This article evaluates a formal theory of domestic political conflict using a forecasting approach. The theory, a mobilization of discontent model, argues that the extent of open political conflict within nations is a function of popular discontent, popular dispositions toward conflict, and the balance of organizational strengt between challengers and the regime. In order to examine the forecasting power of this argument, two competing and less elaborate models of domestic political conflict are also proposed. One, a model of the conflict process, forms linkages between the extent and intensity of conflict. The other is a truly naive model, which represents only a persistence of conflit argument. All three models are used to forecast conflict for 10 randomly selected nations in 1971-1975, and implications for the modelling of domestic political conflict are drawn.

FORECASTING INTERNAL CONFLICT
A Competitive Evaluation of Empirical Theories

TED ROBERT GURR
University of Colorado, Boulder

MARK IRVING LICHBACH
University of Illinois, Chicago

A **common theme** in criticisms of empirical theories of political conflict and revolution is that they are postdictive, not predictive. That is, they can offer plausible explanations after the fact for the occurrence of episodes of rioting or revolution, but they are not used to make forecasts or probability statements about the occur-

AUTHORS' NOTE: *The research reported here has been supported by grants from the National Science Foundation and by institutional support from Northwestern University to the first author. We would like to thank Raymond Duvall, Edward N. Muller, Michael D. Wallace, and Michael D. Ward for their helpful criticisms of portions of the study.*

COMPARATIVE POLITICAL STUDIES, Vol. 19 No. 1, April 1986 3-38

rence of future conflict. Davies's J-curve theory of revolution has been criticized on the grounds that it does not specify how much of a gap between expected and actual need satisfaction is necessary for a revolution to occur, nor does it say why a J-curving pattern of change leads to revolution in some societies but not others (see Cohan, 1975: 197-198; Eckstein, 1980: 158). Similarly, in a recent survey of research on the relationship between relative deprivation (RD) and social movements, Gurney and Tierney remark that "RD studies tend to be synchronic and post hoc. Data are gathered after a riot, or after a movement is under way, thus making it impossible to determine whether RD actually preceded the activity" (1982: 42).

This article evaluates the results of empirical studies that take up the challenge of these criticisms by making theoretically-based forecasts of four properties of conflict in a set of ten countries. One set of forecasts is derived from a complex model of the mobilization of discontent (Gurr and Lichbach, 1979). The second set is generated from a model of conflict processes (Lichbach and Gurr, 1981). The third set is based on the simple assumption that conflict tends to persist over time. The forecasts are expressed in quantitative form and refer to the period 1971-1975. They are then compared to observed properties of conflict in the ten countries—the "realized values," in the language of econometric forecasting. Comparison of the forecasts indicates the degree of accuracy with which empirical theory can predict aspects of conflict. Comparisons among forecasts make it possible to say which model provides the most accurate forecasts, and of what conflict properties; and which countries' conflict is most readily explained. The ten countries are a stratified sample selected from among 86 countries on which we have collected such conflict data. They are Argentina, Brazil, the Dominican Republic, Italy, Kenya, Malaya (West Malasia only, excluding Singapore and North Borneo), Norway, Pakistan, the United Arab Republic (Egypt), and Yugoslavia.[1]

The research design used is technically a postdictive one because we "forecast" what has already happened. The answer to this potential objection is that the forecasts are based on data that reflect conditions prior to 1971-1975. First, the equations used for forecasting are estimated with data on conflict and its determinants for the 10 countries as of about 1970, which is to say immediately before the beginning of the period for which forecasts are made. The logic and procedures are precisely the same as those that would be required to generate forecasts in 1986 for the properties of conflict in 1987-1992, except that we need not wait five years to assess the accuracy of the

forecasts. In point of fact we are not concerned about predicting the future. The purpose is to determine whether and how well empirical theories of conflict can make forecasts, past, present or future, of some quantifiable properties of internal conflict.

THE CONCEPTION AND MEASUREMENT OF CONFLICT

Some theories of conflict within nations conceive of conflict as a series of discrete, episodic "events" such as revolutions, coups, or numbers of riots. We regard political conflict as a continuous process, one that is manifested partly through the occurrence of events. Some of these events, notably revolutions and coups, are the objects of intensive theoretical inquiry that asks why conflict takes these specific forms (for recent reviews of the theoretical literature on revolutions and coups, respectively, see Goldstone, 1980; Zimmermann, 1983: chap. 7). The theories evaluated here are quite different. They state probabilistically the conditions that determine the ebb and flow in several manifestations of the underlying, and ongoing, process of political conflict: the scope of overt actions by challenging groups, the intensity of their interactions with regimes, and whether they take the general form of protest or rebellion. In other words, these are not theories of "why men rebel," but rather theories of why open political conflict varies in scope, intensity, and general form.

Formally, the theoretical models here specify the conditions of manifest political conflict, defined as open physical confrontations between collective actors over political issues. In common language these manifestations include political demonstrations, riots and clashes, general strikes, coups d'etat, clandestine armed attacks, and open guerrilla and civil warfare. Such forms of conflict are distinguished from more conventional forms of political participation by the fact that one or all parties involved use or threaten to use coercion to exact concessions or compliance from their opponents.

Four measurable properties of manifest political conflict are singled out for theoretical explanation and forecasting. The extent of effort expended by dissident groups is measured using man-days of participation. The intensity of the action is measured by the number of deaths incurred by participants in conflict episodes, including dissidents, their opponents, and victims. We further distinguish between protest, which

is manifest political conflict centering on the actions and policies of authorities; and rebellion, which concerns more fundamental questions of who rules and by what means. Protest typically involves short-lived challenges that take such forms as demonstrations, clashes, riots, and general strikes. Rebellion is usually protracted and involves armed violence between regimes and their opponents. All data on conflict that are used in these studies are aggregated from information on specific events. That is, there are four measures for each country for each year and each five-year period: estimated man-days of participation in all reported protest episodes, and in all rebellions; and reported numbers of deaths in all protests, and in all rebellions. These estimates are weighted by the country's population, man-days per 100,000 population and deaths per 10 million. (For a full analysis of world patterns of conflict using these data see Gurr, 1979; for complete documentation of the data set see Gurr et al., 1978.)

TWO THEORETICAL MODELS AND A NAIVE ASSUMPTION

Three different models are used here for making forecasts of the properties of conflict, each of them derived from verbal theories. The *conflict persistence model,* reviewed first, simply assumes that a country's conflict properties tend to persist over time. The *conflict process model* focuses on the reciprocal effects of the actions and reactions of challengers and regimes. The *mobilization of discontent* model specifies the antecedent socioeconomic and political conditions of conflict. Each model is successively more complex. And each more complex model incorporates some of the elements of the simpler ones.

THE CONFLICT PERSISTENCE MODEL

The simplest theoretical assumption on which to base empirical theories of conflict is that particular political settings and cultures tend to reproduce the same kinds of conflict over time: there may be short-term ebb and flow in its extent and intensity, but the properties of conflict in any given society will tend to be similar over successive five- to ten-year periods. There are elements in more elaborate theoretical arguments that suggest as much.

(1) Challenges of a given extent are likely to persist because the more serious structural conditions and popular grievances that give rise to them are seldom susceptible to rapid change.

(2) Challenges of a given extent and regime responses to them of a particular intensity are likely to be supported by popular and elite beliefs (norms) about their rightness and utility. For example, if particular forms of coercion are widely employed in a society and often meet with success, either for dissidents or regimes or both, one would expect that their past, present, and future practice will be supported by prevailing ideologies and cultural dispositions (see Gurr, 1970a: chap. 6).

(3) Challenges and responses to them tend to persist because they become institutionalized. Tilly (1978: chaps. 3-4) especially emphasizes the importance of organization and mobilization for sustaining challenges. Second, particular modes of challenge may become ritualized and generally accepted as part of the political process. For example, both publics and authorities in most western societies have come to accept strikes, boycotts, and political demonstrations as legitimate means for expressing demands (see the survey evidence in Barnes and Kaase, 1979).

The persistence argument in this simple form avoids the more challenging theoretical issue of why societies vary so greatly among one another in the form, extent, and intensity of conflict. As such it is, in effect, a null hypothesis of little substantive interest for conflict theory. But it does provide a baseline against which to assess other, more elaborate theories. The minimum criterion for empirical theories is that they explain conflict more accurately than a simple projection of past experience. A forecasting model based on the persistence argument could be specified using an elaborate weighting scheme. ARIMA (Box-Jenkins) models, for example, weight past values and past disturbances in deriving forecasts (Lichbach, 1985a; 1985b). Here we specify the model in the most naive way: the future level and intensity of conflict in any society is an unweighted function of its level and intensity in the immediately preceding period.

THE CONFLICT PROCESS MODEL

A more interesting alternative to the naive persistence model is to dissect the truism, "conflict breeds conflict," into a set of more precise

hypotheses about the ways in which the extent and intensity of protest and rebellion interact with one another over time. The conflict process model proposed here treats these properties of conflict as a function of simultaneous and lagged values of one another. The argument is a parsimonious alternative to models that attribute conflict to more "remote" variables such as international dependency, social strains, and group resources.

The process model is derived from four hypothesis. The first incorporates the persistence assumption: (1) the extent and intensity of both protest and rebellion tend to persist over time. Second, protest and rebellion do not occur wholly independently of one another. Widespread protest is likely to instigate or spill over into rebellion whereas widespread rebellion is likely to stimulate protest by more cautious supporters and by others, not necessarily rebels, who oppose the policies followed by regimes in reaction to rebellion. Thus, (2) the present extent of protest influences the present extent of rebellion, and vice versa.

(3) The present extent of conflict simultaneously affects its intensity. The relationship is arguably curvilinear. Up to a fairly high threshold we expect a positive and linear relation: as extent of both protest and rebellion increase, so does the intensity of regime response. Above the threshold, more cautious or conciliatory regime responses are increasingly likely.

(4) The past intensity of conflict determines its present extent. The greater the past intensity of conflict, which we suggested above is partly a function of the severity of regime responses to challenges, the more limited is the present extent of both protest and rebellion. But there is a limit to just how much violence by regimes will deter dissidents. Beyond some threshold of intensity they are less likely to be deterred and more likely to be stimulated into more widespread resistance. (Note that this is complimentary to the argument for the third hypothesis. If this fourth hypothesis is correct, and recognized as such by elites facing challenges, then the pattern postulated in hypothesis 3 has a simple, rationalistic basis: as the scope of challenges mounts, it becomes less costly and more likely to make concessions than to escalate repression.)

The implications of these hypotheses for each of the four properties of conflict have been formalized (Lichbach and Gurr, 1981) in a four-equation econometric model, containing simultaneous and lagged, linear and nonlinear relationships between the extent and intensity of

protest and rebellion. The process model was estimated by regressing 1966-1970 conflict data on 1961-1965 conflict data for 86 countries. Although the proportions of variance explained were relatively low, the results permitted a number of substantive interpretations that can be summarized by reference to the above four general hypotheses from which the model was derived.

(1) The simple persistence of conflict argument is not supported for protest at all: there is no discernible relation between its past and present extent or past and present intensity. Obviously, there are persistent traditions of protest in particular countries (e.g., France, Italy, Argentina) but no global tendencies of this sort were evident in the 1960s. There is evidence for weak tendencies of persistence in the extent and intensity of rebellion, perhaps due to the persistence, from the early to late 1960s, of a handful of protracted internal wars in the Third World, in Vietnam, Burma, Zaire and elsewhere. When we estimated the model using annual data rather than five-year aggregations, however, we found considerably stronger evidence for the persistence argument, for protest as well as rebellion (see Lichbach and Gurr, 1981).

(2) The present extent of protest and rebellion are related to one another, but more weakly than expected.

(3) Our findings strongly support the argument that the extent of both protest and rebellion are major simultaneous determinants of the intensity of conflict. There is weak evidence, for protest only, for the proposed inverted U-shaped pattern in which the intensity of conflict declines when its extent is very high. For rebellion, contrary to the hypothesis, intensity increases at an increasing rate as a function of extent.

(4) Evidence for the argument that the intensity of (i.e., regime response to) past conflict is curvilinearly related to its present extent, is weak and ambiguous. The extent of protest does tend to increase as a function of past intensity, up to some threshold beyond which it declines (dissidents seemingly are inhibited by intensely violent consequences of past protest). The extent of rebellion, though, tends to decrease as a function of past intensity up to some threshold beyond which extent again tends to increase.

Hence, most of the theoretical arguments summarized by the process model are supported. The principal modifications concern the proposed curvilinearities. But most of the modelled relationships persist for short periods of time only. Few five-year lagged relations are statistically

significant at p = .05. The results are consistent with the view that conflict occurs in episodes in which action and reaction, protest and rebellion all affect one another in significant and predictable ways—in the short run. But the long-term continuity from one episode, or era, to the next is not great.

Nonetheless, the process model can be used to generate forecasts of future conflict properties. And because the process model incorporates, and adds to, the effects of simple persistence, forecasts based on the process model should be more accurate than those using the persistence model alone.

MOBILIZATION OF DISCONTENT MODEL

The third model is based upon a complex theoretical argument that specifies a full range of antecedent conditions of conflict: patterns of motivation, belief, mobilization, and capacities for collective action. It derives originally from the theory of conflict behavior proposed in *Why Men Rebel* (Gurr, 1970a), which rests on the premise that a sociopsychological variable, relative deprivation (RD), is the necessary condition for political violence. RD interacts with normative and utilitarian justifications for action and the balance between dissident and regime strength to determine a society's magnitude for political violence. Hypotheses and models derived from the theory have been tested using cross-national aggregate data (Gurr, 1967; 1968; 1970b), with relatively strong correlational results. Microlevel studies of relations between perceived deprivation and participation in collective action provided much weaker support for the theory (reviewed in Muller, 1980).

The theoretical argument subsequently was revised. Rationalistic and normative motivations to conflict behavior were given independent status, following the arguments and evidence of scholars such as Firestone (1974), Muller (1979), and Salert (1976: chap. 2). The social structural sources of RD were more fully specified in an effort to meet criticisms (for example Cohan, 1975: 201-205; Salert, 1976: 64-66) that the cross-national studies measured RD at the wrong level of analysis. A distinction was drawn between persisting, structural sources of collective deprivation, called "strain," and collective deprivation due to short term fluctuations in economic and political performance, labelled "stress." Further, the conditions that intervene between the

potential for collective action and its actualization were elaborated to take into account some of Charles Tilly's arguments (1975, 1978) about the importance of resource mobilization and the relations between challengers and regimes. Two aspects of the international environment were incorporated into the argument: the constraints imposed by economic dependency (see Caporaso, 1978, and more recently, Kick, 1980) and the roles of external supporters of regimes and dissidents, especially when manifested in intervention.

An introduction to the revised theory appeared in Gurr and Duvall (1976). Other elements were incorporated in an empirical study, "Civil Conflict in the 1960s: A Reciprocal Theoretical System with Parameter Estimates" (Gurr and Duvall, 1973). New indicators, consistent with the revised theory, were used to estimate the parameters of the 11-variable, bloc-recursive, simultaneous equation model by reference to political conflict data for 86 countries for 1961-1965. (Earlier cross-national studies in this series used less reliable data for a larger number of countries.) The model accounted for variations among countries in magnitudes of political conflict with a relatively high degree of accuracy: the R-squared values for different measures of conflict ranged from .56 to .78.

Both theoretical and technical questions were raised by the article's results. The determinants of the properties of conflict proved to differ appreciably, which suggested that separate subtheories, and models, were needed for each. Four kinds of general arguments, some of them foreshadowed in previous theoretical statements, were formally incorporated into a new theoretical model. The arguments are reviewed substantively here; for a more detailed discussion of some of them see Gurr and Lichbach (1979: 156-165).

First, whereas the extent of conflict is mainly a function of discontent, dispositional, and mobilization variables,[2] as assumed in earlier versions of the theory, the intensity of conflict is determined mainly by its extent and form. The greater the number of dissidents mobilized by a challenging group, and the longer they persist in collective action, the more repressive and deadly the response of the regimes is likely to be. To the same effect, dissidents who want fundamental institutional changes are more likely than those seeking reforms to mobilize large-scale, persisting actions, categorized here as rebellion, which usually instigate more repressive regime responses than does protest.

Second, the prevailing norms of the political regimes, whether democratic or authoritarian, influence the tactics of dissidents and the

responses of the elites to them. Accumulating evidence on the outcomes of conflict show that democratic elites are disposed to make appreciable concessions to protest whereas authoritarian regimes of left and right are more likely to rely on repression (see the U.S. and comparative evidence reviewed in Gurr, 1980; 1983). This pattern reinforces dissidents' choice of protest tactics in democracies, and reduces the intensity of regime responses in democracies to all kinds of challenges. Thus, regime type is a significant variable in the new model.

Third, it is necessary to distinguish between the effects of dissidents' mobilization into associational groups, which facilitates protest, from their mobilization into clandestine and revolutionary groups, which facilitates rebellion. The countervailing organizational strength of regimes is less likely to inhibit protest, which has become a quasi-acceptable form of political action in most contemporary states, than to inhibit rebellion. Against protestors, strong regimes often find it sufficient to rely on concessions and nonviolent forms of control. Strong regimes also are likely to have the means to put a quick and decisive end to rebellions, thus avoiding protracted and deadly internal wars.

Last, the effects of external support for contenders in internal conflict is more fully specified than in earlier models. Material support is more likely to be offered to participants in revolutionary conflicts than in protest. Support for rebels is likely to be greatest once they are already mobilized, and should most directly affect the extent rather than the intensity of their activity. Support for rebels also is likely to provoke countervailing external support for the challenged regime, enhancing its capacity to fight back.

A major technical question raised by the 1973 study was whether the high level of statistical explanation was specific to the indicators used and the time-period studied. We assumed the relations under study to be general ones, not specific to one time-bound set of data. A test of this assumption is to determine whether the revised model can generate forecasts of conflict in other periods with a similar degree of accuracy. The first step was to fit the model to revised data for 86 countries, once again focusing on 1961-1965.[3] This study is subsequently referred to as the "baseline study."

The results (see Gurr and Lichbach, 1979) generally are consistent with theory, but some relationships proved weaker than expected. This is particularly true of the extent of the protest, which with an R-squared value of only .36 was the most poorly predicted endogenous variable

in the model. Measurement error may be partly responsible. More important, one of the key theoretical and empirical determinants of protest, economic stress (see Gurr and Duvall, 1973: 152-159) was not included because it proved impossible to generate reliable over-time indicators for this study. Thus, its omission reduced our capacity to make accurate forecasts of the extent of protest, but not of the other conflict properties. Explained variance for intensity of protest and the extent of rebellion in the baseline study were in the same substantial range (R-squared values from .56 to .81) as those obtained in the 1973 study.

FORECASTING PROCEDURES AND EVALUATION

Qualitative predictions, based on "expert judgment," about future political instability abound. Andriole and Hopple (1984: 37-46) survey the lengthy semiacademic traditions of informal intuition and judgment, more formalized Delphi procedures, political risk assessment techniques used in industry, and Bayesian techniques used by government. They also report (1984: 107-117), as does Himes (1980: 144-164), that the number of quantitative forecasts of conflict are few indeed. Our previous work (1979) contains the only forecasts based on an elaborated causal model.

To generate forecasts for this article using the mobilization of discontent model, data on the determinants and properties of conflict were coded for the 10 countries using procedures and sources precisely comparable to those used for the baseline study. The causal variables are measured chiefly by data for 1970, the conflict variables by data for 1971-1975. It was evident that the sample includes some exceptional cases: man-days of protest in Argentina and Italy in 1971-1975 were among the highest we have recorded in any country in any five-year period. Moreover, Pakistan fissioned into two separate states as the result of the intensely violent secession of East Bengal, now Bangladesh, in 1971. The inclusion of such extreme cases is a stiff challenge to any exercise in quantitative forecasting.

Two procedures were used to generate forecasts from the mobilization of discontent model for the 10 countries. First, indices were created for the causal variables using the same components and weights used in the 86-country study. Second, the parameter estimates for the

reduced form of the model, also from the 86-country study, were used to generate forecasts. For details on this procedure, see Gurr and Lichbach (1979). Generating forecasts from the conflict process model was simpler, because the causal variables consisted entirely of conflict properties. Parameter estimates for the reduced form of the model, generated from 1961-1965 data, were used to produce forcasts. Finally, forecasts for the naive persistence model were obtained by using the unweighted values for conflict for 1966-1970 as the "predictions" for 1971-1975.

Our forecasting test, in other words, is to ask whether some set of cases under investigation fits a previously specified general pattern. Two alternative statistical procedures are commonly used to do so. Statistical inference procedures may be used to extrapolate, beyond the results for a sample period, a point or mean prediction of a dependent variable: this is one of the common uses of regression procedures (Wannacott and Wannacott, 1970: 27-34). One may also test for the "structural stability" of a model by applying hypothesis-testing procedures about parameter differences to observations that were not contained in the sample that was used to estimate the model (Huang, 1970: 103-116).

The generated forecasts of man-days and deaths from protest and rebellion for all three models are evaluated below by comparing forecasts for 1971-1975 with their "realized values," as they are charaterized in the econometric literature. Two sets of forecast evaluations are offered. First, the relative forecasting abilities of the models is compared. Can the mobilization of discontent model outperform its two competitors? Second, we examine the absolute forecasting ability of the discontent model. How close did its forecasts come to the realized values? There are many ways to compare forecasts with realizations. Four tests are used here.

Deviations around the line of perfect forecasts (1). The root mean square error of the forecasts gives an indication of the imprecision of the forecast:

$$RMSE = [N^{-1}(F - R^2)]^{1/2}$$

where RMSE is the root mean square error; F is the forecasted value; R is the realized value; and N is the number of cases.

The result is an indicator of the forecasting error in terms of the original metric. The closer the measure is to 0, the better the forecast. There

is no upper limit to the measure. It is used as a means of judging the accuracy of predictions of absolute levels of conflict. It can also be used to compare the forecasting accuracy of the models. The forecasting accuracy ratio

$$\frac{\text{RMSE (Discontent or Process)}}{\text{RMSE (Persistence)}}$$

gauges the percentage increase or decrease in forecasting power of the discontent or process models relative to the persistence model. A ratio greater (less) than 1 indicates that the discontent or process model does worse (better) than the persistence model. For example, if the RMSE of the discontent model is 75% as large as the RMSE of the persistence model, then predictions have improved by 25%.

Deviations around the line of fitted forecasts (2). The regression of the forecasts on the realizations can provide a diagnosis of forecasting error:

$$R = B_0 + B_1F + e$$

where B_0 and B_1 are parameter estimates; and e is an error term.

In the case of perfect prediction, the regression line would appear as a 45° line on a prediction-realization diagram. That is, B(0) = 0, B(1) = 1, e = 0, and $R^2 = 1.0$. Needless to say, this is not likely to occur; perfect postdiction was not achieved with the 86-country data set to which indices and parameters were fitted. In the event of imperfect prediction, the regression line gives the translation rules for moving from forecasts to realizations. Its goodness of fit statistics provide criteria of our success in predicting relative levels of conflict.

Linear regression of forecasts on realizations (3). All forecasts in the social sciences are suboptimal (Granger and Newbold, 1977: 268). This is because the theory used to produce a forecast is inevitably ill developed and ill confirmed. Or, from another perspective, the amount of potential information that might be used to produce a forecast is vast. Consequently, any single forecast in the social sciences can be improved upon. How? Each forecast might contain unique information. If so, one would not discard all forecasts except the best, but rather integrate all of them into a single, combined forecast. The composite forecast may well outperform the individual forecasts. Many

combination rules are available (Granger and Newbold, 1977: 272). Here, we generate weighted, composite predictions by regressing all three forecasts on the realized values:

$$R = B_0 + B_1F_1 + B_2F_2 + B_3F_3$$

where F_1, F_2 and F_3 are three types of forecasts.

This equation is used to determine whether the persistence- and process-based forecasts add anything to the variance in realized values explained by the discontent model.

Direction of change (4). Perhaps it is possible to forecast the direction of change in conflict, a less demanding test than forecasting its actual magnitude. We computed actual values in 1971-1975 minus actual values in 1961-1965; we then compared this figure to forecasted values in 1971-1975 minus actual values in 1961-1965. Cases in which no change in actual conflict occurred between the two periods were excluded (in practice, those cases that had 0 conflict in both periods). Comparisons of actual positive or negative change with forecasted positive or negative change tells us how accurately we can predict the direction of change in conflict properties. The percentage of correct predictions out of the relevant number of cases is reported. A test of significance for this percentage, a variant of the one-tailed sign test with matched pairs of data, is also reported. For this latter test, the probability of getting n or more correct predictions out of a possible m predictions is calculated, assuming that a correct prediction is as likely to occur as an incorrect one ($p = .5$), using the binomial distribution.

COMPARISON OF FORECASTS

Which conflict phenomena and which cases are forecasted best? Tables 1 through 4 compare actual conflict scores with scores forecasted from the three models. The root mean square error (RMSE), the forecasting accuracy ratio, and four regression statistics—the intercept, the slope, the standard error of the residuals, and the variance explained—are also reported. For comparative purposes, means and standard deviations of forecasts and realizations appear. Figures 1 through 4 are scatter diagrams of forecasts and realizations. Each of

TABLE 1
Forecasts of Conflict, 1971-1975: Man-Days of Protest

		Forecasts		
Country	Actual	Persistence	Process	Discontent
Argentina	4.684	4.525	1.974	2.322
Brazil	0.945	2.150	2.258	0.933
Dominican Republic	2.856	3.843	1.598	1.392
Italy	4.946	4.206	2.115	2.793
Kenya	2.237	1.390	1.748	1.821
Malaya	1.960	3.923	1.792	2.560
Norway	-0.523	3.585	1.422	2.236
Pakistan	4.035	3.373	1.698	2.389
UAR-Egypt	2.222	1.158	2.035	1.064
Yugoslavia	3.211	2.389	2.101	1.977
Mean	2.66	3.05	1.87	1.95
Standard Deviation	1.68	1.20	0.26	0.64
Root Mean Square Error		1.64	1.72	1.62
Forecasting Accuracy Ratio			1.05	.99
Regression				
Intercept		1.09	-1.54	1.11
Slope		.51	2.24	.50
S.E. of Residual		1.66	1.67	1.62
R^2		.13	.12	.18

NOTE: Forecasts and realized values are $\log_{10}$ transformations of the conflict variables: man-days per 100,00 population and deaths per 10 million. The logged value of −0.523 signifies no conflict.

the ten countries' logged realization on a dimension of conflict can be read off the Y-axis. The realizations are associated with three different forecasts, which can be read off the X-axis: naive (N), process (P) and discontent (D). Thus, the ten countries appear at different points along the Y-axis, with their forecasts distributed horizontally along the X-axis. The three regression lines associated with the three fits of forecasts to realized values, along the line that indicates perfect prediction, are also shown. The differences among the slopes of the lines are graphic representations of the quality of our forecasts of conflict.

MAN-DAYS OF PROTEST

The forecasts of man-days of protest are shown in Table 1 and plotted in Figure 1. The mobilization of discontent forecasts are slightly

TABLE 2
Forecasts of Conflict, 1971-1975: Deaths from Protest

		Forecasts		
Country	Actual	Persistence	Process	Discontent
Argentina	1.383	1.209	0.327	1.224
Brazil	-0.046	0.615	0.449	0.614
Dominican Republic	1.720	2.012	0.207	0.916
Italy	0.391	0.157	0.449	0.599
Kenya	-0.523	1.119	0.236	0.694
Malaya	-0.523	2.384	0.236	0.576
Norway	-0.523	-0.523	0.202	0.271
Pakistan	1.281	1.661	0.149	0.508
UAR-Eqypt	-0.244	0.611	0.423	0.610
Yugoslavia	-0.523	0.018	0.401	0.671
Mean	0.24	0.93	0.31	0.67
Standard Deviation	0.90	0.92	0.12	0.25
Root Mean Square Error		1.14	0.89	0.85
Forecasting Accuracy Ratio			.78	.75
Regression				
Intercept		-.17	.88	-1.18
Slope		.44	-2.08	2.13
S.E. of residual		0.85	0.92	0.76
R^2		.20	.07	.36

NOTE: See note for Table 1.

superior in most of the evaluations. The root square errors of all three forecasts are within .10 of one another, and the ratio of root mean square errors is close to 1, whereas the discontent-based forecast is lowest at 1.62. Although the R^2s are all within .05 of one another, the discontent-based forecast is highest at .18. In a multiple regression in which all the forecasts compete against one another to yield a composite prediction of actual man-days of protest (see Table 6), the parameter estimate for the process forecast has the highest T-value. Note that the R^2 for the composite prediction is greater than for the discontent model prediction; the three predictions together yield an R^2 of .43, compared with .18 for the discontent-based forecast alone.

These forecasts of man-days of protest, however, are not, from the point of view of their absolute magnitudes, particularly accurate. The root mean square errors reveal that the mean magnitude of error is approximately 70 man-days per 100,000 population, very close to the standard deviation of actual protest man-days in the sample. We can,

TABLE 3
Forecasts of Conflict, 1971-1975: Man-Days of Rebellion

		Forecasts		
Country	Actual	Persistence	Process	Discontent
Argentina	4.627	1.088	0.689	2.161
Brazil	2.149	2.223	2.057	2.156
Dominican Republic	2.036	1.592	0.219	3.701
Italy	2.687	2.087	1.694	1.644
Kenya	0.643	-0.444	-0.611	2.990
Malaya	3.269	3.949	2.836	2.445
Norway	-0.523	-0.523	-0.153	-0.126
Pakistan	6.331	-0.194	0.231	2.494
UAR-Egypt	1.454	1.531	0.612	2.977
Yugoslavia	0.701	1.583	2.124	0.279
Mean	2.34	1.29	0.97	2.07
Standard Deviation	2.02	1.39	1.14	1.20
Root Mean Square Error		2.41	2.48	1.83
Forecasting Accuracy Ratio			1.03	.76
Regression				
Intercept		2.07	2.11	.98
Slope		.20	.24	.66
S.E. of residual		2.12	2.13	1.98
R^2		.02	.02	.15

NOTE: See note for Table 1.

however, predict the direction of change in protest man-days fairly well. Out of 9 possible predictions, the persistence model is right 100% of the time, the process forecasts 67%, and the theory-based forecasts are 89% correct (P = .02).

We now turn to an analysis of the forecasting errors for man-days of protest. An examination of the correlations among the forecasting residuals clearly shows that all models make similar errors. The residuals of the persistence and process models correlate at .69, the persistence and discontent models at .85, and process and discontent models at .89. An examination of specific cases reinforces this point. The same three countries are consistently underpredicted. That is, consistently more mandays of protest occurred in 1971-1975 than were forecasted for Italy, Argentina, and Pakistan. Moreover, three other countries are consistently overpredicted: fewer man-days of protest occurred than forecasted for Brazil, Malaysia and Norway.

TABLE 4
Forecasts of Conflict, 1971-1975: Deaths from Rebellion

		Forecasts		
Country	Actual	Persistence	Process	Discontent
Argentina	2.324	0.745	0.274	1.063
Brazil	0.124	0.489	0.833	1.030
Dominican Republic	1.432	2.417	0.367	2.173
Italy	0.760	0.817	0.549	0.217
Kenya	1.329	0.238	-0.281	1.440
Malaya	1.824	2.091	1.820	0.685
Norway	-0.523	-0.523	-0.539	-0.941
Pakistan	2.633	-0.523	0.090	1.116
UAR-Egypt	0.943	1.604	0.168	1.764
Yugoslavia	-0.523	-0.523	0.670	-0.269
Mean	1.04	0.68	0.40	0.83
Standard Deviation	1.10	1.08	0.65	0.94
Root Mean Square Error		1.24	1.30	0.88
Forecasting Accuracy Ratio			1.05	.71
Regression				
Intercept		.79	.94	.44
Slope		.35	.23	.72
S. E. of Residual		1.10	1.16	0.92
R^2		.11	.02	.38

NOTE: See note for Table 1.

TABLE 5
Predictions of Changes of Conflict, 1961-1965 to 1971-1975: Percentage of Correct Predictions

	Persistence	Process	Discontent	Total (N)
Protest-Mandays	100% (.00)	67% (.25)	89% (.02)	9
Protest-Deaths	57 (.50)	57 (.50)	71 (.23)	7
Rebellion-Mandays	89 (.02)	89 (.02)	100 (.00)	9
Rebellion-Deaths	75 (.14)	75 (.14)	88 (.04)	8

NOTE: Cases in which no change in actual conflict occurred are excluded. Probabilities under 1-tailed sign test are given in parentheses.

There are plausible explanations for these forecasting errors. One might expect difficulties when forecasting protest in countries that have particularly high levels of protest: the higher the forecasted level of protest man-days, the higher the forecasted residual. This turns out to be true only for the persistence model: as Table 8 shows, the correlations between forecasts and residuals for the persistence forecast is .35, for process it is .02, and for discontent it is .00. We might also expect to have difficulty forecasting protest in nations that deviated a great deal from the mean level of protest among all nations: the higher the absolute deviation from the mean of actual protest man-days, the higher the forecasted residual. This also turns out to be true: the correlation for the persistence forecasts is .49, .14 for process forecasts, and .35 for discontent forecasts. There are two further explanations of why man-days of protest in both Argentina and Italy were extremely high in both periods, and substantially underestimated. One is that some very salient determinant of conflict in both countries has been omitted from the model or the measures. The alternative has to do with political strikes, which account for the vast bulk of protest in both countries during the two semidecades. Such strikes are

TABLE 6

Multiple Regressions of Persistence, Process, and Mobilization of Discontent Forecasts on Actual Conflict

	Intercept	Slopes/(T-values) Persistence	Process	Discontent	R^2	F	Reg. S. E.
PM	-6.41 (1.38)	0.34 (0.56)	3.24 (1.58)	1.00 (0.89)	.43	1.48(3,6)	1.56
PD	-0.49 (0.47)	0.04 (0.11)	-2.55 (0.89)	2.21 (1.78)	.48	1.85(3,6)	0.79
RM	-1.11 (0.59)	-2.10 (1.36)	2.85 (1.50)	1.64 (1.89)	.39	1.25(3,6)	1.94
RD	0.34 (0.68)	-0.24 (0.46)	0.34 (0.52)	0.87 (1.72)	.41	1.38(3,1)	1.04

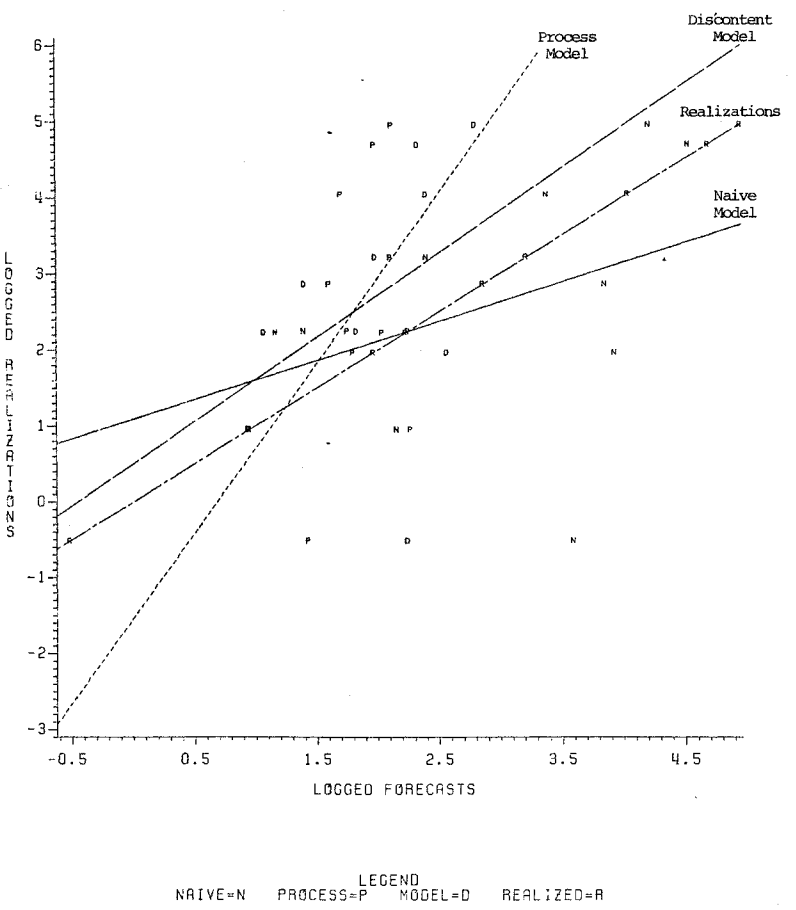

Figure 1: Man-Days of Protest—Logged Forecasts Versus Logged Realizations

a routinized form of political participation in a number of countries. It may that a model that accounts reasonably well for episodic and violent conflict does not explain equally well this ritualized form of nonviolent conflict.

DEATHS FROM PROTEST

The forecasts of protest deaths are shown in Table 2 and plotted in Figure 2. All techniques for evaluating forecasts show the mobiliza-

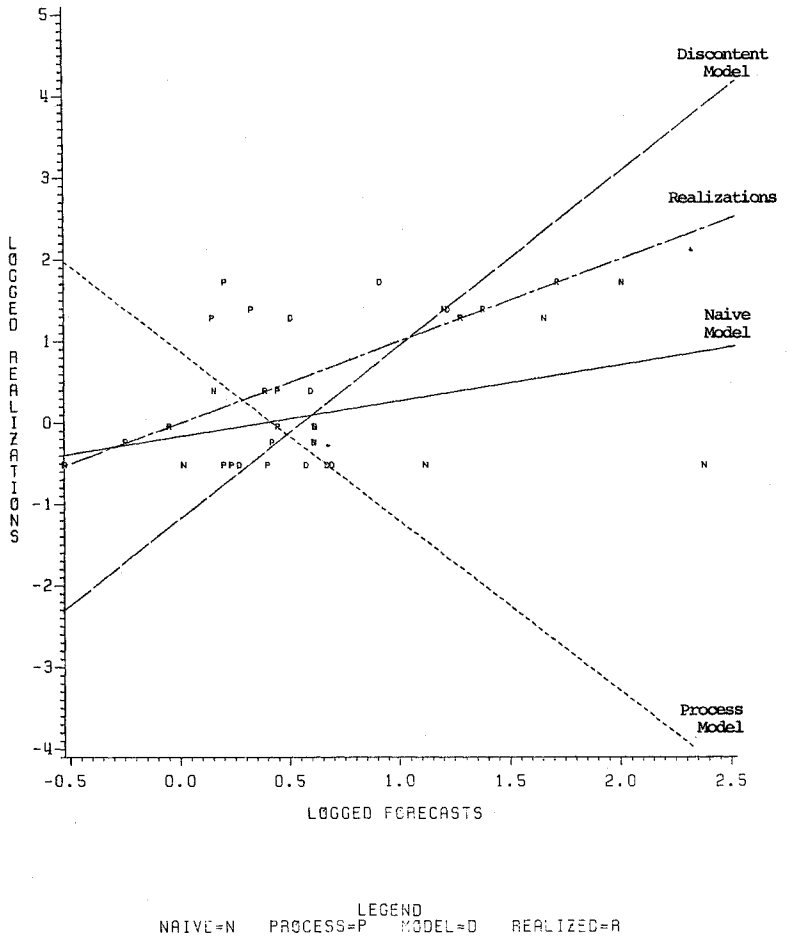

Figure 2: Deaths from Protest—Logged Forecasts Versus Logged Realizations

tion of discontent forecasts to be slightly superior to the others. The discontent forecasts have the lowest root mean square error (.85), which is a 25% improvement over the persistence model, and the highest R^2 (.36). Moreover, in the multiple regressions of forecasts on realized value to create composite predictions (in Table 6), the T-value for the parameter for the mobilization of discontent forecast is higher than for the other parameters. The R^2 value for the composite prediction

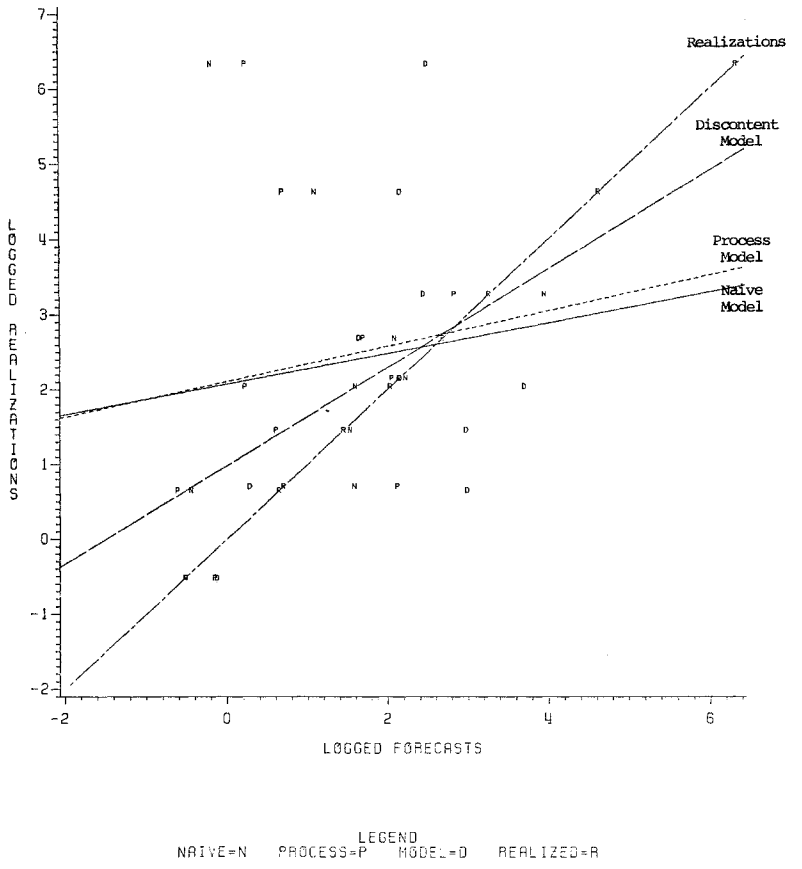

Figure 3: Man-Days of Rebellion—Logged Forecasts Versus Logged Realizations

of .48 is only slightly higher than the R^2 value of .36 for the discontent forecasts alone.

The prediction of the absolute level of deaths from protest is better than for man-days of protest: a root mean square error of .85 implies that the discontent forecasts are incorrect by about 9 deaths per 10,000,000 population. Predictions of the direction of change, however, are less heartening. Out of seven possible predictions, both the persistence and process models are correct 57% of the time, whereas the mobilization of discontent model is correct 71% (P = .23) of the time.

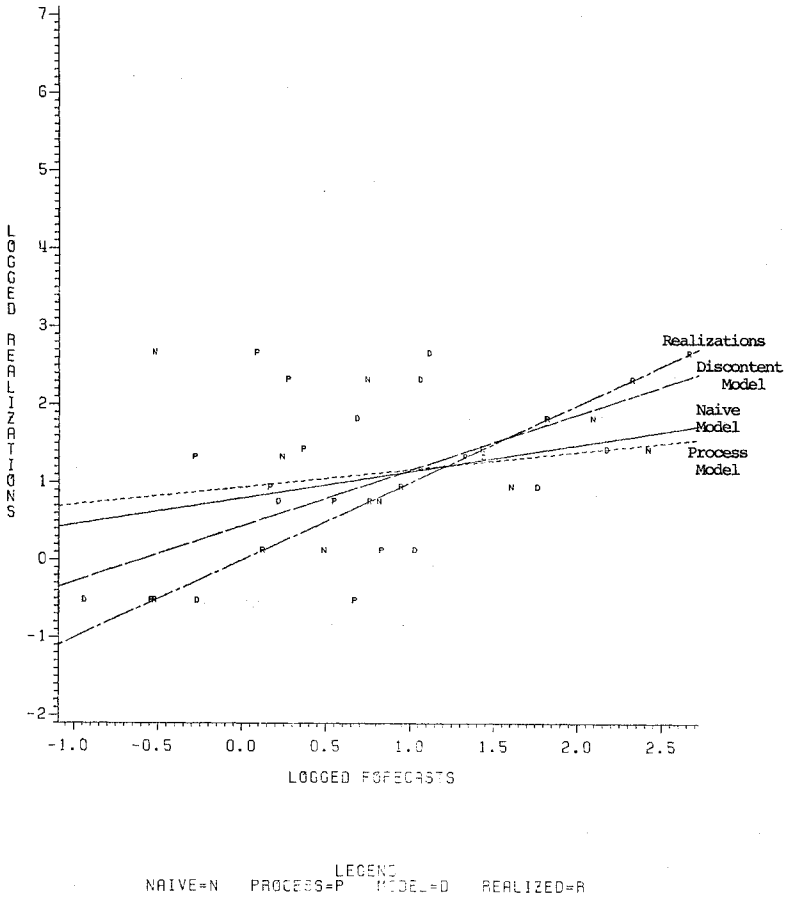

Figure 4: Deaths from Rebellion—Logged Forecasts Versus Logged Realizations

We now turn to an analysis of the errors. All models yield similar forecasting errors, as is clear from the intercorrelations among them: errors from the persistence and process forecasts correlate at .46, from the persistence and discontent forecasts at .53, and from process and discontent at .97 (see Table 7). This pattern implies that the same countries are consistently under- and over-predicted, which is indeed the case. The Dominican Republic, Argentina, and Pakistan have appreciably greater deaths from protest than expected (see Table 10);

Malaysia, Yugoslavia, and Kenya many fewer deaths than expected (see Table 11).

The technical explanation of these errors is the same as for man-days of protest. The higher the forecasted deaths from protest, the

TABLE 7
Correlations Among Forecasting Errors

	Persistence-Process	Persistence-Discontent	Process-Discontent
Protest Man-days	.69	.85	.89
Protest Deaths	.46	.53	.97
Rebellion Man-days	.96	.70	.62
Rebellion Deaths	.71	.71	.48

TABLE 8
Correlations of Residuals with Forecasts

	Persistence	Process	Discontent
Protest Man-days	.35	.02	.00
Protest Deaths	.55	.37	.37
Rebellion Man-days	.48	.40	.20
Rebellion Deaths	.57	.41	.28

TABLE 9
Correlations of Residuals with Actual's Absolute Deviations from the Mean

	Persistence	Process	Discontent
Protest Man-days	.49	.14	.35
Protest Deaths	.00	.68	.56
Rebellion Man-days	.71	.55	.56
Rebellion Deaths	.51	.00	.49

higher are the residuals from the persistence model R = .55), the process model (R = .37), and the mobilization of discontent model (R = .37)—(see Table 8). Moreover, the greater the deviation of actual protest deaths from the mean for all 10 countries, the greater the forecast residuals for the process model (R = .68) and the discontent model (R = .56), but not for the persistence model (R = .00)—(see Table 9).

TABLE 10
Cases with More Conflict Than Forecasted*

		Forecasts		
Category	Rank	Persistence	Process	Discontent
Protest Man-days	1	UAR	ITA	ARG
	2	KEN	ARG	ITA
	3	YUG	PAK	PAK
Protest Deaths	1	ITA	DOM	DOM
	2	ARG	PAK	PAK
	3	NOR	ARG	ARG
Rebellion Man-days	1	PAK	PAK	PAK
	2	ARG	ARG	ARG
	3	KEN	DOM	ITA
Rebellion Deaths	1	PAK	PAK	PAK
	2	ARG	ARG	ARG
	3	KEN	KEN	MAL

*The three cases with the greatest positive forecasting errors (actual minus forecast) are ranked.

TABLE 11
Cases with Less Conflict Than Forecasted*

		Forecasts		
Category	Rank	Persistence	Process	Discontent
Protest-Mandays	1	BRA	MAL	BRA
	2	MAL	BRA	MAL
	3	NOR	NOR	NOR
Protest-Deaths	1	UAR	MAL	MAL
	2	KEN	KEN	YUG
	3	MAL	YUG	KEN
Rebellion-Mandays	1	UAR	BRA	UAR
	2	MAL	NOR	DOM
	3	YUG	YUG	KEN
Rebellion-Deaths	1	BRA	MAL	DOM
	2	UAR	BRA	UAR
	3	DOM	YUG	BRA

*The three cases with the greatest negative forecasting errors (actual minus forecast) are ranked.

MAN-DAYS OF REBELLION

The forecasts for man-days of rebellion are shown in Table 3 and plotted in Figure 3. All techniques for forecast evaluation show that the mobilization of discontent model generates far better forecasts than its competitors. The root mean square error for the discontent forecasts is by far the lowest (1.83), approximately a 25% improvement over the persistence model and its R^2, though low, is the highest (.15). In a multiple regression designed to produce composite forecasts, however, R^2 is considerably raised by combining forecasts, to .39 (see Table 6). The parameter with the greatest T-value is again the one for the discontent forecasts.

If we seek accurate absolute forecasts of the level of man-days of rebellion, none of the models is satisfactory. A root mean square error of 1.83 implies an error of nearly 100 man-days per 100,000 population, slightly less than the sample's standard deviation. We can, however, produce accurate forecasts of the direction of change in man-days of rebellion. The persistence and process models are right 89% of the time, whereas the discontent model is right 100% ($P = .00$) of the time.

There is a distinct pattern to the forecasting errors. All are very highly intercorrelated. The errors from the persistence and process models correlate at .96, those from the persistence and discontent models at .70, and those from the process and discontent models correlate at .62 (see Table 7). Two countries are consistently underpredicted: Pakistan and Argentina had substantially greater man-days of rebellion than expected. There was less consistency in the countries that were overpredicted. However, Egypt and Yugoslavia both tended to have less extensive rebellion than we predicted (see Tables 10 and 11). In other words, the mobilization of discontent argument leads one to speculate that these nations had an unrealized potential for extensive rebellion. The factors that contained the conflict bear further examination.

The principle sources of forecasting error are the same as above. First of all, as the extensiveness of rebellion increased, forecasting errors increased. The correlations between predicted man-days of rebellion and the forecasting residuals were .48 for the persistence model, .40 for the process model, and .20 for the discontent model. Secondly, the more the extent of rebellion deviated from the mean level of rebellion, the greater the forecasting errors. The relevant correla-

tions are .71 (persistence model), .55 (process model) and .56 (discontent model)—(see Tables 8 and 9).

DEATHS FROM REBELLION

Table 4 displays the forecasts for deaths from rebellion and Figure 4 plots these forecasts along with realized values. All forecast evaluation techniques show that the discontent model gives forecasts superior to its competitors. The root mean error (.88) for the discontent forecasts is lower than for the process model (1.30), which is itself outperformed by the persistence model (1.24). The R^2 for the discontent forecasts is .36, which is far better than process forecasts (.02), or the persistence forecasts (.11). In fact, the intercept and slope estimates are far closer to the values we would expect given perfect prediction in the case of the mobilization of discontent model than for the two other forecasts. A multiple regression of forecasts on realized values (in Table 6) also reveals the superiority of the discontent model's forecasts. The three sets of forecasts yield an R^2 of .41, only a slight improvement over the discontent forecasts alone. The T-values for the parameter estimates for the discontent model are again superior.

Forecasting absolute levels of deaths from rebellion is possible: the root mean square error of .88 implies an average error of 9 deaths per 10,000,000 people, somewhat less than the sample's standard deviation. Of eight possible predictions for direction of change (Table 5), the persistence and process models were right 75% of the time, the mobilization of discontent model 88% ($P = .04$) of the time.

The errors made when forecasting deaths from rebellion with the three models are highly intercorrelated, from .48 to .71 (Table 7). Rebellion was predicted to be more intense than it was in Pakistan and Argentina, whereas in Brazil and the Dominican Republic we underpredicted its intensity (Tables 10 and 11).

Forecasting errors increased with the forecasted intensity of rebellion for the persistence model ($R = .57$), the process model ($R = .41$), as well as for the mobilization of discontent model ($R = .28$) (see Table 8). And they increased with deviations of actual levels of intensity of rebellion from the mean level of intensity of rebellion for all but the process model (see Table 9).

SOME GENERALIZATIONS ABOUT THE FORECASTS

What do these findings imply about the models' capacities to forecast conflict? This question can be addressed separately in respect to types of conflict, its magnitudes, specific countries, and the forecasting models.

(1) Rebellion is forecasted better than protest. The equations in 1961-1965 provided a better fit for rebellion than they did for protest and the forecasts to 1971-1975 reflect this. As might be expected, we forecast best what we can explain best.

(2) Intensity of conflict is forecasted better than extent of conflict. The equations in 1961-1965 also provided a better fit for deaths than they did for man-days and the forecasts to 1971-1975 follow suit. Clearly, the explanation for intensity is conceptually closer to the explanandum than is the explanation for man-days. That is, the intensity equation uses one aspect of conflict, man-days, as part of the explanation of another. The key theoretical task, then, is that of accounting the extent of conflict. If this could be done better, both forecasts would be more accurate.

(3) Extreme cases are forecasted less well than modal ones. The correlation-based tests showed that the greater a country's forecasted level of violence, and the greater the absolute deviation of the level of violence in the country from the mean level of violence for all countries, the greater the error in forecasting violence. Discrepancies far from the mean are a technical limitation of forecasting: It is more difficult to predict extreme cases than modal ones (Koutsoyiannis, 1977: 451). For our purposes this is an unfortunate property of econometric forecasting because, when open conflict is concerned, we most want to explain and anticipate the extreme cases. Discrepancies with increasing levels of violence, however, reveal that our forecasts are suboptimal. Presumably, such information could be incorporated in a forecasting model of conflict, thereby producing forecasts superior to the ones presented here.

(4) Forecasts derived from the complex mobilization of discontent model are the best. They consistently yield the lowest RMSE, the highest R^2, and the most statistically significant parameter estimates in composite predictions. Moreover, the theoretical model's advantage is greatest for the best-predicted conflict variables: for intensity of conflict more than its extent, and for rebellion more than for protest. With

respect to the other two models, the naive persistence of conflict model forecasts about as well as the methodologically more elaborate process model.

In brief, the forecasting evaluation of the mobilization of discontent model yields mixed but encouraging results. This model does outperform its rivals. And an earlier test (Gurr and Lichbach, 1979) indicated that it predicted almost as well in the forecasting period (1971-1975) as it did in the period for which it was estimated (1961-1965). But, it is only a fair predictor of absolute levels of conflict and weak in forecasting some important conflict properties, especially man-days of protest.

CONCLUSIONS: FUTURE OF CONFLICT FORECASTING

The competitive evaluation of alternative explanations of domestic political conflict seems the best way to advance the quantitative, comparative study of conflict. Given the proliferation of theories and data collections on domestic violence over the last two decades, some winnowing is clearly needed. The most decisive is likely to take place within this research paradigm: the econometric modelling of global (cross-sectional and time-series) properties of conflict. Such research should provide insights for four groups of people who study conflict: conflict theorists, empiricists, country specialists, and policy analysts. On the basis of our experiences in forecasting conflict, we offer investigators operating in this mode several items for an ideal research agenda.

Conflict theorists should use forecasting largely as used in this article. To better test competing explanations of conflict, however, three improvements over our research design are needed.

Forecast components of the mobilization of discontent model (1). Arguments in the theoretical literature on conflict revolve around the relative importance of discontent, mobilized resources of groups, external intervention, and so forth, in accounting for violent conflict. The mobilization of discontent model synthesizes several such arguments. Separate models could be constructed for each and competitively tested, with results that might help resolve current theoretical disputes (see Eckstein, 1980).

Forecast alternative specifications of the mobilization of discontent model (2). Variations of the basic theoretical argument that might be represented by alternative model specifications should be considered. A better theoretical explanation of man-days of protest is especially needed. The search for more powerful endogenous determinants of external support for regimes and challengers also should continue. Finally, the mobilization of discontent model could be improved by the addition of some of the "process" linkages that proved empirically durable. The systematic testing of alternative models is crucial to the development of any theory. They may either supplant earlier models or be synthesized with them.

Consider other dimensions of conflict (3). Certain theories of conflict suggest that conflict be categorized as reactionary, reformist or radical; others suggest distinctions between communal and antigovernment violence, or separatist and nonseparatist conflicts. How well the mobilization of discontent arguments account for these forms of conflict is unknown.

The empiricists in conflict research will want to probe all the nuances of the fit between theory and data. Although there is almost no end to methodological ingenuity, five further suggestions seem particularly compelling.

Estimate the mobilization of discontent model for different time periods (4). Forecasts from the mobilization of discontent model are conditional upon time-invariant structural relationships. Such models could be reestimated with data for different periods, for example, 1966-1970 or 1976-1980, and the models—and forecasts generated by them—compared. An alternative is to use the parameter estimates from the 1961-1965 model to generate forecasts for points closer in time than 1971-1975. Data for additional postdictive forecasts for the ten countries in 1956-1960 and 1966-1970 have already been gathered.

Forecast over various forecasting periods (5). The mobilization of discontent model was estimated using a five-year data aggregation, and forecasted over a five-year time horizon. To hope for accurate forecasting half a decade into the future is perhaps wishful thinking. Economists have more modest aims: they work at both the near-term (less than a year) and the intermediate term (1-2 years). Models could be estimated on a yearly (perhaps quarterly) basis and then used to

forecast several periods ahead. This would make it possible to assess temporal decline in forecast accuracy.

Forecast the probabilities of conflict (6). This study makes point forecasts of conflict. As research in this mode increases, researchers will undoubtedly want to place confidence intervals around their forecasts. They will also want to make probability statements about future increases or decreases of conflict.

Forecast with more sophisticated persistence models (7). The forecasts of conflict in 1971-1975 use two sets of information. The first consists of data on the determinants of conflict at the onset of the period, plus several simultaneously measured aspects of conflict—man-days and external support—which affect conflict intensity. The second set consists of information from an earlier period about how that data should be processed. In other words, we require models and information from the period to forecast characteristics of conflict during it. This is not an unusual limitation of structural equation models. Nelson (1973: 5), who has used the ARIMA (Box-Jenkins) time-series approach, has criticized longitudinal structural equation models in economics as such: "It would appear that the structural model has transformed rather than solved the forecasting problem." At the very least, to forecast endogenous variables one must predict the time path for the exogenous ones. Comparing mobilization of discontent forecasts to more sophisticated persistence models, such as ARIMA, would provide a stiffer test of the theory. In macroeconomics, univariate ARIMA models often prove superior to multiequation models of the economy.

Focus energies on the intrinsically difficult cases (8). The technical limitations of forecasting dictate, the theoretical expectations about conflict reveal, and our empirical results show that forecasting conflict will prove most difficult in two sets of cases. In the case of *conflict-free states*, continuity will be the easy prediction. Foreseeing the direction of possible change is also no problem. To determine the timing and extent of change is the challenge. The sources of our data are not likely to be particularly well attuned to the underlying structural problems in such societies that might lead to open conflict at some future date.

In conflict-ridden states, the opposite situation is encountered, but with the same limitations. The timing and extent of decreases in violent conflict will be very difficult to forecast. General theories may not be sensitive enough to say whether, how, and when specific deep-seated conflicts are modified. This suggests that we will do best when forecasting intermediate cases, specifying whether somewhat violent states will become somewhat more or less violent. This is no small feat and should not be disparaged. But clearly special attention should be devoted to the intrinsically difficult cases.

Country specialists will criticize models such as those used here and offer modifications centered on a single theme: disaggregation. Four suggestions seem particularly relevant.

Disaggregate time periods (9). In order to account for the ebb and flow of conflict, and especially to gauge its dynamics in relation to short-term political events, one must employ as short a time frame as practical. Many of the relationships in the "conflict process" model used here were statistically significant in analysis using one-year lags, only to evaporate in five-year ones (see Lichbach and Gurr, 1981).

Disaggregate measures of manifest conflict (10). The mobilization of discontent model's forecasting capacity for man-days of protest might be increased if nonviolent protest were eliminated. Another alternative is to assess the extent of dissidence by reference to numbers of participants alone, without reference to the duration of conflict, to test the possibility that the model accounts for the scope of conflict better than its persistence. Some arguments focus on the component categories of conflict. One might build forecasting models of coups, general strikes, civil wars, and so on. Our tastes run to the general, hence the simple distinction of protest versus rebellion. Others will prefer narrowly focused exercises.

Disaggregate conflict determinants (11). Some will object to the index construction strategy used here. Rather than focusing on such macro concepts as "strain" and "stress," others may prefer to work with its components: ethnolinguistic diversity, export ratios, and so forth. Structural equation models of conflict have been built using both philosophies (Gurr and Duvall, 1973; Hibbs, 1973). Given new developments in multiple indicator approaches (Joreskog, 1978) some combination of the strategies is possible.

Disaggregate conflict groups (12). The predictions reported above are highly aggregated. Whereas conflict results from the actions of specific people acting at specific times, we model nations over years of time. The goal of this research has been to estimate the potential for open political conflict in given social situations, not to forecast the "precipitants" of, or immediate responses to specific episodes. Toward that end conflict processes were measured at the national level. Alternative research designs exist. If conflict properties were measured for specific episodes of conflict, such as a sample of protest campaigns, or of "wars of national liberation," it is plausible that the mobilization of discontent model would prove theoretically appropriate—but there is little basis for gauging its empirical fit. There is currently an unbridged chasm, both in theory and evidence, about the properties of conflict between the national level (e.g., the work of Gurr, 1968, and Hibbs, 1973) and the level of conflict groups and episodes (e.g., the work of Tilly, 1975, and Gamson, 1975). Although measures of conflict used here aggregate the activities of all challenging groups to the national level, there is, in principle, no reason why the model could not be tested at the group level of aggregation. Some determinants of conflict presumably operate at that level (e.g., group discrimination and separatism; the organizational strength of challenging groups), whereas others serve as contextual factors operating at the higher, national level (e.g., the regime's political traits).

Finally, forecasting conflict offers much to policy analysts. Our ultimate objective is not to develop a forecasting instrument, but rather to amass evidence for a more general body of theory which, to the extent that it is convincingly accurate, should give all social actors a better and more general understanding of the potentials inherent in their social situation. To the extent that those potentials are widely and correctly understood, conflict theory should more likely contribute to political accommodation and the minimization of violence in conflict situations than to the perpetuation of deadly cycles of resistance and repression. One final variation of the research strategy employed here should prove especially useful to policy analyses of conflict.

Forecast using policy simulations (13). The forecasting approach is used here as a tool to investigate theoretical arguments and to test empirical procedures of index construction and parameter estimating. It has proven to be a powerful way of confronting theory with data. In addition, the theory-based model has potential policy applications: it

is a powerful way in which policy proposals can be confronted with data. In particular we can simulate the effect of changes in policy by using the reduced form of the model. For example, what would be the effect on conflict of doubling the organizational strength of regimes? If the intervention variables are treated as exogenous ones, foreign policy implications become apparent: it is possible to assess the consequences for conflict of doubling support for challengers, or regimes. Such uses of forecasting models are common in economics but virtually unknown in political science.

The models developed here will certainly not please everyone. This is, after all, a first attempt in the social sciences at forecasting macropolitical phenomena with macropolitical determinants. Variations of the research strategy, however, will help answer many of the questions the results will raise for conflict theorists, empiricists, country specialists and policy analysts about this work. No single group of researchers can pose, let alone answer, all relevant questions about a model. If the experience of economics is any guide, then a model's potentials and limitations are clearly recognized only after it has been used often and in various ways.

NOTES

1. The countries were selected using a stratified sampling procedure. "Quotas" were established for countries on the basis of their economic, political, and regional characteristics: the sample was designed to include four democracies, two autocracies, and four elitest states; at least three countries at each of three levels of economic development, and so forth. The countries were randomly chosen from the full list of 86 until the quotas were filled. For a fuller discussion of the sample countries see Gurr and Lichbach (1979: 176-177).

2. In this article "discontent" refers to the summed discontents in a population. These are indirectly indexed in Gurr and Lichbach (1979) using measures of the social stresses and structural strains that are argued to cause collective discontent. The term "mobilization variables" is used here as a shorthand term for the concepts of dissident and regime organizational strength.

3. The data on conflict used in this estimation were slightly corrected versions of the data used in Gurr and Duvall (1973). Indicators of other variables were substantially changed to meet the requirements of the revised theoretical argument and the requirements of forecasting. The latter required a complex new strategy of index construction, described in Gurr and Lichbach (1979: 165-173).

REFERENCES

ANDRIOLE, S. J. and HOPPLE, G. W. (1984) Revolution and Political Instability: Applied Research Methods. New York: St. Martin's Press.

BARNES, S., M. KAASE, et al. (1979) Political Action: Mass Participation in Five Western Democracies. Beverly Hills, CA: Sage.

CAPORASO, J. (1978) "Dependence, dependency, and power." Int. Organization 32: 13-43.

COHAN, A. S. (1975) Theories of Revolution: An Introduction. New York: Halstead Press.

ECKSTEIN, H. (1980) "Theoretical approaches to explaining collective political violence," in T.R. Gurr (ed.), Handbook of Political Conflict: Theory and Research. New York: Free Press.

FIRESTONE, J. N. (1974) "Continuities in the theory of violence: a review." J. of Conflict Resolution, 18: 117-142.

GOLDSTONE, J. (1980) "Theories of revolution: the third generation." World Politics 22: 425-453.

GRANGER, C.W.J. and P. NEWBOLD (1977), Forecasting Economic Time Series. New York: Academic Press.

GURNEY, J. N. and TIERNEY, K. J. (1982) "Relative deprivation and social movements: a critical look at twenty years of theory and research." Soc. Q. 23: 33-47.

GURR, T. R. (1967) The Conditions of Civil Violence: First Tests of a Causal Model. Princeton, N.J.: Center of International Studies Research Monograph 28.

———(1968) A Causal Model of Civil Strife: A Comparative Analysis using New Indices. Amer. Pol. Sci. Rev. 62: 1104-1124.

———(1970a) Why Men Rebel. Princeton, NJ: Princeton University Press.

———(1970b) "Sources of rebellion in western societies: some quantitative evidence." Annals of the American Academy of Political and Social Science 391: 128-144.

———(1979) "Political protest and rebellion in the 1960s: the United States in world perspective, in H. D. Graham and T. R. Gurr (eds.) Violence in America: Historical and Comparative Perspectives. Beverly Hills, CA: Sage.

———(1980) "On the outcomes of violent conflict," in T. R. Gurr (ed.) Handbook of Political Conflict: Theory and Research. New York: Free Press.

———[ed.] (1983) "Group protest and policy responses: New crossnational perspectives." Amer. Behavioral Scientist 26 (January-February).

———and R. DUVALL (1973) "Civil conflict in the 1960's: a reciprocal theoretical system with parameter estimates." Comparative Pol. Studies 6: 135-170.

———(1976) "Introduction to a formal theory of conflict within social systems," in L. A. Coser and O.N. Larsen (eds.) The Uses of Controversy in Sociology. New York: Free Press.

GURR, T. R., and LICHBACH, M. I. (1979) "A forecasting model for political conflict within nations," in J.D. Singer and M.D. Wallace (eds.) To Augur Well: Early Warning Indicators in World Politics. Beverly Hills, CA: Sage.

GURR, T. R. et al. (1978) Comparative Studies of Political Conflict and Change: Cross-National Datasets. Ann Arbor, MI: Inter-University Consortium for Political and Social Research.

HIMES, J. S. (1980) Conflict and Conflict Management. Athens, GA: University of Georgia Press.

HUANG, D. S. (1970) Regression and Econometric Methods. New York: Wiley.

KICK, E. L. (1980) "World system properties and mass political conflict within nations: theoretical framework." J. of Pol. and Military Sociology 8: 175-190.

LICHBACH, M. I. (forthcoming) "Protest in America: a time series analysis of the postwar era using univariate ARIMA models." Western Pol. Q.

———(forthcoming) "Protest: random or systematic? A time series analysis of the postwar United Kingdom using univariate ARIMA models." Armed Forces and Society.

———and T. R. GURR (1981) "The conflict process: a formal model." J. of Conflict Resolution 25: 3-30.

MULLER, E. N. (1979) Aggressive Political Participation. Princeton, NJ: Princeton Univ. Press.

MULLER, E. N. (1980) "The psychology of political protest and violence," in T.R. Gurr (ed.) Handbook of Political Conflict and Violence: Theory and Research. New York: Free Press.

SALERT, B. (1976) Revolutions and Revolutionaries. New York: Elsevier.

TILLY, C. (1975) "Revolutions and collective violence," in F.I. Greenstein and N. Polsby (eds.) Handbook of Political Science Vol. 3. Reading, MA: Addison-Welsey.

TILLY, C. (1978) From Mobilization to Revolution. Reading, MA: Addison-Welsey.

WONNACOTT, R. J. and T. H. WONNACOTT (1970) Econometrics. New York: Wiley.

ZIMMERMAN, E. (1983) Political Violence, Crises, and Revolution: Theories and Research. Cambridge, MA: Schenkman.

Ted Robert Gurr is Professor of Political Science and Director, Center for Comparative Politics, at the University of Colorado, Boulder. His dozen books and monographs include Violence in America: Historical and Comparative Perspectives, *with Hugh Davis Graham (1969; revised ed., 1979) and* Why Men Rebel, *which won the Woodrow Wilson Prize as the best book in political science of 1970. His current work is concerned with the future trends and incidence of deadly conflicts, and the role of the state in those conflicts.*

Mark Irving Lichbach is Associate Professor of Political Science at the University of Illinois at Chicago. His work involves microeconomic and statistical models of governmental policies, political conflict, and electoral politics. He is the author of Regime Change and the Coherence of European Governments *(1985) and of numerous articles that have appeared in* World Politics, Public Choice, Western Political Quarterly, *and other scholarly journals. He currently is working on a book,* Government and Opposition: An Economic Theory of Governability.