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## ***Nested Games: The Cohesion of French Electoral Coalitions***

GEORGE TSEBELIS

This article introduces a theory of Nested Games which accounts for the cohesion of coalitions. The parties in a coalition are considered to be playing a game with variable payoffs. The payoffs depend on a higher-order game between the coalition and its opponents. Several political situations approximate to this conceptualization, such as Government and Opposition coalitions, factions inside parties, international coalitions, class conflict. The theory of Nested Games predicts the cohesion of coalitions as a function of the relative size of both the coalitions and the partners within each coalition.

The test case of the theory is the cohesion of French electoral coalitions in 1978. Empirical results corroborate the theory. All parties behave according to its predictions. Moreover, a difference in the way parties behave, according to whether the game is visible (by the electorate) or invisible, is discovered and explained.

Coalition building involves both co-operation and competition, but the dynamics between these two has not yet been systematically analysed. The existing game-theoretic literature focuses exclusively on the co-operative aspect of participants in a government coalition.<sup>1</sup> The question posed by this literature is which coalition will form, and not which coalitions (once formed) are likely to dissolve. Moreover, the zero-sum game assumption made either explicitly or implicitly by these authors implies that the coalitions formed will be of minimum size. More recently, Grofman has presented a model of proto-coalition formation, based on ideological proximity, where coalitions might not be minimal. His model, however, also assumes that 'proto-coalitions, once formed, remain nondissolvable'.<sup>2</sup>

Recognizing that co-operative and competitive strategies coexist inside an alliance implies that the unity of an alliance is itself a variable to be explained. To analyse this problem, I shall use a game-theoretic framework and I shall develop the concept of Nested Games. Political parties will be considered as pursuing strategies in two different but connected arenas. Their choices affect the

Department of Political Science, University of California, Los Angeles. I would like to thank Robert Bates, David Brady, Pam Camera-Rowe, John Ferejohn, Bernie Grofman, Steve Krasner, Peter Lange, Jack Levy, Tom Rochon and Paul Sniderman for many useful comments in previous drafts and oral presentations. Anonymous referees and especially Ivor Crewe greatly improved the manuscript. None of them is responsible for any remaining errors.

<sup>1</sup> See W. Riker, *The Theory of Political Coalitions* (New Haven, Conn.: Yale University Press, 1962); R. Axelrod, *Conflict of Interest: A Theory of Divergent Goals with Applications to Politics* (Chicago: Markham, 1970); L. Dodd, *Coalitions in Parliamentary Government* (Princeton, N.J.: Princeton University Press, 1976); G. Luebbert, 'Coalition Theory and Government Formation in Multiparty Democracies', *Comparative Politics*, 15 (1983), 235–49.

<sup>2</sup> See B. Grofman, 'A Dynamic Model of Proto-coalition Formation in Ideological N-Space', *Behavioral Science*, 27 (1982), 77–90, p. 86.

balance of forces *within* each coalition, and the balance of forces *between* coalitions. The game between partners is, therefore, nested inside the game between coalitions.

Technically, the partners of each coalition will be considered to be playing a game with variable payoffs. The payoffs vary according to the outcome of a (competitive) game between coalitions.

Substantively, Nested Games are a way of transplanting context into game theory. In fact, instead of assuming that people play games in a vacuum, it shows that these games are embedded in some higher-order network. In my approach this higher-order game determines the payoffs of the players. Parties therefore find themselves in a situation where their payoffs vary according to the specific balance of forces between coalitions, and have to choose strategies that will have implications for the balance of forces both within each coalition and between coalitions.

Several social and political situations represent a structure which can be captured adequately by the Nested Games framework. Class conflict can be modelled in terms of Nested Games, because each social class confronts the other, while facing its own collective action problem, and political influence will ultimately depend on which class solves the collective action problem more effectively. Or the balance of forces might be so favourable to the one side that it does not need to overcome its collective action problem.<sup>3</sup> Factions within political parties face similar Nested Games. Their decision to split from, or remain inside, the party will have implications in the national political game. Primary elections in the United States present another case where the same framework can be useful. Competition between candidates for party nominations may leave incurable wounds, and thereby handicap a party's chances of winning. So initiatives undertaken in the primaries have to be regarded (both by the actors and by observers) as having an impact on the general election.

The framework is general enough to permit empirical tests in different situations. For reasons that will become obvious, the French elections of 1978 have been chosen as the test case. The article is organized into the following sections. Firstly, the choice of France as a case study will be explained and the possible outcomes of French elections will be presented diagrammatically so as to facilitate intuitive speculations about choices of party strategies (Section I). Secondly, the theoretical framework of Nested Games will be presented, in order to examine the validity of these intuitions (Section II). Thirdly, empirical proposi-

<sup>3</sup> C. Offe and H. Wiesenhal, 'Two Logics of Collective Action: Theoretical Notes on Social Class and Organizational Form', *Political Power and Social Theory*, 1 (1980), 67–115, argue that this was the case for class conflict at the end of last century: capitalists did not need to organize at the national level. J. Elster, *Making Sense of Marx* (Cambridge: Cambridge University Press, 1985), p. 346, and A. Przeworski, 'The Challenge of Methodological Individualism to Marxist Analysis' in P. Birnbaum and J. Leca, eds, *Sur l'Individualisme* (Paris: Presses de la FNSP, 1985), provide evidence that the Marxian conception of class struggle can be captured by this formal approach, since the force unifying each class is competition against another class. In other words, classes become classes *against* someone before they become classes *for* themselves.

tions derived from the theory of Nested Games will be tested with French electoral data (Section III). Fourthly, an anomaly in the data will lead to the distinction between visible and invisible politics, and to laws that rule this distinction (Section IV). Finally, Section V will summarize and discuss the argument.

## I: WHY FRANCE?

The French Fifth Republic is an excellent case for studying the stability of coalitions. Under the Fifth Republic, and at least up to 1984, the four major political families (the Gaullists, currently named the RPR; the Giscardians, currently called the UDF; the Socialists, called the PS since 1971; and the Communists, the PCF) formed two competing coalitions, the Right and the Left. The competition between the Right and the Left led to the progressive elimination (under the Fifth Republic) of centre parties.<sup>4</sup> Duverger describes this system as *quadrille bipolaire* and explains that its mechanics are due to the particular electoral system which is used in the French Fifth Republic (with the exception of the 1986 elections), namely the two-round plurality system in the National Assembly elections.<sup>5</sup> In each constituency (*arrondissement*), each of the four major political families presents candidates for the first round of voting. If no candidate receives an absolute majority, then a second round is held one week later. The party that came second *within* each coalition usually endorses and supports the strongest candidate of the coalition (*desistement*). This intra-coalition discipline is the result of agreements between the parties but is not enforced by the electoral law. Due to the difficulty of sticking to this decision, cases of 'triangular competition' (one candidate from one coalition and two candidates from the other competing against each other) have been reported in France.

At the national level, the stability of French coalitions has been challenged several times.

- (1) The Right moved from a period of Gaullist dominance (1958–74) through a slow re-equilibration of forces under Giscard d'Estaing to ambivalent support for Giscard by the Gaullist party in 1981.
- (2) The Left presented a single candidate in the first round of the presidential elections of 1965, split in the presidential elections of 1969, signed the Common Programme of government in 1972, remained united until just before the legislative elections of 1978 when the Common Programme was shattered, reunited for the elections of 1981 and in the first period of government (under Pierre Mauroy as prime minister), only to split again in the summer of 1984 (after the withdrawal of the Communist ministers from the government).

<sup>4</sup> See J. Chapsal and A. Lancelot, *La Vie Politique en France Depuis 1940* (Paris: Presses Universitaires de France, 1969).

<sup>5</sup> See M. Duverger, *Institutions Politiques et Droit Constitutionnel*, 10th edn (Paris: Presses Universitaires de France, 1968).

This history of conflict and co-operation is not unique. In all European democracies parties join or leave coalition governments; the cases of the French Fourth Republic and Italy are the most obvious examples. What is unique to France is that both the co-operative and the competitive forces are magnified in front of the public because the electoral system favours both competition (in the first round) and co-operation (in the second round).

Duverger has demonstrated the implications of electoral laws for party systems.<sup>6</sup> Under proportional representation the parties stress their differences to the electorate. After the election, government coalitions are formed and the previous pre-electoral competitiveness is replaced by co-operation within the government (at least as long as the coalition lasts). In plurality electoral systems, the two major parties try to build their electoral coalitions and reduce intra-party differences in front of the public as the elections approach.

In France, however, each party must do two things. It must affirm its own political line (otherwise it will lose its supporters in the first round); but in the second round it has to promote the coalition. This situation is very similar to the American, in which primaries are followed by Congressional or Presidential elections. The important difference is that in the United States a National Convention or the simple passage of time *may* heal the wounds of the primaries;<sup>7</sup> in France, the two rounds are only seven days apart, so the parties do not have time to change their strategies. It is the simultaneity of elections and the visibility of strategies (coalitions are made *before* the election, and *in front* of the electorate) that makes the study of French politics so suitable for the theory of coalitions.

If the two partners of a coalition go too far in criticizing each other in the first round, they will not have the time to change their strategies in the second round, even if they wish to. The votes of the loser within each coalition will not be transferred to the winner, and, therefore, in the decisive second round the coalition might lose because it has been too competitive in the first round. On the other hand, if a party is not critical enough towards its partner in the first round, it might lose the crucial votes which would make it the frontrunner in that round and thereby give it the right to represent the coalition in the decisive second round (and maybe win the seat).

Having set out the situation which we seek to model, let us now lay out the model itself. We shall begin by considering a single constituency represented in a particular space. This representation will improve our understanding of the dynamics of cohesion and competition at the local level.

Ignore for the moment the internal divisions of the Right, and the existence of smaller parties of both the Right and the Left, and consider the following (sim-

<sup>6</sup> See M. Duverger, *Political Parties* (London: Methuen, 1954) and M. Duverger, *La Monarchie Republicaine* (Paris: Laffont, 1974).

<sup>7</sup> Several times, however, the passage of time has not been enough to heal the wounds and candidates have not endorsed their fellow-party runners, nor have activists of a defeated candidate in the primaries joined the other party (see D. B. Johnson and J. R. Gibson, 'The Divisive Primary Revisited: Party Activists in Iowa', *American Political Science Review*, 68 (1974), 67-77).

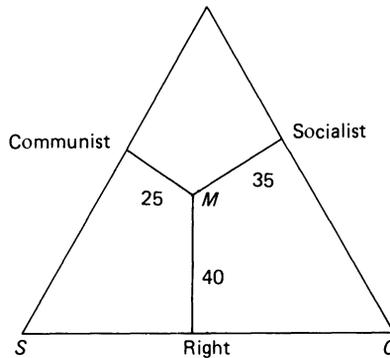


Fig. 1. Barycentric system of coordinates

plified) electoral competition: the Right (as a whole) confronts the two partners of the Left, the Socialists and the Communists. We can use the equilateral triangle of Figure 1 to represent this triangular competition.<sup>8</sup>

It can be shown that the sum of the distances for any point inside the triangle to the sides of the triangle is equal to the altitude of the triangle. This geometric property can be used to map different electoral outcomes in a three-party contest on points inside the equilateral triangle. Each side of the triangle will be named after a party (or coalition), and the distances of any point *M* from each side of the triangle will represent the percentage of the vote of the corresponding party (or coalition). By definition (if we ignore other parties) these percentages sum to 100 per cent, so if the altitude of the triangle is 100, there is a perfect correspondence between the percentage of the vote of a party and the distance from the corresponding side of the triangle. Figure 1 represents the electoral outcome in a constituency where the Right coalition received 40 per cent of the vote, the Socialists 35 per cent and the Communists the remaining 25 per cent. Once the mechanics of this particular spatial representation are understood, it can provide interesting intuitions. One additional reason for the reader to become familiar with this particular representation of outcomes is that, as will be argued later, the distribution of constituencies on this outcome space accounts for the variations in the cohesion of coalitions.

Figure 2 presents the same outcome space, but with some additional significant lines. *C'*, *S'*, and *R'* are the midpoints of the sides representing the Communists, the Socialists, and the Right respectively. *C'S'* represents all the possible ties between coalitions. Indeed, at any point of *C'S'* the Right receives 50 per cent of the vote; the two parties of the Left, therefore, receive the remaining 50 per

<sup>8</sup> Figure 1 focuses on the internal divisions of the Left. If one wanted to examine the Right, then the dual triangular competition (between the Left, the Gaullists and the Giscardians) would be relevant. Generally, the appropriate space to represent electoral outcomes would be an *n*-dimensional Euclidian space (where *n* is the number of parties) and the corresponding *n*-1 dimensional simplex. The triangle of Figure 1 is in fact a two-dimensional simplex, or a barycentric system of coordinates.

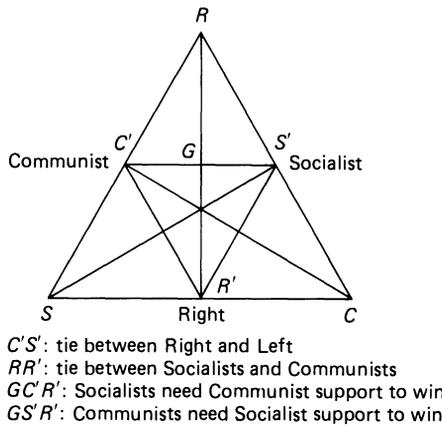


Fig. 2. Ties within and between coalitions

cent. The segment  $GC'$  represents all the cases where the following two conditions hold: (1) the Socialists dominate the Left, and (2) the two coalitions tie. The segment  $GS'$  represents the opposite case of a Communist-dominated Left. The vertical line  $RR'$  represents the ties within the Left. Along this line, the Communists and the Socialists get the same percentage of votes. However, in the upper part of the segment ( $GR$ ), the Left coalition is defeated, while in the lower part ( $GR'$ ) the Left wins the seat.

The area  $C'GRS$  represents all electoral outcomes where the Left wins and the Socialists are the stronger partner of the coalition. The area  $S'GR'C$  represents the case of a Communist-dominated and victorious Left. Within these areas, one has to distinguish between two cases: Case A, where one of the two coalition partners receives an absolute majority (triangles  $SC'R'$  and  $CS'R'$ ) and Case B, where in order to win in the second round, one of the two partners needs the support of the other (triangle  $C'R'G$  for the case of the Socialists and  $S'R'G$  for the case of Communists). Clearly, in such a situation we may reasonably expect the weaker partner to possess considerable blackmail potential.

With respect to electoral outcomes, one can distinguish two sensitive zones: the vertical zone around the segment  $RR'$ , and the horizontal zone around  $C'S'$  (see Figure 3). Electoral outcomes inside the vertical zone are uncertain about which of the two partners will represent the Left in the second round. One might expect that in this area the competitive aspect of party politics would win over the co-operative one. Note also that the nature of the competition is very different if the Left is expected to win a seat (lower part) or to lose one (upper part). In the former case, a seat is at stake, while in the latter case, only an honorary title is at stake.

Electoral outcomes anticipated to be inside the horizontal zone of Figure 3 are uncertain as to which coalition will win. The co-operative aspect of intra-coalition politics is therefore likely to dominate.

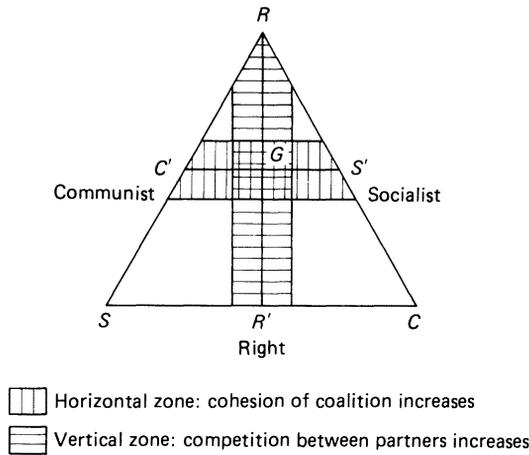


Fig. 3. Areas where co-operation or competition between partners increases

In summary, co-operation is likely when a seat is at stake (horizontal zone), while competition is likely when the two partners are almost equivalent in size (vertical zone). However, these geometrically-generated political intuitions are incomplete in several ways. Firstly, the two zones are not mutually exclusive; our intuitions will therefore be in conflict at the intersection of the two zones (the area around *G*) where each partner of the Left has approximately 25 per cent of the vote. Secondly, the two zones are not collectively exhaustive of the outcome space; thus, for points outside the zones we have no predictions at all. Thirdly, the two zones are not defined in any theoretical or precise way; it is therefore difficult to say whether a point belongs to each one of them or not. Can we then deal with these circumstances within the same framework? It is to this question that we now turn.

## II. THEORY OF NESTED GAMES

Let us now have a closer look at the game between the two partners of a coalition. Assume that each party has two alternative strategies: to co-operate with its partner (*C*) or to defect (*D*). By 'co-operation' I mean the promotion of the coalition's interests, and by defection the promotion of partisan interests and open criticism of the partner. Clearly, in the real world coalition and partisan interests need not necessarily be in conflict, nor are parties restricted to two alternative strategies. For example, one can promote partisan interests without explicitly criticizing the coalition partner, or by attacking the partner directly or indirectly. These assumptions will be relaxed shortly, and replaced with probabilistic statements. For the time being, however, let us examine the outcomes of this two-player game and try to imagine the payoffs for the two players.

A party (player) benefits most when it follows a partisan line, while its partner

promotes the interests of the coalition; in terms of strategies, when it uses  $D$ , while its partner uses  $C$ . This most preferred outcome for player  $i$  is called  $T_i$  (for temptation). The worst possible outcome is the converse situation: when a party carries the weight of the coalition, while the partner promotes its own interests. This is the intersection of strategy  $C$  with  $D$  of the opponent. This least preferred outcome is called  $S_i$  (for sucker).

The other two possible outcomes are mutual co-operation with payoffs  $R_i$  (for reward), and mutual defection with payoffs  $P_i$  (for penalty) for player  $i$ . We know that both these payoffs lie in the  $[S_i, T_i]$  interval, but we do not know which of the two outcomes is preferred by each player. Disregarding ties, two orderings are possible:

$$T_i > P_i > R_i > S_i, \quad (1)$$

$$\text{and } T_i > R_i > P_i > S_i. \quad (2)$$

If (1) describes the preferences of parties, then the game between parties is known as Deadlock, and parties would never form coalitions, because when a party defects, it gets either the best, or the second-best outcome. If co-operation is to occur, the order described in (1) cannot hold.

If (2) holds, then the game between the parties is a Prisoners' Dilemma game. Each player is better off using a partisan strategy (no matter what the other party does), but if they both pursue this strategy, they find themselves worse off than if they had promoted the coalition.

Two more orderings of payoffs are possible and theoretically interesting:

$$T_i > R_i > S_i > P_i, \quad (3)$$

$$\text{and } R_i > T_i > P_i > S_i. \quad (4)$$

If (3) holds, the game between the two coalition partners is known as Chicken where the worst possible outcome for each partner is mutual defection. If (4) holds, the game is known as an Assurance Game where the best possible outcome is produced by mutual co-operation.

Table 1 represents the game between partners at the *national* level, which is most likely to be a Prisoners' Dilemma game.<sup>9</sup> But this is not the only game in town. In fact, it is subsumed in a competitive game between coalitions. The parliamentary seats accrue to the stronger member of the winning coalition. The incentives for co-operation or defection are therefore, modified by the electoral game at the *constituency* level. What are the mechanics of these nested games? To answer this question we shall proceed as follows: (i) a new payoff matrix will be constructed, in order to take into account the utility of events at the constituency level (like winning a seat or helping your partner win a seat); (ii) the impact of the new payoff matrix on the likelihood of co-operation will be assessed.

<sup>9</sup> Arguments can be made that (3) or (4) hold and that, therefore, the game is Chicken or Assurance. These modifications of the payoff matrix, however, while important by themselves, will not influence the subsequent results of this article (see G. Tsebelis, 'An Algorithm for Generating Cooperation in a Prisoners' Dilemma Game', Duke University Program in International Political Economy, Working Paper no. 7, 1986).

TABLE 1 Payoffs of the Game Between Two Coalition Partners

|              | C(operate) | D(effect)  |
|--------------|------------|------------|
| C(o-operate) | $R_1, R_2$ | $S_1, T_2$ |
| D(effect)    | $T_1, S_2$ | $P_1, P_2$ |

$T_i > P_i > R_i > S_i$ : Deadlock  
 $T_i > R_i > P_i > S_i$ : Prisoners' Dilemma  
 $R_i > T_i > P_i > S_i$ : Assurance  
 $T_i > R_i > S_i > P_i$ : Chicken

(i) *The New Payoff Matrix*

This matrix will be constructed by adding to the payoffs of the original matrix of the game at the national level (Table 1) the *expected* payoffs from the game at the constituency level. In order to calculate these expected payoffs, we have to define the utilities and the probabilities of different events at the constituency level.

Two probability distributions have to be defined over the space of electoral outcomes (the triangle in Figure 3). The probabilities  $p_v$  ( $v$  for victory) and  $p_{prox}$  (*prox* for proximity) are defined, respectively, as the probabilities that the anticipated outcome will be a tie between coalitions or a tie between partners. More precisely,  $p_v$  is an increasing function of the closeness of the outcome to a tie between coalitions ( $p_v$  is equal to 1 on the  $C'S'$  segment of Figure 3 and 0 on the segment  $SC$  and the point  $R$ ). In algebraic terms,

$$\partial p_v / \partial \text{victory} > 0. \tag{5}$$

Similarly  $p_{prox}$  is an increasing function of the closeness of the outcome to a tie between partners of the Left ( $p_{prox}$  is equal to 1 on the  $RR'$  segment of Figure 3 and 0 on the points  $C$  and  $S$ ). In algebraic terms,

$$\partial p_{prox} / \partial \text{proximity} > 0. \tag{6}$$

Call  $V_i$  the utility of a seat to the coalition for party  $i$ . This utility will differ according to whether the seat goes to party  $i$ , or to its partner. Call these two different possible values of  $V_i$ ,  $W_i$  (for Win) and  $A_i$  (for Ally winning) respectively. The values of  $W_i$  and  $A_i$  are an empirical matter. It seems reasonable, however, to assume that in all cases  $W_i > A_i$ , since it is better for a self-interested player, such as a party, to win a seat than to leave it for its partner. Moreover, the value of  $A_i$  may be negative; a party might prefer its partner to lose the seat. Local rivalries, or long-term considerations, might account for such payoffs.

The expected value of a seat can now be calculated as the product of its utility ( $V_i$ ) and the probability of winning it ( $p_v$ ). In the case of a disputed seat, the victory can be assured only if both parties co-operate. In the case of competition the stronger partner is likely to forgo the necessary transfer votes in the second

round and thus lose. This reasoning suggests that the utility of mutual co-operation at the local level is higher than at the national. More precisely, the expected utility of a seat has to be added to the utility of mutual co-operation. In algebraic terms,

$$R_i = R'_i + p_v V_i \quad (7)$$

where  $R_i$  is the new utility (at the local level),  $R'_i$  is the utility at the national level,  $p_v$  is defined by inequality 5 and  $V_i$  is either  $W_i$  or  $A_i$ .

The previous thoughts concern the dispute between coalitions for a parliamentary seat. What happens with the intra-coalitional dispute over who is to represent the coalition in the second round? Call  $U_i$  party  $i$ 's utility from representing the coalition in the second round. If defeat is anticipated, this representation will have purely symbolic meaning. Call  $REP_i$  the value of  $U_i$  in this case. Representation of the coalition may, however, be of paramount importance when a seat is at stake. Call  $SE_i$  the value of  $U_i$  in the case of anticipated victory.

The value of  $SE_i$  is always positive, and greater than  $REP_i$  because parties prefer to win seats. However, it is not clear, theoretically, whether the value of  $REP_i$  is positive or negative. Arguments can be made both ways. A party might prefer to represent the Left, despite the probability of defeat, because it thinks that this would improve its position *vis-à-vis* its partner, and the probability of winning the seat in the future, with a more favourable balance of forces between coalitions. However, the party might also think that representing the Left when it loses is a liability for the future.

The expected value of representation of a coalition can now be calculated as the product of its utility ( $U_i$ ) and its probability ( $p_{prox}$ ). This expected utility will modify the payoffs at the national level: it will increase the temptation to defect and decrease the sucker's payoff. Indeed, partners will have an additional incentive to be aggressive against each other if they can ensure themselves representation of the coalition, and (maybe) a seat down the road. Conversely being treated as a sucker will be more painful. In algebraic terms

$$T_i = T'_i + p_{prox} U_i \quad (8)$$

$$\text{and } S_i = S'_i - p_{prox} U_i \quad (9)$$

where  $T_i$  and  $S_i$  are the new utilities (at the local level),  $T'_i$  and  $S'_i$  are the utilities at the national level,  $p_{prox}$  is defined by inequality 6 and  $U_i$  is either  $REP_i$  or  $SE_i$ .

Table 2 represents the new payoff matrix (for the Nested Game). For reasons of simplification, only the payoffs of the row player are presented, and the subscript  $i$ , therefore, has been dropped.<sup>10</sup> The nature of the Nested Game represented by the new matrix is variable. For appropriate values of the different

<sup>10</sup> It is, however, useful to remember that all parameters are indexed by party and the value of an additional seat for Communists may be very different from that for Socialists. Consequently, all the comparative statements that follow concern the behaviour of the *same* party (under different expected outcomes) and not comparisons of different parties.

TABLE 2 General Payoff Matrix for One Coalition Partner (Row Player)

|              | C(o-operate)         | D(efect)             |
|--------------|----------------------|----------------------|
| C(o-operate) | $R = R' + Vp_v$      | $S = s' - Up_{prox}$ |
| D(efect)     | $T = T' + Up_{prox}$ | $P$                  |

Note: Payoffs are functions of the probability of a tie between coalitions ( $p_v$ ) or a tie between partners ( $p_{prox}$ ).

parameters it can become an Assurance game (in the area close to the segment  $C'S'$  of Figure 3 and for sufficiently high values of  $V$ ) or it can remain a Prisoners' Dilemma, or it can become a game of Chicken (in the area close to the segment  $RR'$  of Figure 3 and for negative values of  $U$ ).

(ii) *The Cohesion of the Coalitions*

It has been proved that in a Prisoners' Dilemma, a Chicken, or an Assurance game, the likelihood of Co-operation increases as the payoffs of Co-operation ( $R$  or  $S$ ) increase, and decreases as the payoffs of Defection ( $T$  or  $P$ ) increase.<sup>11</sup> Let us now examine the impact of variations of payoffs or distances from the lines  $RR'$  (tie between partners) and  $C'S'$  (tie between coalitions). We can distinguish the following cases:

1. *V is negative.* If  $V$  is negative, the value of winning an additional seat ( $W$ ) or the value of one's partner winning an additional seat ( $A$ ) is negative. Earlier we excluded the first but not the second possibility. If  $A$  is negative, the closer an ally is to winning a seat, the higher the probability of winning (inequality 5), and the more the reward from mutual co-operation ( $R$  in Table 2) decreases. However, the more  $R$  decreases, the more Defect becomes an attractive strategy, because its dominance becomes more pronounced. So, if  $A$  is negative, that is, if for one party the value of its partner winning a seat is negative, then the closer the coalition is to disputing the seat the more likely the party is to undermine its partner.
2. *V is positive.* Similar reasoning for  $V$  when positive indicates that the cohesion of the coalition increases when victory is near. In particular, since for each party  $W > A$ , the dominant partner of a coalition will be more sensitive to

<sup>11</sup> R. Axelrod, *The Evolution of Cooperation* (New York: Basic Books, 1984) pp. 202–3, and J. Maynard Smith, *Evolution and the Theory of Games* (Cambridge: Cambridge University Press, 1982), pp. 207–8, prove such propositions concerning the Prisoners' Dilemma game. Tsebelis, 'An Algorithm for Generating Cooperation in a Prisoners' Dilemma Game', proves the proposition for all three games. The proof presupposes the possibility of correlated or contingent strategies, which is the case here since the two partners can adjust their strategies to each other over time.

the proximity to victory. We can summarize these results in the following proposition:

*Proposition 1.* The cohesion of a coalition increases the closer the anticipated outcome is to a tie between coalitions when  $V$  is positive. It decreases when  $V$  is negative.

3.  $U$  is positive. When  $U$  is positive the value of winning a seat ( $SE$ ), or simply representing the Left ( $REP$ ) is positive. We have provided arguments why this is always the case for  $SE$  and true, most of the time, for  $REP$ . It is always true that the closer the anticipated result is to a tie between partners, the higher the probability of a tie (inequality 6), so, as Table 2 indicates, if  $U$  is positive the value of  $T$  (the temptation to Defect) increases, and the value of  $S$  decreases (fear of being cheated increases). This means that the dominance of Defection becomes more pronounced and, therefore, the choice of strategy  $D$  is more likely.

4.  $U$  is negative. Similar reasoning for  $U$  when negative indicates that the cohesion of the coalition increases when the two partners are approximately equal. We have argued that the condition for this event to occur is if a party does not want to represent the Left when it is about to lose ( $REP < 0$ ). We can summarize these results in the following proposition:

*Proposition 2.* The cohesion of a coalition decreases the closer the anticipated outcome is to a tie between partners when  $U$  is positive. It increases when  $U$  is negative.

Taken together, Propositions 1 and 2 indicate (1) that most of the time (except when the value of the victory of a seat by the ally is negative), the cohesion of a coalition increases when the anticipated outcome is close to a tie *between coalitions*; and (2) that most of the time (except when the value of representing the coalition when it is about to lose is negative), the cohesion of a coalition decreases when the anticipated outcome is close to a tie *between partners within the coalition*.

The most simple algebraic representation of these two propositions is the following equation:<sup>12</sup>

$$cohesion = c + (aV)victory - (bU)proximity \quad (10)$$

where *cohesion* stands for the cohesion of the coalition,  $c$  is a constant, *victory* stands for the closeness of the anticipated outcome to a tie between coalitions, and *proximity* stands for the closeness of the anticipated outcome to a tie

<sup>12</sup> Equation 5 can be formally derived as a Taylor series first-order approximation of the likelihood of mutual co-operation (that is cohesion), if one uses the chain rule, since the signs of the required first derivatives are given in the text. This remark indicates that one could increase the precision of approximation, and use non-linear estimation routines for the empirical part. However, since this approach is a first approximation, I shall not follow this direction here.

between partners. The Appendix gives the exact algebraic definition of these variables. The coefficients  $a$  and  $b$  are positive as Propositions 1 and 2 indicate.

A comparison of these conclusions with the intuitions proposed at the end of the previous section indicates the following:

1. The epistemological status of propositions 1 and 2 and of Equation 10 is different from the conclusions of the previous section. Similar propositions were *conjectured* in the end of Section 1. They are *derived* here from the Nested Games approach. The emphasis on this difference is not a statement of epistemological preference. Deriving propositions instead of positing them has the advantages of generality, better approximation, and specification of the conditions under which the propositions hold. Each one of these advantages will be treated as a separate point.
2. Equation 10 does not concern French politics alone. It can cover cases of coalition cohesion such as those mentioned in the introduction, provided we can measure the independent variables. This point is developed further in the last section.
3. Equation 10 covers the entire outcome space. We can therefore generate and test predictions about the intersection of the vertical and horizontal zones, as well as the areas not covered by the zones. In fact, the crude dichotomies generated by the two zones are now replaced by continua of outcomes. Moreover, calculus techniques permit us to replace the linear formula of Equation 10 with more precise approximations.
4. Although our conjectures were largely correct, they were misleading on two points. It is not always the case that cohesion increases when the two coalitions are of equal strength. The condition for such behaviour is that the weak party of the coalition wants the partner to win the seat. This is neither a trivial assumption nor, as we shall see, factually correct. Moreover, it is not always correct that cohesion decreases when the two partners are of equal strength. The condition for such behaviour is that both parties want to represent the coalition even when it is about to lose. This, again, is not a trivial assumption, but it turns out to be empirically correct.

### III. TESTING FOR COHESION

In order to test Equation 10, the results of the March 1978 elections for the French National Assembly will be used. The reasons for choice of year will become clear from a schematic reminder of the history of the French Fifth Republic.

From 1958 to 1974 the Gaullists dominated the Right and the Right was in charge of government. From 1974 to 1981, under the Presidency of Giscard d'Estaing, a new balance of forces was created inside the Right and the Gaullist dominance was challenged. In fact, the UDF was created one month before the elections of 1978, in order to challenge the Gaullist dominance more effectively at the electoral level.

This same period was characterized by a change in the balance of forces within the Left, when the new Socialist Party created in Epinay (1971) became the most popular party of France. In fact, 1978 was the first national election in which the Socialist party became the most popular party in France and the dominant force inside the Left. Finally, although the Left came close to winning in 1978, it was only from 1981 to 1986 that it held power.

From this brief overview it becomes clear that 1978 presents two very important characteristics for our study:

1. *The two coalitions were competitive.* In 1978 the two coalitions were of almost equal strength; the vote for the Left in the first round was 49.5 per cent, compared with 46.3 per cent in 1973, and 55.8 per cent in 1981.<sup>13</sup> Since the two coalitions were of approximately equal size, one would expect, given the theory just developed, maximum cohesion within the coalitions.
2. *The two coalitions are not cohesive.* An important shift in the internal balance of power took place within both the Left and Right. It was in 1978 that the two political families of the Right competed widely in the first round for the first time and also the first time that the Socialist party demonstrated its dominance within the Left.

For these two reasons, both centripetal and centrifugal forces were more pronounced during the 1978 election. Thus this particular election is especially appropriate as a test case for a theory of coalition cohesion: the election results of the 474 constituencies of metropolitan France in 1978 were therefore used as the data base.<sup>14</sup>

Before proceeding to empirical tests, the variables of the theory have to be operationalized in terms of the data. Two remarks are in order here. Firstly, how do we operationalize the variable 'anticipated outcomes'? The results of the first round will be used as a proxy for this variable. This choice assumes that the parties have a fairly accurate perception of the electoral outcome, a legitimate assumption given the feedback from the electoral campaign that parties receive both from their activists and the polls (which in France can be conducted but not published during the last week of the campaign). Once the anticipated result is equated with the actual result in the first round, the operationalization of the positioning variables *victory* and *proximity* is straightforward.

Secondly, how do we operationalize the variable *cohesion*? I have already argued that if a party does not co-operate with its partner, but instead aggressively denounces its partner's policy positions, then even if this position is modified the day after the first round, its supporters will find it difficult to transfer their votes to the party considered to be their enemy only a few days previously. Competition, therefore, results in the inefficient transfer of votes between the two partners in the second round. I will use *the difference between the vote for a*

<sup>13</sup> See V. Wright, *The Government and Politics of France* (New York: Holmes and Meier, 1983), p. 190.

<sup>14</sup> Overseas Departments (DOM) and Territories (TOM) are omitted.

*coalition in the second round and the sum of the votes for the coalition partners in the first round* as the best indicator of the *cohesion* of the coalition.<sup>15</sup>

In this discussion, the interaction between party leadership, local party officials and voters is ignored. In fact, the empirical outcomes may be attributed to strategies elaborated at the national or the local level, strategies which were followed precisely by the voters. Alternatively, they can be considered the result of independent decisions made by the voters themselves in the specific political environment. This does not preclude strategic voting (that is, voting contrary to one's nominal preferences) since, as we shall see, parties (or voters) sometimes do not transfer *all* the votes to their partner (defective transfer of votes). More realistically, one could argue that different parties have different levels of control over their voters and that this control increases *ceteris paribus* from Right to Left and from moderate to extreme parties. However, this part of the interaction between voters and parties is deliberately ignored. In what follows it will not matter whether vote transfers originate from party headquarters, from local candidates or from the voters themselves. The reasons for this choice are the obvious simplifying consequences for modelling.

One more point needs to be clarified. One might think that the maximum cohesion of a coalition occurs when the votes in the second round are the same as the sum of the partners' votes in the first round. In this case, the partner delivers to the coalition as many votes as it had in the first round. What happens, however, if the coalition gets more votes in the second round than it got in the first? This happens quite frequently in fact given that turnout increases between the two rounds by approximately two percentage points.<sup>16</sup> But if turnout rises in the second round, this may be due to general factors (like the perceived closeness or political significance of the result) rather than specifically local conditions. Thus, cohesion should account for the variance of vote transfers once this general increase in turnout in the second round is taken into account. Therefore, the consistency where the coalition gains the highest percentage point increase in votes is the most cohesive. Note that this conceptualization of the problem leads to more conservative tests because transfer of all the first round votes to the representative of a coalition is no longer considered all a party can do for its partner.

This conceptualization of cohesion leads to the exclusion of several constituencies from the data analysis. Firstly, it excludes all constituencies where the winner was decided in the first round. Secondly, it excludes constituencies with a triangular competition (two candidates of the same coalition running in the

<sup>15</sup> This operationalization presents a problem because it ignores vote transfers that do not appear on the aggregate level. For example, if the Socialist represents the Left in the second round, one cannot discriminate between the following cases: (1) all Communists transfer their votes and (2) some Communists abstain, while some abstainers in the first round vote Socialist (or vote for the Right, while some votes from the Right are transferred to the Socialist). Unfortunately, there is no way to correct for such ecological fallacies with aggregate data. However, because of the polarized electoral climate, I do not think that the 'invisibility' of the aggregate transfers is very significant.

<sup>16</sup> See N. Denis, 'Les Elections Legislatives de Mars 1978 en Metropole', *Revue Française de Sciences Politiques*, 28 (1978), 977-1005.

second round). In this case, it would be inappropriate to sum the votes of candidates who run against each other. Thirdly, it excludes constituencies where only one candidate is represented in the second round. In this case, one of the two coalitions could not present a candidate in the second round (owing to the threshold imposed by the electoral law) or would not (because it understood that there was no chance of winning); there is, therefore, no way to measure its cohesion. Of the 474 constituencies, seventy (15 per cent) fall into one of these three categories. The first is by far the most frequent: it includes forty-four constituencies where there was a unique candidate of the Right who won in the first round. Such cases are, in fact, cases of maximum cohesion of the Right; cases where one of the two partners puts the interest of the coalition over its own. Such cases should therefore be included in the accounts of the Right and will be assigned the maximum cohesion (which turns out to be 0.091). On the other hand, they cannot be included in the accounts of the Left because no indication of the cohesion of the Left is given. Thus, our empirical investigation will concern 448 constituencies for the Right, and only 404 constituencies for the Left.

For the convenience of readers, the equation to be tested (Equation 10 is repeated here.

$$\text{cohesion} = c + (aV)\text{victory} - (bU)\text{proximity} \quad (10)$$

Readers are also reminded that this equation was derived under the simplifying assumption that the vote was divided into three parts: the two partners of one coalition and the opposite (unified) coalition. This simplification was necessary in order to introduce a two dimensional outcome space (the equilateral triangle), instead of an  $(n - 1)$  dimensional simplex. It is time now to relax this simplifying assumption and take the other parties into consideration. Equation 10 indicates that the smaller the difference in size between the two partners of a coalition the weaker the cohesion of the coalition (if  $U$  positive). In other words, the stronger the second partner of a coalition, the less cohesive the coalition. Similar reasoning in a more complicated multidimensional space suggests that other important allies reduce the cohesion of the coalition, in the same manner as one ally does. This reasoning indicates that an additional term expressing the strength of other allies has to be introduced into Equation 10 for reasons of theoretical consistency.

$$\text{cohesion} = c + (aV)\text{victory} - (bU)\text{proximity} \div (d)\text{others}. \quad (11)$$

Examination of Equation 11 indicates that it is the same as Equation 10, with one additional term. This term is introduced to control for the importance of other allies in the coalition.

One improvement on these results can be considered: the value of an additional seat is not the same regardless of the identity of the opponent. For example, in France, where the Communist party was excluded from the political game for a long period of time, and the Right-wing parties were deliberately using anti-Communist propaganda to undermine the Socialists, one would expect that the transfer of votes inside the Right would be much easier and more

TABLE 3 *Cohesion of French Coalitions as a Function of Their Probability of Winning, the Distance Between Partners, the Existence of Other Allies, and the Identity of the Adversary*

| Coalition | Repr | N   | R <sup>2</sup> | Cons            | Victory       | Prox            | Adv.            | Others           |
|-----------|------|-----|----------------|-----------------|---------------|-----------------|-----------------|------------------|
| Left      | PC   | 141 | 0.56           | -0.36<br>(-10)  | 0.43<br>(10)  | -0.06<br>(-2.2) | 0.002<br>(0.5)  | -0.36<br>(-5.8)  |
| Left      | PS   | 263 | 0.09           | -0.07<br>(-1.9) | 0.06<br>(2.2) | 0.037<br>(1.55) | -0.00<br>(-0.4) | -0.25<br>(-4.5)  |
| Right     | UDF  | 205 | 0.44           | 0.05<br>(1.1)   | 0.09<br>(1.9) | -0.10<br>(-6.7) | -0.02<br>(-4.7) | -0.35<br>(-8.1)  |
| Right     | RPR  | 243 | 0.53           | 0.07<br>(2.0)   | 0.05<br>(1.4) | -0.08<br>(-6.8) | -0.02<br>(-6.3) | -0.44<br>(-11.6) |

Note: Adv. is considered to be RPR for the Left, and PS for the Right.

effective against a Communist than a Socialist opponent. Similar results could be expected for the cohesion of the Left when its Right-wing opponent was the RPR under Jacques Chirac, which was considered very conservative. In fact Jaffre reports survey evidence which corroborates the second conjecture but not the first.<sup>17</sup>

Table 3 indicates the outcome of the estimation of Equation 11<sup>18</sup> using OLS procedures.<sup>19</sup> The first row of the table represents the results of the estimation of Equation 11 in the 141 cases where the PC was representing the Left (and the PS had to transfer its votes in the second round). The R<sup>2</sup> of the estimation and the values of coefficients (top) and *t*-statistics (in parenthesis) are presented.

Out of twelve estimated coefficients (for *victory*, *proximity* and *others* for each of the four political families), one has a wrong sign, two are not significant at the 0.05 level (*t* < 2) and the remaining nine are significant at practically any confidence level. The fit of the model is quite satisfactory in three out of the four cases (R<sup>2</sup> from 0.44 to 0.56). The only exception is the case of the vote transfers of the Communist party, which produces both a very poor fit and the only coefficient with a wrong sign. Contrary to Jaffre, the results indicate that the opponent does not make any difference for the cohesion of the Left, but it does for the Right.

There is one remaining problem: the non-satisfactory fit of the model for the Communist voters. Why do Communist voters behave in a different way from the supporters of other parties? To the student of French political life this finding should not come as a surprise. The Communist party began a vigorous campaign against the Socialists in the summer of 1977 when the negotiations for the

<sup>17</sup> See J. Jaffre, 'The French Electorate in March 1978' in H. R. Penniman, ed., *The French National Assembly Elections of 1978* (Washington, D.C.: American Enterprise Institute, 1980).

<sup>18</sup> With the additional dummy variable for the identity of the adversary.

<sup>19</sup> It might be argued that OLS is not appropriate in this case, since the residuals may be correlated. However, the use of OLS will not bias the estimates, but will decrease their efficiency, making hypothesis-testing more conservative. Thus, if OLS coefficients turn out to be statistically significant, this holds *a fortiori* for the GLS coefficients.

Common Program of the Left came to an impasse. During the entire electoral campaign, the Communist party refused to commit itself to the 'discipline of the Left', because it considered the discussions of vote transfers premature and a distraction from the major issue, which was the negotiations for the Common Program.<sup>20</sup> So the electoral strategy of the PCF remained the big unknown of the election until literally the last moment. It was *after* the first round (and only one week before the second), on 13 March, that the three parties of the Left met and signed a vague political agreement which included vote transfers. This agreement operated only for one week, and it was denounced by all partners after the second round.

In the absence of a clear strategy for PCF voters, it is not surprising that the vote transfers look like random noise and the fit of the model is poor. This is, however, part of the explanation, and not the most interesting one.

#### IV. VISIBLE AND INVISIBLE POLITICS

Another way to explain the electoral tactics of the Communist party is to divide the electoral outcomes into two subsets: when the total of Left votes in the first round is over 50 per cent and when it is under 50 per cent. In the first case, the public's attention is concentrated on the weak partner of the winning coalition while, in the second, it is not. The reason is that the weak partner can determine the electoral outcome if the coalition seems to be winning in the first round. A bad transfer of votes is enough to undermine the strong partner and assure the defeat of the coalition. On the other hand, if the total votes of a coalition places it behind the rival coalition in the first round, the excuse can be made that the coalition would lose anyhow, and the attention of the public is focused on the vote transfers of the weak partner of the opponent.

If the previous reasoning is correct, one would expect supporters of the weak partner of a coalition to run to the rescue of their partner (as Section II indicates) only when the combined votes of the coalition place it ahead in the first round, and their game is visible. In this case they attract the attention of the public, and, therefore, expect that they will be sanctioned for failing to support their partner. So 'fair play' will be expected only when the coalition totals more than 50 per cent of the vote in the first round. Let us examine this conjecture with respect to the Communists. Table 4 indicates that the conjecture is correct. The  $R^2$  of the model jumps from 0.09 to 0.58, and the coefficients are highly significant with the correct sign.

Were the Communists excellent tacticians after all? Did they behave as they should whenever they were visible? The answer seems to be positive if one considers two pieces of evidence. The first is the survey reported by Jaffre,<sup>21</sup> where the Communists appear to vote massively for the Socialist in the second round

<sup>20</sup> See G. Lavau and J. Mossuz-Lavau, 'The Union of the Left's Defeat: Suicide or Congenital Weakness?' in Penniman, ed., *The French National Assembly Elections of 1978*, p. 138.

<sup>21</sup> See Jaffre, 'The French Electorate in March 1978', p. 74.

TABLE 4 Cohesion of French Coalitions When Each Coalition Comes First in the First Round

| Coalition | Repr | N   | R <sup>2</sup> | Cons            | Victory       | Prox            | Adv.             | Others          |
|-----------|------|-----|----------------|-----------------|---------------|-----------------|------------------|-----------------|
| Left      | PC   | 98  | 0.74           | -0.34<br>(-12)  | 0.47<br>(14)  | -0.13<br>(-6.2) | 0.003<br>(1.2)   | -0.25<br>(-5.4) |
| Left      | PS   | 109 | 0.58           | -0.26<br>(-8.2) | 0.31<br>(11)  | -0.04<br>(-1.8) | 0.00<br>(0.17)   | -0.24<br>(-4.5) |
| Right     | UDF  | 118 | 0.61           | -0.04<br>(-0.7) | 0.19<br>(3.4) | -0.13<br>(-7.7) | -0.00<br>(-0.82) | -0.29<br>(-6.2) |
| Right     | RPR  | 123 | 0.70           | -0.13<br>(-2.7) | 0.28<br>(5.6) | -0.12<br>(-8.2) | -0.00<br>(-1.0)  | -0.35<br>(-6.9) |

(while the Socialists do not reciprocate); the other is the analysis of vote transfers done in a special edition of *Le Monde*. The newspaper reports two different patterns of vote transfer inside the Left and provides tables which show that Communist votes were transferred to the Socialist candidate but not vice versa. Spatial voting explanations can account for such a difference: the Communist voters have no choice but to vote for the Socialist candidate in the second round whereas the Socialists can choose the Right instead of the Communists. However, it is interesting to note that, as Table 4 indicates, supporters of the other parties adopted exactly the same strategy as the Communists. In fact, the fit of the model and the significance of the coefficients increases substantially when in each case the only constituencies to be considered are the ones where each coalition was ahead in the first round.

What happens when a coalition appears to lose in the first round? Table 5 addresses this question. The fit of the model drops sharply and the significance of the coefficients decreases. However, the competitive aspect of coalition partners remains: the closer they are to each other, the more votes there are missing in the second round. On the other hand, the closer the coalitions are to

TABLE 5 Cohesion of French Coalitions When Each Coalition Comes Second in the First Round

| Coalition | Repr | N   | R <sup>2</sup> | Cons          | Victory         | Prox             | Adv.             | Others          |
|-----------|------|-----|----------------|---------------|-----------------|------------------|------------------|-----------------|
| Left      | PC   | 43  | 0.22           | 0.22<br>(1.7) | -0.16<br>(-1.5) | -0.06<br>(-0.74) | -0.00<br>(-0.41) | -0.46<br>(-2.3) |
| Left      | PS   | 154 | 0.08           | 0.05<br>(1.4) | -0.04<br>(-1.4) | 0.01<br>(0.58)   | 0.00<br>(0.42)   | -0.16<br>(-2.8) |
| Right     | UDF  | 87  | 0.24           | 0.11<br>(1.2) | 0.01<br>(0.19)  | -0.08<br>(-2.3)  | -0.03<br>(-3.8)  | -0.29<br>(-2.5) |
| Right     | RPR  | 120 | 0.46           | 0.23<br>(5.9) | -0.13<br>(-3.8) | -0.07<br>(-4.5)  | -0.01<br>(-5.2)  | -0.24<br>(-5.2) |

victory, the more partners undermine each other. In view of the theory of Nested Games developed in Section II of this paper, the interpretation of this result is straightforward: each party attributes negative utility to its partner winning an additional seat. So, whenever there is an official excuse, or whenever the attention of the public is not concentrated on its behaviour, each party undermines its own partner.

Thus, the difference in behaviour that arises from winning as distinct from losing in the first round can be attributed to the difference in the visibility between the two cases. The pattern of helping the partner when needed if politics are visible, while undermining the partner when invisible, is reflected in the behaviour of the UDF towards the Gaullists, and to both partners of the Left, but it is not observable in the behaviour of the Gaullists. These results indicate that the confusion of the political line in the leadership of the Communist party did not produce outcomes different from other parties. The strategies and behaviour are fundamentally the same. It is just the degree of precision which varies.

Close examination of Table 5 indicates readily available measures to compare this similar behaviour of parties. The coefficients of *victory* indicate the increase (or decrease) in cohesion caused by approaching the 50–50 split between coalitions in the first round. The coefficients of *proximity* indicate the increase (or decrease) in cohesion caused by an equal split of the vote between partners in the first round. We can see from Table 5 that in visible politics, cohesion is more sensitive to variations of victory than to variations of proximity. Moreover, the ratio of the coefficients (victory/proximity) is a rate of substitution, that is a measure of how many points of increasing *proximity* will produce the same impact on cohesion as a one point decrease of *victory*. This ratio is 3.6 (= 47/13) for the Socialist party, 7.8 (= 31/4) for the Communist party, 1.5 (= 19/13) for the RPR, and 2.3 (= 28/12) for the UDF. So, although the behaviour of all parties is regulated by the same rules, in general the Right is more competitive than the Left (smaller coefficients), and the Communist party is by far more co-operative than the Socialists. Another indicator of the cohesion of coalitions is the estimated intercepts of cohesion, presented in Table 4. The reader can verify that the Right here is more cohesive (–0.04 and –0.13 respectively) than the Left (–0.26 and –0.34), and the Communists (–0.26) more co-operative than the Socialists (–0.34).

A similar analysis could be made with the coefficients in Table 5. It should be kept in mind, however, that the coefficients are not statistically significant, and the results are less reliable. Besides, in this case there is no trade-off effect because the coefficients are all negative, and therefore the comparison is not interesting.

Because of this difference between visible and invisible politics in each constituency, the dominant party of the coalition which is ahead in the first round, can expect the support of its partner, but the dominant party of the losing coalition will find that some of the votes of its partner are missing. As a result, the winner of the first round can almost be assured of success in the second round. Indeed, out of the 404 constituencies there were only thirty-five where the Left

came first in the first round but lost (8.5 per cent) and eighteen cases where the same happened to the Right (4.2 per cent).

One final observation can be made from a comparison of Tables 4 and 5: the competitive behaviour inside the Right is reduced in front of a Communist opponent, regardless of whether politics is visible or invisible.

To summarize, there are two major differences between visible and invisible politics. Firstly, visible politics has much clearer rules than invisible politics. Secondly, while the competitive aspect of coalitions is always present, and while the closer the two partners are in the first round, the more votes will be missing in the second, the co-operative aspect is doubtful: parties attribute positive value to a seat for their partner only in visible politics. In invisible politics, there is only competition.

## V. CONCLUSIONS AND DISCUSSION

Several of the results of this article should be considered in a broader framework. The discussion will distinguish three different subjects: (1) conclusions about France; (2) thoughts about the theory of Nested Games; (3) speculations about the distinction between visible and invisible politics.

### *France*

In a recent article, Rochon and Pierce examine the cohesion of French coalitions and conclude that: 'The general rule for both sympathy and cooperative behaviour between the two parties will be that the coalition is most harmonious when it is least needed, that is when the success of one of the two parties in capturing a legislative seat is not at stake'.<sup>22</sup> The data that Rochon and Pierce use are completely different from the data presented in this article and their analysis captures dynamic rather than cross-sectional characteristics. To the extent that they generalize their results, however, it seems that they are correct only part of the time. Contrary to their assertion, it is precisely when a coalition is about to win (visible politics), that votes are transferred when they are needed, that is, when a close outcome is expected. On the other hand, their conclusion holds for invisible politics. In that case the more the support of a partner is needed, the less it is offered.<sup>23</sup>

The conventional wisdom that the Communists transferred their votes while the Socialists did not can be explained to a certain extent, but can also be challenged. As we saw in Section IV, there is no fundamental difference between the behaviour of Communists and that of other parties. The same equation can account for the behaviour of all parties. What changes is the size, not the sign, of coefficients. Both Jaffre and *Le Monde* find the Communist behaviour different

<sup>22</sup> See T. R. Rochon and R. Pierce, 'Coalitions as Rivalries: French Socialists and Communists, 1967-1978', *Comparative Politics*, 17 (1985), 437-51, p. 493.

<sup>23</sup> For an extended comparison between their results and the results reported in this article see G. Tsebelis, 'When Do Allies Become Rivals?' *Comparative Politics* (forthcoming).

because they are interested in the description, and not in the explanation, of vote transfers. The appropriate explanatory variables are therefore absent from their analysis. How can the previous analysis explain their findings?

Spatial explanations have been offered to account for the difference in the pattern of vote transfers inside the Left. Indeed, we saw that, overall, the Communists are more faithful partners than the Socialists. However, this policy explanation is not sufficient. An additional reason for defective vote transfers, according to the theory of Nested Games, is intra-coalition competition. This competition is the result of closeness in the scores of the two parties in the first round. If, therefore, the Socialists appear to be more competitive than the Communists, it must be that when the Left is led by a Communist at the constituency level, the Socialist is usually only slightly behind, whereas when the Socialist is ahead, the Communist is a long way behind.

Table 6 confirms this explanation. On the one hand, the first column of this table indicates that in constituencies where the Socialists lead the Left, the Communists remain some 10 percentage points behind, no matter how close the coalition is to victory at the constituency level. On the other hand, the second column demonstrates that in constituencies where the Communists lead, the closer the coalition is to a victory, the smaller the difference between the two parties in the first round.

The Left was close to victory in 1978 because of the rapid growth of the Socialist party. This rapid growth, however, had its negative effects for the cohesion of the Left. Political commentators at the time stressed the fact that it created reactions from part of the Communist leadership. This analysis shows that the rapid growth of the Socialists created an additional problem for the unity of the Left: the Socialists started making claims over constituencies which were traditionally represented by a Communist candidate. This dispute created tensions and resulted in defective vote transfers *from the Socialist party*.

Figure 4 gives a graphic representation of the differential distribution of the relative strength of the two parties of the Left. The constituencies of metropolitan France are plotted on the two dimensional simplex (triangle) of Section 1.

TABLE 6 *Proximity of the Two Partners of the Left When They Approach Victory*

|                | Socialist lead | Communist lead |
|----------------|----------------|----------------|
| General        | 0.908          | 0.916          |
| -              | (302)          | (146)          |
| victory > 0.95 | 0.909          | 0.938          |
| -              | (158)          | (85)           |
| victory > 0.97 | 0.907          | 0.943          |
| -              | (113)          | (53)           |
| victory > 0.99 | 0.910          | 0.959          |
| -              | (38)           | (11)           |

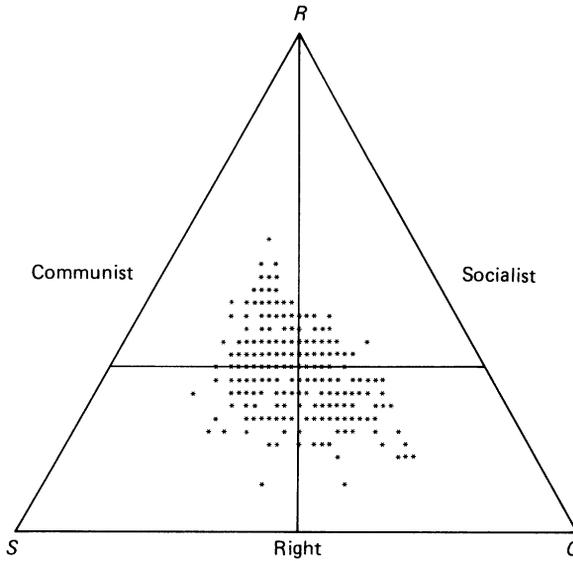


Fig. 4. Representation of first round electoral results (PS, PCF, Right) in barycentric coordinates

Figure 5 presents the differential distribution of constituencies with respect to the Right. Again, the different constituencies are plotted on a triangle, which this time represents UDF, RPR and the Left. The scale of Figure 5 is the same in order to facilitate visual comparisons with Figure 4. Note, by comparing the two triangles, the difference in the spatial distribution of the two coalitions. The

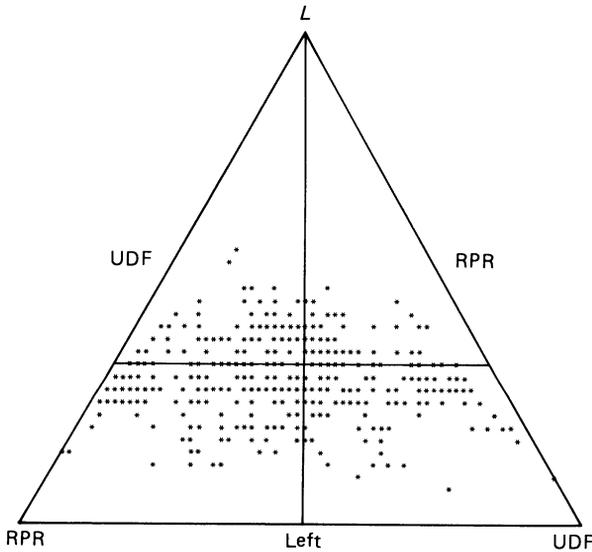


Fig. 5. Representation of first round electoral results (RPR, UDF, and Left) in barycentric coordinates

Right is expanding along and below the horizontal axis (visible politics), while the Left is concentrated around the origin and expands along the vertical axis. But, as we have said, whenever the distribution of election results is along and below the horizontal axis the coalition has the maximum cohesion, while whenever the distribution is along the vertical axis, competition increases.

The victory of the Right in 1978 can therefore be attributed to two factors: (1) an overall better quality of transfers; (2) a more favourable (asymmetric) distribution of strength between the partners which further improved the quality of transfers.

This last remark can be used to explain the evolution of strategies of different parties over time. Since only one election was considered in this paper, the political line of the parties was assumed to be stable, and was represented by the original payoff matrix (Table 1). A more sophisticated framework would be concerned with the impact of constituency politics on the political line of parties at the national level. It is reasonable to expect that if the election results are anticipated to be distributed along (and below) the horizontal axis, the national line will be more co-operative, whereas if the election results are expected to be distributed across the vertical axis, deviations towards more competitive politics are likely. Thus, plotting the distributions of election results over time on the triangle is a way of providing an explanation for the strategy of the parties at the national level.

#### *Nested Games.*

The introduction to this article mentions cases where actors are involved in several games, and the choice of strategies in one game has implications for the other games. Nested Games help us to examine situations in which the payoff matrix itself is a contextually dependent variable. The field of application of such an approach is limited only by the information about the distribution of the relative strength of actors or the different payoffs.

In the formal approach, the payoffs were considered to be dependent on only one distance: from either the horizontal or the vertical axis. Moreover, a first-order approximation was used to derive the formulas to be tested empirically. Both moves were simplifications; more realistic, sophisticated (and complicated) conclusions can be derived.

Finally, all the previous discussion assumed that the internal game was a Prisoners' Dilemma, Chicken or Assurance game, while the external game was competitive. There is no reason to restrict Nested Games to these situations. Any game could be used to develop the theory further.

#### *Visible and Invisible Politics*

This terminology is borrowed from Sartori<sup>24</sup> who argues that Duverger's law(s) do not operate at the party-system level, but only at the party level. The reason

<sup>24</sup> See G. Sartori, *Parties and Party Systems: A Framework for Analysis* (Cambridge: Cambridge University Press, 1976).

that Duverger's laws do not operate at the party-system level is that party strategies are part of visible politics, and therefore electoral considerations cannot be the exclusive basis for party choices. Inside a party, however, factions operate without any constraint (invisible politics) and, therefore, electoral considerations determine faction politics. There are several cases where we suspect that visible and invisible politics follow different rules. We know, for example, that secret diplomacy has different rules and different results from open diplomacy, but we do not know what the differences are because the former is secret. On the theoretical level, all the principal-agent literature in economics builds on this distinction and on the opportunities that a loose monitoring procedure provides for an agent.<sup>25</sup>

The principal-agent literature suggests that whenever a monitoring mechanism is installed, the behaviour of people is modified according to its effectiveness. No matter how self-evident this proposition seems to be, we have very few empirical examples. The reason is precisely the secrecy of invisible politics. This paper speculates that in visible politics people comply with the 'official' rules of the game, no matter what these rules are, while in invisible politics different rules apply. It also conjectures that the threshold point between visible and invisible politics is 50 per cent of the first round votes. We saw that in the case of French coalitions, visible politics means more intelligible behaviour in terms of the Nested Games model, while invisible politics generally means more confusing outcomes. Moreover, we saw that in invisible politics the game between partners is always competitive. Because of these differences between visible and invisible politics, the winning coalition in the first round is very likely to win in the second round, since it will enjoy the advantage of better vote transfers than its opponent. In fact, in only 12 per cent of the constituencies did the winner of the first round not win the seat.

To sum up, the differential distribution of strength at the local level accounts in large part for the variance of vote transfers inside coalitions. Parties (all parties) are more co-operative with their partner when a seat is at stake, and more competitive when they have approximately equal strength. However, if the first round suggests that a defeat is probable, each party undermines its own partner.

Finally, although France was chosen as the case study for the theory of Nested Games, there is nothing in the theory that restricts its applications to this particular country or this particular election. More analysis of these and other election results is necessary in order to examine and further refine the propositions of this article.

#### APPENDIX: DEFINITION OF VARIABLES

|            |                                     |
|------------|-------------------------------------|
| <i>npr</i> | Number of votes for the Gaullists   |
| <i>udf</i> | Number of votes for the Giscardians |

<sup>25</sup> See M. Jensen and W. Meckling, 'Theory of the Firm: Managerial Behaviour, Agency Costs, and Ownership Structure', *Journal of Financial Economics*, 3 (1976), 305-60 and B. Klein, R. Crawford and A. Alchian, 'Vertical Integration, Appropriable Rents, and the Competitive Contracting Process', *Journal of Law and Economics*, 21 (1978), 297-326.

|                |  |
|----------------|--|
| <i>ps</i>      | Number of votes for the Socialists                                       |
| <i>pc</i>      | Number of votes for the Communists                                       |
| <i>reg</i>     | Number of registered voters  |
| <i>fround</i>  | Number of voters in the first round                                      |
| <i>sround</i>  | Number of voters in the second round                                     |
| <i>tleft</i>   | Number of votes for Socialists, Communists and allies in the first round |
| <i>tright</i>  | Number of votes for Gaullists, Giscardians and allies in the first round |
| <i>left</i>    | Number of votes for the candidate of the Left in the second round        |
| <i>right</i>   | Number of votes for the candidate of the Right in the second round       |
| <i>victory</i> | $1 - \text{abs}(fround/2 - tleft)/reg$                                   |
| <i>proxl</i>   | $1 - \text{abs}(ps - pc)/reg$  |
| <i>proxr</i>   | $1 - \text{abs}(udf - rpr)/reg$  |
| <i>otherl</i>  | $(tleft - ps - pc)/reg$  |
| <i>otherr</i>  | $(tright - udf - rpr)/reg$   |
| <i>advl</i>    | Dummy variable with value 0 if the adversary is Socialist                |
| <i>advr</i>    | Dummy variable with value 0 if the adversary is Gaullist                 |
| <i>cohl</i>    | $(left - tleft)/reg$   |
| <i>cohr</i>    | $(right - tright)/reg$   |