8 Was Leo Durocher right?

Do “nice states” finish last?

Richard J. Stoll

Nice guys finish last. (Durocher 2006a)

If I were playing third base and my mother were rounding third with the run that was going to beat us, I'd trip her. Oh, I'd pick her up and brush her off and say, “Sorry, Mom,” but nobody beats me. (Durocher 2006b)

Introduction

Leo Durocher was a baseball player, but is probably best known as a baseball manager. The two quotes above epitomize most people's view of his attitude toward winning.2 If instead of pursuing a career in baseball, Durocher had been an international relations scholar or practitioner, he would have been a realist. While realist thought contains more variety than many believe, it would be fair to say that realists believe that “nice states finish last.” Realists assert that states that do not aggressively pursue and protect their national interest with all means at their disposal (including, when necessary, military force) are destined to fall behind and perhaps be destroyed. And if states display altruistic behavior, this will only make matters worse.

But is this really true? I have done a number of studies through the years that lead me to conclude that (to steal from Stoll 1998) nice states finish pretty well. A number of these studies use the computer simulation EARTH (Exploring Alternative Realpolitik Theses). But I have also conducted an empirical study (Stoll 1998) on this topic and will update that analysis in this paper.3

In this paper, I will briefly review the various strains of realist thought to illustrate that there is more variety to realism than is generally realized. I will then describe the EARTH computer simulation. This is followed by a discussion of a set of simulation studies using EARTH. These studies compare states that use different decision-making rules and observe whether some are more successful than others. Finally, an updated empirical analysis that is based on the findings of the simulation is conducted.
Realism: a big tent or a set of poles with no cover?

Realism is the most widely used framework in international relations and there are traces of it in writings from a long time ago. Most scholars and practitioners who write about realism assert that the foundation of realism is a handful of assumptions. The problem is that the set of assumptions varies from writer to writer. It is well beyond the scope of this chapter to provide a complete description of the literature on realism (in fact, that is probably an impossible task). But nevertheless it is important to bring some semblance of order to this body of work. I divide the literature into neorealism and traditional realism and also present a set of categories within each of these bodies of literature.

Neorealism

Waltz is considered to be the founding father of neorealism (1979). Perhaps the most well-known recent treatise on neorealism is Mearsheimer (2001). Following many neorealists since Waltz, he divides neorealism into two variants: offensive neorealism and defensive neorealism.

The difference between the two variants is the assumption that is made about the major goal that states pursue. In offensive realism, states are assumed to seek to maximize their power. In essence, they seek to become hegemons. In defensive realism, states seek to survive.

Neorealist thought is derived from Waltz's work. And most of its adherents have consciously built on this foundation. But nevertheless there are still two variants. This has implications for testing neorealist propositions. What does it mean to test neorealism? Is it sufficient to explore only one variant, or must both be examined?

Classical realism

The writings I have termed "classical realism" are far more numerous and far more diverse than neorealism. This makes sense because these writings span a much longer period of time, and cross many cultures. So it is harder (and more controversial) to present a scheme that tries to organize this literature. Nevertheless I will propose such a scheme. As noted above, the credit for this scheme should be shared with Thomas Cusack.

The scheme classifies realist writing into two dimensions, and each dimension consists of two categories. The first dimension is based on whether the writer is optimistic or pessimistic about a world of realist states; that is, if states behave according to the tenets of realism, will most of the states (at least the significant ones) survive, or will the multistate system collapse? The second dimension is whether the writer is extreme or moderate in her or his position. There is a distinctive realist literature in each of the resulting four categories. Table 8.1 displays the scheme.

<table>
<thead>
<tr>
<th>Optimist</th>
<th>Extremist</th>
<th>Moderate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Universal empire</td>
<td>Automatic stabilization</td>
<td>Conscious balancing Cycles of concentration</td>
</tr>
</tbody>
</table>

Extreme optimists believe that if all states behave according to the tenets of realism, then the system will be stable. Conflict will occur, but few states (perhaps even none) will be eliminated. The process by which this occurs is similar to that of Adam Smith’s invisible hand. One or more states acting in their self-interest seek gains. But other states will see these actions as threatening their self-interest and will move to restrain or stop the initial aggressors. The result is a world in which all means, including armed conflict, are used to regulate the behavior of states. It is not a pleasant world but, according to extreme optimists, it works.

Moderate optimists believe that, while the self-interest of states is a powerful force for maintaining stability in the system, it is not sufficient. Some additional element is needed, and there are several that have been suggested by this group of writers. What these elements have in common is that each adds a degree of consciousness about the overall system. One element referenced in this literature is the presence of one or more diplomats who has the vision and desire to keep the system stable. A second alternative in this literature is a rule by which states (or perhaps only essential states) cannot be eliminated. Finally, some writers believe that the system of states needs one or more balancing states. A balancer is a state that does not act in its own self-interest. Instead, it stays aloof from the rest of the system, but acts against aggressive states if they appear to be on the verge of upsetting the system. The state that is most frequently mentioned as having played this role in Europe is Great Britain.

The remaining two categories in the classical realist literature have a pessimistic perspective. The extreme pessimist perspective is quite simple. A system of states that behaves according to realist principles will ultimately collapse into an empire.

The final perspective is that of the moderate pessimists. This group of writers argues that a system of states that behave according to realist principles will collapse into an empire. But that is not the end of the story. The empire will collapse and be replaced by a new state system. Moderate pessimists see a cycle of concentration (empire) and diffusion (multistate system).

Summary

As you can see, realism is a more diverse theoretical perspective than is commonly assumed. This creates some special challenges if one is interested in
trying to understand the implications of this theoretical framework. It suggests that any approach that one uses must be flexible and able to take this diversity into account.

But, despite the variation that exists within realism, there are some things that we can say. First, a realist world (any realist world) is one in which conflict is endemic. Second, there are two questions that are central to any variant of realism:

1 Under what conditions will states survive and prosper in a realist world?
2 Under what conditions will the system of states survive and prosper if states operate according to realist principles?

How do we attempt to answer these questions? In the next section, I propose one approach to studying these questions.

Computer simulation as a tool for research into realism

To explore realist thought, one needs to use an approach that will allow the study of the long-term interaction of a large number of actors (states). The approach should be flexible but rigorous. Formal theory is an extremely powerful tool for such analysis. But there are limits to what it can do. First, it is very difficult for this approach to treat a large number of actors in an individual way through time. As well, there are only so many factors (complications) that can be added to a formal model. As two of the formal theorists who study realism comment:

Realist-neoliberal debates, then, are readily formalized [using game theory], but we should not delude ourselves into believing that we have overcome the hardest problems. First, our model does not take account of investment and endogenous resources growth. Second, we ignore the costs of conflict. Finally, our model ignores uncertainty and misperception.

(Niou and Ordeshook 1991: 510)

Admittedly, this quote was chosen for a specific reason. The computer simulation I describe below deals with all the factors that are omitted from the formal model of Niou and Ordeshook.

But the ability to incorporate more factors, more actors, and a large number of iterations comes at a significant price. The great strength of a formal model is that it can allow the researcher to reach definitive conclusions through the process of proof and deduction. That is not possible using this type of computer simulation. The best one can do is to determine the typical or average behavior across a large number of simulation runs. That is a weaker conclusion but, considering the advantages of this approach, I believe it is worth pursuing not as a replacement for formal theory, but as a complement to it.

EARTH: a computer simulation of a realist world

The computer simulation I use was inspired by another simulation developed by Stuart Bremer and Mike Mihalka in the 1970s (1977). Thomas Cusack and I rebuilt it in the 1980s (Stoll 1987), taking advantage of the advances of computer technology, both hardware and software. It ran much faster and had capabilities not available in the original version. The simulation involves an initialization, followed by a series of iterations. There is an extensive description of the simulation in a book Cusack and I published (Cusack and Stoll 1990: 63–94). Shorter descriptions are present in the other pieces that have been published using EARTH. Consequently, I provide only a brief description of the simulation. Figure 8.1 shows the initial “map” of the system.

Initialization

At the beginning of a run, a set of parameters is read that sets values for the system and values for the individual states. The appendix provides a description of all parameters (there are a total 29 parameters for a run). Examples of parameters are the number of states in the system, the reparations rate (the proportion of a state’s power that must be surrendered when it loses a war). Examples of parameters at the state level are the proportion of states assigned to each possible decision-making style (the various styles are discussed below), and the distribution of power assessment ability among states (states can underestimate or overestimate power).

Civil war phase

Unlike the rest of the simulation, this phase can be bypassed. Indeed, for all the studies discussed in this paper, that was the case. For the sake of

![Map of the system at the start of a run.](image)
completeness I provide a brief description. At periodic intervals (as given by a parameter), the possibility of civil war is stochastically determined. If civil wars can occur, individual states (but only if they consist of more than one hexagon) are examined to see if civil war will break out.

The probability of a civil war breaking out in a state is a function of the difference between the maintenance costs the state must pay to prevent a civil war, and the maintenance cost it is paying (the greater the degree to which states underfund maintenance, the more likely the state is to experience a civil war). If a civil war breaks out, the extent of the war (how many hexagons revolt against the state) is determined. The winner of the war is a function of the power available to the two sides. If the rebellion fails, the result is simply a loss of power among all hexagons that participated in the war. If it succeeds, the state is broken up into two or more states.

Dispute initiation

In the next phase, a potential initiator of state-to-state conflict is selected. For the most part, a state's chance of becoming a potential initiator is a function of the amount of power the state possesses. The higher the proportion of the system's power held by the state, the more likely it is to be selected as a potential initiator. If a state is selected as a potential initiator, it checks the power balance between itself and each of its neighbors. If it cannot find a neighbor that it calculates is weaker than itself, the simulation moves to the power growth phase (see below). If the potential initiator calculates that it is more powerful than a single neighbor, a conflict is started with that state. If the potential initiator calculates that it is more powerful than a number of neighbors, it initiates a conflict against the weakest neighbor.

Dispute escalation: alliance formation

The neighbor that is selected (hereafter called "the target") now does its own calculation of the power balance. If it calculates that it is more powerful, then the focus shifts back to the initiator. If the target calculates that it is weaker, it tries to build a minimal winning coalition. It does this by seeking allies from those states that are contiguous to the initiator. It asks each state it selects to join in a coalition against the initiator. Each of these states makes its own decision to join or to stay out of the conflict. A state that is asked to join bases its decision on its own calculation of whether it is to its benefit to join the coalition.

The initiator calculates the current power balance (i.e., it includes the allies of the target). If it calculates that it is weaker, then it seeks allies using the same procedures as the target (i.e., build a minimal winning coalition contiguous to the target). After the alliance-building is completed, the initiator once again calculates the power balance. If the initiator calculates that it is weaker, it backs down and the simulation moves to the power growth phase. If the initiator calculates that it is stronger, the target engages in a second round of alliance formation. A war is then fought.

War

The outcome of the war is a function of the actual power balance between the two sides. It is possible to allow for the war to end in a tie, but I have never used this option; there is always a side that wins and a side that loses, and all wars end during the iteration. All participants in the war lose a certain amount of their power as a cost for fighting (determined by a parameter set by the user).

States on the losing side pay two additional costs. First, each state on the losing side gives up some of its power. This power is then distributed to the members of the winning side. Each state on the winning side receives a portion of the "pool" of power that is equal to its proportion of the total power in the winning coalition (i.e., if the state's power was 10 percent of the total power on the winning side, it will receive 10 percent of the "pool" of power given up by the losing side).

Second, territory is lost by the leader of the losing coalition (this is either the initiator of the conflict, or the first target). The amount of territory (hexagons) lost by the leader is a function of the decisiveness of the defeat. In some cases, the leader loses all its territory and is eliminated from the map. The territory the leader surrenders is distributed to members of the winning coalition, with the larger members having the first opportunities to gain hexagons. It is possible that some (or even most) of the members of the winning coalition receive no territory. After the costs of the war are assessed, the simulation moves to the power growth phase.

Power growth

At the beginning of a simulation run, each hexagon is assigned an internal growth rate. After all the effects of the war are calculated, the power of each hexagon is increased. The simulation then returns either to the civil war phase (if that portion of the simulation has not been bypassed) or to the dispute initiation phase.

Decision-making style

The world of EARTH is one of conflict. But states can operate in different ways in this world. Some may act aggressively, while others may be relatively "nice." In the simulation, each state is assigned one of four different decision-making styles. Styles reflect different rules for initiating and for joining conflicts.
Primitive power-seekers make decisions in a basic (and brutal) fashion. Given the opportunity to initiate a conflict, a primitive power-seeker will do so if it calculates that it is stronger than a target. Similarly, a primitive power-seeker will accept a request for an alliance if it calculates that it will be on the more powerful side.

A rational state performs a more sophisticated set of calculations. Instead of simply determining whether it will be on the more powerful side, it calculates the expected value of fighting a war. That is, it calculates not only the probability of winning and losing, but the expected power gain (or loss) from each. It is possible, for example, that in winning a war, the state will give up more power (because it pays a cost to fight the war) than it will gain from winning. In this case, winning the war will have a negative expected value and the rational state will not get involved in the conflict. The rational state calculates the expected value of the conflict if it is given the chance of initiating a conflict, and if it is asked to join a conflict. Based on the expected value, the rational state decides to get involved in the conflict or to stay out.

The third type of decision-making style is power-balancing. If given the opportunity to initiate a conflict, a power-balancer makes the same calculations as a primitive power-seeker: it initiates if it calculates it is stronger than the target. But it has a very different calculus if asked to join a conflict. A power-balancer always agrees to join an alliance with the target. It never joins an alliance with the initiator.

The final type of decision-making style in EARTH is one that I believe reflects the calculations and behavior of “nice states.” In the simulation, the name of this decision-making style is “collective security.” A collective-security state never initiates a conflict. A collective-security state never agrees to join an alliance with an initiator, but it always agrees to join an alliance with a target.

Summary of EARTH

No single model, whether a computer simulation or a formal model, can capture realism in all its varieties. There are just too many variants and too little consensus in the literature. Nevertheless, I believe that EARTH has the flexibility to study a number of variants of realist thought. This flexibility is achieved by varying the parameters of the simulation, and conducting a number of identical runs with different random-number seeds. For example, I can examine what happens when power is distributed evenly across the system of states, or when it is distributed unevenly.

Because of the random components in EARTH and the large number of parameters that can be varied, a great deal of data must be generated to determine the typical behavior across a set of runs. Typically, individual runs are set to go 1000 iterations. In addition, key parameters have to be given multiple values, and identical sets of parameter values are run several times with different random seeds. To illustrate, in a recent study that looked at the impact of civil war in a realist world (Stoll 2005), the runs I did generated about 3 million observations.

“Nice states” in the realist world of EARTH

What do realists expect to happen to “nice states” in a realist world? That is very clear. Realists expect nice states (states that behave according to the principles of collective security) to damage themselves through their involvement in conflicts that are not in their self-interest. And they run the risk of suffering such severe damage that they may be destroyed.

What happens to collective security in the artificial world of EARTH? The results are something quite different from the expectations of the realists. A number of studies have been run using EARTH, comparing what happens to collective-security states with the other decision-making styles in the simulation (Cusack 1989; Cusack and Stoll 1990: 137–182; Cusack and Stoll 1994). Different studies compare different decision-making styles with collective security. But the overall conclusion is always the same: collective-security states are more successful in the realist world of EARTH than any of the other decision-making styles. Specifically, in these simulation studies:

- On average, collective-security states survive for more iterations than the states using other decision-making styles.
- Collective-security states are more likely to survive to the end of a simulation run than states using other decision-making styles.
- At the end of a run, on average, collective-security states are more powerful than states using other decision-making styles.13

Table 8.2 provides a few more details of the findings of these studies.

So, in the abstract, artificial, realist world of EARTH, “nice states” finish first.

Nice states in the real world

The results of the EARTH studies clearly point to the superiority of the collective-security decision-making style. Nice states outperform the decision-making styles more closely associated with realist thought. This is an intriguing (and, for many, an unexpected) finding. But while I have tried to argue that EARTH can reflect most of the critical features of a realist world, the simulation may be deficient in one or more ways. So while the collective-security decision-making style may work in an artificial world, perhaps the realists are correct when it comes to the real world. Clearly, an empirical test of these findings is needed.14

It is not possible to conduct an empirical test that exactly matches the simulation runs. There are several reasons why this would be difficult. To
Table 8.2 Relative success of collective security states in EARTH studies

<table>
<thead>
<tr>
<th>Study</th>
<th>State survival</th>
<th>Average power of state</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cusack, 1989</td>
<td>Collective-security states are about twice as likely to survive as power-balancers and primitive power-seekers.</td>
<td>At the end of a simulation run, collective-security states have about 3.8 times the power of power-balancers and primitive power-seekers.</td>
</tr>
<tr>
<td>Cusack and Stoll, 1990</td>
<td>Collective-security states are about one and one-half times more likely to survive than power-balancers, and about two and a third times more likely to survive than primitive power-seekers.</td>
<td></td>
</tr>
<tr>
<td>Cusack and Stoll, 1994</td>
<td>Collective-security states survive for over 20 percent longer (i.e., average number of iterations) than rational states. Collective-security states have about a 40 percent greater chance of surviving to the end of a simulation run than rational states.</td>
<td></td>
</tr>
</tbody>
</table>

give just one: it would involve classifying states as using one (and only one) of the four decision-making styles that are part of EARTH. To say the least, this would be problematic. Any such coding would be highly controversial and this would lead to grave doubts about the findings of the study.

My approach begins by identifying situations in which states behave as collective-security states. I then compare the success rate of these states with states that behave in other ways. This line of attack eliminates the need to classify states as using a single decision-making style. Instead, states are classified by their behaviors in specific situations. One implication is that state behavior can change from situation to situation.

State behavior in militarized interstate disputes

The empirical test involves state behavior during militarized interstate disputes (MIDs). Collected by the Correlates of War project (Gochman and Maoz 1984; Jones et al. 1996; Faten et al. 2004), the definition of a militarized interstate dispute is: “a set of interactions between or among states involving threats to use military force, displays of military force, or actual uses of military force. To be included, these acts must be explicit, overt, nonaccidental, and government sanctioned” (Gochman and Maoz, 1984: 587). The temporal domain of the current (MID 3) data set is 1816–2001. During this time period, there are 2331 disputes, with a total of 5600 state involvements.

To identify states whose behavior in disputes is consistent with the collective-security decision-making style, I begin with those states in the MID data set that were coded as revisionist. Revisionist states in MIDs are those who are seeking a change in the status quo (Jones et al. 1996: 178). These changes can involve:

- Making claims on territory.
- Attempting to overthrow a regime.
- Declaring the intention not to abide by another state’s policy.

States behave in a manner consistent with collective security if they intervene against revisionist states. More specifically, I code a dummy variable, with the state being considered a collective-security state if it participates in a dispute and meets the following criteria:

- The state is not initially involved in the dispute.
- The state is not coded as a revisionist state.
- The state intervenes against one or more states that are coded as being revisionist.

I believe that states in MIDs that meet these conditions are behaving in a manner consistent with the collective-security decision-making style of EARTH.

Dispute outcome: the outcome variable

The Correlates of War project codes a variety of outcomes for a militarized interstate dispute. To determine whether a state was successful, I consider only decisive outcomes. Note that outcomes are coded for each side in a dispute, not for individual states (i.e., if there are multiple states on the same side, all have the same coding for outcome). A state is coded as winning if its side is coded as achieving a victory in the MID, or if the other side is coded as yielding. A state is coded as losing if the other side is coded as winning or if its side is coded as yielding. All other outcomes are treated as missing data.

Additional variables

Recently, researchers have been urged to build their models with greater attention to the role of each variable, with an eye toward minimizing the
number in each equation (Achen 2002, 2005; Ray 2003, 2005). That is the
tack I will take here. I seek to include only two types of variables.

The first are several dummies that represent different types of state (i.e.,
states that behave in a manner different than collective-security states).
The dummy variable for collective-security states allows me to calculate
the probability that this type of state will be on the winning side in a
dispute. This information is useful. But in order to see if the findings
from the simulation are reflected in the real world, it is important to compare
the success rate of collective-security states to other types of state. So
I include dummy variables for revisionist states and states that initiate
disputes.

While realist writings do not advocate that states should always seek to
revise the status quo, significant portions of realist thought argue that states
should seek to improve their position (and their power). So, to some extent,
including a dummy for states that behave in a revisionist fashion allows me
to assess the relative success of collective-security states versus states that are
behaving in the aggressive manner advocated by realists.

The initiation of disputes is not behavior that is consistent with collective
security. This is true both in EARTH and in the collective-security
literature (see, for example, Claude 1971). But it is consistent with
realism. States in the simulation only initiate conflict if they calculate they
can win; as well, in the escalation process, if the state calculates it can no
longer win, it backs down. This behavior is consistent with a prudent
realist state.

I also include one control variable: a dummy variable for war interven-
tion. More precisely, I code a dummy variable for states who become
involved in a dispute after a war has broken out among some of the initial
disputants. Joining a dispute at this point is potentially a very costly under-
taking for a state, because of the chance it will become involved in a war.

The logit analysis of dispute outcome with these variables is shown in
Table 8.3. All of the variables in the equation are significant at the 0.01
level. All of the variables have the signs that would be expected. All of the
conditions that are tapped by the variables have a positive impact on the
chances of the state being on the winning side of the dispute. The dummies
for collective-security states are a bit larger than the dummies for revisionist
states and dispute initiators. By a slight margin, collective-security states are
more likely to win a dispute than the other types of state represented in the
equation.

It is often useful to take the results of a logit (or probit) and express them
in terms of predicted probabilities. In particular, it allows me to consider
the substantive impact of the difference in coefficients between collective-security
states and revisionist states. Table 8.4 displays the predicted probabilities.
The first set is calculated assuming there is no ongoing war in the dispute;
the second set is calculated assuming that at least some of the initial parties
to the dispute have begun a war. The condition labeled “Not Specified”

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collective security state</td>
<td>1.105***</td>
</tr>
<tr>
<td></td>
<td>(0.22)</td>
</tr>
<tr>
<td>Revisionist state</td>
<td>1.078***</td>
</tr>
<tr>
<td></td>
<td>(0.15)</td>
</tr>
<tr>
<td>Dispute initiator</td>
<td>0.795***</td>
</tr>
<tr>
<td></td>
<td>(0.15)</td>
</tr>
<tr>
<td>Ongoing war in dispute</td>
<td>0.736***</td>
</tr>
<tr>
<td></td>
<td>(0.26)</td>
</tr>
<tr>
<td>Constant</td>
<td>-0.776***</td>
</tr>
<tr>
<td></td>
<td>(0.100)</td>
</tr>
</tbody>
</table>

Observations 1188
Pseudo R² 0.10
LR chi-square (4 df) 165.42
Chi-square prob. 0.00

Notes
Standard errors in parentheses
*** p < 0.01, ** p < 0.05, * p < 0.1.

occurs when the state is not a collective-security state, nor a revisionist state,
nor a dispute initiator.

It is clear that collective-security states have only a small margin of
superiority over states that behave in a manner consistent with realism.
I will say a bit more about the disparity between the world of EARTH and
the real world in the conclusion. But nevertheless, I contend that the results
of analyzing militarized interstate disputes are, from the point of
view of realist writings, unexpected. As I said in the conclusion of the
paper analyzing the MID 2 data, the analysis shows that nice states finish
pretty well.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Predicted probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not specified</td>
<td>0.315</td>
</tr>
<tr>
<td>Revisionist state</td>
<td>0.575</td>
</tr>
<tr>
<td>Dispute initiator</td>
<td>0.504</td>
</tr>
<tr>
<td>Collective-security state</td>
<td>0.582</td>
</tr>
</tbody>
</table>

Ongoing war in dispute

<table>
<thead>
<tr>
<th>Condition</th>
<th>Predicted probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not specified</td>
<td>0.490</td>
</tr>
<tr>
<td>Revisionist state</td>
<td>0.739</td>
</tr>
<tr>
<td>Dispute initiator</td>
<td>0.680</td>
</tr>
<tr>
<td>Collective-security state</td>
<td>0.744</td>
</tr>
</tbody>
</table>
Conclusion: to do well in a realist world, be nice!

I have tried to make several points in this paper. The first concerns the status of realism as a theoretical framework. The second concerns the utility of computer simulation as a research tool to explore the consequences of theoretical frameworks such as realism. The third concerns the ability of states that behave “nicely” to survive and prosper in a realist world.

First, realism is the most widely used framework in international relations. Although it is most closely associated with writings about the European state system that existed for several hundred years, traces of it can be found far earlier and in writings about non-Western systems. But a closer look at realist writing reveals that it is not a single, coherent framework, but a collection of overlapping (and sometimes even contradictory) writings. It is important to keep this in mind when trying to use realism to understand the world.

Second, computer simulation can be a very useful tool for exploring certain types of theoretical issues. The EARTH simulation illustrates several situations in which it is particularly applicable:

- If we need to probe the long-term implications of a theoretical framework (particularly if we suspect there may be emergent properties that arise from the continual interactions of lower level entities).
- If we must deal with a large number of actors in the theoretical framework.
- If we need to vary a number of elements in the framework because we cannot specify a specific value for the parameter.

But these advantages come at a price. The conclusions that are reached using this approach generally specify “typical” or “average” outcomes, rather than specific deductions or conclusions.

Finally, what of “nice states” in a realist world? In the artificial world of EARTH, they are consistently more successful than states that use decision-making styles that are associated with realism. This finding is not the product of a single study, but occurs across a number of simulation studies. But of course this finding, no matter how strong, emerges out of a theoretical world. Does it hold in the real world? Based on the analysis of intervention in militarized interstate disputes presented here, the answer is yes. The margin of success over other state behaviors is much smaller than in the simulation studies; this indicates that there is at least one element in the real world that is missing or incorrectly specified in EARTH. But nevertheless, it is there; nice states are more successful. This should give pause for advocates of realism and offer support for those who wish to follow another path.

Leo Durocher may have been right about baseball, but he appears to be wrong about the world.

Appendix: description of parameters necessary to run EARTH

The EARTH simulation requires that 29 parameters be specified. A brief description of each parameter and its minimum and maximum possible values is given below.

1 Name: Run number
   Meaning: Experimental run number; first two numbers placed in output file names, last three numbers placed in file name extensions.
   Minimum value: 0.0
   Maximum value: Compiler-dependent

2 Name: Error range
   Meaning: One standard deviation from mean (100 percent) of accuracy in the assessment of power (in percent terms).
   Minimum value: 0.0 (completely accurate)
   Maximum value: 1000.0

3 Name: Mean of power distribution
   Meaning: Average value for the normal distribution of power at initialization (in absolute terms).
   Minimum value: 1.0
   Maximum value: 200.0

4 Name: Power range
   Meaning: Standard deviation for the normal distribution of power at initialization (note: keep in mind the mean value immediately above)
   Minimum value: 0.0 (all equal)
   Maximum value: 1000.0

5 Name: Reparations
   Meaning: Proportional factor; share of power that defeated states must transfer to victorious states as indemnities (absolute proportional factor).
   Minimum value: 0.0 (no reparations)
   Maximum value: 1.0

6 Name: Likelihood of victory parameter, sigma
   Meaning: Parameter controlling the shape of the curve associating power ratio with the likelihood of victory.
   Minimum value: 0.0
   Maximum value: 10.0

7 Name: Interstate war cost maximum parameter
   Meaning: Parameter controlling the proportion of power lost by states simply as a function of their involvement (absolute proportional factor).
   Minimum value: 0.0 (no costs other than those associated with reparations and losses of territory)
   Maximum value: 1.0

8 Name: Seed
   Meaning: Value used to initialize random number generator (should be a prime).
Minimum value: 0.0
Maximum value: Compiler-dependent

9 Name: Collective security states
Meaning: Number of states at initialization of system using collective security rules. Also guides characteristics of later entries to system.
Minimum value: 0.0
Maximum value: Maximum of system size
Dependency: Note that the maximum of system size minus the sum of the values given for the number of collective security states, primitive power-seekers, and expected utility states is equal to the number of states using power-balancing rules.

10 Name: Primitive power-seekers
Meaning: Number of states at initialization of system using primitive power-seeking rules. Also guides characteristics of later entries to system.
Minimum value: 0.0
Maximum value: Maximum of system size
Dependency: Note that the maximum of system size minus the sum of the values given for the number of collective security states, primitive power-seekers, and expected utility states is equal to the number of states using power-balancing rules.

11 Name: Expected utility states
Meaning: Number of states at initialization of system using expected utility rules. Also guides characteristics of later entries to system.
Minimum value: 0.0
Maximum value: Maximum of system size
Dependency: Note that the maximum of system size minus the sum of the values given for the number of collective security states, primitive power-seekers, and expected utility states is equal to the number of states using power-balancing rules.

12 Name: Civil war occurrence interval
Meaning: Parameter controlling relative frequency with which civil wars can occur during run.
Minimum value: 1; effectively means that the likelihood that a civil war can occur, given that states are prone to such, is 1.0 for each iteration.
Maximum value: 9999; civil war and associated procedures, e.g., netting control costs from power to derive effective power, shut off. Note that with 9999, model run terminates when a universal empire has been created. Any value less than 9999 permits run to continue past creation of first universal empire up till the maximum number of iterations specified (see below).

13 Name: General imperial policy control parameter mean
Meaning: Mean of normal distribution of imperial control policies (0.0 = the average state has a control cost policy equal to that required per the universal minimum unit control parameter, see below).
Minimum value: -1.0

14 Name: General imperial policy control distribution parameter
Meaning: Standard deviation of normal distribution of control policies (see above). In setting values, keep in mind the mean of the distribution (absolute).
Minimum value: 0.0
Maximum value: 1.0

15 Name: Minimum unit control cost parameter
Meaning: Parameter setting for proportion of weighted power of conquered territory that core must allocate to insure continuation of rule. If greater than calculated maintenance cost (function of power, time controlled, and distance from core), it overrides calculated cost; otherwise, calculated is in effect (absolute).
Minimum value: 0.0
Maximum value: 1.0

16 Name: Universal civil war probability weighting parameter
Meaning: Weight in function that produces probability score that state will confront civil war (absolute: lower than 1.0 reduces probability).
Minimum value: 0.0
Maximum value: 1.0

17 Name: Civil war cost maximum
Meaning: Parameter controlling the proportion of power lost by each side in a rebellion (absolute proportional factor).
Minimum value: 0.0; no costs
Maximum value: 1.0

18 Name: Maintenance cost error distribution
Meaning: Standard deviation of normally distributed error that characterizes states' assessments of maintenance costs required to retain control of their empires (percent value).
Minimum value: 0.0; no error in assessments
Maximum value: 1000.0

19 Name: Maximum iteration
Meaning: Maximum number of iterations in experimental run.
Minimum value: 1
Maximum value: Compiler-dependent

20 Name: Mean growth rate
Meaning: Mean of normally distributed growth rates (e.g., 1 = 1 percent per iteration).
Minimum value: 0.0
Maximum value: Contingent on initial power distribution, growth rate variance and maximum iteration (set to 200.0)

21 Name: Growth rate variance
Meaning: Standard deviation of normally distributed growth rates (percent).
Minimum value: 0.0
Maximum value: Contingent on initial power distribution, mean growth rate, and maximum iteration (set to 100.0)

22 Name: Interstate war cost disproportionality parameter
Meaning: Creates asymmetric war costs with stronger side suffering smaller relative costs, and vice versa.
Minimum value: 0; this effectively retains the basic formulation of equal war costs
Maximum value: Should be a value less than interstate war cost maximum parameter (set to 100.0)

23 Name: Tie possible
Meaning: Permits non-decisive outcomes in interstate wars.
Minimum value: 0; no ties possible
Maximum value: 1; ties possible (note: only 0 and 1 are permissible values for this parameter)

24 Name: Tie exponent
Meaning: Parameter controlling the range of power ratios that will produce tied outcomes in interstate wars. (Effective only when "tie possible" = 1.) Note that the greater the value, the smaller the range in which ties occur.
Minimum value: 0.0
Maximum value: 60,000.0

25 Name: Map file
Meaning: Controls the writing of updated maps of system to output file and screen.
Minimum value: 0; no maps written
Maximum value: 1; map written every iteration; a number, $x$, between 0 and value for "maximum iteration" is interpreted as write every $x$th iteration

26 Name: State history file
Meaning: Interval controlling how often state history file is written to disk.
Minimum value: 0; not written
Maximum value: 1; write characteristics of state every iteration; a number, $x$, between 0 and value for "maximum iteration" is interpreted as write every $x$th iteration

27 Name: Maximum allies
Meaning: Maximum number of allies that an initiator or target state can acquire during alliance formation process.
Minimum value: 0 (but not a good idea)
Maximum value: Maximum of system size

28 Name: Number of rows in system
Meaning: Number of rows on the map when system is initialized
Minimum value: 1
Maximum value: 80

29 Name: Number of columns in system
Meaning: Number of columns on the map when system is initialized

Minimum value: 1
Maximum value: 80

Notes
1 Stuart Bremer was a critical influence on the work reported here. Most obviously, the simulation used here is a direct descendant of a simulation developed by Stuart and Mike Mihalka. But he influenced it in other ways as well. First, he was an eloquent advocate for the kind of work presented here. Second, his scholarship, his passion for research, and his leadership in our discipline influenced many people, including me. We will miss him.
2 There is reason to believe that the first quote has been taken out of context (Brainy Encyclopedia, 2006).
3 The work in this paper was originally done for a presentation to the faculty of Rice University (Stoll 2004). If you are having trouble sleeping, play the video of the presentation. You will drift off in no time.
4 Some realists claim that Thucydides was the first realist in the western world. Others feel that, while it is plausible, the "fit" may be less than some of the enthusiasts for this proposition (Monten, 2006).
5 To illustrate, Wayman and Diehl's (1994) introduction to their edited volume on realpolitik contains a table that compares the realist propositions used by their contributors. There are nine sets of contributors and a total of 15 different propositions. But only one proposition (states are key actors) is used by all the contributors. Only three additional propositions (states are unitary and pursue state interests, states are rational, and states enhance and maintain their own power) are used by over half the contributors (see Table 1.1 on p. 9).
6 This scheme for classifying classical realism was first presented in Cusack and Stoll 1990: 40–54.
7 It is ironic that, although a computer simulation with random elements is a tool for exploring theory, the large number of runs that results must be subjected to statistical analysis in order to ascertain the typical or average behavior.
8 Every publication I have done that uses EARTH contains a description of the flow of the program. Each time I sit down and use only the flow chart of the simulation that is in Cusack and Stoll 1990: 65–69. I have proceeded in this fashion in order to avoid plagiarizing my previous work. But there are only so many ways to describe EARTH. So it is possible that the description of EARTH in this chapter is similar to descriptions from some of the other publications cited in the references.
9 States begin as single hexagons. The system of states can range from a 2 by 2 map, to an 80 by 80 map. All runs using EARTH have been conducted with a 7 by 14 map (i.e., the initial system consists of 98 single-hexagon states).
10 A state is assigned an ability to estimate its own power and also an ability to estimate the power of other states. A state may underestimate or overestimate power, so its calculations of the power balance with a neighboring state may be incorrect.
11 The user determines the number of states in the system that will have each decision-making style. In the initialization of the simulation, the actual assignment of a decision-making style to a particular state is done randomly.
12 Note that, in most circumstances, if a universal empire emerges (one state controls the entire map), the run ends even if it has not reached 1000 iterations.
13 When calculating the average power of states at the end of a simulation run, a value of 0 is assigned for the power of all states that do not survive to the end of the run.
14 I conducted such a test on the MID 2 data set (the Correlates of War Project MID data set that spanned the time period 1816–1992). Here, I replicate the analysis of that study using the latest version of the MID data, which brings the data through 2001. The original empirical work is reported in Stoll 1998.
15 Most of the dispute outcomes are not decisive. Coding non-decisive outcomes as missing reduces the number of cases from 3600 to 1188.
16 With almost 1200 cases, this is not surprising; in fact it would be surprising if one or more of the variables were not significant.
17 A very similar version of this appendix appeared in Stoll 2005.

References