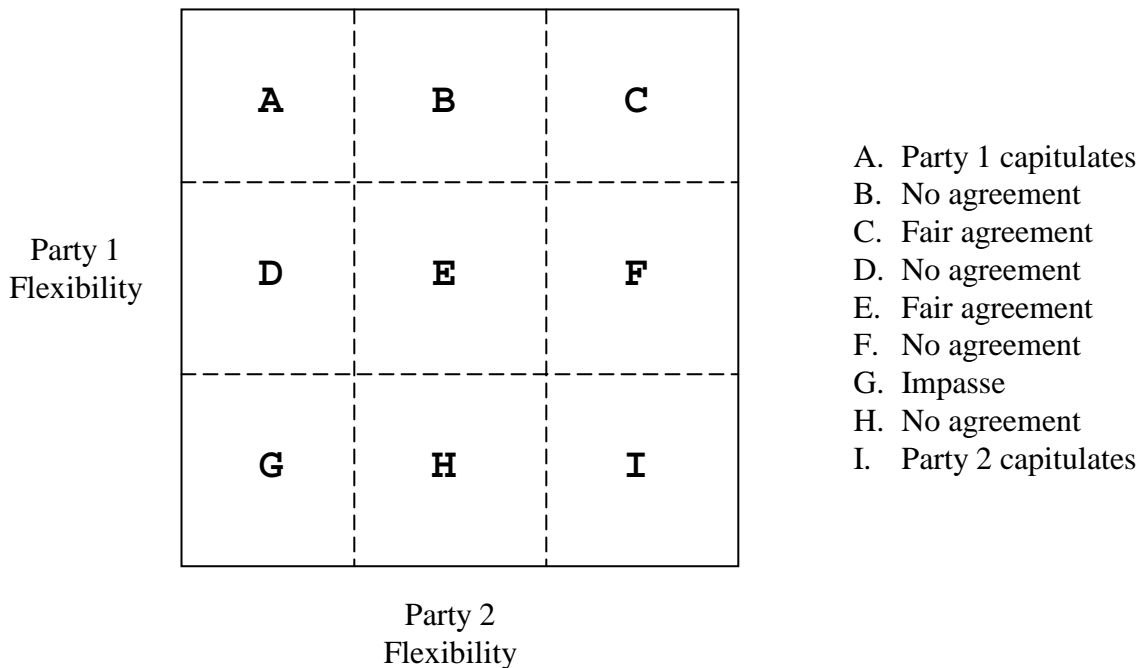


Figure 2. Alternative Interpretation of Vector Sum – Party Flexibility

It is relatively easy to see that the further the total flexibility is toward the upper right, the greater the chance for the negotiation being successful and resulting in a *fair* agreement. However, what about other locations on the grid? What interpretation should they be given? The authors gave these locations a qualitative interpretation that would be understandable to researcher or practitioner alike. The interpretation is given below in Figure 3. Large asymmetries in flexibility may lead to capitulation of the more flexible party to the less flexible one (cells C and I). Agreements are less likely to occur when there are smaller asymmetries between the parties as in cells B, D, and H. Extended impasses are the likely result when both parties are inflexible (cell G). And, agreement is more likely to occur when parties show symmetrical flexibility as in cells C and E. Although these decisions are somewhat arbitrary, they do convey the qualitative interpretation one might give to the mathematical result. However, the (x, y) location of

the total flexibility would perhaps be more useful for comparing the characteristics of two negotiations with more precision. Both ways of looking at the results seem to be useful.



*Figure 3. Qualitative Interpretation of Flexibility*

*Implementation.* The present implementation of the program is accessible from a UNIX server via the Internet from a Netscape or Internet Explorer client. The questions, answers, and other information are stored in a relational database on the server. Because of this database implementation, the knowledgeable user can employ the SQL language to generate any report or update any information in the database. In particular, the weights assigned to each question can be changed and questions can easily be added or

changed. The use of EXCEL spreadsheets can facilitate multiple changes to a database table.

Furthermore, since multiple users can access the web-based system at one time from different locations, there can be more than one negotiator at a time viewing the results and making changes. Ultimately, this may be useful for distance learning applications such as using the system to help train a new member of a negotiating team.<sup>iii</sup>

### **How the Program Works**

We produce below an abbreviated version of the program as it is presented to the user. Questions in each part include definitions and examples to provide a common frame of reference. They also help the user understand the kind of information being sought by the query. Answers are coded ( $c_{ij}$  in the model) for flexible behavior based on our understanding of the results of the studies reviewed above. Each question is also assigned a weight ( $\beta_j$  in the model) based on the strength of effect sizes (ES) obtained in a meta-analysis (Druckman, 1994).<sup>iv</sup> These ES indicate the extent to which a variable such as issue size contributes to negotiation flexibility: the strongest contributors are weighed '1.0,' modest contributors are weighed as '0.6,' and the weakest contributors receive a weight of '0.2.' As noted above, a variable's weight is intended to reflect its strength, as shown by the results of experiments or derived from interpretations of case studies when experimental evidence was not available. These *a priori* decisions, based on research, are only one basis for weights. Another basis is from the experience of users who can also assign weights to questions on an EXCEL spreadsheet. The codes and weights are then combined by the program to yield an overall judgment of each

negotiating delegation's (or team's) flexibility. These judgments are then used to estimate the likelihood of various outcomes (projected from the point in time when the questions are answered) shown in Figure 3 above. In many cases, the program produces two possible outcomes, and distinguishes between them as being more or less likely to occur.

The program provides the user with many diagnostic options. By answering questions for each of the sections, the user can observe differences and similarities among the aspects such as issues compared to situations or processes. By answering the complete set of questions for each of several cases, the user will be able to compare the outcomes likely to be achieved. If the cases are completed negotiations, the user can compare the estimated flexibility and outcomes with those that were actually achieved. These kinds of comparisons are illustrated for a number of completed negotiations following the example of a computer run to follow.

*Enter the name of the first team:* Assume that the first team is Red. [Press return.]

*Enter the name of the second team:* Assume that the second team is Blue [Press return.]

We include below, for illustrative purposes, 15 questions asked of both teams. After the Red or Blue team representative makes a choice, the program assigns a weighted value based on the importance of that variable determined *a priori*. Definitions and examples follow each question. Conclusions appear at the end of the run.

*Please answer the following questions:*

*--Negotiating Issues--*

*Depict the differences between the negotiating parties on this issue: large - 1, moderate - 2, relatively small - 3? [Red picks 1; Blue picks 1]*

Definition and examples: This refers to the perceived consequences of agreements or non-agreements for the parties to the negotiation. "Large issues" are those viewed as having implications for the relationship between the parties or for the future of international relations in the world, for example, negotiating reductions in the most deadly strategic nuclear weapons or the conditions for ending a war. "Small issues" are those with limited rather than broad implications, such as bilateral trade agreements on particular commodities. Since many issues would seem to fall between these "extremes," we have including a rating of "medium-sized issues," for example, negotiating over territorial jurisdiction or over a country's base rights.

*Is there an outcome that stands out or is salient as a plausible agreement? no - 1. yes - 2 [Red picks 1; Blue picks 1]*

Definition and examples: By salient outcomes we refer to the presence of a "formula" that provides the basis for agreement. In the INF talks, the proposed "double zero" option was such a formula. In the SALT talks, progress occurred when the idea of nuclear parity became a matter of foreclosing coercion rather than of permitting deterrence. Or a salient outcome could be the discovery of a fair solution which, to be achieved, calls for equal concessions from all sides. The distinction being made here is between negotiations where such salient options can be found to exist and those where they are absent.

*Characterize the extent to which members within each party agree on the positions taken on this issue. unanimous agreement – 1, small differences – 2, or large differences – 3.*

[Red picks 1; Blue picks 2]

Definition and examples: This refers to the extent to which the members of a negotiating team who usually represent different government agencies are in agreement on the "official" positions put forth at the negotiating table. "High consensus" indicates high levels of agreement among the agency representatives on the team. "Low consensus" indicates divisions among team members on the issues, even if an official position is put forth by the delegation. It is possible that there is consensus in some issues and dissensus on others; this would be indicated by the rating "medium consensus."

*For this issue, characterize the extent to which the party's values or ideologies are at stake. to a great extent – 1, to some extent – 2, not appreciably – 3.* [Red picks 1; Blue picks 2]

Definition and examples: This is the distinction between issues where only interests are at stake and those where both interest and broader values are at stake. Negotiations that concern primarily technical issues such as verification or arms reductions emphasize the interests of the nations. Talks that include issues of the relationship between the nations often have implications for the nation's values, ideology or independence: for example, talks between Middle Eastern countries over the recognition of Israel, talks about power sharing between incumbent regimes and communist insurgencies, or base-rights negotiations where the host country's sovereignty is regarded as an issue by that country

*-Negotiating Parties and Delegations-*

*How would you depict the relationship between the parties? friendly – 3, neutral – 2, antagonistic -1 [Red picks 1; Blue picks 1]*

Definition and examples: This category refers to the relationship between the nations outside the negotiation. A friendly relationship is characterized by mutual security pacts, most favored nation status, or unrestricted travel for citizens of both nations. West European-American relations are an example. An antagonistic relationship is characterized by membership in competing alliances, trade restrictions, and restricted travel for citizens of both nations, e.g. Soviet-American relations during the Cold War.

*How attractive does the delegation consider the above-mentioned alternative to a negotiated agreement? (the prior question asks for an alternative option) very attractive – 1, moderately attractive – 2, generally unattractive - 3 [Red picks 1; Blue picks 2]*

Definition and examples: BATNAS (best alternative to negotiated agreement) refer to the consequences of failing to reach an agreement through negotiation. Attractive alternatives are those as good or better than the offered negotiated agreement: for example, in foreign military base negotiations where the United States attempted to retain operating bases abroad, the best alternative to a negotiated agreement was relocation on another country's soil. Unattractive BATNAs occur when the offered agreement is better than any alternatives. For example, it would be more expensive to relocate bases-

*How does the delegation prepare for the talks? by developing strategies - 1 or by studying the issues -2 [Red pick 1; Blue pick 1]*

Definition and examples: Two types of preparations by the negotiation teams are contrasted. "Developing strategies" are usually intended to persuade the other side to

accept the strategist's positions; "studying options" are usually intended to discover a solution to the conflict that is acceptable to all parties.

*How much latitude does the delegation have in developing its positions or in deciding on tactics? little – 1, somewhat – 2, very much -3 [Red picks 1; Blue picks 2]*

Definition and examples: This refers to the extent to which the negotiators are constrained by instructions from their government's home offices. It is often related to the level of the chief negotiator and delegates. Relatively high latitude would seem to characterize presidents and foreign ministers talking with their counterparts.

Ambassadors are likely to be somewhat more constrained by instructions than heads of state or secretaries while career diplomats are likely to have much less decision latitude than Ambassadors.

*How much interest has your president (or prime minister) shown in these negotiations? Very much – 3, somewhat - 2; very little - 1 [Red picks 2; Blue picks 1]*

Definition and examples: Some negotiations between governments are placed high on a President's policy agenda. A case in point is the INF talks between the United States and the Soviet Union; the strong interest shown by both Reagan and Gorbachev influenced the course of these talks. Alternatively, some negotiations are virtually ignored by the heads of state or foreign ministers despite active negotiating by their national delegations. Examples are the long Vienna negotiations between East and West over troop reductions in central Europe and many talks between governments intended to extend previous agreements such as base rights.

*How many agencies are represented on the delegation? More than five – 1, five – 2. Less than five - 3 [Red picks 1; Blue picks 2]*

Definition and examples: This refers to the variety of agencies represented on the national delegation. Negotiations over global environmental issues are likely to have broad national agency representation on the delegations while those that focus on defense issues are likely to be dominated by representatives from the foreign and defense ministries..

*--Negotiating Situation--*

*Is there an official time when if the talks do not produce an agreement, they will end in deadlock or stalemate? yes – 2, no – 1. [Red picks 2; Blue picks 2]*

Definition and examples: This question distinguishes between those talks where the consequences of not reaching an agreement by a certain time are substantial (e.g. , loss of bases or the end of a cease fire) and those where no agreement does not alter the existing situation. Examples are negotiations over troop reductions or over a new trade agreement. Many talks fall between these "extremes," such as when no agreement by a certain time could lead to a deteriorating situation. An example is talks over measures to decrease global environmental pollution.

*To what extent are the talks visible, in terms of media coverage, to the outside world?*

*very visible - 1; somewhat visible - 2; or almost invisible- 3 [Red picks 2; Blue picks 2]*

Definition and examples: Visibility refers to the extent to which the talks are covered by the world-wide media such as CNN or the New York Times. Typically bilateral talks get more coverage within the respective countries but multilateral talks, especially on security or arms-control issues, are covered more widely in the world media. Highly visible political negotiations are likely to be more stressful than those that deal with relatively

routine issues out of the limelight. Research has shown that coverage can influence the course of negotiations.

*-Negotiating Process-*

*What is your party's approach to these negotiators? as a strategic or competitive game – 1, as a problem-solving debate – 2, (Red picks 1, Blue picks 2)*

Definition and examples: A strategic or competitive negotiator is one who views the negotiation as a win-lose contest, is generally unwilling to compromise his or her positions, and tries to extract concessions from the other side. A cooperative negotiator is one who views the negotiation as a problem-solving challenge, is willing to consider making compromises, and search for solution that satisfies all parties.

*Have a few concessions (tough posture) or many concessions (soft posture) been made by your party? Or has it alternated? Few concessions – 1, alternated – few and many – 2, many concessions – 3 [Red picks 2; Blue picks 3]*

Definition and examples: We refer here to the process of negotiating. It should be possible to distinguish among negotiations in terms of an overall amount of movement from initial positions. Some negotiations are characterized by a flurry of concessions made by one or both sides, resulting in an agreement. The stream of unilateral moves made by Gorbachev concerning reductions in INF weapons is an example. Other negotiations are characterized by few concessions made by either side resulting in stalemate. The 13-year talks about conventional weapons in Europe is an example. Many negotiations fall between these "extremes," illustrating some position movement by both sides or more movement by one nation than another. The record of SALT I and II

illustrate an asymmetrical rate of movement with most of the concessions being made primarily by one side

*Are the third-party's role primarily that of mediator or lobbyist?* lobbyists – 1,  
mediators – 2 [Red picks 1;Blue picks 2]

Definition and examples: The outcomes of many negotiations are of interest to non-participating countries. These countries often play a role "behind the scenes," by putting pressure on the participating countries to consider certain kinds of agreements. This was surely the case in the bilateral Intermediate Nuclear Forces (INF) talks where the implications of outcomes for non-participating European countries were substantial. It is much less the case for non-participating nations in bilateral trade negotiations or in the large conference diplomacy forums of the UN where few nations are excluded from participation. Here, we are distinguishing between those talks where third parties are lobbyists, actively involved in trying to influence the process, as compared to mediators where active influence is more limited.

Upon completion of the questions, the user clicks on "submit" and views a summary table of his or her responses with a weighted sum. The next window presents the grid shown in Figure 3 above with a symbol located in the appropriate cell. For this example, the weights, question codes, and weighted sums are displayed in Table 2. The weighted sums are 15.4 for Red and 21.2 for Blue; Blue is somewhat more flexible than Red. These scores are translated into points on the grid in Figure 3. Each score is considered as a percentage of the maximum flexibility, which is 33. Thus, Red (party 1 in the grid) uses 47% of the available flexibility ( $15.4/33$ ) while Blue (party 2) uses 64% ( $21.2/33$ ). Since each cell of the grid uses 33% of the total flexibility, the intersection of

the parties' flexibility is close to the border of cells E (agreement) and F (no agreement). Since the point is located just to the left of the line separating these cells (in cell E), we conclude that the parties are moving toward a fragile agreement that could unravel if Red does not show more flexibility.

Table 2. *Weighted Scores for Red and Blue (Grid location: cell E)*

<b>Question</b>	<b>Weight</b>	<b>Red Choice</b>	<b>Blue Choice</b>
<b>Issues</b>			
Differences	1.0	1	1
Salient outcome	.6	1	1
Consensus	.6	1	2
Values	1.0	1	2
<b>Parties and Delegations</b>			
Relationship	1.0	1	1
BATNA	1.0	1	1
Preparation	1.0	1	1
Latitude	1.0	1	2
Presidential interest	.6	2	1
Agencies	.2	1	2
<b>Situation</b>			
Deadline	1.0	2	2
Visibility	.6	2	2
<b>Process</b>			
Approach	1.0	1	2
Concessions	1.0	2	3
Third-parties	.6	1	2
<b>Weighted sum</b>		<b>15.4</b>	<b>21.2</b>
<b>Percent of range</b>		<b>47</b>	<b>64</b>

*-Help!-*

When a diagnosis - based either on questions in a particular section or on the complete set of questions - suggests an impasse or projects no agreement, a user can access a help window. The window is organized by type of impasse and tactics. Examples are drawn from historical cases and from the findings obtained in experiments. Following are examples of advice given on issues, process, delegation activities, and situation.

*Issues.* If the issues are too contentious or “too large,” you may try to fractionate them or divide them into smaller parts. This strategy was suggested in a chapter written by Roger Fisher in 1964. He advanced the idea of distinguishing between smaller and larger issues and, then, tackling the smaller ones first. By doing so, agreements may be easier to attain, generating the confidence needed to address the larger issues. Support for this idea was obtained in an experiment reported in 1971 by Deutsch and his colleagues: They found that the smaller the issue, the easier it was to get an agreement. The tactic has also been used with some success in the Israeli-Palestinian negotiations. By withdrawing from some of the occupied territories, the negotiators were able to build confidence in addressing larger issues. However, the confidence gained in this case was not sufficient to overcome their divisions on larger issues. In another experiment reported by Druckman and his colleagues in 1988, fractionation worked in getting more agreements but did not induce more cooperation during the process or improve their relationships. Only by addressing their larger value differences, in pre-negotiation sessions, were they able to improve the process or insure more durable outcomes.

We hope that this information is helpful to you. If you attempt to fractionate the issues, observe any impacts on the negotiation and, then, re-answer the questions for a revised diagnosis on issues.

*Process.* If the delegations are intransigent, you may try a strategy referred to as “firm but flexible.” This consists of timing the display of tough (withholding concessions) and soft (offering concessions or other rewards), sequencing them by presenting firm positions early and softer postures later in the talks. Such flexibility (or cooperation) in the context of firmness has been found in repeated experiments to be effective in eliciting reciprocated concessions from the other. In their 1992 experiment, Hilty and Carnevale referred to this tactic as “two faces.” It can be orchestrated by the chief negotiator who encourages mutual concessions but remains firm on the principle of an equitable agreement. This was done effectively by the negotiators representing the United States in the Open Skies talks with the Soviet Union and their allies. It contributed to an agreement on a modest suite of sensors that could be fitted to aircraft that would conduct over-flights to monitor military activities in Europe and North America. The tactic can also be implemented by different members on a national negotiating team. This was done effectively by the United States delegation to talks on base-rights in Greece. As reported in McDonald and Bendahmane (1990), the chief negotiator handled the tasks of negotiating on the issues that divided the parties. The sitting Ambassador dealt with his Greek counterparts on relationship issues which, according to Fisher and Brown (1988), are better addressed outside the bargaining room.

Sometimes, the other delegation reacts more to the firm than to the flexible part of the strategy. When this happens, it might be worth taking a unilateral initiative in the

form of a non-contingent (no reciprocation implied) concession or a gesture that conveys empathy or trust. This works when it starts a process of give-and-take between the parties. It does not work when the other party exploited it for gain. The historical record on initiatives in international relations is mixed as shown by the authors in Ramberg's (1993) book on the subject.

We hope that this information is helpful to you. If you decide to use the tactic, observe how it influences the negotiation, and, then re-answer the questions for a revised diagnosis on process.

*Delegation activities.* If, despite using a variety of approaches, the negotiating delegation is stuck in an impasse, you may try introducing new faces into the venue. Sometimes senior policy-makers or national leaders can inject enthusiasm (and authority) into a stagnated process. Clearly, the talks between the United States and Soviet Union were sparked by the involvement of President Reagan and General Secretary Gorbachev. Their involvement served to galvanize the bureaucracies to pave the way toward an eventual agreement, as documents in a 1991 article by Druckman et al. . Similarly, the involvement of the U.S. Secretary of State and the Spanish Foreign Minister and a critical juncture in the base rights talks between those countries was a turning point as document in a 1986 paper by Druckman. However, this approach may not always work wonders. President Clinton's direct involvement in the recent Camp David talks failed to bring the Israelis and Palestinians closer to an agreement and was followed by an escalation of the conflict. Perhaps, the success of this approach depends on timing Leaders' involvement may work better when the parties are prepared to strike a deal and only need confidence that the details serve their interests.

We hope that this information is helpful to you. If you decide to involve senior policy makers in the negotiation process, observe its impact on the negotiation and, then, re-answer the questions for a revised diagnosis on delegation activities.

*The situation.* If some alterations of the negotiating situation are likely to lead to progress in the talks, here are some suggestions that may be useful to you. Time pressure can be manipulated for impact. Numerous experimental studies have shown that by putting too much pressure on the process too early, negotiators are discouraged from engaging in search processes for optimal (or integrative) agreements. Time pressure is more beneficial when parties are ready to reach agreements. In the multilateral seabeds arms control talks the parties used deadlines to squeeze bluff out of their positions as Ramberg notes in his 1977 article. In base-rights talks, deadlines serve effectively to soften contentions in order to seal agreements. Again, timing is important! Deadlines encourage movement when the alternative, continued intransigence, is viewed as being less desirable. They do not encourage the sort of flexibility reflected in problem-solving activities. These activities are facilitated under certain conditions. Research reported by Druckman (1993a) and others has shown that flexibility is increased when negotiators are insulated from the media and when constituents and other parties with vested interests are held at bay. However, in their 1965 book on labor negotiations, Walton and McKersie called attention to a dilemma caused by keeping constituents too far from the deliberations: Although agreements are easier to reach when constituents are not involved, the agreements reached are harder to sell to them.

We hope that this information is helpful to you. If you decide to alter the situation in these ways, observe what happens to the negotiation process and, then, re-answer the questions for a revised diagnosis of situational impacts.

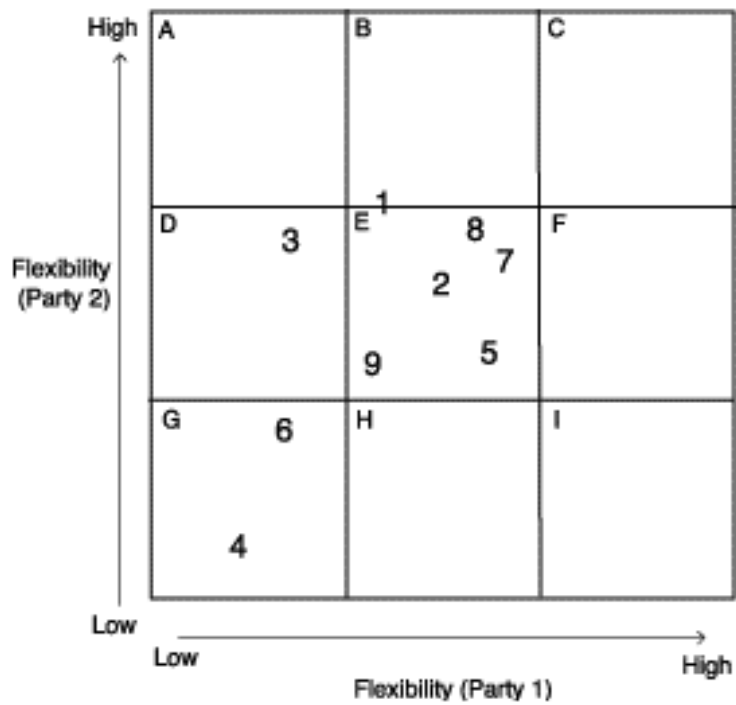
### **Validity of Diagnoses**

We have compared the diagnosed outcomes with the actual outcomes obtained in nine completed cases in the areas of arms control, trade, territory, and environment. . Examples of cases included the Panama Canal talks (1974 and 1977 rounds), the Mutual and Balanced Force Reduction talks, the test-ban negotiations (1962-63), and the talks between the U.S. and Canada on acid rain. Scholars with specialized knowledge about these cases answered the questions about their case. As shown in Figure 4 and in Table 3, 8 of the 9 cases were diagnosed correctly – the diagnosed outcome corresponded with the actually obtained outcome -- as a fair agreement, asymmetrical agreement (capitulation), no agreement or impasse.

In the one case where the program failed to predict the outcome, the 1975-76 base rights talks between Spain and the United States, it did diagnose the rationale behind the impasse. In a separate diagnosis of this case, shown in Figure 5, we discovered that the diagnosed outcome was on the border between no agreement and a fair agreement (cells E and F). By analyzing each section separately, we were able to identify the sources of the problem. These were found in the process and delegation activities, which were located in the capitulation (cell I) or no agreement cells (cell B) of the program's outcome matrix. This captured the actual negotiation where process problems were reflected in the asymmetrical demands and offers made by the parties and delegation problems were

reflected in delays caused by frequent consultations during and between rounds with the Spanish Foreign Ministry or the U.S. State Department.. (See Druckman, 1993, 1995, for more details on both of these analyses and for other examples of section-by-section diagnoses.) These comparisons provide impressive evidence for the validity of the program's diagnoses.

**Figure 4. Location of Cases in Flexibility Grid**



**CASES**

1. Panama Canal, 1977
2. Panama Canal, 1977
3. Spain military base rights, 1965-66
4. MBFR, 1974-77
5. INF, 1965-67
6. Philippines regime vs. National Democratic Front, 1987
7. Test Ban, 1962-63
8. ECE on Air Pollution
9. U.S. Canada on acid rain

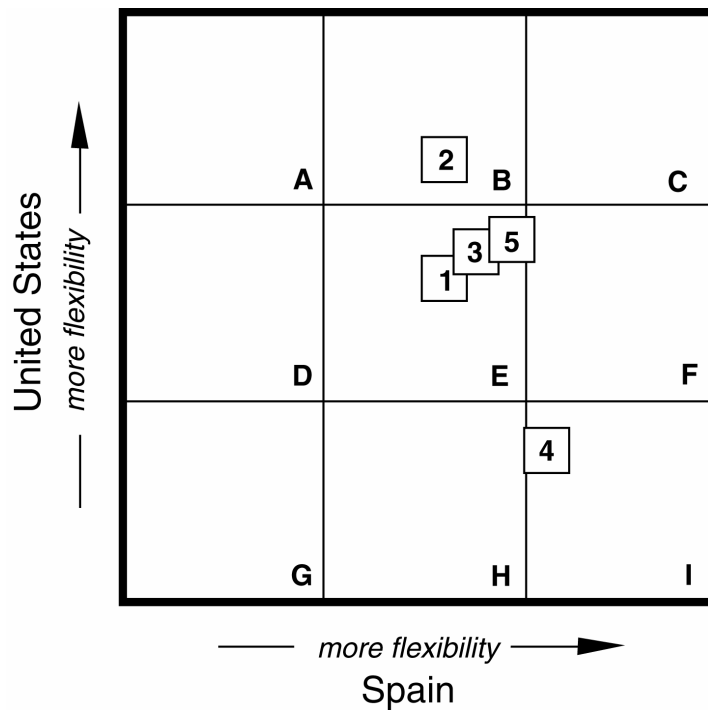
**KEY**

- A. Party 1 capitulates
- B. No agreement
- C. Fair agreement
- D. No agreement
- E. Fair agreement
- F. No agreement
- G. Impasse
- H. No agreement
- I. Party 2 capitulates

**Table 3. Comparing Outcomes: Computer Diagnosis and Actual Outcome**

<b>Cases</b>	<b>Computer Diagnosed Outcome</b>	<b>Actual Outcome</b>
1	No Agreement	No Agreement
2	Agreement	Agreement
3	No Agreement	Long Impasse, then Agreement
4	Impasse	Impasse
5	Agreement	Agreement
6	No Agreement	No Agreement
7	Agreement	Agreement
8	Agreement	Agreement
9	Agreement	Agreement

**Figure 5. Spanish Base-Rights Case**



- P1. US  
P2. Spain  
1. Issue - base rights  
2. Delegation activities  
3. Situation  
4. Process  
5. Total

- A. Party 1 capitulates  
B. No agreement  
C. Fair agreement  
D. No agreement  
E. Fair agreement  
F. No agreement  
G. Impasse  
H. No agreement  
I. Party 2 capitulates

## Conclusion

The effort to develop an interactive computer program that serves as a decision aid for negotiators has proven to be a challenge. In its present version, the program is a monitoring tool that enables negotiators to: (a) ascertain the relative flexibility of parties at any point in time for each of several aspects of negotiation and across those aspects, (b) compare flexibility and probable outcomes at different points as events and proposals change through the course of a negotiation, (c) compare different cases in terms of flexibility and probable outcomes, and (d) compare several perspectives on negotiation based on hypotheses about key factors thought to drive the talks (e.g., delegation activities, events surrounding the talks, the process at the table). Users can also perform their own sensitivity analyses by comparing results obtained from different patterns of answers to the questions or from different scenarios.

Another function served by the tool is as a learning device. The feedback given about the state of the talks and projected outcomes can influence its course. Negotiators may react to the diagnosis by moving quickly to agreement when it shows high mutual flexibility or by increasing their intransigence when the diagnosis shows asymmetrical flexibility. (See Druckman and Bonoma, 1975, and Druckman, 1986, for evidence on the effects on bargaining of a noticed difference in flexibility.) Or, upon learning that a compromise is unlikely, negotiators double their efforts to achieve it. Along with the advice given in the help window, these feedback effects may have motivational consequences that can influence the outcome. At the very least, they are likely to encourage discussion among the negotiators, including the possibility of joint (between

delegation) planning. Increased understanding of these possible effects is a goal for further research.

Each of these functions is facilitated by the web-based access currently available to users. Such access also is likely to expand the number and variety of users of the program. We can now envision new possibilities for the role of computer tools research and practice. Information about a large number of negotiation cases can be accumulated from diplomats and analysts around the world; survey methodologies can be used to sample cases and respondents. Negotiators on different continents can interact electronically by addressing the same questions about common cases in which they participated; this form of interaction can be a basis for dialogue between diplomats from different cultures.

The information obtained about cases not documented in the literature would also contribute to the help function discussed above. Presently, we are limited by available documentation which, for many cases, does not provide sufficient information about the negotiation process to be useful. The program's survey can provide information about tactics that contribute ideas for impasse resolution. These examples of tactics come directly from tacticians rather than indirectly from scholarly reports of cases. They would be catalogued, along with examples from documented cases and experiments, by type of negotiation in order to allow users to search for cases similar to the current situation in which an impasse has occurred. These enhancements contribute further to bridging the gap between theory and research on the one hand and practice on the other.

## References

- Bass, B.M. (1966). "Effects on subsequent performance of negotiators of studying issues or planning strategies alone or in groups." *Psychological Monographs* Whole no., 614.
- Benton, A.A. and D. Druckman (1973). "Salient solutions and the bargaining behavior of representatives and non-representatives." *International Journal of Group Tensions* 3, 28-39.
- Beriker, N. and D. Druckman (1996). "Simulating the Lausanne Peace Negotiations, 1922-23: Power asymmetries in bargaining." *Simulation & Gaming* 27, 162-183.
- Bonham, G.M. (1993). "Cognitive mapping as a technique for supporting international negotiation." *Theory and Decision* 34: 255-273.
- Brown, B. R. (1977). "Face-saving and face-restoration in negotiation." In D. Druckman (ed.) *Negotiations: Social-Psychological Perspectives*. Beverly Hills: Sage.
- Deutsch, M., D.Canavan, and J.Z. Rubin (1971). "The effects of size of conflict and sex of experimenter on upon interpersonal bargaining." *Journal of Experimental Social Psychology* 7, 258-267.
- Druckman, D. (1995). "Situational levers of position change: Further explorations." *The Annals of the American Academy of Political and Social Science* 542. 61-80.
- Druckman, D. (1994). "Determinants of compromising behavior in negotiation: A meta-analysis." *Journal of Conflict Resolution* 38, 507-556.
- Druckman, D. (1993). "Statistical analysis for negotiation support." *Theory and Decision* 34, 215-233.
- Druckman, D. (1993a). "The situational levers of negotiating flexibility." *Journal of*

*Conflict Resolution* 37: 326-276.

Druckman, D. (1986). "Stages, turning points, and crises: Negotiating military base rights, Spain and the United States." *Journal of Conflict Resolution* 30: 327-360.

Druckman, D. (1968). "Prenegotiation experience and dyadic conflict resolution in a bargaining situation." *Journal of Experimental Social Psychology* 4, 367-383.

Druckman, D. and T.V. Bonoma (1976). "Determinants of bargaining behavior in a bilateral monopoly situation II: Opponent's concession rate and similarity." *Behavioral Science* 21: 252-262.

Druckman, D. and P.T. Hopmann (1989). "Behavioral aspects of negotiations on mutual security." In P. L. Tetlock et al. *Behavior, Society, and Nuclear War*. New York: Oxford University Press.

Druckman D., B. J. Broome, and S.H. Korper (1988). "Value differences and conflict resolution: Facilitation or delinking?" *Journal of Conflict Resolution* 32, 489-510.

Druckman, D. J.L.Husbands, and K. Johnston (1991). "Turning points in the INF negotiations." *Negotiation Journal* 7, 55-67.

Evan, W.M. and J. A. MacDougall (1967). "Interorganizational conflict: A labor-management bargaining experiment." *Journal of Conflict Resolution* 11: 398-413.

Fisher, R. (1964). "Fractionating conflict." In R. Fisher (ed.) *International Conflict and Behavioral Science: The Craigville Papers*. New York: Basic Books.

Fisher, R. and S. Brown (1988). *Getting Together*. Boston: Houghton Mifflin.

Fisher, R. and W. Ury (1981). *Getting to Yes*. Boston: Houghton Mifflin.

- George, A. (1993). *Bridging the Gap: Theory and Practice in Foreign Policy*.  
Washington DC: United States Institute of Peace Press.
- Hilty, J. and P. Carnevale (1992). "Black-hat/white-hat strategy in bilateral bargaining." *Organizational Behavior and Human Performance* 55: 444-469.
- Hopmann, P.T. and C.Walcott (1977). "The impact of external stresses and tensions on negotiations." In D.Druckman (ed.) *Negotiations: Social-Psychological Perspectives*. Beverly Hills: Sage.
- Jacobson, D. (1981). "Intraparty dissensus and interparty conflict resolution." *Journal of Conflict Resolution* 25, 471-494.
- Jensen, L. (1979). "Bargaining strategies and strategic arms limitations." Paper presented at the annual meetings of the American Political Science Association, Washington, DC.
- Klimoski, R. J. (1972). "The effects of intragroup forces on intergroup conflict resolution." *Organizational Behavior and Human Performance* 8: 363-383.
- McDonald, J.W. and D.B. Bendahmane (1990) (eds.). *U.S. Bases Overseas*. Boulder, CO: Westview.
- Pew Case Studies in International Affairs (1999). "The ISD compendium of case study abstracts and indexes." The Institute for the Study of Diplomacy, Edmund A. Walsh School of Foreign Service, Georgetown University.
- Pinckley, R.I., M.A. Neale, and R.J. Bennet (1994). "The impact of alternatives to settlement in dyadic negotiation." *Organizational Behavior and Human Performance* 57: 97-116.
- Raiffa, H. (1982). *The Art and Science of Negotiation*. Cambridge, MA: Harvard

University Press.

Ramberg, B. (1993). *Arms Control Without Negotiation: From the Cold War to the New World Order*. Boulder, CO: Lynne Rienner.

Ramberg, B. (1977). "Tactical advantages of opening positioning strategies: Lessons from the Seabeds Arms Control talks, 1967-1970." *Journal of Conflict Resolution* 21: 685-700.

Samarasan, D.K. (1993). "Analysis, modeling, and the management of international negotiations." *Theory and Decision* 34: 275-291.

Schelling, T.C. (1960). *The Strategy of Conflict*. Cambridge, MA: Harvard University Press.

Shakin, M. (1999). "An ESD computer culture for intercultural problem solving and negotiation." *Group Decision and Negotiation* 8: 237-249.

Shell, G.R. (1995). "Computer-assisted negotiation and mediation: Where we are and where we are going." *Negotiation Journal* 11: 117-121.

Spector, B.I. (1993). "Introduction." *Theory and Decision* 34: 177-181.

Ulvila, J. W. (1990). "Turning points: An analysis." In J.W. McDonald and D. B. Bendahmane (eds.) *U.S. Bases Overseas*. Boulder, CO. Westview.

Ulvila, J. W. and W.D. Snyder (1980). "Negotiation of international oil tanker standards: An application of multiattribute value theory." *Operations Research* 28: 81-96.

Wall, J.A. and A. Lynn (1993). "Mediation: A current review." *Journal of Conflict Resolution* 37, 160-194.

Walton, R.E. and R.B. McKersie (1965). *A Behavioral Theory of Labor Negotiations*. New York: McGraw-Hill.

Wheeler, M. (1995). "Computers and negotiation: Backing into the future." *Negotiation Journal* 11: 169-176.

Zartman, I.W. and M. Berman (1982). *The Practical Negotiator*. New Haven: Yale University Press.

Zechmeister, K. and D. Druckman (1973). "Determinants of resolving a conflict of interest: A simulation of political decision making.: *Journal of Conflict Resolution* 17, 63-88.



## Endnotes

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<sup>i</sup> Readers interested in using the program may obtain web-site information from the senior author at [ddruckma@gmu.edu](mailto:ddruckma@gmu.edu)

<sup>ii</sup> **The section's range is calculated as the difference between the maximum and minimum score for a question times the weight divided by the range (maximum – minimum) for all questions in the section. For the first question in the issue section:  $(3-1) \cdot 10/80 = .25$  or 25% of the total range.**

<sup>iii</sup> **The programming of the system is accomplished in a scripting language similar to C, called PHP. All the software for the system is open source and free, including MYSQL, relational database software, Apache server, and PHP interpreter.**

<sup>iv</sup> **Effect sizes indicate the relative strength of relationship between independent (e.g., size of issue) and dependent (e.g., flexibility) variables. They were computed for only some of the variables represented by questions in the program. Weights for other variables were estimated from both experimental and case studies not included in the meta analysis. To the extent that these estimate are not precise, the program allows the user to insert his or her own judgments (based on experience) or to delete the weight option which effectively results in equal weights for all variables or questions.**