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THE ROLE OF A DECISION MAKER'S PERSPECTIVE IN THE GENERATION AND ASSESSMENT OF ACTIONS IN A CONFLICT SITUATION

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A THESIS

SUBMITTED TO THE GRADUATE FACULTY

in partial fulfillment of the requirements for the

degree of

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BY

CAROL ANN MANNING

Norman, Oklahoma

1982

THE ROLE OF A DECISION MAKER'S PERSPECTIVE IN THE

GENERATION AND ASSESSMENT OF ACTIONS

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A THESIS

APPROVED FOR THE DEPARTMENT OF PSYCHOLOGY

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Abstract

Two experiments were performed to assess the influence of perspective and information on the generation of actions an opponent might take to resolve a conflict. Both experiments employed a problem in which guerrilla forces captured the French embassy in a hypothetical South American country and took the personnel hostage. In the first experiment, subjects were assigned the perspective of a guerrilla, a hostage, or an advisor to the President of France. Subjects generated five actions the French government was most likely to take to resolve the conflict, ranked the actions, then provided likelihood estimates and estimates of the French government's preferences for a specified set of actions. No large differences in performance resulted from manipulating perspective. However, some subtle differences were observed. Hostage subjects generated acts more likely to benefit both the guerrillas and the French than subjects in other conditions. All Guerrilla subjects generated at least one military action, while some subjects in the other perspective conditions failed to generate any.

Experiment 2 was performed to assess the effect of providing both a perspective and information about an opponent's objectives on the generation of actions the opponent might take to resolve a conflict. Subjects in one Guerrilla condition read irrelevant information about the geography of France, subjects in another Guerrilla condition were asked to imagine the French government's objectives, and subjects in a third Guerrilla condition were provided with an explicit description of the French government's objectives. Another set of subjects assigned the French perspective was used as a control condition. Again, no major differences were found in act generation, but some subtle differences

were observed. The Guerrilla subjects who read explicit information about the French government's objectives generated acts that were more beneficial to the French than subjects in the other Guerrilla conditions. Guerrilla subjects reading irrelevant information about France generated acts that tended to benefit both parties more than the acts generated by French subjects. In neither experiment did subjects differ in their estimates of the likelihood with which the French government might take a specified set of actions or in their estimates of the French government's preferences for a specified set of actions.

These results may suggest that perspective has only a limited influence on the generation and assessment of actions an opponent might take to resolve a conflict. Without further research, it is difficult to determine whether perspective impairs a decision maker's performance in a conflict situation or whether its influence is only salient in hindsight.

The Role of a Decision Maker's Perspective in the Generation and Assessment of Actions in a Conflict Situation

Decision makers who face an opponent in a crisis attempt to anticipate the opponent's action so they can minimize its impact. The purpose of this study was to determine whether decision makers' perspectives will influence their ability to examine a situation from an opponent's perspective and correctly anticipate the actions the opponent will take to resolve a conflict.

Historically, decision makers sometimes have failed to anticipate how their opponent would react to an action, often with disastrous consequences. For example, in the recent Faulkland Islands crisis, Argentine President Galtieri's perspective on the situation may have biased him such that he was unable to consider the situation from the British perspective. Therefore his perspective may have prevented him from predicting the British response to the invasion. Citizens of Argentina are taught that the Malvinas islands were stolen from the Argentines by British imperialists and were the rightful property of Argentina (Whitaker, Rohter and Onis, 1982). Perhaps this belief in the righteousness of Argentina's cause led Galtieri to asssume incorrectly that the British government's failure to protect the Faulklands adequately was an acknowledgement that Argentina had a rightful claim to the property. Thus, his perspective may have prevented Galtieri from realizing that British citizens had labeled him a dictator reminiscent of

Hitler and would react indignantly to an invasion of their possession and the capture of their citizens. Intuitively, it seems that decision makers' own perspectives might influence their evaluation of an opponent's perspective and thus their prediction of an opponent's behavior in a conflict.

However, before considering how decision makers' perspectives might affect their assessment of an opponent, it is desirable to discuss the cognitive processes involved in making decisions. Decision makers dealing with a problem identify and assess potential solutions and then determine which solution is best before making a choice. Decision making seems to involve several processes: generating possible actions or alternative solutions to a problem, forming hypotheses about possible states of nature that might affect the consequences of taking an action, and generating the outcomes or possible consequences that might result from taking an action (Raiffa, 1968). Decision makers also estimate the probability with which they believe outcomes might result from taking an action and estimate the utilities they have for the outcomes identified. Assessment of these components allows each action to be weighed against the others so a choice of the best action can be made.

Trying to anticipate an opponent's strategy for action in a conflict is a more complex problem. In a conflict, decision makers might influence the outcome of their opponent's action if they anticipated the act in advance and acted to minimize its impact. A decision maker who wants to anticipate the opponent's next move must identify the actions the opponent might consider taking, the states of nature that might influence the consequences of the opponent's actions, and the outcomes or

consequences that might result from the acts the opponent considers. The decision maker must also estimate the likelihood with which a state of nature might affect the opponent's acts and the opponent's preferences for the outcomes, then combine this information to estimate the likelihood with which the opponent might take each action.

The inability to consider a situation from an opponent's perspective may influence any or all of the processes involved in decision making. For example, it is possible that President Galtieri's perspective that the invasion of the "Malvinas" was designed to recover Argentina's stolen property prevented him from identifying the action that the British would respond by sending troops to defend their possession because he could not examine the situation from the British perspective. It is perhaps more likely that Galtieri considered this British reaction, but believed that the likelihood of Britain's taking this action was so low that it was a negligible risk. Alternatively, Galtieri might have incorrectly assessed the British government's preferences for possible outcomes resulting from taking a military action. If Galtieri incorrectly assumed that the British felt the Faulklands belonged to Argentina, then he might have believed that the British would have little value for an action requiring that they send troops halfway across the world to fight a battle.

It is also possible that Galtieri correctly predicted that the British would send troops to defend the Faulklands, but incorrectly generated outcomes that might result from the action. Britain's economic problems might have made the British government reluctant to invest sizable amounts of money in dispatching a large fleet to recover the Faulklands, especially if the British were not committed to the cause. Thus, Galtieri might have generated the action that Britain would attack

the Faulklands but his perspective may have led him to expect that Britain would send a force that was not powerful enough to regain the Faulklands. Moreover, Galtieri's confidence in the ability of the Argentinian air force to withstand a British attack and his belief in the righteousness of his cause might have led him to predict the British would be defeated if they chose to fight.

In hindsight, it appears that Galtieri might have incorrectly assessed the situation in the Faulklands because his perspective did not allow him to comprehend accurately Britain's perspective on the situation. However, it is difficult to determine whether Galtieri's failure was due to his perspective on the problem or whether he would have failed even if he had complete insight into the British perspective.

As this example illustrates, predicting how an opponent will behave in a conflict is a very complex task. Decision analysis, the application of formal decision theory, prescribes a method for assessing potential solutions to decision problems which involves explicitly specifying the decision components described earlier. These components are then used to construct a decision tree so the decision maker can explicitly choose the action having the highest expected utility. Decision theory assumes that the acts, the states of nature, and the outcomes associated with a decision can be identified and that the probabilities and utilities for outcomes can be estimated, so the primary effort required to make a decision should involve the proper combination of these components. However, if the components of a decision are not specified accurately nor completely, then applying decision-theoretic techniques to a decision may not result in an optimal solution.

Game theory (von Neumann & Morgenstern, 1947) is a branch of formal decision theory which applies the techniques employed in decision theory to the situation where a decision maker is opposed to a human opponent rather than "playing a game against nature". Game theory prescribes solutions for conflicts between two human parties which employ mathematical methods for combining the likelihood of outcomes with the parties' utilities for the outcomes to arrive at an optimal strategy for action. These solutions depend on the assumption that the potential actions are known to both parties, that the outcomes of the actions are known, and that both decision makers' utilities for all outcomes have been specified. With the exception of a conflict involving a parlor game in which all rules and possible moves have been specified in advance, the assumption that all components are known is not likely to be met. This suggests that unless a decision maker can imagine which actions an opponent will consider, the outcomes that may result from the actions, and the opponent's preferences for the outcomes, then any attempt to employ game-theoretic techniques to determine which action the opponent is likely to take may be unsuccessful.

Decision makers attempting to predict their opponent's decisions should evaluate the impact of both the state of nature, (i.e., the situational factors beyond the control of either decision maker) and the opponent's perspective on the situation because both may influence the opponents' choice of action. The state of nature may affect the opponents' choice of action because it could affect the outcomes resulting from taking an action. The opponent's perspective may also influence the opponent's choice of action because it may determine which issues regarding the conflict the opponent considers to be important and

may also determine the opponent's utilities for outcomes that may result from taking the actions. Therefore, decision makers' success in predicting their opponent's actions may be highly dependent on their ability to view the conflict from the opponent's perspective.

If decision makers could accurately anticipate the likelihood with which the state of nature would affect the outcomes of an action and could combine this information with valid conjectures made about the opponent's perspective, then they might correctly predict the opponent's decision. No research has been performed which examines decision makers' performance in generating and assessing decision components when anticipating another person's decision. However, two relevant bodies of literature suggest that decision makers may not perform this task very well. Research performed on processes involved in identifying decision components suggests that decision makers may not generate an adequate set of act alternatives (Gettys, Manning and Casey, Note 1) or an adequate set of hypotheses about states of nature that might influence the outcomes of an action (see Gettys, Manning, Mehle and Fisher, Note 2, for an overview). Additional research suggests that decision makers appear to have difficulty estimating the probability of occurrence of events (Slovic & Lichtenstein, 1971; Tversky & Kahneman, 1974) and that they do not incorporate all dimensions of a problem in their estimates of utility (Payne, 1976; Tversky, 1972). These results suggest that formal decision theory techniques may not give satisfactory results in real-world decision making because decision makers often fail to adequately identify the necessary decision components and accurately estimate their probabilities and utilities.

Another body of literature may explain why decision makers' predecision processes are inadequate. Research on schema theory (see Taylor and Crocker, 1980, for a summary) suggests that previous knowledge of a topic may bias the interpretation of new data related to the topic, and that perspectives, in particular, are sufficient to bias data interpretation. Schema theory proposes that new data are interpreted in the context of information already available in memory. Inferences based on the content of information previously stored in memory are typically made about any unspecified elements of the new data. The new data and the inferences made about them are then integrated with previous knowledge and are encoded in memory. Thus, if information is schematically processed before it is encoded in memory, then the information retrieved will be biased. Evidence for schematic processing is provided by research which suggests that schemata may affect the content of information retrieved from memory (e.g., Bower, Black and Turner, 1979; Bransford, Barclay and Franks, 1972; Owens, Bower and Black, 1979; Sulin and Dooling, 1974).

The decision makers' own perspectives are one type of schema containing information about their own viewpoint and objectives. The perspective provides a knowledge base allowing inferences about unspecified elements of any new information to be made and encoded in memory. It has been demonstrated that perspective also may affect the content of information retrieved from memory, (Abelson, 1975; Anderson & Pichert, 1978; Bower, 1978) and may affect causal attributions in personal communication (Taylor & Fiske, 1975).

Besides influencing the content of information retrieved from memory, schemata may also affect other processes involved in making

decisions. Studies have shown that schemata can affect subjects' generation of hypotheses about states of nature (Manning, Gettys, and Mehle, Note 3), schemata can influence subjects' expressed confidence in inferred information (see Spiro, 1977), and causal schemata may bias probability estimation (Tversky and Kahneman, 1977, but see Burns and Pearl, 1981). Explaining why an event may occur also seems to induce a schema that subsequently affects subjects' estimations of the likelihood of the event's occurrence (Ross, Lepper, Stack and Steinmetz, 1977). Each of the processes described above requires retrieving information from memory. If the information retrieved for decision processing was schematically biased as it was encoded in memory, then the results of decision processing may be biased by the inclusion of biased information.

Because schemata have been demonstrated to affect some of the cognitive processes involved in decision making, perspective may also influence a decision makers' cognitive processes. Perspective could bias the information encoded in memory regarding the state of nature. Biased information encoded in memory might determine how new information about nature's influence on potential outcomes of actions might be interpreted, and could also affect the estimation of the likelihood with which an outcome influenced by the state of nature might occur. Thus, biased information could alter the choice of an action taken to solve a problem.

Furthermore, perspective might affect decision makers' prediction of of the actions an opponent will take to resolve a conflict. Decision makers' own perspectives of the conflict might provide a context with which information about the opponent might be integrated, and might suggest inferences that could be made about any missing information

regarding the opponent. This information and the inferences about the information would then be encoded in memory. If the encoded information about the opponent was biased by the decision maker's own perspective, then the decision maker will probably have a biased interpretation of the opponent's perspective. To assess how the opponent views the conflict and to estimate the opponent's preferences for outcomes, decision makers should attempt to examine the situation from the opponent's perspective. However, if they employ biased information about the opponent, then decision makers may not be able to examine the situation accurately from the opponent's perspective. If decision makers cannot accurately examine a situation from the opponent's perspective, then they may not be able to determine which issues the opponent considers important, may not be able to estimate the opponent's preferences for outcomes, and thus, may not be able to anticipate the actions the opponent is likely to take.

Thus, research on schemata suggests that perspective may influence the cognitive processes involved in making a decision. If it can be demonstrated that perspective affects a decision maker's act generation, the results would be important because they might suggest how decision making in a conflict situation might be improved. A demonstration that perspective influences act generation might also be important because it would suggest that the perspective of the decision maker should be considered when planning future research on decision making.

Rationale for the experiments

If perspective affects the processes involved in anticipating an opponent's actions, then decision makers with different perspectives on a problem may generate acts they believe their opponent will consider taking which are different than actions the opponent generates. Decision

makers with different perspectives may also infer that the opponent's preferences for actions are different than the opponent feels and may estimate that the probability of an opponent's taking an action will be different than the opponent estimates. Experiment 1 was performed to examine the effect of interpreting data from different perspectives on predicting an opponent's act generation, likelihood estimation, and estimation of the opponent's preferences for actions.

If decision makers' perspectives influence their ability to examine a situation from an opponent's perspective, then manipulating the amount of information provided about the opponent's objectives might influence the decision makers' act generation performance, likelihood estimation and estimation of the opponent's preferences. Experiment 2 varied the amount of information provided about an opponent's objectives to examine its effect on a decision maker's prediction of the opponent's act generation, likelihood estimation and estimation of the opponent's preferences for actions.

Both experiments employed a hypothetical conflict between two decision makers as an experimental task. The conflict involved a political crisis in which the personnel of the French embassy in an imaginary South American country were taken hostage by a band of guerrilla fighters who claimed they were protesting human rights violations committed by their country's government. Subjects were asked to think of the five actions the French government would be most likely to take and to rank these actions in order of likelihood. Subjects then provided likelihood estimates and estimates of the French government's preferences for a specified set of actions that might be taken to

resolve the conflict.

Experiment 1 was a single-factor experiment containing three types of perspective. The perspectives were for a hostage, a member of the guerrilla forces holding the hostages captive or an advisor to the French president. The subjects' perspectives were manipulated by providing written descriptions of the crises which enumerated each decision maker's objectives in the situation. The French Advisor and Guerrilla perspectives represented the two opposing decision makers. The Hostages, although not in direct opposition to either the French or Guerrilla subjects, represented a decision maker with another perspective on the problem.

The problem was worded to provide a justification for subjects in each experimental group to perform the tasks. The Guerrilla subjects were told that they needed to anticipate what the French government would do so they could plan their actions. The French Advisor subjects were told that they were providing potential solutions to the President of France. The Hostage subjects were told that they need to know what the French government will do so they can anticipate what might happen to them.

Experiment 2 was performed to examine the effect of providing information about the opponent's objectives on decision makers' predictions of the opponent's act generation, likelihood estimation and estimation of the opponent's preferences for actions. Experiment 2 was a single-factor experiment which compared three Guerrilla perspective conditions provided with different types of information about the French government's objectives with the French perspective, which served as a control condition. Experiment 2 employed the same international conflict situation as in Experiment 1. In Experiment 2, both the perspective and

the degree to which the opponents' objectives were known were manipulated. The French Advisor perspective remained the same as in Experiment 1 and three variations of the Guerrilla perspective were included.

The Guerrilla conditions were manipulated by varying the amount of information subjects were provided about the French objectives. Subjects in the Imagine Information condition were shown the Guerrilla perspective and were then asked to imagine the French government's objectives. They were also asked to imagine how the objectives of the French might differ from those of either the Guerrillas or the Hostages. Subjects in the Explicit Information condition read the Guerrilla perspective and were then shown the description of the French government's objectives read by subjects in the French Advisor condition. Subjects in the Irrelevant Information condition read the same written description as the Guerrilla subjects read in Experiment 1 describing their own perspective. They then read an additional paragraph describing the geography of France. This condition was included to determine whether any additional information about the opponent would affect a decision makers' prediction of the opponent's act generation, likelihood estimation or preferences for actions.

Providing Guerrilla subjects with different amounts of information about the French government's objectives may allow them to examine information about the situation from the French perspective. Guerrilla subjects who have more information about the French government's objectives may be able to more accurately understand the French subjects' decision-making strategies than Guerrilla subjects who have little or no

information about the French government's objectives. Thus, Guerrilla subjects having more information about the French government's objectives might generate actions more similar to those the French subjects generate than actions generated by Guerrilla subjects having less information about the French government's objectives. They might also provide likelihood and preference estimates that more closely resemble those of the French subjects than the likelihood and preference estimates provided by Guerrilla subjects who have less information about the French government's objectives.

Providing information about the French government's objectives may also allow Guerrilla subjects to examine the situation from both the perspective of the French government and the perspective of the guerrillas. Guerrilla subjects who can look at a situation from more than one perspective might have a tendency to generate acts that would benefit both the French and the guerrillas because they may be able to understand both parties' objectives better than Guerrilla subjects who examine the situation from only their own perspective. Thus, Guerrilla subjects provided with explicit information about the French objectives might generate qualitatively different actions than subjects not provided with explicit information about the French objectives.

The distinction between Experiments 1 and 2

Although this manuscript describes two experiments, the distinction between Experiments 1 and 2 was drawn for expositional and logical purposes. The conditions contained in Experiments 1 and 2 might be considered a single experiment because subjects were randomly assigned to experimental conditions for which the data were collected concurrently. However, there are no theoretical reasons to compare each experimental

group with all the rest. Therefore, the experimental groups were partitioned into two experiments which addressed the effect of perspective and information on act generation performance, likelihood estimation and estimates of preferences. The Hostage and Guerrilla conditions were compared with the French advisor condition to examine the effect of perspective on these decision processes. The Irrelevant Information, Imagine Information, and Explicit Information conditions of the Guerrilla perspective were compared with the French group to examine the effect of information about an opponent on these decision processes.

The French advisor group provided another link between the two experiments. Originally, data were collected for two French Advisor conditions designed to serve as distinct control groups. However, observation of the data suggested that the variability between subjects was very high for all conditions. Therefore, two French Advisor groups were combined into a single control condition to provide a more stable estimate of French performance against which the experimental conditions could be compared. A third link between the experiments occurred because, before analyzing the data, it was necessary to combine the acts generated by subjects from both experiments so they could be classified at the same time.

Because the two experiments are so closely related, their methods will be discussed concurrently before the results for either experiment are presented. Following the method of the two experiments, a third section specifically describing the methods employed to classify and categorize subjects' responses and the rationale for using these classifications will be presented. This section may be skipped without

interrupting the continuity of the paper by readers not interested in the methodology employed. The results of each experiment will then be discussed independently. Finally, the conclusions suggested by examination of all the data will be discussed.

METHOD

Experiment 1

Subjects

Forty-five introductory psychology students from the University of Oklahoma participated in the experiment in exchange for course credit. Fifteen subjects were randomly assigned to each of three experimental conditions.

Materials

Experiment 1 was performed to assess the effect of perspective on act generation, likelihood estimation and estimation of an opponent's preferences. The descriptions of the decision makers' perspectives employed in this experiment are presented in Appendices A-C. Appendices A, B and C contain the "Hostage", "Guerrilla", and "French advisor" perspectives, respectively.

Two of the tasks subjects performed in Experiment 1 involved estimating the likelihood of occurrence and the French government's preferences for a set of 20 specified actions that might be taken to resolve the crisis. The actions used for these tasks were obtained from a group of subjects who participated in an experiment performed previously designed to elicit all actions the American government might take to solve a similar hostage problem. These actions are presented in Appendix D.

The Dogmatism Scale Form E (Rokeach, 1954) was administered to subjects to estimate the differences in their assessment of the French government's potential actions based, not on their perspective, but on their acceptance of the absolute authority of a government. It was thought that controlling for differences in dogmatic beliefs might reduce some extraneous variability in subjects' act generation performance and in their numerical estimation scores. However, dogmatism did not account for a significant proportion of the variance when used in any of the analyses as either a covariate or as a blocking variable. Therefore, the dogmatism scale was not employed in any of the analyses reported.

Procedure

Subjects were seated in front of a CRT controlled by a microcomputer. Subjects first read the perspective of either a hostage, guerrilla or French advisor. They were allowed to read the problem as many times as they wanted before proceeding to the experimental tasks, but were not allowed to review this information after they had begun the tasks. Before each new task, subjects were reminded of their perspective.

The subjects' first task was to enter the five actions they thought the French would be most likely to take to alleviate the situation in Maracaibo. Subjects typed in the actions one at a time. Subjects were allowed to review their act list after completing a new act. After the subjects entered five acts, they assigned each act a rank from 1 to 5 according to their estimate of its likelihood, so the action subjects thought the French would be most likely to take was given a rank of 1, and the action the subjects thought the French would be least likely to take was given a rank of 5.

Each of the next two tasks subjects performed required the use of

the 20 specified actions presented in Appendix D. Before proceeding to the tasks, subjects were allowed to read the set of actions one time. Subjects' next task was to assign likelihood estimates to each of the 20 acts in Appendix D. Because the acts might not be mutually exclusive (e.g. the French might negotiate with the guerrillas while concurrently planning a rescue mission) each act in the list was rated independently. The order of presentation of the 20 acts was randomized for every subject.

Subjects entered their likelihood estimates by using two keys to move the cursor of the CRT left or right along a scale presented on the screen. The numbers on the likelihood estimate scale ranged from 0 to 100, where 0 was "very unlikely" and 100 was "very likely". Subjects were allowed to adjust the cursor until they were satisfied with their likelihood estimate. They hit another key to enter their rating into the computer.

After completing the likelihood estimation task, subjects evaluated the French government's preferences for the specified set of actions in Table 1. Subjects evaluated each act independently, using a 20 point scale. A rating of 0 on the scale indicated the French thought the act was "very bad" and a rating of 20 indicated the French thought the act was "very good". Subjects entered their preference estimates by adjusting the cursor of the CRT left or right along the scale until they were satisfied with their rating. They then hit another key to enter their rating into the computer. After performing the computer-controlled tasks, subjects completed the Dogmatism Scale Form E (Rokeach, 1954).

Experiment 2

Subjects

Sixty introductory psychology students from the University of Oklahoma participated in the experiment in exchange for course credit. Fifteen subjects were randomly assigned to each of the four experimental conditions.

Procedure

Subjects first read a description of the crisis from their assigned perspective. Fifteen subjects read the French Advisor perspective and forty-five subjects read the Guerrilla perspective employed in Experiment 1. The Guerrilla subjects were then presented with different amounts of information about the objectives of the French government. Subjects in the Irrelevant Information condition read the text presented in Appendix E, which described the geography, climate and industry of France. Subjects in the Imagine Information condition were told "When thinking about what the French government might do in this situation, try for a minute to imagine the goals that might direct their planning. Imagine how the French government's goals may differ from those of the guerrillas. Then imagine how the French government's goals may differ from those of the hostages". Subjects in the Explicit Information condition were told "When thinking about what the French government might do in this situation, try for a minute to imagine how their goals might direct their planning. Below is a description of what the French government's goals might be." Subjects were then shown the same description of the French objectives read by the French advisor subjects.

All subjects then performed the same experimental tasks employed in Experiment 1. Subjects generated five acts the French were most likely to

take and ranked them in order of likelihood. Subjects then provided likelihood and preference ratings for the set of 20 specified acts presented in Appendix D. Finally, subjects completed the Dogmatism Scale, Form E.

Classification of responses

It was necessary to classify subjects' responses so that it could be determined whether they varied in their content or in their benefit for the decision makers involved in the conflict. Three procedures were employed to classify subjects' responses. First, the 525 actions generated by subjects in both experiments were classified into 35 act categories so that only distinct responses need be analyzed. Second, an independent group of subjects evaluated the benefit of the 35 distinct act categories from the perspective of the French and the guerrillas so differences in subjects' preferences for actions could be assessed. Third, an independent group of subjects rated the content of the 35 distinct act categories on five semantic scales so qualitative differences between conditions could be assessed.

The following sections describe each of these classification procedures in more detail and provide the rationale for using these classifications. The descriptions of these classifications do not directly address the questions examined by the experiment. Therefore, the reader may proceed to the Results and Discussion section on page 32 without any loss of continuity.

Assignment of acts to the act tree

The acts generated by subjects in both experiments were pooled to form a set consisting of 525 discrete acts that subjects thought the

French were most likely to take to solve the crisis in Maracaibo. Recall that data were collected for all conditions at the same time, so it was considered appropriate to pool responses from all subjects. Because many of the acts subjects generated were very similar, it was necessary to combine the similar acts to allow a more accurate characterization of the quality of subjects' act generation performance. Therefore, the following procedure was employed to reduce the set of discrete acts to a set containing unique actions.

Two independent raters examined the pooled set of 525 discrete acts to identify equivalent acts. The raters' classifications were compared, and the acts both agreed had the same meaning were assigned a single descriptive label. This classification procedure produced 154 unique acts, and another ten acts were categorized as "infeasible or irrelevant". The raters then further reduced the volume of data by assigning each unique act a classification from the hierarchical act "tree" shown in Appendix F. The act tree was created by the experimenter to provide a hierarchical organization for all acts the French might take to solve the problem. The limbs of the tree represented the eight major themes subjects suggested the French might employ to solve the problem. Branches within the limbs of the act tree represented variations on each of the major themes (e.g., the branches of Limb 1 describe possible ways the French might use military force). The experimenter and raters added branches to the act tree until all 154 acts could be described by a limb and branch classification. The raters also assigned a classification to each of the 20 specified acts for which the subjects in Experiments 1 and 2 provided likelihood and preference ratings. The raters agreed 80.5% on

the classifications they assigned to the 174 acts. The percentage of agreement was somewhat low because it was often difficult for the raters to interpret the subjects' intended meanings. For example, the action "Pressure the local government to do something" might suggest that the French government wanted the government of Guayaquil either to rescue the hostages, to demand the hostages' release, or to give in to the guerrillas' demands. The raters and the experimenter discussed the acts on which the raters disagreed until an appropriate classification was chosen. This procedure yielded 35 representative acts corresponding to the 35 branches of the hierarchical act tree.

Estimating the benefit of representative acts

The next task was to determine whether the acts subjects generated differed according to the benefit they would provide for either of the decision makers directly involved in the conflict. If perspective affects the prediction of the acts an opponent is likely to take, then the acts generated by Hostage or Guerrilla subjects might be more likely to benefit or harm the French or the guerrillas than the acts the French generate. Also, if perspective affects prediction of the likelihood with which an opponent will take an action, then the Hostage or Guerrilla subjects might predict that the French may be more or less likely to take acts that would benefit or harm the French or guerrillas than the French predict. Furthermore, if perspective affects the prediction of an opponent's preferences for actions, then the Hostage or Guerrilla subjects might predict that the French might show a higher or lower preference for acts that would benefit or harm the French or guerrillas than the French predict.

Forty introductory psychology students evaluated the benefit of the

35 representative acts produced by the classification procedure described above. Twenty subjects read the Guerrilla perspective and estimated the benefit of the 35 acts for the guerrillas. Another twenty subjects read the French perspective and estimated the benefit of the 35 acts for the French. All subjects rated each of the 35 randomly-ordered acts on a 20 point scale. For subjects who read the Guerrilla perspective, a rating of 0 on the scale was "Would badly hurt guerrillas", a rating of 20 on the scale was "Would greatly benefit guerrillas", and a rating of 10 on the scale was "Would neither hurt nor benefit guerrillas." For subjects who read the French perspective, a rating of 0 on the scale was "Would badly hurt the French", a rating of 20 on the scale was "Would greatly benefit the French" and a rating of 10 on the scale was "Would neither hurt nor benefit the French".

From these data, two estimates of the benefit of each of the 35 representative actions for both decision makers were obtained. These estimates were the median benefit rating for the French (called the "French Benefit score") and the median benefit rating for the guerrillas (called the "Guerrilla Benefit score"). The ratings which subjects initially made on a scale ranging from 0 to 20 were transformed by subtracting ten from each score, producing benefit scores which ranged from -10 to +10. Thus, a numerical French Benefit score near 0 described an act considered to neither hurt nor help the French. A positive numerical French Benefit score described an act considered to benefit the French, while a negative French Benefit score described an act considered to harm the French. A similar transformation was applied to the Guerrilla Benefit scores. The nine acts labeled irrelevant or useless were not

rated by subjects, but were assigned a French Benefit score and a Guerrilla Benefit score of 0 because they would neither benefit nor harm either group.

Analyses derived from benefit scores. The benefit scores derived above were employed in several ways to assess whether the Hostage, Guerrilla or French subjects differed in their act generation, their likelihood estimation, or their estimation of the French government's preferences for actions. First, each subjects' act generation performance was characterized by assigning a French Benefit score and a Guerrilla Benefit score to each act they generated. The average French and Guerrilla benefit scores were computed for each subject, then were compared across conditions to determine whether the typical act generated by subjects in different perspective conditions was biased toward either the French or the guerrillas.

The French and Guerrilla benefit scores provided another basis for categorizing subjects' responses. The French and Guerrilla benefit scores were used to derive a French benefit classification and a Guerrilla benefit classification for both the 35 representative acts from the hierarchical act tree and the 20 specified acts for which the subjects made likelihood and preference estimates. A classification was made by assigning each act to one of three mutually exclusive categories which described the benefit of the act for one of the decision makers involved in the conflict. For example, each representative act was assigned a French benefit classification based on whether the act would benefit the French, harm the French, or neither benefit nor harm the French. If the act received a French Benefit score greater than or equal to 5, it was considered to benefit the French. If an act received a French Benefit

score less than or equal to -5, it was considered to harm the French. If the act received a French Benefit score between -5 and 5, it was considered to neither harm nor benefit the French. Each act was also assigned a Guerrilla benefit classification based on whether the act would benefit the guerrillas, harm the guerrillas, or neither benefit nor harm the guerrillas. If the act received a Guerrilla Benefit score greater than or equal to 5, it was considered to benefit the guerrillas. If the act received a Guerrilla Benefit score less than or equal to -5, it was considered to harm the guerrillas. If the act received a Guerrilla Benefit score between -5 and 5, it was considered to neither benefit nor harm the guerrillas.

Each of the five acts subjects generated were assigned a French benefit classification and a Guerrilla benefit classification, then the number of acts subjects generated that were considered to benefit the French, harm the French, benefit the guerrillas, or harm the guerrillas was counted. These frequencies were subsequently compared to determine whether subjects in the various perspective conditions differed in the number of acts they generated that would benefit or harm the French or in the number of acts they generated that would benefit or harm the guerrillas. The mean likelihood and preference estimates for sets of specified acts classified as benefiting or harming the French or guerrillas were also computed and compared to determine whether subjects in the various perspective conditions differed in their likelihood estimation or in their beliefs about the French government's preferences for acts that would benefit or harm the French or for acts that would benefit or harm the guerrillas.

It was necessary to determine whether the acts subjects generated differed in their semantic content. If perspective affects the prediction of the acts an opponent might take in a conflict, then the acts generated by Hostage or Guerrilla subjects might differ in their semantic content from the acts French subjects generate. Also, if perspective affects the prediction of the likelihood with which an opponent might take an action, then the Hostage or Guerrilla subjects might predict that the French would be more or less likely to take acts that could be classified into various semantic categories than the French subjects predict. Furthermore, if perspective affects the prediction of the French government's preference for actions, then the Hostage or guerrilla subjects might predict that the French government might have a higher or lower preference for acts that fell into various semantic categories than the French subjects predict.

Numerical values were assigned to the 35 representative acts on five bipolar scales representing several semantic distinctions along which the acts might vary. The first scale described the dimension of violence-nonviolence. Decision makers having different perspectives might have been expected to differ in the number of violent acts they generated or the degree of violence inherent in their acts. For example, the Guerrillas might have underestimated the French government's tendency to use violence. If so, they might have generated fewer violent acts than the French or the violent acts they generated might have been less violent than the acts the French generated.

The second scale described whether or not an action reflected France's desire to maintain its image as a world power. Subjects who had

a different perspective than the French might have overlooked France's interest in maintaining its image while subjects having the French perspective should have been aware of that objective. Subjects unaware of France's desire to maintain its world image might have generated more acts failing to reflect France's desire to maintain its world image than the French generated.

The third scale described whether an act suggested France would refuse to cooperate with the guerrillas or would concede to them. Depending on their perspective and their interpretation of the French objectives, subjects holding other perspectives might have predicted the French would be willing to cooperate with the guerrillas. These subjects should have generated more acts suggesting the French would cooperate than the French generated. However, if subjects holding other perspectives predicted the French desired to hurt their opponents, they might have expected the French to refuse to cooperate with the guerrillas. These subjects should have generated fewer acts suggesting the French would be willing to cooperate than the French generated.

The fourth scale described whether actions were direct or indirect in achieving the release of the hostages. Subjects holding other perspectives might have expected the French to take more direct actions to gain release of the hostages. If so, these subjects should have generated more direct actions and fewer indirect actions than the French generated.

The fifth scale described whether the act would benefit one or both parties. The scale was not designed to examine the relative benefit of the acts for either party because the French and Guerrilla Benefit scores

described earlier provided such estimates. Instead, the fifth scale described the degree to which actions reflected the decision makers' recognition that solving a problem does not necessarily require one party to be hurt. Subjects in a position to be aware of the objectives of both parties in the conflict might have been more likely to generate acts reflecting compromise between the two parties than subjects aware of only their own objectives.

Five naive subjects rated each of the 35 distinct acts on the five scales described above. Median scale ratings were computed for each act. The scale scores were then correlated with each other to allow the experimenter to determine which scales were highly related to the others. These correlations are displayed in Table 1. The scale "refuse to cooperate-concede" had a high correlation with the scale "violence-nonviolence", with the scale "doesn't reflect-reflects France's desire to maintain its image as a world power", and with the scale "action benefits one-both parties". Because this scale was so highly related to three of the other four scales, it was eliminated from further analyses.

Analyses derived from semantic content scale scores. The semantic content scale scores derived above were employed in several ways to assess whether the Hostage, Guerrilla or French subjects differed in their act generation, their likelihood estimation, or their estimation of the French government's preferences for actions. First, each subjects' act generation performance was characterized by assigning to the five acts generated a score from each of the four semantic content scales. Four semantic content scores were then computed for each subject by finding the mean of the five semantic content scores associated with each of the five acts subjects generated on each semantic content scale. The

subjects' mean semantic content scores were compared across conditions to determine whether the typical act generated by subjects in any perspective condition could be characterized as being more or less extreme on any of the semantic content scales than the typical act generated by subjects in other conditions.

Table 1

Correlations between semantic content scales

Scale	Violence-nonviolence	Reflects-doesn't reflect F's desire to maintain its world image	Refuse to cooperate-concede	Indirect-direct	Affects one-both parties
Violence-nonviolence	1.0	-.383	.604	-.175	.535
Reflects-doesn't reflect	-.383	1.0	-.406	-.121	-.269
Refuse to cooperate-concede	.604	-.406	1.0	.118	.647
Indirect-direct	-.175	-.121	.118	1.0	-.205
One-both parties	.535	-.269	.647	-.205	1.0

The semantic content scores provided another basis for categorizing subjects' responses. The semantic content scores for each of the representative acts were used to derive a set of semantic classifications for both the 35 representative acts from the hierarchical act tree and

the 20 specified acts for which the subjects made likelihood and preference estimates. The semantic content classifications were made by assigning each representative act to one of three mutually exclusive categories for each semantic content scale. Recall that the 35 unique acts were assigned values on the semantic content scales ranging between 1 and 20. If an act was assigned a score on a semantic content scale less than or equal to 5, it was described by the label at the left extreme of the scale. If the act was given a value on a semantic content scale greater than or equal to 15, it was described by the label at the extreme right of the scale. If an act was given a value between 5 and 15 on a semantic content scale it was considered to fall at neither extreme. For example, if an act received a value of 2 on the violence-nonviolence scale, it was considered to be violent. If the act received a score of 18 on the violence-nonviolence scale, it was considered to be nonviolent. if the act received a value of 8 on the violence-nonviolence scale, it was considered to be neither violent nor nonviolent. Three mutually-exclusive categories were formed for each scale, and each act was assigned to one of the three categories.

The number of acts subjects generated that were categorized as belonging to one of the extreme semantic categories was counted for each subject in each condition. These frequencies were compared for subjects in each condition to determine whether the Hostage, Guerrilla or French subjects generated different numbers of extreme acts. The average likelihood and preference estimates for specified acts categorized as belonging to each of the extreme semantic categories was computed for subjects in each condition. These average likelihood and preference estimates were then compared to determine whether perspective would

influence subjects' estimation of the likelihood that the French would take qualitatively different acts or their estimation of the preference the French government would have for qualitatively different acts. The results of the analyses described in this section will now be discussed.

RESULTS AND DISCUSSION

Results of Experiment 1

Experiment 1 was performed to examine the effect of perspective on a decision maker's identification and assessment of the actions an opponent might take to resolve a conflict. As described earlier, several dependent measures were obtained from subjects to assess this effect. Subjects generated five acts they believed the French were most likely to take to solve the experimental problem and ranked them in order of likelihood. Subjects then estimated the likelihood and the French government's preferences for a specified set of acts.

Analyses were performed to determine whether perspective affected subjects' act generation, likelihood estimation or estimation of an opponent's preferences for actions. None of the analyses performed found large differences between subjects in the different perspective conditions. However, some subtle differences were observed in subjects' act generation performance. The results obtained from these analyses will now be discussed and conclusions that can be drawn from the results will be presented.

The effect of perspective on act generation performance

Several analyses were performed to determine whether acts generated by subjects in the different perspective conditions differed in their semantic content or in their utility for either decision maker.

Semantic content analysis. Two analyses were performed using the semantic content scale values described in the section "Describing the semantic content of representative acts" on page 27. The semantic content scale values were obtained by having an independent group of subjects rate each of the 35 representative acts on four semantic scales: "violence-nonviolence", "the act doesn't reflect-reflect France's desire to maintain its world image", "indirect-direct action", and "would benefit one-both parties". The semantic content scale values derived from this procedure were assigned to each of the five acts generated by subjects in Experiment 1 to aid in analyzing subjects' act generation performance.

In the first analysis, the four semantic scale values for each act generated were averaged across the five acts generated by each subject to determine whether the experimental conditions differed in the semantic content of the typical act they generated. A MANOVA performed using the four average semantic scores as dependent variables found a marginally significant difference, $F(8,110) = 1.52$, $p < .15$. On tests of the individual dependent variables, only the average values for the scale describing whether an action would benefit only one or both parties approached significance, $F(2,57) = 2.75$, $p < .08$. The 15 Hostage subjects generated acts having a mean value of 8.5, the 15 Guerrilla subjects generated acts having a mean value of 7.0, and the 30 French subjects generated acts having a mean value of 7.1 on this scale. Multiple comparisons performed using Tukey's method suggested that the average subject in the Hostage condition generated more acts that would benefit both parties than the average subject in the French condition,

$t(57) = 2.16$, $p < .05$.

The second analysis employing the semantic content scale values examined the number of acts generated that were categorized at the high or low extremes of the four semantic scales. Eight extreme categories of acts were examined: violent acts, nonviolent acts, acts which did not reflect France's desire to maintain its image as a world power, acts which reflected France's desire to maintain its image as a world power, direct acts, indirect acts, acts that would benefit one party and acts that would benefit both parties. An overall test of the effect of condition was performed using the number of acts generated in each of the eight categories as dependent variables. The overall test of the significance of the experimental conditions was marginally significant $F(16,98) = 1.4$, $p < .16$. Individual tests of significance for the number of acts generated in individual semantic categories suggested there was a difference in the number of violent acts generated, $F(2,57) = 2.38$, $p < .11$, and in the number of acts generated that would benefit only one party, $F(2,57) = 3.87$, $p < .03$. The mean number of violent acts and the mean number of acts that would benefit only one party can be seen in Table 2. Multiple comparisons of means suggested that the Guerrilla subjects generated more violent acts than the French subjects, $t(57) = 2.1$, $p < .05$ and the Hostage subjects generated fewer acts that would benefit only one party than either the Guerrilla subjects, $t(57) = 2.48$, $p < .05$, or the French subjects, $t(57) = 2.46$, $p < .05$.

Table 2

Mean number of acts generated in semantic content categories

		Category	
	N	Violent acts	Acts that benefit only one party
Condition			
Hostage	15	1.6	1.7
Guerrilla	15	1.8	2.6
French	30	1.3	2.5

The Guerrilla subjects, on the average, appeared to generate more violent acts than the French. This result seems to be supported by the observation that 100% of the Guerrilla subjects generated at least one military action, while only 80% of the Hostage subjects and 90% of the French subjects generated at least one military action. However, the impact of this result is reduced by observing that the typical act generated by the Guerrilla subjects was no more violent than the typical act generated by subjects in other conditions. Perhaps the guerrillas were not more violently inclined than the French but predicted the French would consider taking military actions because failure to anticipate a military action if one was taken would be disastrous.

The Hostage subjects generated fewer acts than either the French or Guerrilla subjects that would benefit only one party. This result is supported by the result reported previously that the Hostage subjects' average act was more likely to benefit both parties than the average act generated by French subjects. These results suggest that the Hostage

subjects may examine the situation from both perspectives.

Benefit analyses. Another set of analyses was performed to determine whether the act generation of subjects in different perspective conditions was differentially biased towards the French or the guerrillas. These analyses employed the French and Guerrilla Benefit scores obtained from an independent group of subjects (see the section "Estimating the benefit of representative acts" on page 23 for a description of the procedure). In Experiment 1, subjects having different perspectives did not differ with respect to the benefit for the French or the guerrillas of the average act they generated, or the benefit for the French or the guerrilla of the act they ranked "most likely". Subjects also did not differ in the number of acts they generated that could be considered beneficial or harmful to either the French or guerrillas.

Act rankings. Although the acts subjects generated seemed to be of similar semantic content and seemed to be equally beneficial for both the French and the guerrillas, it is possible that the benefit of the acts generated might differ as a function of the ranks they assigned. Recall that subjects ranked the acts they generated in order of likelihood. Perhaps the subjects in different perspective conditions generated the same acts, but differed in the acts they predicted were more likely to be taken. An analysis was performed to determine whether the experimental condition interacted with the rank of the acts generated. No interaction between the condition of the subject and the rank of the act was observed using the French or Guerrilla Benefit scores as dependent variables. This result suggests that subjects having different perspectives not only generate similar acts, but they also feel the acts they generate are of similar likelihood.

The effect of perspective on estimation of likelihood and preference

The next set of analyses examined the likelihood and preference estimates subjects provided for a specified set of acts. Previous analyses suggested that, with a few exceptions, decision makers seemed to generate the same actions, regardless of perspective. However, when subjects having different perspectives were provided with the same set of potential acts as their opponents, it would be interesting to determine whether the likelihood with which they predicted that the French government would take each of the specified acts differed as a function of their perspective. It would also be interesting to determine whether subjects having different perspectives would predict that the French government's preferences for the specified acts was the same as the French subjects predicted. The results of analyses designed to answer these questions may suggest whether decision makers' perspectives on a problem could influence their probability and utility estimation.

Subjects made likelihood estimates and estimates of the French government's preferences for the set of 20 specified acts shown in Appendix D. The likelihood and preference estimates were analyzed using both the semantic content classifications described in the section entitled "Analyses derived from semantic content scale scores" on page 29 and the French and Guerrilla benefit classifications described in the section entitled "Analyses derived from benefit scores" on page 25. The classification procedures partitioned the specified acts into similar categories according to their semantic content and their benefit for either the French government or the guerrillas. Average likelihood and preference estimates for acts in the semantic content categories and the French and Guerrilla benefit categories were computed for subjects in the

French and Guerrilla benefit categories were computed for subjects in the different perspective conditions. However, no effect of perspective on estimates of likelihood or preferences estimates were found in any of these analyses.

These data suggest that perspective has no detectable influence on the estimation of likelihood or preferences for actions. Additional evidence supporting this conclusion was provided by observing that the average ratings made by subjects in the perspective conditions for both likelihoods and preferences were highly related. Tables 3 and 4 show the correlations between the average likelihood estimates for different conditions, and correlations between preference orderings for different conditions, respectively. The high correlations between these estimates provide additional evidence which suggests that perspective had no great effect on subjects' ratings of likelihood and preference.

Table 3

Correlations between group's average likelihood estimates

Condition	Hostage	Guerrilla	French
Hostage	1	.945	.921
Guerrilla	.945	1	.942
French	.921	.942	1

Table 4

Correlations between group's average preference orderings

Condition	Hostage	Guerrilla	French
Hostage	1	.928	.933
Guerrilla	.928	1	.957
French	.933	.957	1

Summary of results for Experiment 1. The results reported in this section suggest that the perspective of a decision maker may have a small effect on the generation of an opponent's moves in a conflict. Subjects in the Hostage condition generated fewer acts benefiting only one decision maker than either the French subjects or the Guerrilla subjects generated. The average act generated by the Hostage subjects was also more likely to benefit both decision makers than the average act generated by the French subjects. Perhaps the Hostages' reduced opportunity to act to resolve the situation allowed them to look at the conflict from the viewpoint of both opponents. This conjecture is supported by the result that subjects in the Hostage condition generated acts which on the average would equally benefit the French government and the Guerrillas, $t(14) < 1$. Thus, the Hostage subjects' act generation did not appear to favor one group over the other.

The Guerrilla subjects generated a greater number of violent acts than the French subjects generated. However, this result may not imply that the Guerrilla subjects were more violently inclined than the French subjects because other results did not support this hypothesis. For

example, the Guerrilla subjects' average actions were rated no higher on the violence scale than the average actions generated by the French subjects. Also, the actions generated by the Guerrilla subjects on the average received Guerrilla Benefit scores no lower than the actions French subjects generated. If the Guerrilla subjects were generating highly violent actions, then it might be expected that their mean Guerrilla benefit scores would be lower than those of the French because violent actions should be less beneficial to the guerrillas than other kinds of actions. These results seem to suggest that the Guerrillas may have generated a greater number of violent acts than the French subjects only because all of the Guerrilla subjects considered that the French might take military actions, while some of the French subjects failed to consider this possibility. However, in other aspects of their act generation performance, the Guerrilla subjects generated acts which were no more violent than those generated by subjects in any other condition.

When a specified set of acts is evaluated by decision makers having different perspectives, their perspective does not seem to influence their ratings of the likelihood that the opponent will take one of the specified acts or their predictions of the opponent's preferences for the acts. The results for Experiment 2 will now be described, then a general discussion of the reasons these results may have occurred will be presented.

Results of Experiment 2

Experiment 2 was performed to determine the effect of presenting information about an opponent's objectives on the identification and assessment of the actions an opponent might take to resolve a conflict. Four experimental conditions were employed in Experiment 2. Three groups

of subjects given the Guerrilla perspective were also provided with varying amounts of information about the French government's objectives regarding the experimental problem. Subjects in the Irrelevant Information condition were given information about the geography of France which was irrelevant to the problem at hand. Subjects in the Imagine Information condition were asked to imagine the French government's objectives in the situation. Subjects in the Explicit Information condition were provided with a written description of the French government's objectives.

The results of Experiment 1 suggested that perspective may produce only small differences in act generation performance, and apparently produces no differences in estimation of the likelihood of occurrence of an action or in the estimation of an opponent's preferences. Thus, any differences observed between subjects in Experiment 2 should be due to the information subjects receive about the opponent's objectives, rather than the subject's perspective. Because subjects in Experiments 1 and 2 performed the same tasks, the same analyses used in Experiment 1 were employed in Experiment 2.

The effect of information on act generation performance

Semantic content analysis. Two analyses were performed using the semantic classifications obtained from an independent group of subjects (see the section "Describing the semantic content of representative acts" on page 27 for a description). The first analysis compared the mean semantic scale ratings for subjects in the four conditions to determine whether the typical acts subjects generated differed in their content. A MANOVA performed to test the overall effect of condition using the

average ratings on each of the four semantic scales as dependent variables was marginally significant, $F(12,200) = 1.67$, $p < .08$. Tests of the individual dependent variables were also marginally significant for two scales. Subjects' typical acts differed on the semantic scale "doesn't reflect-reflects France's desire to maintain its world image", $F(3,71) = 2.35$, $p < .08$, and on the scale "benefits one-both parties", $F(3,71) = 2.08$, $p < .1$. Subjects' mean ratings on the two scales can be seen in Table 5.

Table 5

Average rating for generated acts on semantic content scales

	N	Category: Doesn't reflect-reflects France's desire to maintain its world image	Category: Benefits one-both parties
Condition			
Irrelevant Information	15	10.0	8.7
Imagine Information	15	9.9	7.6
Explicit Information	15	11.1	8.2
French	30	10.8	7.1

Individual comparisons of the means suggested that subjects in the Explicit Information condition tended to generate acts that were more likely to reflect France's desire to maintain its world image than the

acts subjects in the Imagine Information condition generated, $t(71) = 2.04$, $p > .10$. Providing explicit information about the French government's objectives may have made the Explicit Information subjects more aware of the French desire to preserve their dignity.

Additionally, individual comparisons suggested that the Irrelevant Information group tended to generate acts more likely to benefit both parties than the acts the French generated, $t(71) = 2.33$, $p < .1$. Perhaps providing irrelevant information about France made the French opponents seem less abstract and therefore made it easier to consider actions that would benefit both parties. This idea is supported by the observation that the Guerrilla subjects provided with explicit information about the French opponents also tended to generate acts more likely to benefit both parties (although the average rating for their acts on the scale "Benefits one-both parties" was not significantly higher than the average rating for the French subjects' acts). Decision makers provided with any type of specific information about the opponent might be more likely to consider the situation from both their own and the opponent's perspective.

Benefit analyses. The next analyses examined the number of acts generated in the four categories of acts that were based on the acts' French and Guerrilla Benefit scores (described in the section "Estimating the benefit of representative actions on page 23). Subjects did not differ in the number of acts they generated considered to benefit or harm the French or guerrillas. However, they differed in the benefit of the average act they generated, and in the benefit of the act they ranked "most likely". The overall tests of both the French and Guerrilla Benefit

scores were marginally significant, with $F(6,142) = 1.89$, $p < .09$, for the benefit of the average act generated, and $F(6,138) = 1.51$, $p < .18$, for the benefit of the most likely act generated (the act given a ranking of 1). Tests of the individual dependent variables suggested that subjects differed only on their French benefit scores for the acts they generated for both analyses, with $F(3,71) = 2.41$, $p < .08$ for the average act generated and $F(3,71) = 2.96$, $p < .04$. for the act considered most likely. Subjects' mean French utilities for the average act generated and for the most likely act are presented in Table 6.

Table 6

Benefit analysis of generated actions

	N	Mean French benefit score*	
		Average act	Most likely act
Condition			
Irrelevant Information	15	9.6	9.7
Imagine Information	15	9.5	11.1
Explicit Information	15	10.9	13.2
French	30	10.2	11.1

*Higher numbers mean the act was more beneficial to the French

Multiple comparisons of means suggested that the average act generated by subjects in the Explicit Information condition was slightly more beneficial to the French than the average act generated either by

subjects in the Imagine Information condition, $t(71) = 2.40$, $p < .1$ or by subjects in the Irrelevant Information condition, $t(71) = 2.17$, $p > .1$. Additionally, the Explicit Information subjects' most likely acts were more beneficial to the French than were the most likely acts of either the Irrelevant Information subjects $t(71) = 2.94$, $p < .05$, or to a lesser extent, the most likely acts of the French subjects, $t(71) = 2.04$, $p > .1$.

The analyses performed to assess the effect of providing information about an opponent's objectives on act generation performance suggest that providing explicit information about the French government's objectives may have sensitized these subjects to their opponent's position in the conflict. The acts generated by the Explicit Information subjects upheld France's dignity and were more beneficial to the French than the acts generated by subjects in the other Guerrilla conditions. For example, the Explicit Information subjects generated acts which reflected France's desire to maintain its world image more than the acts generated by subjects in the Imagine Information Condition. The average acts generated by subjects in the Explicit Information condition were more beneficial to the French than the average acts generated by subjects in the other Guerrilla conditions, and the most likely act generated by Explicit Information subjects was more beneficial to the French than the most likely act generated by subjects in the Irrelevant Information condition.

As might be expected, the acts generated by subjects in the Guerrilla conditions who were provided with little or no specific information about the French objectives did not support the French objectives as strongly as the acts generated by the Explicit Information

subjects. It appears that only decision makers who have explicit information about their opponents' objectives can accurately integrate this information into the acts they generate.

However, the French subjects' acts also did not seem to be as strongly supportive of their government's objectives as the acts generated by the Explicit Information subjects. This hypothesis is supported by the observation that only 33% of the subjects in the Explicit Information condition generated at least one action suggesting that France might concede to the guerrillas' demands while 50% of the French subjects generated at least one such action. Decision makers given explicit information about their opponents' objectives might lose the conflict if they predicted that their opponents would only take actions that would satisfy the opponents' objectives while the opponents actually took actions which were less beneficial to their own government. However, in a real-world situation, the opponents might be more capable of integrating their own objectives with the acts they generate to resolve a conflict. In that situation, a decision makers' ability to predict which actions would benefit the opponent would be desirable.

The effect of information on estimation of likelihood and preference

The next set of analyses involved the likelihood and preference estimates subjects provided for a specified set of acts. Previous analyses suggested that subjects in the experimental conditions differed somewhat in the semantic content and the benefit for the French government of the acts they generated. The analyses reported in this section might suggest whether information about the opponent's objectives might also affect estimation of the likelihood of occurrence and the opponent's preferences for a specified set of actions. A number of

categorization procedures were employed to partition the specified acts into similar categories according to their semantic content and their benefit for the French or guerrillas. The procedures for obtaining these categories were described in the sections "Analyses derived from semantic content scale scores" on page 29 and "Analyses derived from benefit scores" on page 25. Subjects' average likelihood and preference estimates for acts in the semantic content categories and the French and Guerrilla benefit categories were computed and compared. However, no effect of information was observed in any of these analyses.

These data suggest that information may have no detectable influence on the estimation of likelihood or preference for actions. Additional evidence supporting this conclusion is provided by observing the correlations between average likelihood estimates made by the different conditions and the correlations between the average preference orderings made by the different conditions. Tables 7 and 8 display both sets of correlations. The high correlations support the conclusion that providing different amounts of information about an opponent's objectives had no great effect on subjects' estimates of likelihood and preference.

Summary of results for Experiment 2. The results reported in this section suggest that providing specific information about an opponent's objectives may aid a decision maker in identifying actions that would be likely to attain the opponent's objectives. Guerrilla subjects in the Explicit Information condition provided with a written description of the French government's objectives generated actions which were more beneficial to the French government than the actions generated by other Guerrilla subjects provided with little or no information about the

French government's objectives. This result is not unexpected because decision makers who have more information should perform better than decision makers who have less information.

Table 7

Correlations between groups' average likelihood estimates

Condition	Irrelevant Information	Imagine Information	Explicit Information	French
Irrelevant Information	1.0	.813	.943	.891
Imagine Information	.813	1.0	.890	.914
Explicit Information	.943	.890	1.0	.910
French	.891	.914	.910	1.0

Table 8

Correlations between groups' average preference orderings

Condition	Irrelevant Information	Imagine Information	Explicit Information	French
Irrelevant Information	1.0	.888	.937	.908
Imagine Information	.888	1.0	.899	.944
Explicit Information	.937	.899	1.0	.895
French	.908	.944	.895	1.0

Subjects in the Irrelevant Information condition generated acts which were more likely to benefit both parties than subjects in the

French condition. Providing decision makers with any explicit information about their opponent may make it easier for them to examine the conflict from both their own and the opponent's perspective.

CONCLUSIONS

The results of Experiment 1 suggested that some subtle differences in subjects' act generation performance may have resulted from manipulation of their perspective. The Hostage subjects generated acts that seemed to be more beneficial to both decision makers involved in the conflict than subjects in other experimental conditions. Also, all the Guerrilla subjects anticipated that France might take military actions, while some subjects in the other experimental conditions did not generate military actions.

The results of Experiment 2 suggested that manipulating the amount of information available about the opponent's perspective can influence subjects' act generation performance. Guerrilla subjects provided with explicit information about the French government's objectives generated acts that were more beneficial to the French government than other Guerrilla subjects who were provided with little or no information about the French government's objectives. Subjects in the Irrelevant Information condition generated acts that were more beneficial to both decision makers involved in the conflict than subjects in the French condition.

However, in neither experiment were differences observed in subjects' estimates of the likelihood with which the French would take certain actions, nor were there differences in subjects' estimates of the preferences the French government might have for certain actions. This

result suggested that the differences observed in subjects' act generation performance were probably due to the way they retrieved information from memory rather than differences in evaluation of the probabilities and utilities of the acts they generated. This conclusion is only tentative because likelihood and utility estimates for generated acts were not obtained.

It was rather surprising that although subtle differences were observed, no large differences were found between subjects having different perspectives. This result was unexpected because both personal experience and previous research on schematic processing suggest that perspective seems to affect the interpretation of information and thus, might also affect the generation and assessment of decision components. Two explanations might account for the lack of large differences found in this study. First, the experimental procedures employed might not have produced the effects that real differences in perspective will produce in the real world. It is always difficult to simulate real world cognitive processes in the laboratory. In the present study, perspective was manipulated by having subjects read a written description of a problem. This manipulation may not have been potent enough to simulate the perspective of a real decision maker. Alternatively, the subjects may not have been able to relate easily to the problem or their assigned perspectives. Further research might compare the act generation performance of subjects selected on the basis of their perspective for a real-world problem to assess whether this explanation has any merit.

Second, perhaps perspective affected act generation performance but the results were obscured by high variability in subjects' responses. Future research might involve training subjects in techniques of

likelihood and utility estimation to reduce the variability in their responses.

Third, it is possible that perspective does not have a major effect on act generation performance, but only subtly influences the processing of information about a decision. This conclusion seems counterintuitive because, as mentioned before, perspective seems to have a large effect on how information is interpreted. However, the impression that perspective has a major impact on processing information may be biased by the observer's hindsight (Fischhoff, 1975). Before a particular outcome has occurred, the available data may suggest that one of several outcomes might result from an action. However, after an outcome is known (i.e., in hindsight) people tend to view that outcome as having been inevitable. Fischhoff has shown that this "hindsight bias" leads to overestimating the predictability of outcomes. Thus, the statement "President Galtieri should have known that Britain would react violently to his invasion of the Faulklands" may be based on the hindsight bias. Perhaps the effect of perspective is also salient only in hindsight. Decision makers may generate actions fairly well given the data available to them, and our observations that certain actions should have been identified may only be obvious after the outcome has occurred.

The results of this study suggest that perspective may have only a subtle influence on the generation and assessment of the actions a decision maker predicts an opponent will take. Additional research should be performed to determine whether this conclusion can be supported when other experimental manipulations are employed.

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Appendix A

Hostage Perspective

Imagine that you are a member of the French consulate in Guayaquil, a small country in South America. The French embassy was captured several hours ago by a band of guerrillas and you are now a hostage in the consulate headquarters. You were bound and gagged and were placed in a room with the rest of the embassy personnel under heavy guard. You have learned through an interpreter that the guerrillas claim they captured the French embassy to protest the Guayaquil government's violations of the human rights of its citizens.

You arrived at the French embassy only about 3 months ago. Since your arrival, you spent most of your time learning your job and had little opportunity to travel outside the French compound. In fact, you cannot even speak the local language. You were aware of some political unrest around Maracaibo, but, until now, that was of little concern to you because your job primarily involved keeping records about payroll and personnel matters within the embassy. You now wish you had kept up with the political situation in the country.

The French embassy is located in Maracaibo, a major seaport of Guayaquil. You have been told that guerrilla forces currently control much of the area around Maracaibo. Maracaibo is located on the western shore of a large enclosed bay, Lake Maracaibo, and is near a channel between the bay and the open sea. Maracaibo is about 330 miles by air from the capitol of Guayaquil, and the roads between it and the capitol are poor. The guerrillas have set up observation posts on the road to the capitol and on the channel which connects Maracaibo to the ocean.

Maracaibo is about 400 miles away from French Guiana, a possession of France, and is about 1100 miles from Florida.

France imports some oil from Guayaquil, but it is not their primary supplier. However, the Government of Guayaquil is not particularly friendly to the French government. As a result, your co-workers do not believe that the government of Guayaquil is likely to intervene on your behalf.

Your major goal in this situation is obviously to remain alive. You don't want to do anything to endanger your own life or the lives of the other members of the staff. Thus, you don't want to do anything that might antagonize your captors. You also don't want to embarrass the French government by admitting any wrongdoing on its part.

Appendix B

Guerrilla Perspective

Imagine that you are a member of a band of guerrilla fighters in Guayaquil, a small country in South America. You have just helped to capture the French embassy in Maracaibo. You and your companions are holding the French embassy personnel hostage in the consulate headquarters. The embassy personnel were bound and gagged and placed together under heavy guard in a room in the embassy. Your leader has released a statement to the press which says that your group captured the French embassy to protest the Guayaquil government's violations of the human rights of its citizens.

Until 3 months ago you were a teacher in a small village located about 30 miles away from Maracaibo. At that time, a unit of the Guayaquil army entered your village, killed most of the inhabitants (including your family) and burned all the homes and crops. They claimed they were justified in raiding your village because the village supported local guerrilla activity directed against the government. Since that time, you joined the guerrilla forces and helped them in their numerous attempts to retaliate against the government. The raid on the French embassy was designed to direct international attention to the human rights violations of the Guayaquil government.

The French embassy is located in Maracaibo, a major seaport of Guayaquil. Your compatriots currently control much of the area around Maracaibo. Maracaibo is located on the western shore of a large enclosed bay, Lake Maracaibo, and is near a channel between the bay and the open sea. Maracaibo is about 330 miles by air from the capitol of Guayaquil, and the roads between it and the capitol are poor. Some of your friends

have set up observation posts on the road to the capitol and on the channel which connects Maracaibo to the ocean. Maracaibo is about 400 miles away from French Guiana, a possession of France, and is about 1100 miles from Florida.

The French import some oil from Guayaquil, but it is not their primary supplier. However, the Government of Guayaquil is not particularly friendly to the French. As a result, your leaders are not overly concerned about the government of Guayaquil intervening on behalf of the hostages.

The primary goal of your group in this situation is to gain the attention of the media so that you can publicize the human rights violations committed by the government of Guayaquil. You hope that by publicizing the atrocities committed by the government, your group could gain popular support for a revolution.

To do this, you have to keep the hostages from escaping, because if they escape, you will lose the attention of the press. You also want to avoid hurting the hostages because committing any violence would reduce the degree to which other countries would support your position.

You also have personal goals to fulfill. You have become an advisor to the leader of the guerrilla forces. If your group is successful in attaining its goals, you may have the opportunity to become an important figure in the new government.

Appendix C

French Perspective

Imagine that you are a political advisor to the President of France on matters related to South American countries. The President has called you to an emergency meeting because he was just informed that a band of guerrillas has captured the French embassy in Guayaquil, a small country in South America. The embassy personnel have been bound and gagged and are being held in the consulate headquarters under heavy guard. The guerrillas released a statement to the press claiming that they captured the French embassy to protest the Guayaquil government's violations of the human rights of its citizens.

You have worked as an advisor to the President for only the last 3 months. The president relies on you to summarize and evaluate the political unrest which often occurs in small South American countries. He also asks you to suggest ways that France might help to reduce the danger of violence in the more volatile areas. You are very knowledgeable about this topic because you studied the political systems of South America when you were in graduate school. You have also traveled extensively in South America. However, you feel uncomfortable about finding a place in Paris society and feel especially uncomfortable with interacting with the President.

The French embassy is located in Maracaibo, a major seaport of Guayaquil. It has been reported that the guerrilla forces currently control much of the area around Maracaibo. Maracaibo is located on the western shore of a large enclosed bay, Lake Maracaibo, and is near a channel between the bay and the open sea. Maracaibo is about 330 miles by air from the capitol of Guayaquil, and the roads between it and the

capitol are poor. The guerrillas have set up observation posts on the road to the capitol and on the channel which connects Maracaibo to the ocean. Maracaibo is about 400 miles away from French Guiana, a possession of France, and is about 1100 miles from Florida.

France imports some oil from Guayaquil, but it is not their primary supplier. However, the government of Guayaquil is not particularly friendly to the French government. As a result, it is not very likely that the government of Guayaquil will intervene on behalf of the hostages.

As the representative for the French government, your goal in this situation is to get the hostages out of Maracaibo. You are concerned about the personal safety of the hostages, but you are more concerned about maintaining France's image with other nations of the world. After the crisis is resolved, it will be of primary importance to the French government that other nations believe they were always in control of the situation in Maracaibo. You want to maintain France's image as an influential nation in world politics, and the inability to deal with a hostage crisis might tarnish that reputation. Also, evidence of the French government's inability to deal with a hostage crisis might encourage other terrorists around the world to take French citizens hostage.

Also, your personal goals will influence your evaluation of the situation. You are ambitious, wanting to remain in the position of importance you have just attained. If you make a mistake in your evaluation of the crisis, the likelihood of your retaining the position of aide to the President will be greatly reduced.

Appendix D

Specified acts the French might take to resolve the crisis

1. The French could have a neutral nation negotiate with the guerrillas for the hostages' release.

2. The French could have the UN negotiate with the guerrillas for release of the hostages.

3. The French could impose economic sanctions on Guayaquil hoping that the government would pressure the guerrillas to release the hostages.

4. The French could declare war on Guayaquil.

5. The French could take hostages from among the guerrillas and offer to exchange hostages.

6. The French could tell the guerrillas that they will not give in to any demands.

7. The French could offer to give the guerrillas money in exchange for the hostages.

8. The French could sever all diplomatic relations with Guayaquil.

9. The French could try to smuggle guns to the hostages.

10. The French could offer to publicize the plight of the guerrillas in exchange for the hostages.

11. The French could stop importing oil from Guayaquil.

12. The French could threaten to bomb Maracaibo if the hostages are not released.

13. The French could offer the guerrillas guns in exchange for the hostages.

14. The French could refuse to publicize any of the guerrillas' press releases.

15. The French could send Navy ships to blockade Maracaibo's harbor.

16. The French could send spies to Maracaibo to infiltrate the guerrilla forces and rescue the hostages.

17. The French could send in troops to rescue the hostages.

18. The French could send spies to Maracaibo to infiltrate the guerrilla forces and create dissension among them.

19. The French could send a show of force to Guayaquil to frighten the guerrillas.

20. The French could give the guerrillas what they want.

Appendix E

Irrelevant Information about France

You have been able to locate in a history book the following information about France:

France is about a third larger than California and has more land than any other nation in Western Europe. However, France ranks fourth in population among the nations of Western Europe. France has Belgium, Luxemberg and West Germany on its northern border, Switzerland and Italy on its eastern border, and Monaco, Spain and Andorra on its Southern Border.

France has 4 climatic regions. It has hot summers and mild winters along the southern border next to the Mediterranean Sea. Mountainous regions in the southwest and southeast have cold winters with considerable snow. The central area is moist with seasonal variations. The west and northwest are cool with fairly heavy rainfall.

France is highly industrialized and is one of the world's leading producers of steel, bauxite, cement and electric power. However, about half its people live on farms or in rural villages.

Appendix F

Hierarchical tree of actions the French government is likely to take

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1. Military action
    - 1.1 Rescue attempt
    - 1.2 Military intervention against guerrillas
    - 1.3 Blockade
        - 1.3.1 To prevent Guayaquil from trading w/ other countries
        - 1.3.2 To prevent guerrillas from getting supplies
    - 1.4 Capture hostages then exchange
    - 1.5 Military action against Guayaquil

2. Put pressure on involved parties
    - 2.1 Against Guerrillas
        - 2.1.1 Diplomatic/political
        - 2.1.2 Economic
        - 2.1.3 Other
    - 2.2 Against Guayaquil government
        - 2.2.1 Diplomatic/political
        - 2.2.2 Economic
        - 2.2.3 Other
    - 2.3 Threats
        - 2.3.1 Guerrillas
        - 2.3.2 Guayaquil government
    - 2.4 Provide show of force

3. Negotiate
    - 3.1 Clarify guerrillas' demands
    - 3.2 With the guerrillas
        - 3.2.1 French could negotiate w/ the guerrillas
        - 3.2.2 Use intermediaries to negotiate

4. Work with the government of Guayaquil to free hostages
    - 4.1 Ask or convince govt of Guay to release hostages
    - 4.2 Ask govt of Guayaquil to handle the problem
    - 4.3 Negotiate w/ guerrillas w/ help of government of Guayaquil
    - 4.4 French and Guayaquil govt use force against the guerrillas

5. Refuse to cooperate
    - 5.1 Do Nothing
    - 5.2 Refuse to cooperate

6. Covert action against the guerrillas
    - 6.1 Double cross the guerrillas
    - 6.2 Use spies or undercover activity
    - 6.3 Plan escape attempt by hostages

7. Capitulate to guerrillas' demands
    - 7.1 French could help the guerrillas negotiate w/ the government

of Guayaquil
7.2 Use force to help the guerrillas
7.3 Give guerrillas something specific
7.4 General concessions

8. Ask other countries for help
8.1 With negotiation
8.2 Ask for military aid
8.3 Ask for economic/diplomatic aid
8.4 Ask for other types of aid

9. Other irrelevant acts