Making Formal Models Freshman Friendly

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An electronic version of this paper, along with electronic versions of the resource and replicable documents in the Appendices, are available at http://www-personal.umich.edu/~lpowner .

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Abstract
The increasing prominence of rational choice and rational choice-based models of international politics is not normally reflected in undergraduate introductory courses. We present participatory learning activities designed to illustrate major formal modeling concepts in a freshman-friendly manner. These models, and the games and activities used to illustrate them, highlight the importance of leader preferences, strategic behavior, constraints on decision-making and the influence of domestic politics on international relations. The use of participatory activities facilitates internalization of sophisticated concepts while at the same time promoting higher order thinking skills as students work to express concepts they have just learned. This paper briefly presents the rationale and arguments for both participatory learning and the use of formal arguments in introductory courses. It then outlines class games and activities designed to major modeling ideas in international relations.

Introduction and Motivation

In the not so distant past undergraduate students who enrolled in political science courses did so for one of three reasons. The first, and perhaps modal, reason was to nurture an interest in politics and current events. Students who made a habit of reading the newspaper flocked to political science classes in order to understand the political system they were living in. The second reason, which often overlapped with the first, was because political science has the reputation of being a good pre-law major. Since political science classes force students to think through arguments and to formulate coherent opinions on complex issues, this reputation was not unwarranted. The third and final reason was that political science was a subject that fulfilled a general education requirement that didn't involve any math. The only numbers political science students were forced to grapple with were those that appeared in charts and graphs; equations and algebra were out of the question.

My, how times have changed. While political science is still the best place to get a fix for current events and excellent preparation for law school, mathematics, the very subject some students were intent on avoiding, has begun to infiltrate political science. For professors and graduate students, this trend is not surprising, and is, for some a little late in coming. "Math" has often been an integral part of the study of politics, as most graduate students learn the hard way when they are faced with calculus and statistics during their first semester of graduate school. With the possible exception of political theory, all of the areas of political science utilize some form of quantitative logic, be it through formal theory, survey research, or econometrics. Given the theoretical advances quantitative and formal work has given rise to it's actually rather surprising that our undergraduates have been "sheltered" from the math for so long.

In the fall of 2001, the international relations professors at the University of Michigan, along with several others around the country, conducted a pedagological experiment. Instead of using the traditional style of textbook for the Introduction to World Politics class, which was organized loosely around general topics such as international war, trade and organizations, they ordered a textbook that was written from a formal theory, or game theoretic, perspective. While the old substantive topics were still there, everything was viewed through the lens of expected utility decision theory. While this approach is quite common in economics classes, even at the undergraduate level, it is not a familiar one to the undergraduate political science curriculum. Within the first few pages of the book, students were presented with (though some would say, "subjected to") expected utility equations that required them to employ math skills they had first been taught during algebra class in eighth grade. Later chapters would require them to do more challenging tasks, such as sketching win-sets for games with multiple players and even solving games involving imperfect information. Indeed, for the final exam, the professor advised students to bring calculators since the game tree on it would require some algebra and arithmetic that would be hard to work out by hand!

While the reviews from professors on the back of the textbook are, naturally, highly complimentary, the larger question to ask is, "*yes, but what did the students think of it*?" The student reaction has generally been two-fold. The first reaction is one of initial suspicion and eventual acceptance. Most students are skeptical of the math when faced with it in the first chapter, but many soon become accustomed to thinking like formal theorists and come to appreciate the rigor of thought that comes with this type of approach. Indeed, one more than one occasion students have written on end-of-term evaluations that they liked the mathematical approach because they liked the confidence that came with getting the "right" answer or because it gave them a framework for analyzing political interaction on their own. The second reaction is one of initial skepticism and eventual intolerance. Students would sometimes complain that the math "sucks the fun out of the politics" and that the class left them wanting more substance or "real-world examples." Sadly, some members of this second group were so intimidated by the math that they quickly became bogged down in the algebra and soon grew discouraged with the class in general.

While we feel the first group represents a majority of the students, albeit a sometimes-silent one, the ideas presented in this paper were written with the second group of students in mind. As graduate students who were required to teach this material with almost no formal theory background ourselves, we empathized with the struggling students and wanted to find a way to "make formal models freshmen-friendly." Having taught from this book for a combined total of ten semesters, we feel the key to making game theory palatable for undergraduates is to make it interactive, relative, and, above all, fun. While the algebra and general math cannot be avoided, game theory does not have to be lacking in substance and "real-world" applications. The following classroom activities were designed by the two of us to help bring the disheartened or disinterested students back into the class as participants who engage with the material.

Fortunately, our efforts seem to have met with much success. Across the board, students rave about the "games" and often attribute their understanding of the concepts directly to them. It is, for example, not uncommon to see students write about their experience with one of the class activities on an exam to demonstrate they understand the topic in question: they write, "just like we showed in class" or, "just like in the alliance game," in their exam responses. Perhaps more importantly, students who do so are those who also *truly understand the concept.* The student who writes about the "alliance game" in class has a vivid and fun memory associated with the concept of "war diffusion" and is much more likely to remember it than a student who only read about it or heard it in lecture. While such "active learning" techniques have often been promoted by those who study effective teaching, we feel these methods are under-utilized in political science, especially in the teaching of methods and abstract reasoning, and by teaching assistants as well as professors.

We see no reason for this trend to continue. Instead, we would like to encourage instructors at all levels to employ teaching methods that get students out of their seats and into the subject matter with a more hands-on approach. Political science is all about the interplay between strategic actors and lends itself quite naturally to role-playing and interactive scenarios. Instructors should take advantage of this and look for opportunities to have students step into roles of actors discussed in different theories or models (e.g., the median voter, a president facing re-election, a member of multi-lateral alliance, etc.).

The activities in this packet are designed to be implemented in a single 50-to-75 minute class session. In contrast to many other 'active learning' lesson plans, which require multiple class days and substantial preparation to conduct sophisticated simulations or similar activities, these are self-contained and often require little physical preparation beyond photocopying. The self-contained nature facilitates their use by teaching assistants and others who may not have full control over curricula to allocate multiple class days to a simulation or similar activity, and also decreases the risk associated with planning multiple classes (and often a substantial grade component) around an untried activity; the low preparation level allows adoption on short notice by a wide range of instructors.

We would also note that the usefulness of many of these activities is not limited to international relations courses, nor are they limited to courses with a formal modeling or methods focus. The median voter and prisoner's dilemma activities are easily transported into comparative politics, and the Allison-inspired game and median voter activities have been used in American politics classes. These activities do not teach the mathematics and the methodology of formal modeling; instead, they introduce students to the logical intuition behind the mathematics and diagramming. Most 18-year-olds arrive at college with substantially underdeveloped analytical and critical thinking skills, and without careful preparation by the instructor, they will overwhelmed by the reasoning tasks that abstract modeling requires. These activities draw on their intuitive understanding of strategic interaction by activating their competitive instincts through careful environmental and incentive structure design.

These activities are designed for classes of 20-35; most will accommodate fewer or more though additional instructor preparation may be required. Most activities work best in a classroom with (at least minimally) flexible seating. Several require students to be able to position themselves back to back or otherwise conceal their work, while others require participants to be able to circulate freely or observe activity in the center of the room. Most activities require little physical preparation beyond photocopying and/or using a paper cutter; any other needs are easily obtained in the departmental office or substitutes are easily found. Successful users of these games and activities will complement this rather brief prep time, however, with a trial run of the game with a group of compliant graduate or advanced undergraduate students or a set of willing colleagues. The key to successful use of these or similar games or activities is to construct (mentally or with the trial group) a set of plausible alternative outcomes besides the ones that are desired for optimal discussion, and to have plans to ensure achievement of desired learning objectives no matter the activity outcome. What will you do if the prisoner's dilemma game produces no cooperation because all players used grim trigger strategies? What if the president in the Allison policy-making game becomes too panicked or stressed to continue? What if none of the players in the Morrow 1994 game stumble onto the incentive to misrepresent their signals and so send only truthful messages the entire game?

We present eight activities below. Each is presented in a standard lesson plan format, and identifies the concept(s) illustrated by the game, materials and preparation required, estimated duration, and any necessary vocabulary. Procedures for conducting the activity are discussion questions for post-activity debriefing and additional presenter notes where appropriate. Student reproducibles and any necessary supplementary material are included in appendices at the rear, beginning on page 29.[1]

[1] Two additional games are in draft stage and are not included here. One game introduces students to the intuition of Bueno de Mesquita et al., "An Institutional Explanation of the Democratic Peace," *American Political Science Review* 93,4 (1999): 791-807. The second offers ideas for extension of the Alliances, Alliance Reliability, and War Diffusion game (item E below) to discussions of balance of power theories and power transition theory. Interested instructors should contact Leanne Powner at LPowner@UMich.edu for copies of the draft plans.

A: Bureaucratic Politics, SOPs, Special Interests, and the Policy Process

Concept(s) Illustrated:
This popular game puts the 'mock' in democracy by allowing SOP-armed bureaucracies and highly vocal special interests to try to shape foreign policy during a series of crises. Students observe satisficing and other limitations of SOPs and organizational structure, bureaucratic politicking between agency leaders, and what happens to the 'national interest' in the face of pluralistic foreign policy-making.

Materials:
One set of role placards (see Appendix 1)
One set of role selection slips for each class (see Appendix 1)

Duration:
Allow at least 20-30 minutes to play, and 10-15 for debriefing. Enthusiastic classes or instructors with longer class periods can play for up to an hour or so.

Preparation:
1. Fold role placards into thirds so they will stand up on students' desks.
2. Cut apart role selection slips; place in an envelope for students to pass around.
3. Classroom desks should, if possible, be arranged in a circle or horseshoe formation.

Terms to Introduce/*Review*:
standard operating procedures
bureaucratic (or government) politics explanations
pluralistic models of policy-making
satisficing

Procedure:
1. Find a student volunteer to play the part of the president. (I normally ask if anyone there ever wanted to be president when they grew up; this being political science, there's *always* at least one.) Invite the president to sit in the front of the room.
2. Pass around an envelope containing the role slips, and invite students to select a role randomly. Larger classes might split the stack of roles and circulate two envelopes, one from each end of the horseshoe.
3. Go around the class and ask students to identify their role and its interests in foreign policy. Provide students whose selected role is an agency with the appropriate placard. List the agencies on a chalkboard or transparency projector.
4. Explain to the students that today, you're going to model the policy formation process. The president will be faced with a number of foreign policy crises, and he/she must select an appropriate policy response from the options available. Each agency has one – and only one – SOP which it may offer, and the agencies' goal is to have their SOP selected the most. Other groups also have interests in the policy process, though, and should articulate their interests and try to get them reflected in the policy outcomes. After all,

the president faces an uncertain re-election this fall. You will act as the president's Chief of Staff, managing access and information flow.

5. Begin confronting the president with crises, starting with one crisis element at a time. (After the first piece of bad news, the game leader may need to prompt the president to poll his bureaucracies for options.) For best effect, do not allow the president to resolve a crisis before making it worse. For example, start by telling the president that a massive civil war has re-erupted in Chad and involves ethnic cleansing. Then, after the president has begun to formulate a response, add the information that this is prompting large refugee flows that are threatening to destabilize neighboring countries with ethnic tensions of their own. Keep piling on the crises, but keep pestering the president to resolve previous ones. (A suggested list of crises follows the Presenter Notes below, but new ones may be required over time.)
6. As the president does select SOPs to respond to the various crises, tally these on the board by their sponsoring agency. You may need to remind the agencies that they can only offer their one SOP, and that they should be working to discredit or object to the other agencies' proposals while buttressing their own.

Discussion Questions:

1. Are SOPs effective for responding to crises? Why do departments have them?
2. How is having multiple departments competing to have their policies adopted good for policy? How is it bad? [marketplace of ideas vs expense of multiple plans, etc]
3. Exact mechanics of this simulation aside, does this scenario of bureaucratic angling seem like a credible explanation for policy choices? Under what conditions might it explain better than others?
4. Is there really any 'national interest' in a bureaucratic politics policymaking model?
5. Can we use the idea of bureaucratic politics to predict actions before they occur, or can it only be used to explain events and choices after they've happened?

Presenter Notes:

2. The role of journalist can be pivotal. You may wish to assign it to an assertive individual or redistribute roles after most students pick. The journalist may go 'on scene' and report from the crisis zone, he or she may interview policymakers or interest representatives, or he or she may add information or new 'spins' to the crises the game leader presents. The international political activist is one of the pro-environment, anti-globalization types who go around protesting at WTO meetings. The ethnic minority voter may represent the ethnic, racial, or other minority group of his/her choice, and may change this identity as often as he/she wishes during the game. Additional roles for larger classes might include the US Trade Representative (with an appropriate SOP), the Secretary-General of the UN (who might have an SOP), a former President (à la Jimmy Carter, perhaps), a retired prominent newscaster, a potential challenger for the presidential nomination from within the president's party, a major movie star, etc.

5. I suggest that you address the student as Mr. or Madam President as they seem to enjoy this. Where possible, link the crises together and dribble them out piecemeal to keep the pressure on the president high. I usually have the hurricane prompt major migration of Mexicans into the

United States, who then compete for jobs and relief supplies with the locals; the terrorist group receiving the French nuclear weapon is an Al Qaida cell based out of Russia; the Chinese sanctions are in retaliation for sanctioning France for selling the weapon (or alternatively, for embargoing Russia until the democratically elected government is restored), etc.

6. SOPs are package deals; the president may not elect, for example, to raise the terror alert without also mobilizing the national guard. (Business interests may need prompting about why this action in particular is not in their interests.) Chad is landlocked and cannot be reached by carrier-launched airplanes. Past groups have attempted to bomb the hurricanes, on the theory that the explosions might disrupt the eye wall and cause the storm to dissipate.

<u>Suggested Crises:</u>

- A civil war in southern Chad with ethnic cleansing is causing large refugee flows which threaten to destabilize neighboring countries like Sudan and Nigeria, which already have high ethnic tension.
- A massive hurricane in the Caribbean basin hits Mexico, followed by another hitting Texas and Louisiana. [Alternatively: An earthquake off the California coast causes a tidal wave to strike Los Angeles, San Diego, and the Baja California peninsula; Mexicans are streaming into the United States for help and overwhelming public service agencies.]
- France sells nuclear weapons to a terrorist group – or may have, the intelligence isn't clear. No one knows who the group is, where the weapon is, or even if a weapon was sold.
- Russia has a military coup; the economy collapses at the news.
- The European Union and Canada conclusively link genetically modified foods to several serious diseases, promptly block all agricultural trade with the United States, and file suit in the World Trade Organization.
- Iraqi underground forces have launched a chemical weapon capable Scud missile at Israel. No intelligence on missile payload – it might have chemicals, or it might not. It will detonate in 10 minutes. (detonation causes president to lose the Jewish vote)
- A border dispute between Angola and Namibia breaks into open warfare; South Africa and Botswana are preparing to side with Namibia while Congo and Zambia side with Angola.
- North Korea's military assassinates Kim Jong Il and declares martial law; large numbers of economic refugees flood into China.
- Kurds in Southern Turkey and Northern Iraq revolt and declare independence.
- China threatens to pull out of the WTO and forbid US goods in its market. (usually in retaliation for sanctioning France, if class has sanctioned France.)
- Pakistan accidentally launches a nuclear weapon at India; India retaliates.
- Grenada installs a communist government. Fidel Castro sends his congratulations and encourages Grenada to join him as he prepares to invade Puerto Rico to re-ignite the spread of Communism in the Western Hemisphere.
- A militant group from Northern Ireland detonates a bomb at a royal review of NATO forces, killing the Queen, the Prince of Wales, and the American Ambassador, who attended on behalf of the United States.

B: The Median Voter Theorem in World Politics

Concept(s) Illustrated: This game is designed to demonstrate Black's (1958) median voter theorem by showing students that, in a situation where a majority wins, preferences are single-peaked and the issue is uni-dimensional, the median outcome always wins.
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Materials:
A chalkboard is best, but if unavailable, use a roll of wide masking tape, 10 sheets of paper, and a marker.

Duration:
Allow approximately 15 minutes for the initial version; 20-25 for the power-weighted version at bottom.

Preparation:
None beyond collecting materials if needed

Terms to Introduce/*Review*
Median voter
Pivotal actor
Strategic voting
Single-peaked preferences
Circular preferences

Procedure:

1. Select five students and ask them to come to the board. If you don't have a chalkboard in your room, stretch a piece of tape across the floor and have students line up on it.
2. Write the following five numbers above or near the students lined up on the chalkboard (or write the numbers on the paper, large enough so they can be seen by other students): 5, 10, 21, 35 and 50. Make sure you keep the numbers in order.
3. Tell students that this five-person committee is going to decide the new drinking age for the campus. (You can pick any issue you like; I find that students tend to find this example funny, especially given the extreme values on either end.)
4. Explain that you are going to conduct a pair-wise (or round robin) competition to determine the new drinking age. Let the class know that they should be on the lookout for the person who wields the most "influence" or "power" in this situation. (Don't give it away yet, but the median voter, the student who is holding "21", will have to be included in every winning coalition. This affords this voter considerable power.)
5. Instruct the members of the committee that they must vote sincerely, or for the preference that is closest to them.

6. The game should proceed as follows:

Round	Who Wins?
5 vs. 10	10 (4 votes to 1).
5 vs. 21	21 (3 votes to 2). It doesn't matter how 10 votes, 21 will still win.
5 vs. 35	35: 21 votes with 35.
5 vs. 50	Either, 21 breaks the tie
10 vs. 21	21 (3 to 2)
10 vs. 35	35: 21 votes with 35
10 vs. 50	Either, 21 breaks the tie
21 vs. 35	21 (3 votes to 2)
21 vs. 50	21 wins no matter how 35 votes
35 vs. 50	35 (4 votes to 1)

Discussion Questions:

1. Who is the most powerful player and why?
2. Who is the pivotal actor?
3. How does the median voter theorem help explain US presidential elections? [Hint: why do politicians cater to the center?]
4. What groups serve as "median voters" in American politics? Put another way, what groups are essential for politicians?

Presenter Notes:

Alternatively, to involve the whole class and to identify the more salient elements for world politics, you might ask all students to fold a sheet of paper in half, and on the top half have them write a number between 0 and 100 (inclusive). Tell them that this represents their ideal point on an international relations issue of the game leader's choice (preferred emissions levels in an environmental agreement, preferred tariff level in a trade agreement, etc.).

Using a line on the floor or the chalkboard as above, ask 3 students to stand at their ideal points, and conduct a pairwise (sincere) vote as above. Ask two or four more students to join the group at the chalkboard, and repeat the voting exercise. (You may wish to repeat this a third time with a new group of 5-7 students to promote an understanding of the abstract idea of the median voter, regardless of the specific actors and ideal points involved.) What happens to the outcome as more actors get to vote?

Pause here to discuss the general concept of the median voter theorem: the median actor tips a plurality into a majority, and so can always beat any other position in a pairwise vote. Ask the class if outcomes in world politics are selected by voting in this manner, where the median preference wins, and if so where. Most will identify the UN General Assembly; ask then what issues the GA addresses. Why are contentious or important issues reserved to the Security Council? Because the powerful states control activity there. Discuss how most 'voting' or reaching of agreements in world politics relies on informal 'voting,' where actors' ideal points are weighted by their relative power.

To demonstrate, ask students to count the number of writing implements they have with them today, and write this number on the bottom half of the page below their ideal points. This number now represents their ‘power’ in the classroom system, and is how many ‘votes’ they have in reaching an agreement. Begin again with a small group (3 or 5 students), and this time locate the median *vote* rather than the median vot*er*. (A calculator is often very useful at this point.) You may wish to use the same groups as the unweighted example to demonstrate how power shapes outcomes when votes are not evenly distributed. If time and space permit, compare the outcome of the whole class voting under weighted rules to the outcome under equality rules. Here, relevant substantive discussions would be the various UN-sponsored environmental agreements or WTO trade agreements, or loan decisions in the IMF and World Bank, where voting weight is determined by national contributions.

C: Power, Losses, and War Outcomes

Concept(s) Illustrated:
This game links the scientific method and the concept of the empirical study of international relations phenomena to the role of power in war outcomes. Actors' motivation, represented here by the number of battle losses an actor can lose before losing the war, affects war outcomes strongly. Other factors like luck also intervene to prevent the stronger party from winning every time.

Materials:
List of letters with random power values to assign to students (see Appendix 2)
2 sets of 15 tokens/chips (in two different colors)
Small folded slips, two sets numbered 1-5
Two large inter-office envelopes or opaque bags
One small envelope/pouch
(optional) Section Guide: War, Power, and Winning, or something similar, one copy per student (see Appendix 2)

Duration:
Allow at least 15-20 minutes of play, plus additional time for the hypothesis-generating discussion and the debriefing.

Preparation:
1. Produce three copies of page 31 (see Appendix 2). Cut one apart and place enough A-Z slips in one large envelope/bag to represent each student in the class. Cut a second apart and place in the small envelope for students to select a player identity. Note that the list does not use the letter "I"; the letter "O" is the 25th (last) one on the list and for clarity's sake should be used last. This game provides enough identities for 35 players, including 10 in common Greek letters.
2. Small numbered slips represent the number of battles students can lose before losing the war; place in small envelope.

Terms to Introduce/*Review*:
Private information
Dyad (optional)
Hypothesis
Assumption
Political capacity

Procedure:
1. With the class, formulate hypotheses about likely outcome patterns of both battles and wars for dyads of strong states, dyads of weak states, and a mixed (strong-weak) dyad.

What factors shape these predictions? You may wish to use the Section Guide: War, Power, and Winning (Appendix 2, page 32), or something similar, to frame the discussion.

2. Assign each student a letter and its corresponding power value by circulating the small envelope containing the A-Z letters. Explain the power values and say that corresponding letters are in the envelope. Students will be randomly drawn from the envelope to fight wars. Does this assumption mirror how and why wars are fought in reality?
3. If war outcomes were entirely determined by power, which side would win? [side with larger power value] Put tokens representing each side's power into the remaining bag. Explain that this represents a reasonable assumption: the stronger the side, the more likely it is to win – i.e., to have its color token drawn from the bag.
4. Selected students draw values from the small envelope. These values are private information and represent how many battles each side is willing to lose before it quits the war. Explain that these values are uniformly distributed [1,5]: all values have an equal chance of being drawn, and player A having drawn a given number does not preclude player B from having drawn the same number (i.e., both have similar loss tolerances).
5. Appoint a student as Recorder. Student tracks on board the outcomes of wars and battles, using a table similar to (see page 2), between 'strong' (power ≥ 10) states, weak states (power < 10), or mixed dyads.
6. For each battle, draw a chip from the bag. The student whose chip is drawn 'wins' that battle. (Replace chip before next 'battle'; imposing costs for fighting [by removing chips from the bag] at this stage adds too many complications. Costs of fighting are imposed in the Bargaining game.) Recorder tallies outcomes. Each player in the war should track his/her losses and quits upon losing the number of battles specified in his/her private information. A war will require no more than 9 draws per pair of players.
7. Play sufficient 'wars' to accumulate enough data for students to evaluate their hypotheses; plan to conduct at least 6-7 wars and more if possible.

<u>Discussion Questions:</u>

1. Do the group's experiences (represented by the Recorder's tallies) support the hypotheses? Why or why not? What factors intervene (i.e., variables are omitted) between the power-based hypotheses and the observed outcomes? [chance, willingness to bear costs]
2. Which factor matters more in predicting outcomes of wars, power or willingness to bear losses? Can students name wars in which each dominated?
3. When does chance/luck have the most influence on the outcome of battles? [when players' power values are similar (i.e., players are evenly matched)]
4. Under what conditions do stalemates or a draws emerge in 'real' wars? [when players are reasonably well matched in both power and willingness to bear losses. Students may need assistance in seeing the influence of power here as no costs are imposed for continued fighting.]
5. In this game, a player's power doesn't change between battles. Is fighting a battle really costless for the parties? Would losses in one war affect a player's power in another war

with a different opponent? How could we model that in the game? [for each battle, would need to remove a chip for the winner, and remove two or more chips for the loser]

6. Why does the game ask players to draw new private information each time, even if that player has previously been in a war? [willingness to bear costs is situation-specific; particularly true in democracies.] What effect would someone drawing a 10 have on the game? [war would be excessively long; no matter the other's power, the high-losses side would probably win] [you may need to remind students that this is private information and that no one would know *why* the war was continuing.]
7. *Advanced groups:* How might we measure willingness to bear costs prior to observing the outcome of the war?

Presenter Notes:

If time is constrained or the class is large, you may wish to run several wars simultaneously. Each group needs a bag of chips (2 colors x 15 chips each color), and a set of private information (slips numbered 1-5 x 2 sets per team). This often works best if an additional game leader assists – a graduate student, advanced undergraduate, or a colleague – to help the groups get started. If poker chips are unavailable, try Popsicle or craft sticks (from the local craft store or a superstore), or some type of flat-topped dry beans, marked with two colors of marker or paint. Folded pieces of colored or color-marked paper do not usually withstand the rigors of multiple rounds well.

The initial concept for this game was developed by Jim Morrow.

Suggested Table for Recorders

		Dyad Type		
		Strong-Strong	Strong-Weak	Weak-Weak
Battles Won	Battles won by … Stronger of dyad			
	… Weaker of dyad			
Wars Won	Wars won by … Stronger of dyad			
	… Weaker of dyad			

D: Bargaining and War

Concept(s) Illustrated:
This game uses the 'Power, Losses, and War Outcomes' game (item C, above) as a base to explore the effects of allowing states to bargain before beginning to fight. Students learn that states with low tolerance for costs will be more likely to settle in bargaining – that they will take the sure outcome of a bargained solution over the risky outcome of a costly war.

Materials: *(same as Power, Losses, and War Outcomes)*
List of letters with random power values to assign to students (see Appendix 2)
2 sets of 15 tokens/chips (in two different colors)
Small folded slips, two sets numbered 1-5
Two large inter-office envelopes or opaque bags
One small envelope/pouch
(optional) Section Guide: Bargaining and War, or something similar (see Appendix 2)

Duration:
Allow at least 20-25 minutes for play.

Preparation:
Same as for *Power, Losses, and War Outcomes*; you will need to prepare a small envelope of player identities for class circulation and a large envelope of player identities for the game leader to select combatant. Additionally, each simultaneous war needs a bag or envelope of chips or similar objects (see presenter notes below) and a set of private information in a small envelope or bag.

Terms to Introduce/*Review*:
dyad
relative gains

Procedure:

1. Distribute letters and power values as last time (use the same set). Explain the new sequence of play to students, and remind them to track their point gain/loss in each round because the goal of the game is to have the most points in the class at the end of the play period. You might offer a small number of bonus points or a treat as an incentive to get students to bargain harder.
2. The game leader selects a warring dyad from his/her large envelope of player identities, and calls the first dyad forward as a demonstration. Have the warring students select private information from a small envelope.
3. BARGAINING PHASE - 1 minute maximum. Players must agree on the division of 100 points, with the caveat that each player wants to maximize his/her own score across the

entire class. The "stronger" player in terms of power (or alphabetically prior by last name if a tie) gets to make the first proposal.

→ If players can agree, points are divided as agreed and the round ends.

→ If players can't agree, WAR results – proceed to step 4.

4. WAR PHASE : proceeds as previously, except now war has costs. The winner of the war gets all points, minus 10 points per battle fought. The loser of the war gets zero points, minus 15 points per battle fought. [The loser will have a negative score, unless has points from previous wars.] The only way for the loser to recover is to bargain/fight again and win.

Discussion Questions:

1. What's the role of power in the war phase? in the bargaining phase? (I find these make the most sense when discussed in this sequence)
2. What's the role of private information in the war phase? in the bargaining phase? (Be sure to consider both high and low values of private information.)
3. How do power and private information - here, willingness to bear losses - interact to produce incentives for signaling and/or misrepresentation? Did any of this occur in your wars?
4. How would entering a war with a negative score affect your bargaining strategy?

Presenter Notes:

The complexity of this game, along with the requirement that each individual play more than one war, generally requires the assistance of a second (and possibly a third) game leader to facilitate multiple simultaneous 'wars.' Each war requires a bag of chips (or similar objects like craft or Popsicle sticks which have been colored with a marker or paint), and its own set of private information slips. I recommend conducting one war as a demonstration, then establish 2-3 stations.

For a variant, you might allow students to pick their own battles after a period of instructor-selected random wars. Appropriate discussion questions then would be which actors chose to initiate wars, and how were targets selected?

E: Alliances, Alliance Reliability, and War Diffusion

Concept(s) Illustrated:
This game is designed to illustrate Morrow's (1991) idea that states can offer security or autonomy to potential alliance partners. It also demonstrates the idea of chain-ganging, or how alliances work to spread wars (Christensen and Snyder, 1990).

Materials:
Player identities (See Appendix 3)
Copies of Section Guide: Alliances and Security Policy, or something similar, one per student (See Appendix 3)
One large envelope
One small envelope per class

Duration:
Allow approximately 5 minutes for alliance formation, and then another 15-20 minutes for play.

Preparation:
Make a copy of the player identity sheet for each class to play the game, and one copy for the game leader. Cut apart the numbers, keeping each set in a

Terms to Introduce/*Review*:
mutual defense pact
neutrality pact
entente
chain-gang
collective security
autonomy (vs. security)
asymmetric vs. symmetric alliances

Procedure:
1. Pass around one envelope containing player identities. Students select identities from one; the game leader pulls wars from another. Both envelopes should contain only as many slips as there are students/players. Explain the sequence of play, including what happens with wealth points.
2. Give students 3-4 minutes to mingle and form at least 4 alliances; they can make more if they want. They can forge defense or neutrality pacts. Defense pacts cost 1 unit of "power" (security) or 10 units of wealth (autonomy). Remind students to track what kind of alliances they are forming, with whom, and how much security or autonomy they are spending. Neutrality pacts are free for both parties.

3. Students also have the option of arming internally. It costs 10 units of wealth to increase their power by one point. They must write down how much of their wealth they are converting to security before the game starts; once play begins, no more conversion is allowed.
4. Have students return to their seats. Seats should be in a circle. Students compute their end power and end wealth. Start with initial security value, then subtract 1 for each defense pact; add 1 for each 10 units of wealth converted to power. [This increases dependence on allies while emphasizing that the risk of being drawn into someone else's war reduces your security.]
5. Place two chairs in the center of the room. Draw two letters and have the corresponding students come to the chairs. (There should only be as many slips in the envelope as there are students.)
6. Have each of the students read their end power aloud. Then ask the students if they would like to call on their allies for assistance, starting with the 'weaker' side.
7. If they do, each calls the first defense pact from their sheet.
8. The ally then has the choice of coming up and standing next to the seated ally. They can defect; if they do ask them why. They may want to do this if one state is hopelessly outmatched.
9. If a student is allied with A but has a neutrality pact with B, he/she has the option of honoring the neutrality pact and remaining seated, or he/she can defect.
10. If two students are called who have alliances with each other, those alliances are now void for the rest of the game. [This only affects the primary combatants/initiators, not the allies.]
11. The losing side's wealth points are distributed among the winning sides (equally; add up losers' wealth, divide by number of players on winning side). [You might allow one opportunity for players to convert wealth to power (or the other way) in mid-game. If you do, a good discussion question is what effect that mid-game power switch had on alliance behavior.)

<u>Discussion questions:</u>

1. This game was trying to illustrate the war diffusion process (i.e. alliances help wars spread). Do you think it did an accurate job of it? Why or why not?
2. Do you think internal balancing is a safer option for all states, or just some? If some, which ones? (i.e. those that have a lot of initial wealth)
3. Why might some countries not honor alliances? What kind of message does this send to other states?
4. What is the theoretical argument for honoring an alliance with the weaker side?
5. Why do we divide the losers' wealth among the winners? Who ends up with wealth at the end? What good is wealth? Is this closer to a realist or liberal view of power and war?

F: The Prisoner's Dilemma (I): *Law and Order* Style

Concept(s) Illustrated:
The purpose of this game is to demonstrate to students why it pays to always defect in a one-shot game of the prisoners' dilemma. The game also highlights ways in which the prisoners' dilemma can be lessened substantially.

Materials:
None, except access to a blackboard/overhead to display the payoff matrix (negative values here represent years in jail)

Player 1/ Player 2	Cooperate	Defect
Cooperate	-5, -5	-10, 0
Defect	0, -10	-2, -2

Duration:
Allow approximately 20 minutes.

Preparation:
None. In fact, this game is most effective if the instructor says nothing before starting it. I find it works best if I do it right at the beginning of class.

Terms to Introduce/*Review*
Prisoner's Dilemma
Normal/strategic form game
cooperate/defect notation
iteration
tit for tat, grim trigger strategies *(optional)*
reciprocity
shadow of the future (δ)

Procedure:
1. While this takes some acting ability, I normally walk into the room a bit late and let the students know that the draft copy of the midterm (or final) exam has been stolen and that we have narrowed it down to two suspects, both of whom are students in the class. (It is key to identify students ahead of time who you think can take being a part of this role-play. I tend to pick the talkative students with whom I have a good relationship who will also understand that this is just an exercise and not a real accusation.)
2. Call those two students forward and ask one of them to step out into the hall. (I normally ham it up by telling them to "go really far down the hall so they won't hear the other student screaming.")

3. Write the payoff matrix on the board. (At this point, students who have kept up with the reading will know what is going on).
4. Present the student with two options: they can either tell you the other student did it (defect) or keep quiet (cooperate).
5. Have the student pick an option and then let them return to their seat.
6. Instruct the class not to reveal which option student one chose to student 2.
7. Bring student 2 back into the room.
8. Repeat steps 4 and 5.
9. Depending on what the students picked, reveal the final outcome.

<u>Discussion Questions:</u>

1. Discuss strategies that came out of this. Why does it always make sense to defect?
2. What would happen if I called a second pair of students forward after seeing this? What do you think they would do?
3. If I had students play this multiple times with the same partner, do you think their strategies would change? Why?
4. What is the role of the shadow of the future in this game? How does it facilitate cooperation by making enforcement effective? [To hint, ask students how actors might have changed their behavior had you announced the last round of play.]
5. How could we set the game up so that the players would cooperate with each other? [communication, credible commitment, credible threat of punishing defection -- reciprocity strategy, infinite or indefinite-duration play]
6. How can international institutions help facilitate the emergence of these cooperation-conducive features? [ensure repeated interaction, reduce noise to improve monitoring, increase credibility of punishment for defection]
7. Does the assumption of maximizing one’s personal score reflect a realist or liberal approach to international relations? Is this consistent with reality, in whole or in part?

G: The Prisoner's Dilemma (II), Iteration, Enforcement, and Cooperation

Concept(s) Illustrated:
This game asks students to consider why enforcement matters in cooperation, and then to play iterated prisoner's dilemma to see how cooperation can emerge even with incentives to defect. Students will identify strategies of reciprocity that allow cooperation to occur.

Materials:
Quarter-sheets of paper labeled "C" on one side and "D" on the other – one per student
Copies of "Section Guide: Cooperation and Institutions" or something similar – one per student (see Appendix 4)

Duration:
With preceding and concluding discussion elements as indicated in the Procedure section, I normally find that this activity takes 35-40 minutes.

Preparation:
None beyond photocopying the Section Guide and making the C/D sheets.

Terms to Introduce/*Review*
selection model
Prisoner's Dilemma
strategic form game (may be review for some)
cooperate/defect notation
iteration
tit for tat, grim trigger strategies *(optional)*
reciprocity
shadow of the future (δ)
relative vs. absolute gains

Procedure:
1. *Stages of Cooperation:*
   a. Ask students to help you describe the sequence of steps that states take to reach an international agreement, and use the space on the Section Guide to construct a series of yes/no decision nodes for each step. These typically include reaching an agreement, ratifying the agreement, implementing it, and enforcing it. Students often omit the very critical first step before all of this: the decision to open negotiations. We study the tree backwards because we understand it that way: enforcement is best understood, then implementation (managerials vs others), ratification, distribution/coord/shape of agreement if any, opening is least understood. Also, actors think this way: strategic in the sense that they must expect to reach the end of the tree – which is the only place they'll

get benefits – before they'll open negotiations. Only a small subset of the cases will make it all the way to the bottom without falling off the tree.

b. This, then, represents a selection model. Successful cooperation cases must differ systematically in some way from unsuccessful cooperation and cases on which cooperation is never attempted.

2. *Enforcement as Iterated PD:*

a. Tell the story of Prisoner's Dilemma, and establish a preference ordering for the players over the possible outcomes (DC>CC>DD>CD).

b. Convert the preference ordering to a strategic form game. Review reading a strategic form game as you construct one using 1-4 as payoffs in the grid on the bottom of page 1 of the Section Guide.

3. *Playing PD:*

a. Arrange students into pairs, and ask each to select one player to be Rose and one to be Colin. Students should write the name of their actor (Colin or Rose) on the "Hi, I'm ____" line so they can remember which payoffs to read. Reiterate here that payoffs are read (row, column).

b. Give each player a C/D card, where C is cooperate [with the other prisoner] and D is defect [talk to the prosecutor].

c. Ask the students to sit back to back, or in some other position where they can conceal their choice of move from the other player. Remind students that they want to maximize their *personal* score – you might hint that this means always defect in hopes of cooperation on the other's part – and that communication between the prisoners is prohibited.

d. Have students select their moves by placing their card with that letter face up on their desks. When all players have chosen moves, have them reveal moves with their partners and find their respective scores on the payoff matrix. Use tally marks for each round to keep score in the appropriate row. (Students should record both their score and the other player's score.)

e. Play ten rounds, but *do not reveal to students when the game will end or how many rounds you will play*. This simulates infinite iteration. After ten rounds (suggested), move on to discussion questions.

4. *Discussion Questions:*

a. Discuss strategies that came out of this. Who had the highest score individually? Which pair had the highest combined score? Which had the biggest gap between the players' scores?

b. Did any patterns of play emerge - any stable CC or DD equilibria, or pairs that stumbled onto tit for tat (TfT) or another reciprocity pattern?

c. How does reciprocity work to enforce agreements? What kinds of agreements can we enforce via TfT? What kinds can't? [common pool resources, commitment problem ones]

d. If you knew your opponent was playing a tit for tat strategy, how would that affect your choices? What if he/she was playing a grim trigger strategy?

e. What outcome (or outcome sequence) maximizes total payoffs? [CC, CC...] Did any groups come close to this maximum payoff? Note that the outcome that maximizes total payoffs is not the same as the one that maximizes individual payoffs.
f. Under what conditions can we achieve consistent CC outcomes to maximize payoffs? [communication, credible commitment, credible threat of punishing defection -- reciprocity strategy, infinite or indefinite-duration play]
g. How can international institutions help facilitate the emergence of these features? [ensure repeated interaction, reduce noise to improve monitoring, increase credibility of punishment for defection]
h. How can cooperation emerge in single shot play, where payoffs have a PD structure?
i. What is the role of the shadow of the future in this game? How does it facilitate cooperation by making enforcement effective? [To hint, ask students how actors might have changed their behavior had you announced the last round of play.]
j. Does the assumption of maximizing one's personal score reflect a realist or liberal approach to international relations? Is this consistent with reality, in whole or in part? Remind them of the difference between the strategies that maximize total points and individual points, and discuss relative and absolute gains.

Presenter Notes:

2. See, e.g., Morrow 1994 or Goldstein 2003 for a brief Prisoner's Dilemma story with acceptable payoffs. After Sandler and Hartley, I usually name my prisoners 'Colin' and 'Rose,' so that in the strategic form game, Colin plays the columns and Rose plays the rows. Students find Colin and Rose corny, but it helps them to remember who's what and payoff orderings (a gentleman always lets a lady go first). I have often found establishing a preference order easier to explain by working it out as a loose extensive form game or 'decision schematic,' even if students are unaware of all the conventions of extensive form games, where they can see the logic for each actor, then converting to a strategic form in step b. A handout on how to solve a strategic form game is available on Powner's website, http://www-personal.umich.edu/~lpowner.

3. 3.d – You may wish to review reading the matrix here, and ensure after the first round that pairs have recorded the correct results.

4. 4.a – Most times, a grim trigger strategy appears; I find asking about this kind of behavior to be worthwhile as well.

4.d – You may need to show them why 3n is a higher payoff in infinite play than (1n/2)+(4n/2) - alternating CD/DC. I find using a simple numeric example – like the results of the suggested ten rounds of play – to be the most effective way to make this point.

H: Coordination, Distribution, and Information Problems

Concept(s) Illustrated:
This activity is designed to teach the concepts of coordination, distribution, and information problems in international cooperation as established in Morrow 1994; its sequence of play closely follows the model there. Following the discussion in Bueno de Mesquita 2003: 255-64, it does not discuss or simulate the equilibria of Morrow's model.

Materials:
Section Guide: Cooperation and Institutions (one per student; used in Prisoner's Dilemma game – see Appendix 4)
#10 (letter-sized) envelopes, one per pair of students and one for instructor
two colors of marker or pen

Duration:
About 45 minutes to an hour for experienced instructors; you may wish to allow more time on early runs.

Preparation:
1. Prepare one envelope for the instructor containing folded slips of paper bearing 1, 1, 2, 2, 2, 2, 2, 2, 3, 3. These represent 'the game we're playing,' corresponding to Morrow 1994's 'state of the world' and are distributed so that the most probable game we're playing is battle of the sexes.
2. Prepare one envelope for each pair of students containing 5 folded slips of paper marked with blue marker/pen, and 5 folded slips marked with green marker/pen. Other colors may be substituted, but should not be able to be seen through the folded paper. These represent the players' private information (signals, in Morrow 1994's terms) about the state of the world.

Terms to Introduce/*Review*:
Battle of the Sexes (BOTS)
Coordination games
Coordination problems
Distribution problems
Information problems
private information
outcomes vs choices/moves
perceptions as probabilities over types/states
first mover advantage
uncertainty (moves by 'nature')

Procedure:

1. *Preparatory Discussion and Setup:*
    a. Using the back of the Section Guide from the Prisoner's Dilemma (PD) and Enforcement activity, have students find a partner and assign identities as Rose or Colin, then write these identities in the blank provided.
    b. Review the logic of coordination games and BOTS: players must cooperate by selecting the same choice to obtain any points at all.
    c. Create three 2x2 matrices on the board and recreate the games from the Section Guide. Solve collectively for the Nash Equilibria. What *outcome* does each player prefer…
    -- if we're in a world where A is the 'better' policy (game 1)?
    -- if we're in a world where B is the 'better' policy (game 3)?
    -- if we're in a world where both policies will work, but A is better for Rose and B is better for Colin (game 2)?
    How could each player get its most preferred outcome in game 2? {prior commitment, first mover advantage, etc.}
    d. For each game (1-3) ask both players which *move* each would prefer if they knew they were playing in game 1, 2, 3.
    e. Explain to the students that an information problem means they don't know which game they're playing - how does this affect player's choice of preferred moves? Establish that Rose prefers A in 1 and 2 [write this in bracket over 1 and 2], but B in 3; Colin prefers A in 1, but B in 2 and 3 [write in bracket under 2 and 3]. Remind them that these problems occur earlier in the cooperation process than the previous problems of PD-like enforcement; distribution, coordination, and information problems occur in the negotiation stage.

2. *Version 1 – No Communication:*
    a. Inform students of the distribution of probability over the possible games. Game 1 (coordinate on A) occurs with p = 0.2, Game 3 (coordinate on B) occurs with p = 0.2, and Game 2 (battle of the sexes) occurs with p = 0.6. In any given round, players do not know which game they are playing – they face an information problem – but must select a move anyway. Establish that under uncertainty and with so much probability on Game 2, both actors have incentives to play their most preferred strategies – which results in 0 payoffs for either.
    b. Select one pair of students for demonstration purposes and play a round so all students understand the sequence of play.
    c. SEQUENCE OF PLAY:
        a. Instructor selects The Game We're Playing (1, 2, or 3) from the envelope. This is private information known only to 'Nature.'
        b. Players pick which move they prefer to play independent of the other (i.e., there is no communication); they note their preferred move in column 1.
        c. Players reveal their moves and note in column 2; instructor reveals The Game We're Playing and players note this in column 3.
        d. Based on The Game We're Playing, students consult the appropriate payoff matrix to determine their payoffs for each round. Players note only their *own* payoffs in column 4.

d. Play 5-6 rounds as a class, enough to fill the chart.
e. Pause for discussion.
    a. Ask students to tally their total payoffs. How many points do most players have?
    b. Is achieving cooperation – getting points – easy? When is cooperation emerging in these games? [more or less by accident, or by a tacit understanding to both keep playing the same coordinated strategy {all A, all B, alternating, tacit 'landmark' cooperation [cf. Schilling – when Brian and Brad play, they might have a mutual inclination to coordinate on B]} Establish that achieving cooperation under these means ignores the distributional aspects.
    c. How could the players achieve cooperation more frequently? Lack of communication about perceived state of the world (The Game We're Playing) hinders cooperation, even when both know it would be beneficial to coordinate *no matter* the true state of the world.
    d. Would communication resolve the distribution problems, though? Hint that the continued existence of the distribution problem and information problem, even with communication, creates incentives to misrepresent one's private information.

3. *Version 2 – With Communication:*
    a. Distribute the envelopes of blue and green slips, one envelope per pair. Explain that these contain private information for each player about the true 'Game We're Playing.' Drawing a blue-marked slip is private information that the player thinks we're really playing Game 1 or 2. If we're really playing Game 1 or 2, what move does Rose prefer? What move does Colin prefer?
    b. Establish that he prefers playing A, even though B is his better move in Game 2, because he knows Rose will play A based on her private information. Getting 1 point in BotS from playing her preferred move is better than getting nothing from playing one's own preferred move. Blue signals, then, are favorable to Rose. In the bracket above 1 and 2, write "BLUE SIGNAL."
    c. Repeat the logic with green signals, indicating that the actor thinks we are playing Game 2 or 3, and which are favorable to Colin. In the bracket below 2 and 3, write "GREEN SIGNAL."
    d. Using a demonstration pair, play a few brief rounds where students select private information (a Signal, in Morrow's terms) before choosing their moves. (Continue to prohibit communication.) Does private information make cooperation (or at least coordination) easier? If players were allowed to communicate their private information, would cooperation be easier? Remind students that even with private information *and* communication, they can never rule out the chance that The Game We're Playing is Game 2. The best they can do is agree to coordinate and accept the distributional consequences produced by uncertainty.
    e. Inform students that they will now be able to communicate a Message to the other player between receiving private information (their Signal) and selecting a move. Note that Messages and Signals do not necessarily have to be the same: in a world of anarchy,

nothing compels players to be honest about the information they have. Why might a player have an incentive to misrepresent his/her signal and lie in his/her message?

f. SEQUENCE OF PLAY:
    a. Instructor select The Game We're Playing (1, 2, or 3) out of an envelope; this is private information known only to Nature.
    b. Players select private information - Signals - from the envelopes distributed to each pair and note their Signals in column 1.
    c. Players select and send a Message (note in column 2) and receive the other player's Message (note in column 3). This is the only permitted communication.
    d. *Making use of their private information and messages*, players pick which move they prefer to play, *independent* of the other (i.e., no communication) and note their move in column 4.
    e. Players reveal moves and note the opponent's choice in column 5. The instructor reveals The Game We're Playing and students note this in column 6.
    f. Based on The Game We're Playing, students consult the appropriate payoff matrix to determine their payoffs for each round. Players note only their *own* payoffs in column 7.

g. Play enough rounds to fill the chart, and one or two more if time allows.

4. *Discussion Questions:*
   a. What did you learn about achieving cooperation in this game? Did communication help cooperation? Why or why not?
   b. How might institutions promote cooperation when payoffs resemble BOTS? When payoffs resemble Coordination? Compare this to the discussion on the reverse of the Section Guide about how institutions promote cooperation under PD-like payoffs.
   c. What effect do information problems have on solving distribution problems? How can institutions help solve information problems? [When an information problem exists, institutions can provide unbiased (or less-biased) information on the State of the World and thereby reduce actors' incentives to misrepresent. This increases the ease of cooperation, but still does not solve the distribution problem.]
   d. *Advanced Groups:* What effect would a high shadow of the future have in the negotiation stage if payoffs look like Coordination? What effect would it have in the negotiation stage when payoffs look like BOTS? How does this compare to its effects in the enforcement phase, when payoffs look like PD? (cf. Fearon 1998)

<u>Presenter Notes:</u>

1. I strongly suggest doing this organizational stage first to avoid disrupting the students' train of thought.
2. The best available example for a Battle of the Sexes game, in this formulation, is the Chunnel: Cars can drive on the left as equally well as on the right, but France would prefer to drive on the right and Britain would prefer to drive on the left. One set of drivers is inconvenienced no matter which, and each would prefer the other to be inconvenienced instead of itself.
3. 3.e – I find that I normally have to play one round with communication, let students observe the results, then walk them through the logic of misrepresentation.

References

Allison, Graham. 1969. "Conceptual Models and the Cuban Missile Crisis." *American Political Science Review* 63,3: 689-717.

Black, Duncan. 1958. *The Theory of Committees and Elections*. Cambridge, UK: Cambridge University Press.

Bueno de Mesquita, Bruce. 2003. *Principles of International Politics.* 2nd edition. Washington, DC: CQ Press.

---, et al. 1999. "An Institutional Explanation of the Democratic Peace." *American Political Science Review* 93,4: 791-807.

Christiansen, Thomas, and Jack Snyder. 1990. "Chain Gangs and Passed Bucks: Predicting Alliance Patterns in Multipolarity." *International Organization* 44,1: 137-68.

Fearon, James. 1998. "Bargaining, Enforcement, and International Cooperation." *International Organization* 52,2: 269-305.

---. 1995. "Rationalist Explanations for War." *International Organization* 49,3: 379-414.

Goldstein, Joshua S. 2003. *International Relations*. 5th ed, revised. New York: A.B. Longman, 2003.

Morrow, James D. 1994. "Modeling the Forms of International Cooperation." *International Organization 48*,3: 387-423.

---. 1991. "Alliances and Asymmetry: An Alternative to the Capability Aggregation Model of Alliances." *American Journal of Political Science* 35,4: 904-33.

Appendix 1: Materials for Bureaucratic Politics Game

Departmental SOPs: Print-and-go versions of the desk placards in a landscape layout are available on the web at http://www-personal.umich.edu/~lpowner under 'Publications.'

Department of Defense:
SOP: Bomb from an aircraft carrier.
Advantage: No US lives lost.
Disadvantage: Planes only have 500-mile range

Department of State:
SOP: Institute economic sanctions.
Advantage : Diplomatically acceptable.
Disadvantage: Hurts US economy and US producers.

Department of Homeland Security:
SOP: Raise the terror alert and mobilize the National Guard and reserves.
Advantage: Protects domestic population
Disadvantage: High levels of alert are costly and disrupt society.

UN Ambassador:
SOP: Offers to mediate/ open negotiations.
Advantage: Looks respectable internationally.
Disadvantage: Slow, other side might not agree

National Security Advisor:
SOP: Denounce other party and taking the issue to the UN.
Advantage: Avoids concerns of US unilateralism.
Disadvantage: Slow and does not affect situation on the ground.

US Agency for International Development:
SOP: Airlift food and medical personnel. Arrange for massive loans.
Advantage: Quick response for humanitarian concerns. Disadvantage: Expensive and does not address the root cause.

Vice President
SOP: Allege Al Qaida plot.
Advantage: No financial cost.
Disadvantage: May cause drastic harm to the US.

White House Office of Media Relations
SOP: Deny everything and initiate media damage control.
Advantage: Preserves president's image for election
Disadvantage: Allows crises to grow, risks antagonizing key voting populations.

Agency List and Suggested Student Roles:
Vice President
Department of State
Department of Defense
Department of Homeland Security
US Agency for International Development
National Security Advisor
US Ambassador to the UN
White House Office of Media Relations
Foreign policy voter
Government spending voter
Ethnic minority voter
Economic voter
International political activist
Journalist
Congressional Opposition Leader
Congressional Majority Leader (President's party)
Economist
Think tank foreign policy scholar
Retired senior general
CEO of a major corporation
Labor union leader
Feminist

Appendix 2: Materials for War, Power, and Losses Game

Student player identities. Power value indicated below letter identity.

A 4	F 2	L 2	R 14	W 6
B 10	G 12	M 9	S 7	X 8
C 13	H 8	N 1	T 15	Y 7
D 9	J 14	P 10	U 4	Z 6
E 7	K 5	Q 1	V 3	O 9
Δ 6	Σ 11	Γ 4	Ω 1	Π 3
Φ 9	Θ 3	Ψ 2	Λ 8	Ξ 7

PS 160 Intro to World Politics
Section Guide: War, Power, and Winning

List:
political capacity
private information
motivation/willingness to bear costs
dyad

Hypotheses:

	S-S	S-W	W-W
Battle outcomes:			
War outcomes:			

Data:

	S-S	S-W	W-W
Battles won by: stronger			
weaker			
Wars won by: stronger			
weaker			

Do the data support our hypotheses? Why or why not?

What role does the private information, willingness to bear costs, play in this game? How does it affect the outcomes of battles? of wars?

PS 160 Intro to World Politics
Section Guide: Bargaining and War

<u>List</u>
dyad
private information
type
relative (vs absolute) gains

War	My Private Info value	Opponent ID	Opponent's power	Points gained (+)	Costs of battle (-)
1					
2					
3					
4					
5					

Net
Points: ____________

The goal of the game is to have the most points in the class at the end of play.

When called for a war, draw private information. Then, you have one minute to bargain with your opponent over the distribution of 100 points. The player with more power gets to make the first proposal. If you can agree, points are divided as you agreed. If you can't agree, then you take your chances at winning all 100 points in a war – minus the costs of that war. *If you win*, you get *all 100 points* but pay war costs of 10 points per battle fought; if you lose, you get *zero points* minus 15 points per battle fought. Use the table above to track your score.

What's the role of power in the war phase? in the bargaining phase?

What's the role of private information in the war phase? in the bargaining phase?

How do power and private information - here, willingness to bear losses - interact to produce incentives for signaling and/or misrepresentation? Did any of this occur in your wars?

How would entering a war with a negative score affect your bargaining strategy?

Appendix 3. Alliances, Alliance Reliability, and War Diffusion Game

Player Identities: Make one copy per section and one copy for game leader.
Values represent player identity (letter), power (left number), and wealth (right number).

A 5 85	F 5 24	L 4 46	V 5 28	W 8 78
B 2 98	G 2 12	M 4 41	U 2 25	X 3 10
C 4 25	H 2 33	N 9 99	T 1 16	Y 2 11
D 8 83	K 2 28	P 1 10	S 1 84	Z 4 27
E 6 62	J 3 78	Q 1 15	R 1 12	O 7 50

PS 160 Intro to World Politics
Section Guide: Alliances and Security Policy

Vocabulary
entente
neutrality agreement
non-aggression pact
defense pact
internal balancing
external balancing
war diffusion

Player Number:
Original Power:
Original Wealth

Alliance Number	With?	Power Committed	Wealth Committed
1			
2			
3			
4			
5			
6			

End Power: End Wealth:

Possible Discussion Questions:

6. What was this game trying to model? What happened when there was a war?

7. Is internal balancing is a safer option for all states, or just some? If some, which ones?

8. Why might a state not honor an alliance? What kind of message does this send to other states?

Appendix 4: Prisoners' Dilemma (II) and Coordination, Distribution, and Information Problems

PS 160 Intro to World Politics
Section Guide: Cooperation and Institutions

List

stages/phases of cooperation: negotiations, ratification, implementation, enforcement
institution
regime
shadow of the future (δ)
iterated Prisoner's Dilemma
Battle of the Sexes
problems of cooperation: coordination, distribution, information
mixed motive games: PD, BOTS

Stages of Cooperation

Iteration and PD

		Colin	
		C	D
Rose	C	(,)	(,)
	D	(,)	(,)

"Hi, I'm ________________."

My score	
Opponent	

Goal: Maximize *your* payoff

How can cooperation emerge in single-shot PD?

How does δ play a role in achieving cooperation?

How do institutions promote cooperation when payoffs have a PD structure? How do they affect δ?

Distribution, Communication, and Information Problems

"Hi, I'm ___________________."

If you're Rose, you prefer AA>BB.

If you're Colin, you prefer BB>AA.

Goal: Maximize *your* payoff.

1 *Pure coordination*

COORDINATE ON A

	A	B
A	2,2,	0,0
B	0,0	1,1

p(game 1)= 0.2

2 *Dist and Coord*

BOTS

	A	B
A	2,1	0,0
B	0,0	1,2

p(game 2)= 0.6

3 *Pure Coordination*

COORDINATE ON B

	A	B
A	1,1	0,0
B	0.0	2,2

p(game 3)= 0.2

Version 1:

My Move	Opponent's Move	Game we're playing	Payoff

Version 2:

My Signal (private information)	My Message	Opponent's Message	My Move	Opponent's Move	Game we're playing	Payoff

What did you learn about achieving cooperation in this game?

What effect do information problems have on solving distribution problems?

How do institutions promote cooperation when payoffs look like BOTS? Like Coordination?