Dynamics of Conflict

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For my favorite mathematicians,
Christopher and Cynthia

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Lawrence, Kansas, USA Ronald A. Francisco

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Chapter 1
Introduction to the Problem Set

The effects of chance are the most accurately calculable, and therefore the least doubtful, of all the factors of an evolutionary situation

R.A. Fisher

1.1 Introduction

We explore the dynamics or mechanisms of conflict in this book. This is possible at last because we have data that permit dynamic analysis. In many fields, the mechanism of a physical or social process is the first factor to investigate and is usually prior to any other work. But in much of social science, the sequence has been reversed, simply because the underlying data in the field of protest and repression and many others for decades were insufficient for the tests necessary to find dynamic properties: equilibria, divergence, or oscillation. This kind of mathematical work was for the most part relegated to game theory, which needs no data. Now we have the resources to estimate dynamic models. We do not assume rationality of the individuals underlying our data, but we do consider them self-interested and risk-averse. After all, who wants to be arrested, injured, or killed in pursuit of a public good?

The likelihood of protest participation is low. We know that not more than five percent of any local population ever participates in protest (Lichbach, 1995). Not many need to take part, however, in a densely populated area, to make an impact upon the neighborhood and even public policy. Nonetheless, it is important to keep in mind that we are for the most part working with fervid minorities in this book. Even bandwagon mobilization (Chapter 4) does not bring the level of mobilization to high levels. Game theorists have long been puzzled about why anyone would act for a public good (Riker and Ordeshook, 1973). Lichbach extended collective action theory so that it would function with risk and probable inefficacy (Lichbach, 1995, 1996). We are interested in the people who decide to act, or more accurately, how many choose to act. They are represented in our data. We seek principally to find out what happens when they act and the state responds to them or simply ignores them. This is the process or mechanism that we attempt to discover.

Why should we consider the mechanism of conflict important? The answer to this question is that it is the basis of understanding two- or more-sided conflict and competition. We know a great deal about the correlates of conflict. We also know what

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happens to dissent when repression grows harsh (Francisco, 2004). But prior to these concerns is the fundamental problem of the dynamic process (Morrison, 1991). Unless we understand the mechanism, we can understand nothing else about the problem. Only four things can happen in dynamic analysis: (1) stability or equilibrium; (2) divergence, that is, exponential growth or decay; (3) oscillation, a wave function that signifies instability if it is not damped; and (4) a saddlepoint, or unstable equilibrium. A saddlepoint result is shaped as a hyperbolic paraboloid and is only stable at the midpoint (0,0,0) and nowhere else. It certainly makes a difference to people in a conflict which of these mechanisms emerges. Anything but stable equilibrium brings disadvantages that might expand to severe levels. Divergence means sharp escalation or decay, something that is uncomfortable for a community. So too is oscillation, since things might be pleasant one moment and a cauldron of conflict in another. The saddlepoint, as in game theory, is stable as long as none of the instrumental players shifts position, but in the real world, position shifts are common over time with scores of players, and then the saddlepoint becomes unstable as well. All of these alternatives to equilibrium are noxious, especially at the local level and for participants (Kauffman, 1993). One of the more noteworthy discoveries in this arena was the finding by the 19th century mathematicians Laplace and Lagrange that the solar system had to have negative eigenvalues or it would fly apart into space (Tabak, 2004). Another relevant topic is that equilibrium in game theory is different from other equilibria that we uncover with empirical data (Riker, 1982, 45). Stuart Kauffman stresses the beauty and order of the natural biological world, a world infinitely more complex than is the general context of protest and repression (Kauffman, 1993).[1] So complex and dynamic processes can maintain order. Equilibrium or stability is essentially what is called a "steady-state or evoluative" context, one that allows transactions without great surprises or systemic shocks (Morton, 1999, 83). Another definition of statistical equilibrium is "the condition of a macroscopic system when we observe no change over time" (Coleman, 1975, 15). Still another maintains that stability is achieved "if the system returns to equilibrium when it is pushed slightly away from equilibrium" (Roughgarden, 1998, 239). In practical terms, equilibrium best implies a return to origin, or zero, after protest, repression, or interaction is completed.

In this volume we attempt to use the proper (interval-level) data for conflict and also the standard procedures of interactive time-series data estimation. Recent papers have attempted to do this, but have relied on ordinal data or artificial manufacturing of interval data from the ordinal origin, for example, Carey (2006). They have also neglected the interaction inherent in protest and repression. To model interaction of two sides, one needs at least two equations for estimation (see King, 1989). Below we introduce two models that will be the workhorses for estimation of parameters and discuss how we analytically estimate parameters.

[1] Kauffman even suggests that in an ecosystem, many players can be frozen in Nash equilibrium while other players continue to adapt and evolve (Kauffman, 1993, 256). We expect that our contexts are much simpler. Certainly we do not have to worry about the carrying capacity of the environment, which matters heavily for ecologists and biologists.

1.2 A Summary of Objectives

We have two primary objectives in this volume. First we seek to test interval conflict data in dynamic analysis to explore what happens when mobilization leads to protest and then some form of repression in a variety of institutional, contextual, and government-form contexts. The problem we confront is how protest and repression differ in different governmental contexts. We investigate what happens in different forms of democracy and then what happens in dictatorship and authoritarian forms of government. An added focus is what happens when a dictatorship collapses and political transition begins. Bandwagon mobilizations happen in both types of government. These events are different from normal protest and repression. They accelerate rapidly and repression may be applied at the beginning of mobilization, the end, or not at all. We consider six of these events in Chapter 4. Civil war marks our final substantive topic. Civil war is certainly a definite and incongruous means of conflict that warrants separate treatment. We estimate seven unrelated civil wars in Chapter 5. As noted later, the nature of civil war requires a different model form from the rest of the volume.

The second goal of the book is to test theory. We view this enterprise as part of the empirical tests of formal models. The theory under examination is Mark Lichbach's rational choice theory (Lichbach, 1995, 1996). Lichbach's theory is an extension of Mancur Olson's (1965) collective action theory. Lichbach was able to apply the theory to mobilization in conflict by using dozens of solutions grouped in four areas: market, community, contract, and hierarchy. We will also have occasion to test the theory of mobilization in conflict by DeNardo. In the 1980s, he crafted a rational choice model for conflict mobilization (DeNardo, 1985). And in the chapter on dictatorship, we will invoke the theory of Wintrobe, who constructed a dictatorship strategic theory (Wintrobe, 1998). Our problem in this context is whether the theory available conforms to empirical analytic results. If so, we confirm theory. If not, how not? Does theory need revision in terms of advancing the Collective Action Research Program (Lakatos, 1970)? So we will be mindful of theory as we proceed.

Another set of assumptions we tackle is that democracies are not repressive and that dictatorships repress heavily. A separate question that has heretofore not been tested empirically is whether inconsistent repression accelerates protest (see Lichbach, 1987). We have occasion to test this game-theoretic conjecture in Chapter 2. We examine the German governments' treatment of leftist protesters, mainly university students. This allows us to focus on one group for a long period of time to see what happens between dissidents and the state when the state represses only occasionally.

Each system can be characterized by an underlying mechanism. It is that underlying form of movement that provides the foundation of a process or conflict. Scientists study stable systems in experimental settings and then perturb them to see if they remain in equilibrium. The most simple example (Luenberger, 1979, 184) is a vertical stick: secured at its bottom, it is in unstable equilibrium; secured at its top, it is in stable equilibrium, since any perturbation will move it, but it will always return to the vertical position. A system that remains stable under perturbation also remains