

Final-Offer-Selection VS Last-Offer-by-Issue. Systems of Arbitration

Arbitrage des propositions finales ou l'arbitrage de chaque problème

A. V. Subbarao

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Résumé de l'article

L'arbitrage des propositions finales, en tant que méthode de règlement des impasses, existe dans plusieurs législations en Amérique du Nord. Toutefois, ce système diffère de l'une à l'autre au moins sous quatre aspects: les sujets arbitrables, la formation du conseil d'arbitrage, le rôle de l'arbitre et les critères de décision.

Suivant les critères de décision que les arbitres doivent suivre dans le règlement des impasses en matière d'arbitrage des propositions finales, il existe deux systèmes ou régimes. L'un consiste dans l'arbitrage des propositions finales dans leur globalité où l'arbitre doit trancher le conflit en statuant sur l'enveloppe globale présentée par les parties; l'autre où l'arbitre tranche point par point en choisissant pour chacun d'eux la dernière proposition des parties avant la rupture des négociations.

L'article analyse les conséquences de l'un et de l'autre systèmes d'arbitrage exécutoire sur le processus et le dénouement des négociations. Théoriquement, on est venu à la conclusion que chacun de ces deux systèmes pouvait avoir des réactions différentes sur le processus et le dénouement des négociations. L'expérience a permis de vérifier toutes les variables autres que les critères de décision qui différencient les deux systèmes. Les différences entre les deux critères sont importantes pour comprendre les effets divergents qu'ils ont sur le processus et le dénouement des négociations.

Le premier système (l'arbitrage des propositions globales) considéré comme substitut de la grève, incite les parties à s'entendre, alors que le deuxième système (l'arbitrage des propositions finales point par point), tout comme l'arbitrage traditionnel, a un effet de « glaciation » dans les négociations bilatérales.

Le système d'arbitrage des propositions finales globales a sur les négociations un impact comparable à celui de la grève au choix sous le régime de négociation dans la fonction publique fédérale. Il peut donc le remplacer comme l'une des méthodes de règlement des conflits pour les employés de la fonction publique fédérale.

Final-Offer-Selection VS Last-Offer-By-Issue Systems of Arbitration

A. V. Subbarao

This paper analyzes both theoretically and empirically the impact of the two “one-or-the-other” systems of binding interest arbitration on negotiation process and outcome.

Eversince Carl Stevens¹ proposed “one-or-the-other” arbitration as a “strike-like institution” in 1966, it attracted the attention of both practitioners and researchers in the field of labour-management relations. It was adopted as a method of impasse resolution in a number of public and private sector jurisdictions in North America.² Recently, there is an increasing volume of writings analyzing the experiences with this method of arbitration in different jurisdictions.³

* SUBBARAO, A.V., Associate Professor and Coordinator of the Human Resource Management Division. The Department of Business Administration, University of Ottawa, Ottawa, Ontario.

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¹ Carl STEVENS, «Is Compulsory Arbitration Compatible with Bargaining?» *Industrial Relations*, Vol. 5, No. 2, February, 1966, 38-52.

² For a review of «one-or-the-other» (final offer) method of arbitration in different jurisdictions in North America, see Peter FEUILLE, *Final offer Arbitration: Concepts, Developments and Techniques*, Chicago: International Personnel Management Association, 1975, and James L. Stern, Charles M. REHMUS, J. Joseph LOEWENBERG, Hirschel KASPER and Barbara D. DENNIS, *Final Offer Arbitration: The Effect on Public Safety Employee Bargaining*, Lexington, Massachusetts: Lexington Books, 1975.

³ See, Fred WHITNEY, «Final-Offer Arbitration: The Indianapolis Experience», *Monthly Labor Review*, Vol. 96, No. 5, May 1973, 20-25; Gary LONG, and Peter FEUILLE, «Final-Offer Arbitration: ‘Sudden Death’ in Eugene», *Industrial and Labor Relations Review*, Vol. 27, No. 2, January 1974, 196-203; Charles M. REHMUS, «Is a ‘Final Offer’ Even Final», *Monthly Labor Review*, Vol. 97, No. 9, September 1974, pp. 43-45; James L. STERN, «Final-Offer-Arbitration — Initial Experience in Wisconsin», *Monthly Labor Review*, Vol. 97, No. 9, September 1974, pp. 39-43. Gene SWIMMER, «Final Position Arbitration and Inter-temporal Compromise: The University of Alberta Compromise», *Relations Industrielles*, Vol. 30, No. 3, 1975,

But, the findings are not conclusive with regard to the impact of the “one-or-the-other” arbitration on negotiation process and outcome because of the differences in impasse resolution procedures among different jurisdictions. The “one-or-the-other” arbitration is different from one jurisdiction to the other and the differences are dichotomized under the following four categories. First, in some jurisdictions like in Wisconsin,⁴ an arbitrator is required to decide and award “one-or-the-other” of the parties’ *package of final offers* while in others like in Michigan,⁵ a third party can award by selecting on *each separate issue* “one-or-the-other” of the bilateral negotiating parties’ last offers. In this paper, the former is called the final-offer-selection (FOS) and the latter, the last-offer-by-issue (LOBI) system of arbitration and in both systems, third party’s award is binding on bilateral parties. Second, in some cases, a single third party will resolve the impasses whereas in others, a tripartite panel of arbitrators is required. Third, in some jurisdictions, negotiators are permitted to change their last positions and third parties are allowed to mediate and arbitrate while, in others, bilateral parties submit their respective final positions along with their arguments, on the basis of which third parties are required only to arbitrate and award. Fourth and final, only economic issues in impasse are arbitrable in some legislations whereas in others, all issues are subjected to third party arbitration.

A system of “one-or-the-other” arbitration adopted in any jurisdiction in North America consists of a combination of one of the dichotomized provisions of the four categories described above. But, in this research, FOS is defined as a system of binding arbitration in which bilateral negotiators submit their respective package of final offers and a single third party neutral, without and mediation, arbitrates and *awards one of the two packages*. And the LOBI is a system in which bilateral parties submit their respective last offers on the issues in impasse and a single arbitrator, without mediation, *awards by selecting on each separate issue “one-or-the-other” of the parties’ last offers*.

pp. 533-536. Robert E. DUNHAM, «Interest Arbitration in Non-Federal Public Employment» *The Arbitration Journal*, Vol. 20, No. 4, March 1976, pp. 45-57; Lawrence T. HOLDEN Jr., «Final-Offer-Arbitration in Massachusetts: One Year Later», *The Arbitration Journal*, Vol. 31, No. 1, March 1976, 26-35; and James D. DWORKIN, «Final Position Arbitration and Inter-temporal Compromise» *Relations Industrielles*, Vol. 32, No. 2, 1977, pp. 250-261.

⁴ Wisconsin Statutes of 1973. Section 111.77.

⁵ Michigan Police-Fire Fighters Arbitration Act of 1972, Section 8.

The purpose of this research is to investigate the impact of these two different systems of arbitration on bilateral negotiation process and outcome. The negotiation process is operationally defined to mean the parties' concessions. The outcome is the difference between the parties' positions at the conclusion of bilateral negotiations which may terminate either in a settlement or in an arbitration and it is called the terminal outcome. Negotiation process and terminal outcome are the two components of the dependent variable and the two systems of arbitration are the two categories of a single independent variable. The impact of the independent variable on the depended variable is investigated in this study and the research problem is succinctly stated in the following two questions:

- 1) Do these two systems of arbitration have a corresponding differential impact on the negotiation process and outcome?
- 2) If so, how do the systems of arbitration differ from each other with regard to their relative impact on the negotiation process and outcome?

In this study, an experimental research was conducted for the purpose of finding specific answers to these questions. Because of the differences among the systems of arbitration in different jurisdictions described in paragraph two of this paper, field research was not selected for investigating these research questions. Moreover, the researcher's inaccessibility to labour-management bilateral negotiations in field settings added to the problems in pursuing field research. Laboratory experimental method, on the other hand, permitted the control of variables other than the arbitral decision criteria which was considered important for the purpose of understanding differences in impact on negotiation process and outcome between the FOS and LOBI systems of arbitration.

In the following first section, the theoretically hypothesized impact of the two systems of binding arbitration on negotiations is briefly summarized. The second section contains a detailed account of the experimental research design. The third section presents the results of the study which are discussed with respect to the two research questions raised above.

THEORETICAL BACKGROUND

Theories of labor negotiations suggest that the parties will threaten and will also resort to work stoppages, if necessary, for the purpose of imposing the costs of disagreement on the opponent. If the costs of

disagreeing are greater than the costs of agreeing, then the opponent will concede⁶. The threatened cost associated with bilateral negotiations is what assures concession behavior and true negotiations.

In situations where the parties are prohibited from work stoppage either by mutual agreement or by statute and are required to resolve their impasses through binding arbitration, they can only “threaten” arbitration during negotiations. The “threat of arbitration” implies that either party may indicate its intention to refer an impasse to a neutral third party whose award will be final and binding on the parties. Stevens⁷ suggests that under certain systems of interest arbitration the party’s threat of arbitration, much like the threat of work stoppage, may have the effect of increasing the opponent’s subjective estimate of the costs of disagreeing on one’s own terms and thus, may involve the “concession and compromise posture” crucial to the negotiation process. Stevens⁸ theorizes that in pre-arbitration negotiations, a party’s subjective estimate of the cost of disagreeing with the opponent is a function of the party’s expectations regarding a possible interest arbitration award. The cost of disagreement is the cost of the award. The greater the “uncertainty” associated with an award, the greater will be the expected cost of disagreement. The “uncertainty” of an award is defined to mean the probability that the interest arbitration would result in an outcome to a party less desirable than the party could have obtained through a bilateral settlement. The party’s threat of arbitration will cause the opponent to concede if the “threat” imposes a cost of disagreeing which exceeds the cost of agreeing on the party’s offer. In other words, the “uncertainty” of an award in a system of binding interest arbitration is theoretically expected to encourage free negotiations. The parties’ threats of arbitration may generate concessions and compromises.

In the FOS system, the award is “uncertain” to the extent that the arbitrator may order either of the parties’ package of final offers. One party’s “threat” of arbitration may generate concessions from the other only if the other expects the cost of disagreeing to be greater than the expected cost of agreeing on such terms. The expected cost of agreeing with the opponent is the difference between the opponent’s and the threatener’s offer if they were to settle on the opponent’s terms at a

⁶ Neil W. CHAMBERLAIN, and James W. KUHN. *Collective Bargaining* (Second Edition), New York: McGraw Hill Book Company, 1965.

⁷ STEVENS, *op. cit.*

⁸ STEVENS, *ibid.*

given point in time during negotiations. The expected cost of disagreeing with the opponent is the difference between the opponent's offer and the expected award. Since the third party's award is of the strictly "either-or" variety, the cost of disagreement is minimized if one expects his package to be awarded. If, however, one expects the neutral to rule in favor of the opponent, then the expected cost of disagreement is high. Negotiators may reduce their respective expected costs of disagreement through concessions and compromises. They may negotiate (i.e., concede and compromise) at least until their respective expected costs of disagreement are perceived as equal. At that point, the difference between their offers is expected to be small.

In the LOBI, the neutral will award by picking *on each issue* either the party's or the opponent's last offers. The third party neutral may exercise the arbitral discretion in either of the following two ways. One, an arbitrator may award by selecting on some issues the party's last offers and on the rest those of the opponent in such a way that the award compromises the interests of both parties. On the other hand, an arbitrator, by picking on few issues from the party's package and on the rest, from that of the opponent, may create an uncoordinated package and issue an award which, to a party, may be more undesirable than the opponent's package of last offers. Should a party expect the former to take place, he may concede on those issues that he would not want to risk and develop his last offers in such a way that they might be found reasonable and picked up by the arbitrator. If the bilateral parties concede on different issues, their concessions may not converge into an agreement. The sum of the differences between their respective last positions at the termination of negotiations may be large and it may even be greater than that in the FOS. But, if the parties expect that the arbitrator might award an uncoordinated package, they may negotiate and concede for the purpose of minimizing the cost of disagreement and avoiding an undesirable award. The parties however, may fail to reach an agreement if there are differences between their perceptions of the expected undesirability of the award. But, the sum of the differences between their respective last offers on issues in impasse is expected to be small.

Thus, bilateral parties are expected to negotiate for the purpose of reaching agreements in both the systems of arbitration. Their respective concessions in the two systems are hypothesized to be equal. With the result, the terminal outcomes of bilateral negotiations are hypothesized to be equal in the FOS and LOBI systems of arbitration. These hypotheses were tested in a controlled laboratory experiment.

THE EXPERIMENTAL DESIGN

Following the lead of Siegel and Fouraker,⁹ the laboratory experimental method is used to investigate the impact of the two systems of binding arbitration — the independent variable — on the — dependent variable — as measured in terms of concession process and terminal outcome. The FOS and LOBI systems are the two separate and distinct experimental treatments and are employed, respectively, as experimental conditions I, and II in the single factor experiment. The two experimental conditions are exactly similar in all respects except in terms of the decision criteria used by the third party neutral in issuing arbitration awards. The experimental controls and procedures which are alike in the two experimental conditions are discussed in the following two-sections and the third sub-section presents the third party neutral's decision criteria used in each experimental condition.

Experimental Controls

The laboratory experiment is controlled so that the difference in variance in the dependent variable between the two experimental conditions can be attributed to the differences in arbitral decision criteria between the two systems of binding arbitration. Explicitly, the specific variables controlled by the laboratory experiment are (1) the information given to negotiators (2) interpersonal communications between negotiators and (3) their bargaining behavior.

First, the scenario for negotiations in the experiment was the same in both the experimental conditions. The parties were required to negotiate over two issues, namely, the percentage increase of annual salary and the reduction of weekly hours of work of firemen in the City of Winterland (fictitious name). The negotiators were given detailed information regarding the budget of the fire department, number of firemen employed and the existing salaries and hours of work of firemen in the City of Winterland. In addition, the information given to the bargainers also provided full details on the following factors:

- 1) Comparative salaries of firemen in other cities;
- 2) Comparative salaries of policemen in the same city;

⁹ Sidney SIEGEL, and Lawrence E. FOURAKER. *Bargaining and Group Decision Making*, (Experiments in Bilateral Monopoly), New York: McGraw-Hill Book Company, Inc., 1960, 132 pp.

- 3) Comparative salaries of policemen in other cities ;
- 4) Comparative salaries of building trades in the same city ;
- 5) Cost of living figures in the same city ;
- 6) Ability of the city to pay ; and
- 7) Wage controls.

The «Information for Bargainers» was authenticated by Local 1215 of the International Association of Firefighters, Richfield, Minnesota. This authentication helped in the design of a scenario which was as close to reality as possible, with regard to the issues, the percentage increase of annual salaries and the reduction of weekly hours of work of firefighters.

Second, the interpersonal communications were controlled in the experiment by conducting negotiations in silence through the exchange of written bids transmitted by the experimenter. This procedure eliminated variance associated with interpersonal perceptions, prejudices and incompatibilities.¹⁰

Third, the bargaining behavior which also was controlled in this experiment was defined as the expression of threats or promises between the opponents. Availability of threat messages may stimulate competition among subjects and thereby reduce negotiating efficiency. Threats and promises were controlled in this experimental negotiation process by not allowing the use of such messages. They were eliminated partly because of past research results,¹¹ but also because of the author's experience with a pilot experiment where the subjects were provided with one threat and one promise message. Post pilot experiment interviews with subjects indicated that all subjects used threat messages and did so merely because these messages were available.

¹⁰ SIEGEL and FOURAKER, *ibid*, stated that in laboratory experiments on bargaining such variables should be either systematically studied or controlled. Therefore, because face-to-face negotiations could possibly have had an impact upon the negotiation process and outcome, interpersonal communication was limited to written bids.

¹¹ Effects of threats on bilateral negotiations are discussed in, Harold H. KELLEY, «Experimental Studies of Threats in Interpersonal Negotiations». *The Journal of Conflict Resolution*, Vol. IX, No. 1, March 1965, 79-105, and in John CHENEY, Thomas HARFORD and Leonard SOLOMON, «The Effects of Communicating Threats and Promises Upon the Bargaining Process», *The Journal of Conflict Resolution*, Vol. XVI, No. 1, March 1972, 99-107.

Experimental Procedure

The experimental procedure is the same in both the experimental conditions.¹² In order to avoid major group differences between the experimental conditions, all the subjects were recruited from the undergraduate students registered at the University of Minnesota during the spring quarter, 1974, in collective bargaining classes offered by the Industrial Relations Department. One week before the experiment was conducted, the experimenter approached three classes with the permission of the respective instructors and invited the students to voluntarily participate in the experiment. Forty-four students volunteered and they were given copies of the «Information for Bargainers». The students were given information regarding times and places of the two experimental sessions. They were given the opportunity to sign up for the session they found most convenient. At this preparatory stage, the subjects were not given any information regarding the difference between the two experimental sessions. They also were not told about the roles they would play in the experiment. The students were informed that by participating in the experiment they could earn points which would contribute to their course grade.

These 44 students, who participated in the experiment at the scheduled times and places, negotiated as members of 22 teams. In each experimental condition, there were eleven teams. In each experimental session, the students were assigned to the roles of either union and/or employer negotiator by random procedure. Thus, it was possible to minimize systematic bias in carrying out the experiment. The union and employer negotiators were seated in two separate rooms. In each room, their seats were identified from «A» through «K». The subjects were instructed in writing that they would be negotiating in the experiment over two issues, namely, the percentage increase of annual salaries, and the reduction of weekly hours of work for firefighters in the fictitious city of Winterland. Salary negotiations spread a positive range of from one to ten percent per year and were measured on the following interval scale:

¹² The major procedural problem in laboratory experimental method was group comparison. If the groups compared are not equal, their differences may have an impact on results. Similar experimental procedures are suggested if different experimental conditions are employed. See, Carol FLEISHER FELDMAN, and Wilbur A. HASS. «Controls, Conceptualization, and Interrelation Between Experimental and Correlational Research», *American Psychologist*, Vol. 25, No. 7, July 1970, 633-635.

Percentage Increase of Annual Salaries Scale	1	2	3	4	5	6	7	8	9	10
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The hours issue was negotiated over a range of from fifty-eight to forty hours per week using two hour intervals. As shown below, hours were measured on a one through ten interval scale:

Weekly Hours of Work Scale	58	56	54	52	50	48	46	44	42	40
	1	2	3	4	5	6	7	8	9	10

The subjects were informed in written instructions that they could earn as many as one-hundred points depending upon their negotiating performance. They were told that the points they earned would be notified to their instructor who would award an appropriate grade as given below depending on the number of points the subject secured in the experiment:

75 to 100 points«A» grade
50 to 74 points«B» grade
49 points and below«C» grade

These instructions were based on the assumption that the participating students would aspire to achieve as high a grade as possible, hopefully an «A». Such aspirations would motivate them to bargain as effectively as possible. The higher the score achieved by one party on the team, the lower would be his opponent's score. As shown in Tables 1 and 2, in this experiment, the maximum pay-off for a subject was 100 points and if one party were to earn 100 points his opponent would get only 10 points. Thus, the conflict situation in the experiment had a built-in maximization of difference in pay-offs between the two negotiators on a team¹³. The intra-team conflict was real, since the subjects were not told either verbally or via written instructions what

¹³ In real world conflicts, motivation of the parties to negotiate may be high. Motivation of the subjects in the laboratory experimental negotiations can be improved if the rewards have some value to the participants and if the difference between the party's and its opponents' payoffs is maximized. See, Philips S. GALLO Jr., and Charles MCCLINCKOCK, «Cooperative and Competitive Behavior in Mixed Motive Games», *The Journal of Conflict Resolution*, Vol. 4, No. 1, March 1965, 68-78.

the opponent's pay-off was in the experiment. The conflict situation offered no possibility for the subjects to distribute equally their pay-off without any real bargaining.

The subjects assigned to play the role of the union were given «Instructions for Union, (See Appendix I)», «Pay-off Table for Union» (Table 1) and eleven copies of the proposal (Figure 1).

The subjects assigned to play the role of the employer were also given a set of «Instructions for Employer» (See Appendix II), «Pay-off Table for Employer» (Table 2) and eleven copies of the counterproposal (Figure 2). The subjects were then allowed a trial negotiation before the actual negotiation commenced. The union initiated and forwarded a trial proposal to which the employer responded with a trial counterproposal. The experimenter collected the trial proposal and trial counterproposal. If the trial proposal and counterproposal bids were identical on the respective issues, then the team reached a bilateral agreement. None of the teams in the experiment had a trial settlement and hence all the trial impasses were resolved through third party intervention, the latter issuing a trial binding award. The identity of the third

TABLE 1
Payoff Table For Union

Percentage Increase of Annual Salaries of Firemen	Bid Numbers	Weekly Hours of Work									
		58	56	54	52	50	48	46	44	42	40
		1	2	3	4	5	6	7	8	9	10
		Payoff Points									
One	1	10	15	20	25	30	35	40	45	50	55
Two	2	15	20	25	30	35	40	45	50	55	60
Three	3	20	25	30	35	40	45	50	55	60	65
Four	4	25	30	35	40	45	50	55	60	65	70
Five	5	30	35	40	45	50	55	60	65	70	75
Six	6	35	40	45	50	55	60	65	70	75	80
Seven	7	40	45	50	55	60	65	70	75	80	85
Eight	8	45	50	55	60	65	70	75	80	85	90
Nine	9	50	55	60	65	70	75	80	85	90	95
Ten	10	55	60	65	70	75	80	85	90	95	100

* Please use only bid numbers in bargaining.

FIGURE 1

Proposal

I demand the following bids for the firemen in the City of Winterland:

Salaries Bid No

Hours of work Bid No

party neutral person was not revealed to the subjects. To maintain the anonymity of the third party neutral person, the experimenter collected the trial proposals and counterproposals and brought them to

TABLE 2
Payoff Table For Employer

Percentage Increase of Annual Salaries of Firemen	Bid Numbers	58	56	54	52	50	48	46	44	42	40	
		1	2	3	4	5	6	7	8	9	10	
		Payoff Points										
One	1	100	95	90	85	80	75	70	65	60	55	
Two	2	95	90	85	80	75	70	65	60	55	50	
Three	3	90	85	80	75	70	65	60	55	50	45	
Four	4	85	80	75	70	65	60	55	50	45	40	
Five	5	80	75	70	65	60	55	50	45	40	35	
Six	6	75	70	65	60	55	50	45	40	35	30	
Seven	7	70	65	60	55	50	45	40	35	30	25	
Eight	8	65	60	55	50	45	40	35	30	25	20	
Nine	9	60	55	50	45	40	35	30	25	20	15	
Ten	10	55	50	45	40	35	30	25	20	15	10	

* Please use only bid numbers in bargaining

Figure 2

Counterproposal	
I offer the following bids for the firemen in the City of Winterland:	
Salaries	Bid No
Hours of work	Bid No

a separate room. He, then, came back to the experimental rooms with trial awards. (The trial award was issued in each experimental condition following a separate procedure which is discussed in the following sub-section). On an individual basis, the experimenter informed the subjects of the arbitration award and the associated points earned in the trial session. Finally, the subjects were told that the trial-run had no relevance to the points that could ultimately be earned in the experiment.

Following the trial, the teams were given exactly thirty minutes to complete actual negotiations. The experimenter exchanged the proposals of each union negotiator with only one specified employer negotiator. He did this by identifying the negotiators in teams «A» through «K» for each experimental session. After 30 minutes had expired, the negotiators were asked to stop their bargaining. At this point in the process, if the employer was agreeable to the bids in the proposal, or if the union was satisfied with the bids in the counterproposal, they were told to exchange similar bids. By so doing, they reached an agreement and were able to immediately figure out the points they earned in the negotiations. If, on the other hand, they were not able to reach a settlement, they were told that their last proposals and last counterproposals would be considered by a third party neutral person.¹⁴

¹⁴ At the end of the session, the experimenter informed the subjects that they would leave all of the documents relevant to the experiment in their seats. It is these documents which comprised the experimenter's data base.

The Arbitral Decision Criteria

In each experimental session, the subjects were instructed in writing, before the commencement of trial negotiations, regarding the decision criteria followed by the neutral person in awarding points. In the experimental condition I (FOS) the subjects were informed that the neutral was absolutely free to award either the union's last proposal or the employer's last counterproposal.¹⁵ The subjects in the experimental condition II (LOBI) were told that the neutral would award one of the following four.¹⁶

- 1) Both the bids on the union's last proposal; or
- 2) Both the bids on the employer's last counterproposal; or
- 3) The bid on salaries from the union's last proposal and the bid on weekly hours of work from employer's last counterproposal; or
- 4) The bid on salaries from the employer's last counterproposal and the bid on weekly hours of work from the union's last proposal.

In both the experimental sessions, the experimenter played the role of the third party neutral person, a fact never revealed to the participants. Under experimental condition I (FOS), the arbitration award was determined by a toss of a coin. The union's proposal was awarded in the case of a head, and the employer's counterproposal was awarded in the case of tail. Under experimental condition II (LOBI) arbitration option actually awarded was drawn off a random table. Out of the two bids — union's and employer's — on each issue, one was randomly selected. Excepting the third party neutral person's decision criteria, the experimental procedures and controls were exact-

¹⁵ For illustration, the union's last proposal had bids 8 (on salaries) and 9 (on weekly hours of work) and the employer's last counterproposal has bids 3 (on salaries) and 2 (on weekly hours of work). The neutral will select one of the following two and that will determine your points:

- 1) 8 (on salaries) and 9 (on weekly hours of work); or
- 2) 3 (on salaries) and 2 (on weekly hours of work).

¹⁶ For illustration, the union's last proposal has bids 8 (on salaries) and 9 (on weekly hours of work) and the employer's last counterproposal has bids 3 (on salaries) and 2 (on weekly hours of work). The neutral person will select one of the following four and that will determine your points:

- 1) 8 (on salaries) and 9 (on weekly hours of work) or
- 2) 3 (on salaries) and 2 (on weekly hours of work) or
- 3) 8 (on salaries) and 2 (on weekly hours of work) or
- 4) 3 (on salaries) and 9 (on weekly hours of work).

ly similar within the two experimental conditions. Hence, the resulting differences in the negotiation process and outcome which are analyzed in the following section can be attributed to the differences in impact between the arbitrators' decision criteria in the two systems of binding arbitration.

RESULTS AND DISCUSSION

The effect of variation in the independent variable (i.e., the systems of binding arbitration) on the dependent variable (i.e., terminal outcomes and parties' concessions) was analyzed in order to discern whether the results confirmed or rejected the hypothesized impact of the two systems of arbitration on negotiation process and outcome.

The terminal outcome was a negotiation outcome index measuring the sum of the differences between the union's and employer's final bids on the two negotiable issues, namely, the salary and hours of work.¹⁷ Since the parties in negotiations might maintain a desired pay off level by simultaneously increasing the bid on one issue while decreasing the bid on the other, the terminal outcome associated with each of the issues was summarized in an effort to construct a total terminal outcome measure for each team. The means and standard deviations of terminal outcomes in the FOS and LOBI systems are reported in Table 3. The mean of terminal outcomes in the LOBI sys-

TABLE 3
Terminal Outcome

	Final-offer- selection system	Last-offer- by-issue system
Number of teams	11	11
Means	2.8	5.9
Standard deviations	1.89	2.19

tems was larger than that in the FOS system. The difference between the two means of terminal outcomes was statistically significant ($t = 3.4$,

¹⁷ As an illustration, if the union's final bids with respect to salaries and hours were '9' (9 percent increase) and '6' (43 hours of work week) and the employer's final bid were '5' (5 percent increase) and '2' (56 hours of work week) then the index value of the team's terminal outcome would be 8: '4' point difference on salaries plus a '4' point difference on hours.

$P > .01$). The results of analysis of terminal outcomes, thus, rejected the hypothesis of no differential impact of the two systems of arbitration on terminal outcome.

Negotiation process was analyzed in terms of the concessionary behavior followed by the parties during negotiations. Concessionary behaviour of union was measured as the sum of the difference between the union's initial and final bids on the salary and hours of work issues.¹⁸ The means and standard deviations of unions' concessions are reported in Table 4. The results indicate that the unions' concessions are more or less equal in both the systems of arbitration.

TABLE 4
Unions' Concessions

	Final-offer- selection system	Last-offer- by-issue system
Number of subjects	11	11
Means	4.4	4.3
Standard deviations	2.14	1.49

Concessionary behaviour of employer was measured as the sum of the difference between the employer's final and initial bids on salary and hours of work issues.¹⁹ The means and standard deviations of employers' concessions are reported in Table 5. The means of employers' concessions were different between the two systems of arbitration ($t = 1.30$, $P > .2$). The employer's concessions were larger in the FOS system than in the LOBI system. The analysis of results of employers' concessions did not confirm the hypothesis of equal impact of the two systems of arbitration on negotiation process.

The results of parties' concessionary behaviour and terminal outcomes are briefly discussed with reference to the two research

¹⁸ As an illustration, if '9' and '5' were the initial and final bids, respectively, of the union on salary and '8' and '4' were the initial and final bids, respectively, of a union on hours of work, then the union was shown to have conceded by '8': '4' units attributed to salary and '4' units attributed to hours of concessions.

¹⁹ As an illustration, if '2' and '6' are the initial and final bids, respectively, of the employer on salary and '1' and '5' are the initial and final bids, respectively, in hours of work, then the employer was shown to have conceded '8': '4' units attributed to salary and '4' units attributed to hours of work concessions.

TABLE 5
Employer's Concessions

	Final-offer- selection system	Last-offer- by-issue system
Number of subjects	11	11
Means	4.7	3.3
Standard deviations	2.88	1.81

questions raised in the study. With respect to the first question, the results suggest that the two systems have a differential impact on the negotiation process and outcome. Regarding the second question, the results indicate that the two systems may not have a differential impact on the unions' concessionary behaviour but they do have on employers' negotiations. During negotiations, employers conceded more in the FOS system than in the LOBI system. Because of the larger employers' concessions in the FOS than in the LOBI system, the mean of terminal outcomes in the former system was smaller than that in the latter system.

The differential impact of the two systems of arbitration on negotiation process and outcome is of considerable importance to policies relating to impasse resolution procedures in labour-management relations. In the FOS system of binding arbitration, bilateral parties may negotiate and concede for the purpose of avoiding an award based on the opponents' package of final offers. If their concessions fail to converge in a bilateral agreement, they may not be able to avoid an award. But the award may have eliminated the expected cost of disagreement to a party whose package of final offers was selected by the arbitrator. If the arbitrator awarded the party's package of final offers because it was more reasonable than that of the opponent, the arbitrator's decision might reinforce the party's pre-arbitration negotiation behaviour. The opponent who may have failed to negotiate and develop a reasonable package of final offers may have to incur the cost of disagreement. Since the extent of the cost of disagreement to the opponent is related directly to the difference between its own package of final offers and that of the party which was awarded, the opponent may learn through experience and during the subsequent round of contract negotiations in the FOS system, may negotiate genuinely for the purpose of reaching bilateral agreements.

In the LOBI system, on the other hand, parties may withhold concessions on some or all issues in negotiation with the expectation that the arbitrator may award by compromising the interests of bilateral parties. If the arbitration award consists of party's last offers on some issues and those of the opponent on the other remaining issues, the arbitrator's decision may confirm the party's expectations and may reinforce their respective pre-arbitration negotiation behaviours. The parties may learn to withhold and may not negotiate genuinely during subsequent rounds of contract negotiations in the LOBI system. In other words, the arbitral decision criteria and the discretion given to the arbitrator in developing an award in the LOBI system, may have a «chilling effect»²⁰ on bilateral negotiations.

The results of this research seem to indicate that the impact of the LOBI system on negotiation process and outcome may be more or less like that of the conventional binding arbitration, whereas the FOS system, as a «strike-like» institution may generate «free» negotiations leading to bilateral agreements. Of the two «one-or-the-other» arbitration systems analyzed in this study, the final-offer-selection system of binding arbitration seems to have the impact similar to that of the right to workstoppage on negotiation process and outcome. Hence, the final-offer-selection system may be the real alternative to the «strike-route» and it should replace the «arbitration-route» which is one of the two dispute resolution processes²¹ provided in the Canadian Federal Public Service Staff Relations Act of 1967.

APPENDIX I

Instructions for Union

You have been grouped at random with one other student into a bargaining unit and have been selected at random to assume the role of the President of the International Council of Firemen, Local 1000. You will be referred to for the remainder of the experiment as 'union'. Your bargaining partner will play the role of the Fire Commissioner of the Fire Department, City of Winterland. He will be designated as 'employer'. The identity of your partner, as well as your own, will be kept secret; at

²⁰ Peter FEUILLE, «Final Offer Arbitration and the Chilling Effect», *Industrial Relations*, Vol. 14, No. 3, October 1975, 302-310.

²¹ For a discussion of the two alternative impasse resolution procedures in the Canadian Federal Public Service Staff Relations Acts of 1967, see A. V. SUBBARAO, «The Impact of the Two Dispute Resolution Processes on Negotiations», *Relations Industrielles*, Vol. 32, No. 2, 1977, 216-233.

no time will you either see him or speak with him. Your task in the experiment is to bargain with the employer.

Your payoff Table shows the number of points you can earn. Your payoff is the number of points in the cell at the intersection of the row representing the percentage increase in annual salaries and the column indicating the reduction of weekly hours of work. For illustration, if you have settled for a ten percent increase in salaries and a 40 hour workweek, you have earned 100 points.

You will bargain by exchanging proposals with the employer. You will have to record the bid numbers on each proposal when it is exchanged with the employer. Each proposal has provision for two bids, one with respect to the percentage increase of annual salaries and the other for the reduction of weekly hours of work.

You will initiate bargaining by proposing the percentage increase of annual salaries and the reduction of weekly hours of work for your firemen. You should start bargaining from a position which is quite favorable to you. The higher the number of the bid, the greater will be your payoff. The experimenter will take your proposal to the employer. If he agrees, you have a settlement with your bargaining partner and you will be so informed by the experimenter. Otherwise, the experimenter will bring you a counterproposal from the employer. You have now two options: (1) agree with employer's counterproposal and so inform the experimenter or (2) make another proposal with a new set of bids. The bargaining session will be limited to 30 minutes and you can send a maximum of 10 proposals. You are not absolutely required to send all the 10 proposals, if you do not want to and you are at liberty to set intervals between your proposals to suit your strategies and conveniences. You will stop bargaining exactly after 30 minutes time is over.

All your proposals must be in good faith. If the employer agrees to your proposal, you are bound to honor those bids. You must therefore be sure that you would be satisfied with each proposal you make, if that proposal were to be accepted. If the employer makes you another counterproposal, however, you are released from your previous proposal and you may propose any new bids you may wish.

If you have settled with your bargaining partner, the bargaining is all over. If you have not settled within 30 minutes, the bargaining is automatically terminated. A neutral person will then award points to you and your bargaining partner.

APPENDIX II

Instructions for Employer

You have been grouped at random with one other student into a bargaining unit and have been selected at random to assume the role of the Fire Commissioner of the Fire Department, City of Winterland. You will be referred to for the remainder of the experiment as 'employer'. Your bargaining partner will play the role of the President of the International Council of Firemen, Local 1000. He will be designated as 'union'. The identity of your partner, as well as your own, will be kept secret; and at no time will you either see him or speak with him. Your task in the experiment is to bargain with the union.

Your payoff Table shows the number of points you can earn. Your payoff is the number of points in the cell at the intersection of the row representing the percentage increase of annual salary and the column indicating the reduction of weekly hours of work. For illustration, if you have settled for one percent increase of annual salary and 58 hour workweek, you have earned 100 points.

You will bargain by exchanging counterproposals with the union. You will have the record the bid numbers on each counterproposal when it is exchanged with the union. Each counterproposal has provision for two bids, one with respect to percentage increase in annual salary and the other for the reduction of weekly hours of work.

The bargaining commences for you when the experimenter brings the union proposal. You should start bargaining from a position which is quite favorable to you. The lower the number of the bid, the greater will be your payoff. You have two options open when you receive the union's proposal: (1) agree with the union's proposal and so inform the experimenter, or (2) make another counterproposal with a new set of bids. The bargaining session will be limited to 30 minutes and you can send a maximum of 10 counterproposals. You are not absolutely required to send all the 10 counterproposals, if you do not want to and you are at liberty to set intervals between your proposals to suit your strategies and conveniences. You will stop bargaining exactly after 30 minutes time is over.

All your counterproposals must be in good faith. If the union agrees to your counterproposal, you are bound to honor those bids. You must, therefore, be sure that you would be satisfied with each counterproposal you make, if that counterproposal were to be accepted. If the union makes you another proposal, however, you are released from your previous counterproposal and you may counterpropose any new bids you may wish.

If you have settled with your bargaining partner, the bargaining is all over. If you have not settled within 30 minutes, the bargaining is automatically terminated. A neutral person will then award points to you and your bargaining partner.

Arbitrage des propositions finales ou l'arbitrage de chaque problème

L'arbitrage des propositions finales, en tant que méthode de règlement des impasses, existe dans plusieurs législations en Amérique du Nord. Toutefois, ce système diffère de l'une à l'autre au moins sous quatre aspects: les sujets arbitrables, la formation du conseil d'arbitrage, le rôle de l'arbitre et les critères de décision.

Suivant les critères de décision que les arbitres doivent suivre dans le règlement des impasses en matière d'arbitrage des propositions finales, il existe deux systèmes ou régimes. L'un consiste dans l'arbitrage des propositions finales dans leur globalité où l'arbitre doit trancher le conflit en statuant sur l'enveloppe globale présentée par les parties; l'autre où l'arbitre tranche point par point en choisissant pour chacun d'eux la dernière proposition des parties avant la rupture des négociations.

L'article analyse les conséquences de l'un et de l'autre systèmes d'arbitrage exécutoire sur le processus et le dénouement des négociations. Théoriquement, on est venu à la conclusion que chacun de ces deux systèmes pouvait avoir des réactions différentes sur le processus et le dénouement des négociations. L'expérience a permis de vérifier toutes les variables autres que les critères de décision qui différencient les deux systèmes. Les différences entre les deux critères sont importantes pour comprendre les effets divergents qu'ils ont sur le processus et le dénouement des négociations.

Le premier système (l'arbitrage des propositions globales) considéré comme substitut de la grève, incite les parties à s'entendre, alors que le deuxième système (l'arbitrage des propositions finales point par point), tout comme l'arbitrage traditionnel, a un effet de «glaciation» dans les négociations bilatérales.

Le système d'arbitrage des propositions finales globales a sur les négociations un impact comparable à celui de la grève au choix sous le régime de négociation dans la fonction publique fédérale. Il peut donc le remplacer comme l'une des méthodes de règlement des conflits pour les employés de la fonction publique fédérale.

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