

# An Experimental Study of Alternative Preparation Aids for International Negotiations

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## **Abstract**

We test the relative effectiveness of alternative preparation aids in the context of an international negotiation. We consider three forms of training: reading material, a course on negotiation, and an expert system (*NEGOTEX*) expressly designed to train negotiators. We conducted a laboratory experiment involving 66 pairs of negotiators—one of each pair being American and the other Chinese. Results suggest that in this context, the course had the greatest effect on performance, followed by *NEGOTEX*, and then followed by reading material. In addition, we found that training effects were additive: multiple forms of training lead to better results than individual forms of training, suggesting that (1) training forms complement and do not substitute for one another, and (2) multiple forms of training should be considered, especially when stakes are high.

**Key words:** international negotiations, training aids, knowledge-based systems

## **1. Introduction**

Many conflicts could be more effectively reconciled if the negotiators were more skillful (Raiffa 1982). This perspective is particularly relevant in the context of international negotiations, which often involve different cultures, norms, and consequently, different negotiation strategies (Graham 1985; Gross 1988). Many individual-specific factors such as the personality of the negotiators, their interpersonal skills, and their prior knowledge and experience have been recognized to

The authors are listed alphabetically. They would like to acknowledge the assistance of Haw Jan Wu in designing and executing the experiment.

be influential in successful negotiations (Gilkey and Greenhalgh 1986; Fisher and Davis 1987). At the same time, many business negotiators also recognize that preparation and planning are important factors in successful negotiations (Karass 1970; Baldwin and Ford 1988; Bazerman and Neale 1982; Clopton 1986).

Graham (1985) points out that U.S. merchandise sales to other countries in 1984 totaled more than \$217 billion.<sup>1</sup> Negotiations represent a common mechanism by which these international trades are generated. The new developments in Western European markets as well as the recent political changes in Eastern Europe suggest that this figure will increase significantly over time. Hence, it is not surprising that more and more American firms focus resources on training their employees to become more effective negotiators. Formal approaches to preparing for negotiations vary from reading the tips and guidelines provided in popular press reports (e.g., Sellers 1988) and professional journals (e.g., Nyerges 1987; Byrnes 1987), to broader sets of principles oriented to the more practical reader (e.g., Fisher and Ury 1981; Kennedy 1985), to seminars, to texts describing formal theories (e.g., Young 1975; Roth 1979), and to computer-based training systems (e.g., Rangaswamy et al. 1989; Gauvin, Lilien, and Chatterjee 1990).

The main objective of this article is to evaluate how effective alternative aids are in helping negotiators prepare for international negotiations. In particular, we examine the impact of the following three training aids: general reading materials on negotiations, seminars and lectures on negotiations, and a computer decision support system called *NEGOTEX* (Rangaswamy et al. 1989) that is designed to aid negotiators prepare for an international business negotiation. We describe these training tools in more detail in the next section. In section 3, we discuss an experimental test of the various preparation aids. Section 4 presents the results of the experiment, and section 5 concludes the article with a discussion and provides directions for future research.

## **2. Preparation aids for negotiations**

### *2.1 Reading material*

The vast literature on negotiation may be classified according to whether a study is empirical or theoretical. Empirical studies may be further classified as being either anecdotal, survey-based or case-based, or experimental, while theoretical studies may be viewed as being outcome-oriented or process-oriented. Anecdotal material usually derives from experienced practitioners (e.g., Nierenberg 1973; Kennedy 1985) relating negotiation encounters in which they participated or from personal observations of negotiations (e.g., Douglas 1962). Anecdotal materials attempt to induce reasons for the success or failure of particular negotiation approaches, which are then presented in the form of general tips and guidelines in either print or video format. Case-based empirical evidence (e.g., Weiss 1987) and surveys (e.g., Tung 1988; Ghauri 1986) gathered by academics provide a second

source of general negotiations tips. These tips are often closely tied to the fundamental discipline of the academic [e.g., behavioral science as in Pruitt (1981) and Fisher and Ury (1981), or game theory as in Raiffa (1982)].

Experimental evidence obtained in laboratory settings represents another source of textual knowledge. One set of past studies has been concerned with the test of various game-theoretic models and theories in accurately predicting negotiation outcomes (e.g., Neslin and Greenhalgh 1983; Eliashberg et al. 1986; Shubik 1986). The main characteristics of this body of knowledge are: (1) high internal validity, (2) low external validity, (3) narrow scope of investigation, and (4) insufficient insights into the process of the negotiations.

Other experimental studies have focused on testing various behavioral theories (e.g., Rubin and Brown 1975; Chertkoff and Esser 1976; Neale and Bazerman 1985; Graham et al. 1988). Compared to the game theory-based experiments, these studies take a more descriptive approach to negotiations and tend not to be tied specifically to any formal model. The use of scenarios and role playing is quite common in these studies (e.g., Armstrong and Hutcherson 1989). As with other laboratory-based experimental evidence, the extent to which the findings are applicable to noncontrolled settings is limited.

Another stream of literature is purely theoretical in nature. The approach taken here is axiomatic, and various normative conclusions are derived deductively and stated as general propositions (e.g., Nash 1950; Kalai and Smorodinsky 1975; Myerson 1984). The focus is mainly on characterizing the nature of the *outcome* of the negotiation encounter, and it is typified by many studies done under the framework of game theory. Not much work focusing on the details of the *process* leading to the specific outcomes has been reported (Gale 1986).

The experimental and theoretical materials mentioned above can potentially offer insights on preparing for negotiations in general. However, because they often lack specificity, it is not clear how negotiators can apply these insights to the particular situation they face.

## 2.2 Courses and seminars

Another mode of preparation for negotiations in general, and international negotiations in particular, is through attending various courses and seminars. These can take different forms ranging from formal curriculum-based classes offered at universities as prerequisites for an academic degree (e.g., business and law schools), to lectures offered in executive education seminars conducted at academic institutes, to seminars offered by practitioner experts to the general public (e.g., Karass 1970; Hammer 1984), to in-house, company-tailored seminars. Often, such seminars involve role-playing and provide participants with an opportunity to put what they learn into practice. The interactive learning mode also provides opportunities to clarify issues and raise questions, and enables trainees to relate what they learn to their own specific negotiation needs. Although semi-

nar sponsors provide testimonials and claim considerable improvement in the negotiating skills of their participants, we have not been able to locate any systematic effectiveness studies conducted by independent researchers.

### *2.3 Computer-based preparation tools*

In recent years, computer-based training methods are finding increased use in many different fields. With the wide availability of personal computers in business settings, there is currently considerable interest in using computer-based Negotiation Support Systems (NSSs). Jelassi and Foroughi (1989) define NSS as:

Interactive, computer-based tools intended to support negotiating parties (and possibly a human mediator) in reaching an agreement. They enable the elimination of communication barriers among negotiating parties, provide techniques for structuring decision analysis and for the systematic direction of the patterns and timing of negotiations. Moreover, they provide communication technologies such as electronic messaging, local and wide-area networks, and teleconferencing, as well as computer technologies such as multi-user operating systems, public and private-access databases, and facilities for data management and analysis. (p. 168)

Clopton (1986) notes that as a training tool for negotiation, the personal computer (PC) offers the advantage of degree of focus and control relative to other interactive exercises, such as role-playing. The PC can involve the negotiator in a variety of realistic negotiation environments, can be programmed to provide feedback, and, if well designed, can heighten the user's interest and enthusiasm for negotiation training.

Some NSSs only support prenegotiation strategy formulation. Examples include DECISION MAKER (Fraser and Hipel 1981), NEGOTIATOR (Kersten 1985), RUNE (Kersten and Szapiro 1981), and PERSUADER (Sycara 1990). Other systems such as MEDIATOR (Jarke, Jelassi, and Shakun 1987), DECISION CONFERRING (Quinn, Rohrbough, and McGrath 1985), and ONDINE (Nyhart and Samarasan 1989) also allow for some limited form of actual interactive negotiations. Jelassi and Foroughi (1989) review these systems in terms of their underlying theories, advantages, and limitations.

Recent developments in the area of expert systems and artificial intelligence offer the potential for enhancing computer-based tools supporting negotiation preparation. Much of the actionable knowledge about what to do in various negotiation situations is generally in the form of qualitative insights that establish tentative links between various categorical, rather than continuous, variables. This is particularly true of international negotiations. To represent and deliver such knowledge in computer decision support systems, researchers have proposed the concepts of logic modeling and knowledge-based systems (Kimbrough and Lee 1988; Luconi, Malone, and Morton 1986).

The negotiation domain appears to be particularly well suited to the development of an expert system to aid negotiation team members to prepare for a negotiation. A manager requires expertise to combine and process many related facts and concepts in order to identify effective negotiation strategies. In an international negotiation context, there are many contextual, cultural, and self- and opponent-based factors to be considered in developing negotiation strategies. An expanding research literature attests to a systematic body of knowledge that identifies and describes various other factors and their influence on the process and outcomes of negotiations (Raiffa 1982). The *NEGOTEX* (*NEGOTiations EXpert*) is a computer system that embodies such knowledge from published conceptual and empirical studies.

*NEGOTEX* employs four concepts to formulate a managerially actionable framework: (1) context in which the negotiation takes place; (2) prior evaluations of self, other party, and the upcoming negotiation; (3) negotiation philosophy, style, and goals; and (4) recommended negotiating strategies. To ensure that the system is of a manageable size, *NEGOTEX* is restricted to making recommendations on only a few specified dimensions, such as how to prepare for a negotiation (e.g., whether to have an agenda, who should set the agenda, should minor issues be discussed before major issues, etc.), how to communicate effectively (e.g., summarize your position at the outset, do not put down your competition directly, use quantitative data, use visual evidence, etc.), and the composition of the negotiation team (e.g., include a bilingual team member, send your key decision maker, use lawyers and consultants, etc.). For a more detailed description of the contents of the system, see Appendix 1 and Rangaswamy and associates (1989).

#### *2.4 Focus*

How do we expect these various preparation mechanisms to fare in preparing an individual for a negotiation? We expect the results to be mixed. The traditional, textual approach is easy to use but may be difficult to absorb, integrate, and apply to a specific problem area. Thus, a cursory reading of textual material may provide the reader simply with negotiation hints at the expense of a deeper understanding of the complete negotiation process. Courses provide an integration of diverse perspectives and encourage more active involvement in learning; therefore, courses should be expected to aid preparation better than just reading material. However, the efficacy of a course in influencing a negotiation depends on the ability of negotiators both to recall what they learned and to apply general theory and principles to specific situations. Computer-based tools are likely to engage the user more actively and provide a combination of nonjudgmental training and feedback. But, as with the other training procedures, it is not clear a priori how the experience with the computer will translate into a measure of performance.

The primary objective of this article is to evaluate these alternative negotiation preparation aids. A secondary objective is to obtain an initial assessment of the

applied value of the *NEGOTEX* expert system. We have not encountered prior studies that have been able to measure the relative effectiveness of alternative preparation aids for the same problem. There have, however, been some attempts to obtain "value-in-use" of decision support systems by comparing the performance of those provided access to the system with a control group that does not have access to the system (Sharda, Barr, and McDonnell 1988).

### 3. Experiment

In order to evaluate alternative training methods, we must (1) remove as much environmental noise as possible and (2) provide a relevant context for the test. Consideration (1) follows from our belief that training effects will be more difficult to measure as the situation under study becomes ill-defined, and consideration (2) ensures that any causal link ascertained from the study (e.g., training leads to improved performance) has reasonable external validity. As the focus of our study we chose a laboratory experiment with a relatively simple two-party, one-time, two-issue negotiation task with incomplete information.

#### 3.1 *Experimental setup*

We used a two-factor design with a control group. The negotiation task involved a Chinese manufacturer selling computers to an American distributor. Subjects were students at a large Eastern university. They were instructed to negotiate an agreement for a one-year contract that would specify the quantity of computers sold to the American distributor and their unit price. Subjects were given the case material and the pre-negotiation questionnaire one week prior to the negotiation session. Each party had complete information regarding his/her own production or distribution costs and a range of possible values regarding the other party's costs. Negotiators were free to take as much time as they felt was required to reach a satisfactory agreement. Subjects returned a contract sheet to report the terms of their agreement, and filled out a second questionnaire that measured their perception of the negotiations. The contract form was used to compute the profits to each party.

**3.1.1 Task.** The Chinese negotiator represented a computer manufacturer. He knew his cost was \$310 per unit for the first 1,500 units, and \$290 per unit for the remainder. The American negotiator represented a hardware distributor. He was given a brief table representing a demand function ( $8,000 - 10 \cdot \text{resale price}$ ) and was informed that marketing costs amounted to \$150 per unit. Both parties were unaware of their counterpart's payoff function, but were told to expect a price settlement in the \$350 to \$600 range.<sup>2</sup>

**3.1.2 Measurement.** Prior to their negotiation task, the instructor asked subjects to complete a questionnaire in which, among other information, they indicated how much time they had spent preparing for the negotiation (see Appendix 2 for a description of the items). On the day of the experiment, the American subjects were randomly assigned to a counterpart, and were given a contract form to be signed by both parties and a post-negotiation questionnaire. A similar questionnaire was also given to the Chinese negotiators. In this questionnaire, subjects indicated the amount of time they spent negotiating, and their satisfaction with respect to the atmosphere and the outcome of the negotiation.

### 3.2 Subjects and treatments

We paired a total of 132 graduate students to form 66 negotiation dyads.<sup>3</sup> In each dyad we matched a Chinese student with an American counterpart, with American students randomly assigned to either (1) the control group (no training material), (2) the *TEXT* (reading material only), or (3) the *TNEGOTEX* group (reading material plus *NEGOTEX*). In each of these groups, subjects can be further divided into those who had a negotiation course and those who did not. We recruited subjects through advertisements and paid them for their participation. We also provided cash incentives for above average performances. Cell sizes are reported in Table 1.

We manipulated two training mechanisms: (1) prior exposure to reading material (*TEXT*) and (2) prior exposure to an expert system (*NEGOTEX*). Subjects in the *TEXT* treatment were given an 11-page article published in the *International Marketing Review* (Ghuri 1986) providing general guidelines on international negotiations. The article offers advice to improve preparation and the negotiation process itself. It addresses both integrative (e.g., put yourself in the other party's shoes) and distributive dimensions of negotiation (e.g., build power by setting the agenda).

Subjects in the *TNEGOTEX* condition participated in a training session with an instructor familiar with *NEGOTEX*, described in Appendix 1. We did not use a *NEGOTEX*-only group since our pre-test data showed no interaction between *TEXT* and *NEGOTEX*. Assuming a strict additive effect allowed us to allocate our subjects across three groups (control, *TEXT*, *TEXT* plus *NEGOTEX*—*TNEGOTEX*) instead of four. This sample design is statistically more efficient, an important consideration given the limited availability of students from China.<sup>4</sup> Note that *NEGOTEX* is specifically designed to train Americans in the cultural aspects of negotiation that they will find critical when dealing with Chinese. Thus, to enhance the validity of its role-playing aspects, our experiment required actual Chinese subjects, not surrogates, thus limiting the size of our sample.

In addition to these manipulations, we controlled for exposure to a graduate course on negotiation (*COURSE*). Twenty of the 66 American subjects had taken a one-semester graduate course on negotiation at the same university where they

Table 1. Descriptive statistics: Treatment means and standard deviations in ( )'s.

	Control		Text		TNEGOTEX (Text + NEGOTEX)		Total
	No course	Course	No course	Course	No course	Course	
Price	426	431	377	402	421	393	409
(\$/Unit)	(71)	(54)	(121)	(21)	(81)	(15)	(77)
Quantity	1,856	1,650	1,708	1,422	1,672	1,583	1,684
(Units)	(450)	(238)	(865)	(303)	(463)	(362)	(524)
USPROFIT	49,469	76,000	49,292	145,076	72,909	148,252	80,354
(\$)	(161,152)	(131,337)	(137,166)	(28,860)	(204,643)	(28,159)	(147,772)
TOTPROFIT	275,253	287,500	228,750	274,222	274,329	279,451	267,517
(\$)	(33,407)	(2,887)	(107,621)	(19,917)	(19,052)	(17,492)	(52,930)
PREPTIME	4.33	6.00	3.33	5.89	4.13	5.86	4.59
(Hours)	(1.88)	(2.00)	(2.39)	(2.42)	(2.72)	(1.57)	(2.36)
NEGOTIME	2.39	4.25	2.17	2.56	2.73	4.14	2.75
(Hours)	(1.09)	(1.50)	(1.64)	(1.59)	(1.87)	(0.90)	(1.58)
PATMOS	4.50	4.50	3.33	4.56	3.80	3.86	4.06
(1-5 scale)	(1.20)	(1.00)	(2.15)	(0.53)	(2.01)	(1.35)	(1.59)
POUTCOME	4.11	4.00	2.83	3.78	3.13	3.43	3.52
(1-5 scale)	(1.32)	(1.41)	(2.04)	(0.83)	(2.00)	(0.53)	(1.58)
Sample size	18	4	12	9	15	7	65



were recruited. The course emphasized a game-theoretic analysis of the negotiation situations coupled with exercises. None of the Chinese students had taken the course.

### 3.3 Dependent variables

Training may affect several dimensions of negotiation performance. We distinguished between objective versus subjective and process versus outcome, and used six corresponding performance measures (Figure 1). The two objective performance measures included the amount of profits earned by the American negotiator (*USPROFIT*), and by the Sino-American dyad (*TOTPROFIT*). We view the entire negotiation as consisting of two processes: (1) preparing for the negotiations and (2) participating in the actual negotiations. Accordingly, two objective measures captured these dimensions: the amount of time spent preparing for the negotiation (*PREPTIME*) and the amount of time spent reaching a negotiated agreement (*NEGOTIME*). For subjective process performance, we measured the subjects' satisfaction with the general atmosphere (*PATMOS*), and their satisfaction with the outcome of the negotiation (*POUTCOME*). The objective outcome variables were computed directly from experimental material. *USPROFIT* and *TOTPROFIT* were computed from contract data; *PREPTIME* and *NEGOTIME* were reported by the subjects in pre- and post-negotiation questionnaires;

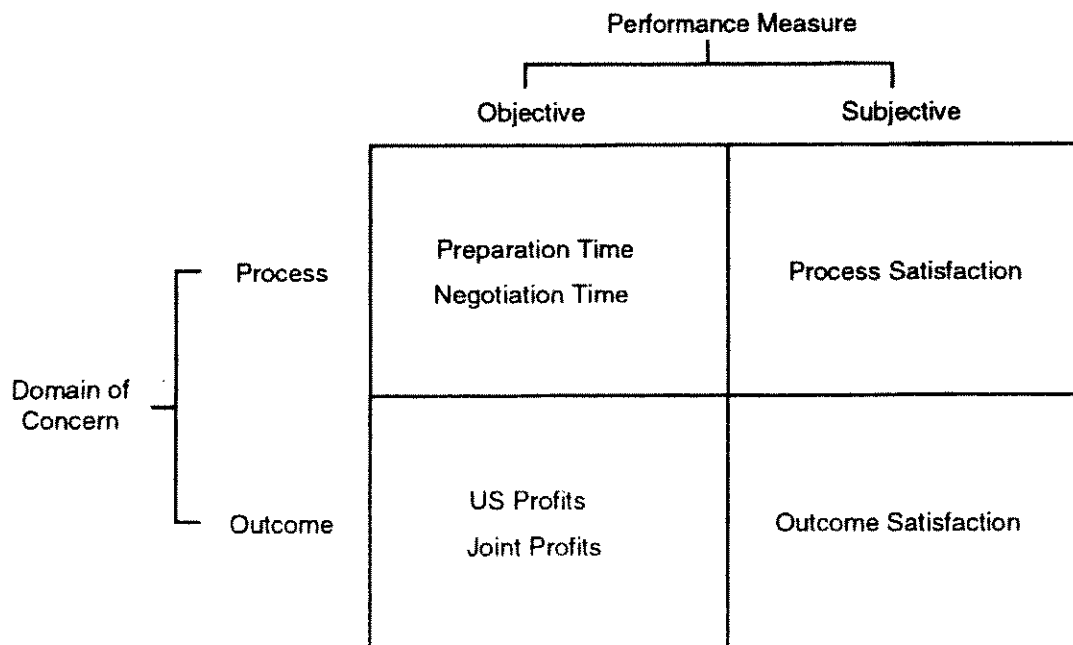


Figure 1. Typology of selected measures of negotiation performance.

*PATMOS* and *POUTCOME* were measured via semantic differential scales in the post-negotiation questionnaire.

### 3.4 Statistical model and hypotheses

For the purposes of hypothesis testing, we cast our framework in the following statistical model:

$$PERFORMANCE = \alpha + \beta_1 COURSE + \beta_2 NEGOTEX + \beta_3 TEXT + e.$$

There is considerable evidence that training has a positive impact on the performance levels achieved by novices in a wide variety of task settings. Here we are concerned with the relative magnitude of these effects, rather than their mere existence. In his review of training research, Wexley (1984) “. . . call[s] for more research which quantitatively integrates findings across studies to produce stable and accurate of effect sizes . . . for various training interventions” (p. 540). Even though little research has been published in the area of sales and negotiations training (see Bazerman and Neale 1982; Bognanno and Dworkin 1978; Clopton 1986; Gauvin, Lilien, and Chatterjee 1990; L’Herisson 1981), it is reasonable to expect that trained negotiators will outperform novices. This leads to:

H1: Training has a positive impact on performance.

We test this first hypothesis by a restriction of the form:

$$H1: \beta_1 + \beta_2 + \beta_3 = 0,$$

on our statistical model. To understand this, note that H1 states that training, irrespective of its specific implementation, has no impact on performance. Since our model distinguishes between various forms of training, we must perform a test on their joint effect. This test is equivalent to one in which we would separate our sample in two groups (control versus trained) and compare their mean performance levels. We report the Wald statistic and its significance level (see details in Judge et al. 1985, ch. 5).

As we have already indicated, we do not have strong priors regarding the relative effect of alternative training modes. Previous research comparing the effectiveness of computer-based instruction with conventional training methods has concluded that they are equally effective (Dossett and Hulvershorn 1983). Computer-based systems offer the benefit of customized instruction, and their interactive teaching mode accelerates knowledge transfer (Johnson, Graham, and Carson 1982). On the other hand, graduate negotiation courses offer a comprehensive coverage of important negotiation issues and reinforce central negotiation concepts, which are significant factors affecting performance (e.g., Schendel and

Hagman 1982). In addition, many courses also incorporate role-playing exercises to reinforce the application of theoretical ideas. Given the complexity of negotiation tasks, we hypothesize that:

H2: Prior exposure to *COURSE* is a more effective training method than prior exposure to *NEGOTEX*, and each of them is more effective than *TEXT*.

We test H2 with the following restrictions:

H2.1:  $\beta_1 > \beta_2$   
 H2.2:  $\beta_2 > \beta_3$   
 H2.3:  $\beta_1 > \beta_3$ ,

for which we report the appropriate t-statistics.

#### 4. Results

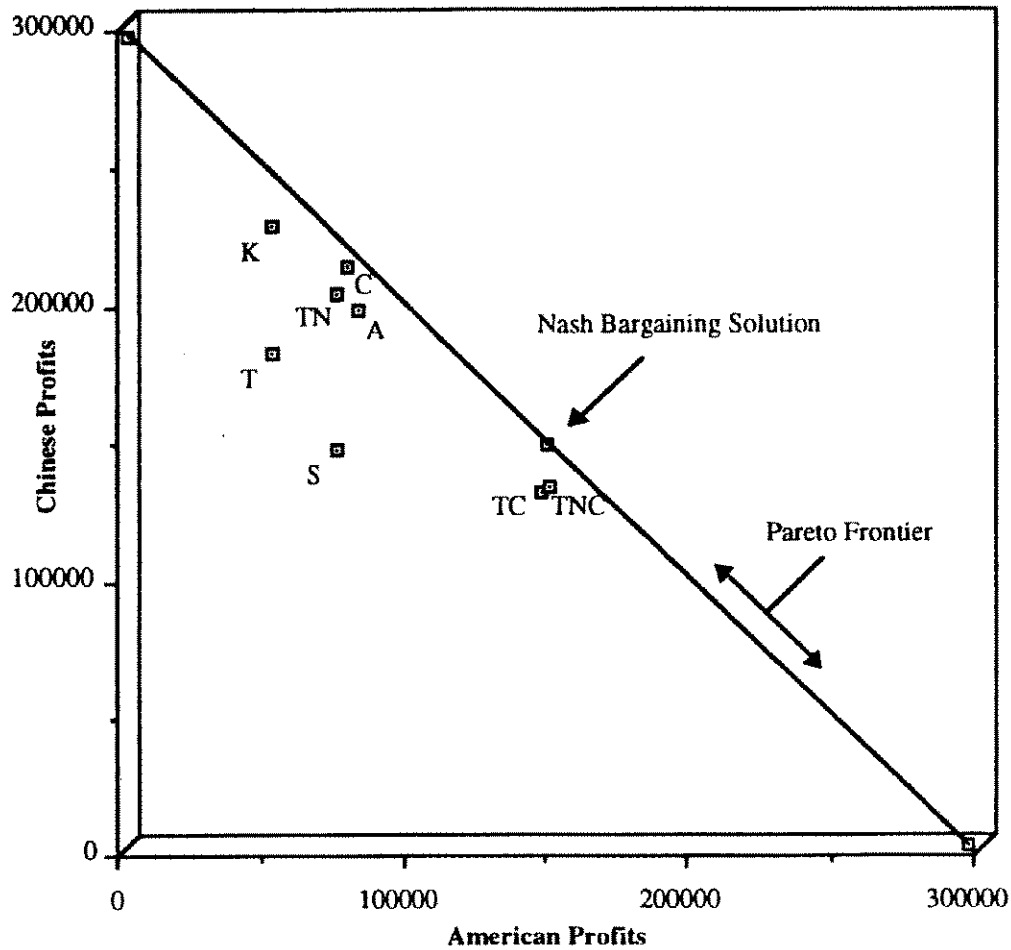
Table 1 presents mean values for our measures, broken down by treatment. A quick glance at Table 1 reveals that untrained American negotiators (control without course: \$49,469) earn less than a third of the profits of fully trained negotiators (*TEXT* + *COURSE* + *NEGOTEX*: \$148,252). Average profits obtained in each treatment are presented in Figure 2.

Table 2 presents the estimated coefficients from weighted least-squares (WLS) regressions.<sup>5</sup> This table presents four tests in addition to overall measures of significance and fit: a Wald's  $\chi^2$  test of overall significance of training effects (*TEXT* + *NEGOTEX* + *COURSE* = 0), and three t-statistics testing for differences in the relative magnitude of those effects (*TEXT* = *NEGOTEX*, *TEXT* = *COURSE*, *COURSE* = *NEGOTEX*).

##### 4.1 H1: Impact of training on selected performance indicators

Training has a significant impact on three of the six performance measures: a positive impact on the amount of profits realized by American subjects (*USPROFITS*  $\chi^2 = 3.42$ ), and on both preparation time (*PREPTIME*: Wald  $\chi^2 = 11.00$ ) and negotiation time (*NEGOTIME*:  $\chi^2 = 7.49$ ). However, we found no significant impact of training on joint profits (*TOTPROFIT*:  $\chi^2 = 0.14$ ), satisfaction with respect to the atmosphere of the negotiation (*PATMOS*:  $\chi^2 = 1.31$ ), or satisfaction regarding the outcome of the negotiation (*POUTCOME*:  $\chi^2 = 1.10$ ).

Statistics of overall fit are low for all performance measures. We can note, however, that the impact of training is greater when we consider measures of negotiation process as opposed to measures of negotiation outcomes. The  $R^2$  for



- A: Average across all conditions
- S: "Stackelberg" solution
- K: Control condition
- C: *COURSE* only
- T: *TEXT* only
- TN: *TEXT* and *NEGOTEX* (*TNEGOTEX*)
- TC: *TEXT* and *COURSE*
- TNC: *TEXT*, *NEGOTEX*, and *COURSE*

Figure 2. Mean profits for all training conditions.

both process measures (*PREPTIME*, *NEGOTIME*) reaches .15, compared to .06 for the *USPROFIT* measure.

Even though the fit of the *USPROFIT* model is low, the actual difference in expected profits is considerable. According to our regression estimates, untrained subjects should expect to earn \$41,348 on average; in contrast, trained subjects

Table 2. Weighted least-squares regression analysis.

Dependent variables	Actual performance				Perceived performance	
	USPROFIT	TOTPROFIT	PREPTIME	NEGOTIME	PATMOS	POUTCOME
Intercept <sup>2</sup>	41,348 (33,230)	273,366*** (11,250)	4.27*** (0.40)	2.52*** (0.25)	4.41*** (0.26)	4.01*** (0.28)
COURSE	71,201** (29,900)	22,624* (12,660)	2.03*** (0.56)	1.12*** (0.39)	0.50 (0.38)	0.45 (0.36)
NEGOTEX	14,400 (40,640)	30,218 (19,060)	0.48 (0.70)	0.97** (0.47)	0.02 (0.53)	0.04 (0.49)
TEXT	18,480 (40,880)	-34,824* (16,060)	-0.71 (0.65)	-0.67 (0.44)	-0.77 (0.48)	-0.96* (0.48)
R <sup>2</sup>	0.06	0.10*	0.15**	0.15*	0.06	0.08
F	1.40	2.32	3.72	3.66	1.29	1.85
Breusch-Pagan	12.43***	57.07***	2.38	3.17	10.55**	9.03**
H1: Wald $\chi^2$	3.42*	.1427	11.00***	7.49***	1.31	1.10
H2.1: COURSE > NEGOTEX†	1.13	-0.35	1.74*	0.25	0.74	0.67
H2.2: NEGOTEX > TEXT	-0.07	2.35***	1.25	2.54***	1.10	1.46
H2.3 COURSE > TEXT	1.04	2.39***	3.20***	3.05***	2.07**	2.35***

Note: Standard errors are in parentheses.

\*\*\*Indicates significance at .01 or less; \*\*at .05 or less; \*at .1 or less.

†t statistics for differences in coefficients

exposed to reading material (*TEXT*), plus the expert system (*NEGOTEX*), plus a course on negotiation (*COURSE*) should earn an average of \$145,429. The fact that this large difference is barely significant is due to the large variance in pay-offs, reflecting the idiosyncratic nature of each dyad in the negotiations.

#### 4.2 H2: Effectiveness of alternative training methods

The net impact of alternative training methods is modeled with a weighted least-squares regression (see Table 2). Results show that *COURSE* has the most consistent impact on negotiators' actual performance. Subjects exposed to a course on negotiation devote significantly more time preparing for the negotiation (*PREPTIME*:  $t$ -statistic = 3.62) and reaching an agreement (*NEGOTIME*:  $t$  = 2.87). They negotiate agreements that yield significantly higher profits to the dyad (*TOTPROFIT*:  $t$  = 1.78) and to themselves (*USPROFIT*:  $t$  = 2.38). However, this form of training has virtually no impact on the subjects' satisfaction relative to either the outcome or the negotiation process.

*NEGOTEX* significantly increases the amount of time required to reach an agreement (*NEGOTIME*:  $t$  = 2.07). Subjects exposed to *NEGOTEX* tend to negotiate agreements yielding higher joint profits, albeit the relationship is not statistically significant (*TOTPROFIT*:  $t$  = 1.58), and there is virtually no increase in individual profits (*USPROFIT*:  $t$  = .35). Similar to *COURSE*, *NEGOTEX* has no impact on subjects' satisfaction with the negotiation process and outcome.

Finally, *TEXT* has a statistically significant negative impact on joint profits (*TOTPROFIT*:  $t$  = 2.17) and on a subject's satisfaction relative to the negotiation's outcome (*POUTCOME*:  $t$  = 2), but no impact on a subject's profits, negotiation process, or satisfaction with the negotiation's atmosphere.

From Table 2 we can see that untrained American negotiators appropriated close to 15 percent of the joint profits to themselves: the expected profits of untrained American negotiators stood at \$41,348, while expected joint profits stood at \$273,366. Adding the intercept to the appropriate coefficient presented in Table 2 (i.e.,  $\$55,748 = \$41,348 + \$14,400$ ), we note that this compares to 18 percent for *NEGOTEX* ( $\$55,748 / \$303,584$ ), 25 percent for *TEXT* ( $\$59,828 / \$239,082$ ), and 38 percent for *COURSE* ( $\$112,549 / \$295,990$ ). It is not clear what fraction of this shift can be attributed to the training method itself, and what fraction should be attributed to the specific training material we used. This issue deserves additional research.

Pairwise comparisons between training methods indicate that *COURSE* significantly outperforms *TEXT* on all dimensions except the subject's own profits, and that subjects exposed to *NEGOTEX* spent significantly less time in preparing for the negotiation than those exposed to *COURSE*. Sixteen out of the 18 results are in the hypothesized direction, and eight are statistically significant. Table 3 summarizes the statistical results.

Table 3. Summary of results.

Performance Indicator	H1: Overall Effect <sup>1</sup>	H2: Pairwise Comparisons <sup>2</sup>		
		Course > Negotex	Negotex > Text	Course > Text
USPROFIT	Supported	Not supported*	Not supported**	Not supported*
TOTPROFIT	Not supported	Not supported**	Supported	Supported
PREPTIME	Supported	Supported	Not supported*	Supported
NEGOTIME	Supported	Not supported*	Supported	Supported
PATMOS	Not supported	Not supported*	Not supported*	Supported
POUTCOME	Not supported	Not supported*	Not supported*	Supported

<sup>1</sup>Based on the significance of Wald's  $\chi^2$  presented in Table 2.

<sup>2</sup>Based on the significance the t-statistics presented in Table 2.

\*Direction agrees with hypothesis but is not significant.

\*\*Direction disagrees with hypothesis but is not significant.

## 5. Discussion

Our results have a number of limitations. First, as with every laboratory study, they are specific to the subjects and the experimental task. While we used actual Chinese students in the study, they were, indeed, role playing, and so the external validity of the results can be questioned. In addition, the large variance in agreements suggests that statistical significance could have been improved with a larger sample size. Unfortunately, the limited availability of a Chinese population at the experimental site precluded our obtaining a much larger sample, leading some of our results to be suggestive rather than (statistically) definitive.

Despite these limitations, our results suggest that: (1) the value of training programs depends on which performance criteria are used to assess training effectiveness, such as joint profits, share of these profits going to the trainees, or measures of perceived effectiveness; and (2) training has a definite impact on the negotiation process, with different forms of training affecting the negotiation process in different ways.

### 5.1 Individual versus joint performance

Training systems can improve an individual's performance by improving Pareto efficiency—the ability to discover joint gains through the process of negotiation—by focusing on the integrative aspect of the negotiation. It can also improve the negotiator's ability to appropriate a large fraction of these gains to himself by focusing on the distributive aspect of the negotiation. Although not statistically significant, *NEGOTEX* directionally increased the profits of American negotiators by modestly increasing joint gains (an increase of 11 percent over untrained subjects' joint gains<sup>6</sup>) and their share (18.3 percent versus 14.6 percent for untrained). In contrast, subjects exposed to *TEXT* increased their individual profits despite seeing lower joint profits (a decrease of 13 percent in joint profits more than compensated for by an increase of 25 percent in profit share).

The negative effect of *TEXT* on joint profits may be a result of a combination of factors, including the brevity of preparation, the specific task, and, perhaps, the specific textual material. In retrospect, the textual material did seem to encourage strategies that might lead to higher individual profits at the expense of joint gains.<sup>7</sup> These results are consistent with experimental results we and others have observed previously (Gauvin, Lilien, and Chatterjee 1990; Bazerman and Neale 1982), where a brief introduction to bargaining principles is enough to modify expectations, preparation, or negotiation strategies focusing on individual gains.

A key issue in designing negotiation systems appears to be the systems' relative emphasis on distributive versus integrative dimensions. Improving along the distributive dimension requires emphasis on appropriation tactics: establishing a power base, or opening negotiations with a sufficiently high (or low) bid, a rela-



tively slow concession rate, etc. The focus of distributive bargaining is on competitiveness. On the other hand, an integrative approach calls for a focus on cooperation: building trust, exchanging information in order to be able to take advantage of trade opportunities, etc.

Broader training tools such as *COURSE* and *NEGOTEX* appear to promote more integrative bargaining relative to the particular *TEXT* used in this study. Perhaps *COURSE* and *NEGOTEX* make subjects think explicitly about the interests of the other party, while *TEXT* does this to a lesser extent. Thus, even in the simple scenario used in this study where opportunities for integrative bargaining are limited (two issues with fairly clear payoff structures), broader training methods appear to enhance individual performance by improving joint performance.

This issue needs more careful study. To address this, future research must manipulate both the complexity of the negotiation problem and its information structure. Situations of complete information leave little room for distributive gains: when both parties know their counterpart's payoffs, the pressure exerted by "fair" focal points such as 50-50 splits precludes most of the benefit of appropriation tactics. Indeed, appropriation tactics can even lead to a reduction of individual profits if they stall the negotiation process and provoke a reduction in joint profits that offset any gains in profit share. In situations of incomplete information, however, the expected benefit of appropriation strategies should increase.

Similarly, the potential for increasing joint profits should be a function of the degree of complexity of the task. In situations involving a single attribute (such as a transfer price), efficient contracts that maximize joint profits are relatively easy to reach. The potential value of training to improve joint profits should increase with the number of attributes, the number of parties involved, the length of the planning horizon, etc.

Overall, it appears that simple tasks of complete information are both unrealistic and can expect to see little gain from training, while complex tasks of incomplete information present opportunities for teaching both distributive and integrative bargaining strategies. This is offered as a conjecture and not as a definitive result of our study.

### *5.2 The impact of training on the negotiation process*

While *NEGOTEX* and *COURSE* are found in our experiment to be statistically equivalent in terms of their impact on actual performance, there are indications that they differ in how they affect these changes: even though exposure to both *COURSE* and *NEGOTEX* results in more time-consuming negotiations, subjects exposed to *NEGOTEX* spent significantly less time preparing than those exposed to *COURSE*.

This result is consistent with some previous empirical findings: computer-based training is as effective as conventional training and less time consuming (e.g., Dossett and Hulvershorn 1983). Subjects exposed to *NEGOTEX* were systemat-

ically guided through issues relevant to the kind of task they were about to confront. In contrast, subjects with exposure to a course on negotiation had to rely on their general knowledge of that domain to prepare adequately. Expert systems *prepare* negotiators for a negotiation task; courses on negotiation *help negotiators prepare themselves* for a negotiation task. Computer-based training systems are a high-fixed/low-variable cost alternative that should be considered in organizations with important and well-defined training needs.

A related issue concerns the interaction that may exist between computer-based and conventional training systems. When stakes are high, negotiators could conceivably benefit from exposure to both forms of training: basic conventional training might be supplemented with an array of computer-based systems dedicated to specific classes of negotiation problems. Table 4 presents the results of WLS regressions testing the possible presence of significant interactions between *COURSE* and *NEGOTEX* for individual profits, joint profits, preparation time, and negotiation time. Our experimental data suggest that training effects are additive: in all cases the interaction term between *NEGOTEX* and *COURSE* is not statistically different from zero.

The fact that training methods have additive effects has two important implications for the design of computer-based training systems. First, since computerized training does not require prior course training, expert systems can be considered as a fully operational training paradigm. Second, since training effects are additive, trainees exposed to multiple forms of training should outperform subjects trained solely by computer-based programs or by conventional programs. Thus the choice of a training program can focus on the economics of providing training. When stakes are low, the volume of training needs will determine

Table 4. Tests for interaction effects on actual performance

	USPROFIT	TOTPROFIT	PREPTIME	NEGOTIME
Intercept <sup>1</sup>	41,775 (33,790)	271,562 (7,697)	4.23 (0.41)	2.55 (0.25)
TEXT	19,059 (41,820)	-37,274* (22,420)	-0.75 (0.66)	-0.63 (0.45)
NEGOTEX	12,075 (61,240)	40,041 (25,370)	0.65 (0.90)	0.81 (0.62)
COURSE	68,852* (36,370)	32,551* (19,180)	2.21*** (0.73)	0.96* (0.52)
NEGOTEX * COURSE (Interaction term)	6,491 (63,450)	-27,043 (20,690)	-0.49 (1.14)	0.45 (0.77)
R <sup>2</sup>	0.06	0.11	0.16**	0.16**
F	1.03	1.87	2.79	2.78
Breusch-Pagan	14.66***	68.67***	3.91	5.79

\*\*\*Indicates significance at .01 or less; \*\*at .05 or less; \*at .1 or less.

whether the program should emphasize courses (wide variety of different negotiation tasks) or expert systems (high volume of similar tasks). As stakes increase, training systems should integrate both forms of training.

## 6. Summary

Overall, the results suggest that training can improve the performance of Americans participating in negotiations with Chinese counterparts, and that training methods differ in the nature of their effect. Based on this study, we conclude that good training methods should include knowledge of both "what are useful negotiation strategies" (descriptive knowledge such as those found in much textual material) and "when to apply these strategies" (strategic knowledge such as those embedded in *NEGOTEX* and which should be part of a negotiation course). The superior performance of *COURSE* and *NEGOTEX* over *TEXT* indicates that training approaches that only emphasize the former type of descriptive knowledge fall short of training methods that provide both descriptive and strategic knowledge.

The *TEXT* (no course) condition was associated with the least preparation time as well. This result suggests that individuals who only read about negotiations may come away with superficial negotiation hints and not incentives for more thorough preparation (and consideration of joint gains) that other preparation mechanisms seem to provide.

*COURSE* was the only training mechanism with a consistently significant effect on actual performance measures (process and outcome). However, *COURSE* and *NEGOTEX* show a statistically equivalent impact on the actual negotiations' outcomes, even though they differ in their impact on the negotiation process: negotiators who received conventional training (a course on negotiation) tend to need more preparation time than negotiators trained with an expert system. Effective training methods can either emphasize preparation for a specific task (such as *NEGOTEX*, which prepares for negotiations involving foreigners) or provide trainees with enough background material to help them prepare for their task (such as a negotiation *COURSE*). The choice of the appropriate training tool will depend on the volume and the variance in negotiation situations that the trainees will be facing.

Future research should assess the relative impact of the training focus (distributive versus integrative) versus the relative impact of the training method (computer-based or conventional) as a function of the negotiation problem. Based on this study we suggest that such research should also manipulate four task-specific factors: (1) the level of complexity of the negotiation problem, (2) the availability of information regarding the performance of the other party, (3) the stakes involved in the negotiation, and (4) the amount of training available to potential trainees.

## Notes

1. According to the U.S. Census Bureau, total U.S. trade (import + export) exceeded \$730 billion in 1989.
2. This task requires integrative as well as distributive analyses on the part of the participants. Consider the following cases:

	$T$	$P^* T$	$Q^* T$	$CHPROFIT$	$USPROFIT$	$TOTPROFIT$
Case 1	\$480	\$715	850	\$144,500	\$72,250	\$216,750
Case 2	\$500	\$725	750	\$142,500	\$56,250	\$198,750

where:  $T$  is the (negotiated) transfer price,  
 $P^*$  is the (American) profit-maximizing resale price, given  $T$ ,  
 $Q^*$  is the associated (negotiated) quantity,  
 $CHPROFIT$ ,  $USPROFIT$  are the associated Chinese and American profits, and  
 $TOTPROFIT$  is the joint profit.

- If both parties analyze the situation properly, they should find that case 1 dominates case 2.
3. We retained 65 dyads in our analysis: we removed one extreme dyadic outlier in which the American negotiator had agreed to lose \$1.5M.
  4. Pre-test results also indicated a strong *COURSE* main effect. This led us to allocate more American students with *COURSE* to the *TEXT* and *TNEGOTEX* treatments.
  5. Breusch-Pagan tests for heteroskedasticity (see Judge et al. 1985, ch. 11) indicated that ordinary least squares would be an inefficient estimator in four of the six equations.
  6. From Table 2, we see that *NEGOTEX* increased the level of joint profits by \$30,218 on average, over the joint profits of untrained subjects, which averaged \$273,366.
  7. The textual material (Ghauri 1986) is a well-written and fairly balanced introduction to the principles of international negotiations. It specifically refers to the need for cooperation, albeit in a binary fashion: "... excessive conflict . . . can entail no agreement" (p. 73). There is an emphasis, however, on the role that relative power plays in the outcome of a negotiation. For instance, the section on face-to-face negotiations begins with this observation: "The negotiation process is now controlled by the party who arranges the agenda, since he can accentuate his own strong points and the other party's weaknesses" (p. 76).

### Appendix 1: Description of *NEGOTEX*

Knowledge-based systems (or expert systems) are computer programs that can deliver specialized knowledge effectively at the point of decision making. In recent years, there has been considerable interest in the development and deployment of such systems in business applications (Silverman 1987). This has led to several successful experimental systems which have been implemented and fielded (Feigenbaum, McConduck, and Nii 1988). As a decision support tool, a knowledge-based system is particularly useful when the problem domain is "semi-structured" and problem-solving is based on logical relationships between the variables rather than on computational or algorithmic relationships.

The actual relationships between the various variables of interest in international negotiations are coded into over 350 rules in *NEGOTEX*. The system uses this framework to generate a list of recommended negotiating strategies based on the subjective assessments of the contextual factors and prior evaluations provided by the user. The system starts a consultation by asking a few preliminary questions such as the names of the two parties, their titles, sex, nationalities, the object of the negotiation, and authority level of the parties. It then uses the set of rules in its knowledge base in a primarily goal-driven (i.e., backward chaining) fashion to search from alternative negotiation strategies, to the underlying negotiation philosophy, style, and goals, to contextual factors and prior evaluations to be asked of the user. Thus, the system maps the user inputs depicting some specific negotiation scenario to the recommended strategies both directly, and by inferring indirectly, the appropriate levels of the intermediary concepts of negotiation philosophy, style, and goals.

Unlike expert systems developed in other areas, which have typically relied on a single source—namely, the domain expert—*NEGOTEX* uses a range of knowledge sources that includes academic and practitioner publications. When experts are likely to disagree on the knowledge elements, or when each expert might have expertise only along a few dimensions, it is important to consider multiple sources in order to identify the core knowledge in a domain. The rules in *NEGOTEX* may be characterized in terms of the negotiation domain to which they apply. Some rules apply to all negotiations. Other rules apply depending on the nationalities of the parties to the negotiation. Currently, the country-specific rules in the system apply primarily to American, Japanese, and Chinese negotiators. The system is being updated to include knowledge about negotiating practices in other countries such as West Germany, France, and the Soviet Union.

The version of *NEGOTEX* used in this study supports four types of explanatory features that enhance its ability to impart negotiation knowledge at a level beyond the immediate negotiation for which it is used. The explanatory features are: (1) clarifying questions asked by the system (with a WHAT feature), (2) providing a context for its questions (with a WHY feature), (3) explaining the reasoning behind a recommendation (with a HOW feature), and (4) allowing the user to examine the impact of changes in his/her inputs (with a WHATIF feature). In con-

trast to commercially available computer-based preparation aids such as the "Art of Negotiating" (Experiences in Software, Inc.), "Negotiator Pro" (Brown Expert Systems, Inc.), and "Negotiating Edge" (Human Edge Software Corp.), *NEGO-TEX* justifies its recommendations by indicating its line of reasoning and by providing appropriate citations.

## Appendix 2: Selected Questionnaire Items

Item	Question
<i>PREPTIME</i>	<p>About how much time did you spend preparing for the negotiation, including reading, strategy formulation, calculation, etc.?</p> <p>___ (1) Less than 15 minutes            ___ (2) Between 15 to 30 minutes            ___ (3) Between 30 to 45 minutes            ___ (4) Between 45 to 60 minutes            ___ (5) Between 60 to 75 minutes            ___ (6) Between 75 to 90 minutes            ___ (7) More than 90 minutes</p>
<i>NEGOTIME</i>	<p>About how much time did you spend in negotiating with the Chinese negotiator?</p> <p>___ (1) Less than 15 minutes            ___ (2) Between 15 to 30 minutes            ___ (3) Between 30 to 45 minutes            ___ (4) Between 45 to 60 minutes            ___ (5) More than 60 minutes</p>
<i>PATMOS</i>	<p>How would you describe the atmosphere of the negotiation with the Chinese negotiator?</p> <p style="text-align: center;">Very Unfriendly <span style="float: right;">Very Friendly</span></p> <p style="text-align: center;">- -                      -                      •                      +                      + +</p>
<i>POUTCOME</i>	<p>How would you evaluate your outcomes in this negotiation with the Chinese negotiator?</p> <p style="text-align: center;">Very Dissatisfied <span style="float: right;">Very Satisfied</span></p> <p style="text-align: center;">- -                      -                      •                      +                      + +</p>

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