

# **Building Institutions for Peacemaking and Peacekeeping: Some Lessons from Systems Control Theory and Collective Action Theory**

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## **Abstract**

This paper examines the design of institutions for peacemaking and peacekeeping from the points of view of systems control theory and collective action theory. The former tells us what kinds of institutions are needed, the latter informs us about the how-to principles by which to design them.

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## 1. Introduction

Institutions emerged and evolved to solve problems posed to individuals. That institutions evolved means that no one individual deliberately set out to plan and design them. They are endogenous, organic outcomes of evolutionary processes (Schotter, 1980). But in recent human history, institutions are increasingly and more deliberately designed to address pressing local, regional, and global problems that perhaps cannot wait for organic solutions to evolve. One of these problems is the ever more far-reaching, destructive, and long-lasting power of the contemporary methods and arsenal of warfare and the concurrent need to keep the peace among and within nation-states.

Recent advances in systems control theory have been applied successfully to many technical problems, but have rarely been tried out on social problems. Of course, societies are far more complex than any technical systems, but given the seriousness of problems we face, any method that may shed some light on possible solutions should be examined.

We can learn from the way natural systems protect themselves against adversity and adapt to changing external conditions. Any viable system – whether in nature or human society – needs numerous automatic feedback mechanisms to maintain it in a safe and healthy state. Such feedback mechanisms consist of three main components: (a) specification of a desired goal, (b) ways to measure deviations from the goal, and (c) corrective action to return bring the system to the goal state if it has deviated. An example from nature is the human immune system, which constantly detects and eliminates disease germs. If the immune system is weakened, as in AIDS patients, the result is illness and death. An example of a regulatory feedback system in human society is the legal system, in which laws define non-acceptable behavior, courts determine whether laws have been violated, and the police and penal system enforce the laws (Ferencz, 1994). An example from a household appliance is a home heating and cooling system. On a thermostat, the user sets the desired temperature, the thermostat then continuously measures the actual temperature and compares it to the desired temperature, and if a sufficient degree of deviation is detected starts the heating or cooling apparatus to bring the home back to the desired state.

Such a system can fail in six possible ways. First, there may be no agreement on the goal (a matter of conflict resolution); second, even if the goal is clear, deviations may not be detected (a matter of observation and measurement); third, even if deviations are noticed, those who could correct them may have no incentive to do so (a matter of economic incentives, and also ethics); fourth, even if those who cause a problem will ultimately suffer from it themselves, they may fail to foresee delayed consequences or lack the incentives to do anything about it (a matter of long-run planning, especially in cases involving far-off future generations); fifth, even if people have timely and accurate information, they may fail to correct a problem due to prejudices or other sources of apparently irrational behavior (a matter of psychology and culture); and sixth, even if people are fully aware of a problem and wish to correct it, they may not know how or lack the necessary resources (a matter of resources, science, technology and education).

All of these six sources of problems must be overcome. If even a single link is missing, things can go wrong. A collection of institutions that address all of them can form a peace system with mutually reinforcing components, which can overcome the war system.

The existing United Nations agencies already address many of these six common sources of problems. The following are some ways in which existing global institutions may be strengthened, or complemented by some new agencies. The proposals are briefly listed. (A discussion of details is in Fischer, 1996).

**Table 1 Six components of a comprehensive peace system**

| General Remedy<br>(source of problem)                     | Some institutions<br>to address the problem         |
|---|---|
| (1) Agreement on goals<br>(conflict)                      | A People's Assembly                                 |
| (2) Detecting deviations from goals<br>(lack of feedback) | Citizen Watch Groups                                |
| (3) Incentives<br>(distorted feedback)                    | Democratization<br>An International Criminal Court  |
| (4) Foresight<br>(delayed feedback)                       | A UN Institute for Mediation                        |
| (5) Reducing prejudices<br>(rejected feedback)            | A UN Television Network<br>A Global Peace Service   |
| (6) resources and knowledge<br>(lack of remedies)         | A World Treasury<br>Strengthening the UN University |

First, to improve decision-making procedures at the global level, it is the UN General Assembly could be supplemented with a People's Assembly of directly elected representatives in proportion to each country's population. Second, to provide better information gathering capacity at the global level, so that problems can be detected and addressed before they become crises, greater openness is suggested, including verification of agreements by voluntary citizen organizations. Third, to give decision-makers an incentive to do what is in the public interest, support for democratization at all levels is advocated, so that those who suffer the consequences of a decision are involved in making it. Also, an International Criminal Court should be created to hold individuals accountable for human rights violations. Fourth, to promote the resolution

of conflicts at an early stage, before they lead to war, it is proposed that the UN take a more active role in mediating conflicts. Fifth, to help overcome prejudice and xenophobia, it is recommended that a global radio and television network be created that can expose people to a broad spectrum of information and points of view from around the world. A Global Peace Service, proposed by Robert Muller, can bring young people from different cultural backgrounds together to help each other solve problems and forge friendships for a lifetime. And sixth, to make available greater resources for the solution of global problems, Jan Tinbergen has called for the creation of a World Treasury. Also, the function of the United Nations University in doing research and disseminating knowledge for possible solutions to problems around the world could be expanded.

Thus, *systems theory can tell us what kind of institutions we need to produce peace, namely (a) institutions to agree on goals, (b) institutions to provide feedback by monitoring convergence or deviation from these goals, and (c) corrective institutions.*<sup>1</sup> But desirable as they are, some of the needed institutions are not in place. Why not? Because institutions are the outcome of collective action and are therefore predicated on the favorable alignment of multiple individual interests that make up the collective. *While collective action theory perhaps cannot tell us how to align these individual interests, how to construct the needed institutions, it probably can tell us which mistakes to avoid.* When these principles are heeded, the outlook for attaining peace are improved. Conversely, when these principles are violated, prospects for successful peacemaking and peacekeeping diminish accordingly.

**2. Peace as a collective action problem**

“Collective action arises when the efforts of two or more individuals are needed to accomplish an outcome” (Sandler, 1992, p. 1). A collective action *problem* arises when a desirable action is not undertaken by those who might benefit from that action. The famous Prisoners’ Dilemma allegory illustrates why mutually beneficial collective action may not be undertaken. Although the Prisoners’ Dilemma metaphor is often seen as the archetype of collective action (e.g., Hardin, 1982, p. 25), the two are not equivalent (Sandler, 1992, p. 44). Whereas the prisoners’ dilemma is a collective action problem, not every collective action problem is a prisoners’ dilemma. Nonetheless, it still forms the basic paradigm from which to explore and expand one’s knowledge base. The prisoners’ dilemma is this. Two prisoners are held in isolation from one another. They are accused of a misdeed which each can confess or deny. If both adopt the strategy of denial, they can be convicted only on a minor charge and receive a two year sentence each. But if one confesses and implicates the other, the confessor gets one year for helping to convict the other whereas the one who continues to deny gets ten years. If both confess, both get five years for showing remorse and confession. Thus, looking at Case I below, the following payoffs emerge for each prisoner (where A and B stand for prisoner A and B).

|                      |          |             |                       |          |           |
|----------------------|----------|-------------|-----------------------|----------|-----------|
| <b><u>Case I</u></b> | B denies | B confesses | <b><u>Case II</u></b> | B denies | B         |
|                      |          |             |                       |          | confesses |
|                      |          |             |                       |          | es        |

|             |                           |                           |             |                           |                           |
|-------------|---------------------------|---------------------------|-------------|---------------------------|---------------------------|
| A denies    | A: 2 year<br>B: 2 year    | A: 10 years<br>B: 1 years | A denies    | A: 1 year<br>B: 1 year    | A: 10 years<br>B: 2 years |
| A confesses | A: 1 years<br>B: 10 years | A: 5 years<br>B: 5 years  | A confesses | A: 2 years<br>B: 10 years | A: 5 years<br>B: 5 years  |

In Case I, block out the bottom row (i.e., assume that A is going to deny). Then B is better off confessing (1 year is better than 2 years). Now block out the top row and assume that A confesses. Again, B is better off confessing (5 years is better than 10 years). Similarly, block out the second column, assuming that B denies. In this case it would be better for A to confess (1 year is better than 2). Finally, block out the first column, assuming that B confesses. And again, A will confess (5 years is better than 10). Both prisoners possess a dominant strategy. The dominant strategy is to confess, regardless of the strategy the other might choose. Therefore, both will confess and get 5 years each which, for the collective of two prisoners, is an outcome worse than if both had denied the misdeed.

Countries, or groups within a nation-state, that are locked in interminable conflict can be represented as prisoners' dilemma game players.

|                               |                               |                           |
|-------------------------------|-------------------------------|---------------------------|
|                               | B cooperates<br>(keeps peace) | B defects<br>(fights war) |
| A cooperates<br>(keeps peace) | A: 5<br>B: 5                  | A: 0<br>B: 10             |
| A defects<br>(fights war)     | A: 10<br>B: 0                 | A: 1<br>B: 1              |

Even though both players may agree that it is preferable to keep the peace (cooperate), the payoff matrix may be structured to produce war (mutual defection). Monitoring and correction thus become important, as systems theory suggests. But before correction mechanisms can be designed, it is necessary to recognize that the outcome of mutual defection in the prisoners' dilemma game is the result of a highly specific set of *institutional circumstances* and the answer to why countries, or groups within countries, keep fighting lies in uncovering the specifics of these circumstances and only then in devising appropriate intervention mechanisms that might change the game structure to favor the alternative outcome of mutual and stable peace. For example, one problem our prisoners have is that they cannot change their circumstances. For our prisoners these constraints include, but are not limited to, the following: (a) the prisoners cannot communicate with one another and therefore cannot threaten each other with post-prison punishment should one confess to the detriment of the other; (b) the prisoners play this game only once whereas in many real-life situations players face each other repeatedly so that "your cooperation tomorrow may depend on my cooperation today, [and] I have an incentive to cooperate today" (Hardin, 1982, p. 3 and

Axelrod, 1984); and (c) if the payoffs were slightly different, different strategies would become dominant. In Case II, for instance, B should deny if A denies and confess if A confesses. Similarly, A should deny if B denies and confess if B confesses. If both prisoners are required to simultaneously reveal their strategy (players make *simultaneous moves*), Case II will have no unique equilibrium outcome. But if the prisoners may make *sequential moves* where B chooses after A has chosen, or A chooses after B, then a superior collective action outcome will result: both deny. To see this, assume that A moves first. A can assure B the minimum sentence of one year by denying. By confessing, B can undermine this outcome only at the expense of getting two years instead of one. Thus, the sequence of moves is an *institutional feature* – as are the possibilities of loyalty and retribution. If B is loyal to A, surely B will deny once A has denied. But perhaps B bears a grudge against A and delights in the opportunity to get A ten years at the expense of getting two years him/herself (when A first denies and then B confesses). In this case, A would have been better off confessing in the first place. Both then get 5 years. To avoid this outcome, *honor among thieves* (*honor among rogue states*) may eventually pay off.

The example and elaboration attest that the actual strategies chosen depend on a host of circumstantial institutional features. It is the analyst's task to identify and precisely specify this complex of variables. In the past, analysts have taken a positivistic approach by observing an outcome and reasoning backward as to which underlying institutional structure could have brought about the specific observed outcome (e.g., Schotter, 1980; Ostrom, 1990). This approach reconstructs or “reverse engineers” an institutional structure or set of possible institutional structures capable of generating the observed outcome. A contrary, constructionist, approach would attempt to specify and create an institutional structure such that a desired outcome – such as peace – results “naturally” as in the players' own best interest.

### **3. Institutions and their design matter**

An important conclusion of collective action theory is simply that institutions matter. They are not an afterthought. They matter. By that we mean not the mere presence of an institution such as, say, a World Criminal Court, but its internal functioning and exactly how its presence and functioning influences the players' payoff matrix. Behavior does not take place in an institutional vacuum. The actions players take (the strategies they decide to play) are determined by the institutions within which they must take effect.

An equally important consideration concerns the nature of the collective action good in question. Not all collective action goods are alike (Hirshleifer, 1983). Even the goal of peace is not alike in all places. In some cases, peace (or at least cessation of continued violence) is a best-shot affair, in others a weakest-link affair, and in still others the outcome of a summation game among multiple players. A best-shot peace occurs when a single player can unilaterally bring about the desired good, wherefore others will wait and free-ride until the capable player moves. For example, the violent intervention in the Persian Gulf war in 1991 was possible only because of the United States' overwhelming advantage in force mobility and projection. From a game theoretic point of view it was clear that others' could and would free-ride on US efforts. Despite what was said in the news media at the time, the US had no particular incentive to act

unilaterally in spite of its ability to do so. Another game developed, between the US and those who wanted it to intervene. The US could credibly threaten to withhold benefits from potential free-riders by delaying intervention and thereby coerce various forms of contributions. In the absence of the US's ability to provide the best-shot solution to the problem, the collective action good of peace in the Persian Gulf may not have come about or at much greater total cost in prolonged fighting, involving more Middle Eastern countries, more lives injured and lost, and more heavily disrupted economies and environments. Once the subgames involving the generation of net benefits for the US were solved, the US then provided the best-shot to bring the Persian Gulf war to a quick conclusion.

In other cases, the production technology by which the collective action good of peace is produced is a weakest-link technology. This means that if even a single player refuses to contribute, the good will not come about. Keeping the peace (rather than making it once war started) is a weakest-link technology because if in a neighborhood of players even one player defects from a state of mutual peace, the good is not available any longer to any of them. The continued conflagrations in the Democratic Republic of Congo serve as an example.

Thus, not only do institutions matter but the *design of institutions* matters. Moreover, as we have seen, it is important to bear in mind that designing a solution to one problem may generate subgames elsewhere. If the primary game is unwittingly made dependent on successful resolution of various subgames, then the prospects for peace (in the primary game) diminish rapidly.

#### **4. Design principles**

This section examines some design principles, not design prescriptions, for building institutions for peacemaking and peacekeeping. We draw on the work of three authors in particular (Axelrod, 1984; Ostrom, 1990; and Sandler, 1997). Keep two thoughts in mind. First, these design principles, if followed, should explain the successful making and keeping of peace. Conversely, their violation or absence should explain the breakdown of peace or the continuance of war. Second, these principles should be viewed as a mutually reinforcing package. Applying selected principles diminish prospects for peace. The whole package must be applied.

1. **THE PRINCIPLE OF CHANGING PAYOFFS.** The idea here is to minimize incentives to defect and maximize incentives to cooperate to induce players towards cooperate action. A number of contemporary civil wars are unnecessarily prolonged because the incentives to defect are large. For example, in Angola UNITA's ability to mine and sell raw diamonds creates a huge amount of cash flow and little incentive to settle political differences. Similarly, the Angolan government's ability to extract and sell petroleum keeps it financed also. Both sides are flush with money and have no reason to settle, even as generations of ordinary Angolans suffer. To change the payoff for UNITA, it is unlikely that anybody can offer them more than what they make on diamond and raw materials trade. Therefore, the onus would fall on diamond consumers which involves another prisoners' dilemma game: for the individual

consumer it is be costly to switch from Angolan diamonds to some other supplier (diamonds do not come with ready-made and credible certificates of origin). Another way to change payoffs would be to contribute (or deny) superior military intelligence and arms to one side, thus changing the balance of force. Sometimes the solution applied, as in the Iran-Iraq war of the 1980s, was to supply both sides equally so that they would fight to exhaustion and a truce, if not peace. These examples suggest that the game structure itself is changed to a *conditional sum game* in which side A is forced to the negotiation table by an outside force but if side B does not reciprocate with fair negotiations, the outside force can withdraw and impose the cost of renewed fighting on both parties.

The principle of changing payoffs also includes consideration of so-called “linkage benefits” and “linkage costs.” For example, existing NATO members faced additional costs in admitting Poland, Hungary, and the Czech Republic to NATO in 1999. But the existing members also derive additional benefits outside of NATO by being more closely aligned with the three new members. In another example of linkages, China’s accession to the WTO is linked by the US and others to improvements in its human rights record. The idea here is to change China’s payoff matrix by linking the question of WTO accession to human rights agendas.

2. **THE PRINCIPLE OF CREATING VESTED INTERESTS AND LEADERSHIP.** If two players are themselves unable to change the relevant payoffs, an external force (a “leader”) may need to intervene. A leader is an external actor able to organize changes in the payoff structure and/or the rules of the game (say, from simultaneous to sequential moves). But the intervention of a potential leader needs to be rewarded with its own positive payoffs, for why else should a leader intervene? This can be illustrated with the sad case of Rwanda in the mid-1990s where almost nothing was done until after several hundred thousands people had been killed. There was no sufficient vested interest.

A contrary example is that of Haiti in the early 1990s. When large refugee streams arrived on Florida’s shores, the US government was prompted to intervene because it now had a vested interest in keeping people out of the US by keeping them in Haiti. Similarly, in the Balkan wars of the 1990s, the initial vested interest was to contain the slaughter within the Balkans. It was only when massive refugee streams spilled into the richer, western European nations, and once there was a real danger of the conflicts spilling into Macedonia, Greece, Bulgaria, and Turkey, that the EU and NATO began to intervene, i.e., once they had a vested interest that affected their own payoff matrix. Therefore, one way to foster peace is to deliberately engineer or trigger vested interests. In practice, this may not be easy as the horrific examples of mass slaughter in Rwanda and other places show. (Indeed, for many years outside forces had a vested interest to stoke such conflicts.)

3. **THE PRINCIPLE OF GRADUATED RECIPROCITY AND CLARITY.** Research has shown that a game strategy called “tit-for-tat” is a highly successful and evolutionary stable strategy. The tit-for-tat strategy works as follows. Suppose there are two players, A and B. In the first interaction with B, A will cooperate. Thereafter, A will always do what B did in the prior round of play. If B cooperates, so will A in the next round. If B defects, so will A in the next round. One important advantage of this strategy is its unmistakable clarity and automaticity. This builds reputation and consequently credible

commitments to cooperate, but also credible threats to defect. There can be no second-guessing about what A will do conditional on what B has done. Moreover, the tit-for-tat strategy holds no grudge and forgives a past defection by B as it readily resumes cooperation once B cooperates again. But even though tit-for-tat is a forgiving strategy, if B misunderstands or mistrusts A, there can be set in motion a series of rounds of mutual defection. Therefore, scholars recommend that A assume a graduated response and show limited provocability. This means that if B defects, so will A but only by something less than full defection. If B continues to defect, then A's defections will gradually move toward full defection also.

4. **THE PRINCIPLE OF ENGAGING IN REPEATED SMALL STEPS.** Cooperation is fostered in circumstances where the parties interact with one another repeatedly and where the end of the interaction is unknown or at least uncertain. By breaking a larger problem of conflict or hostility into smaller parcels, players are forced to interact with one another repeatedly. This increases the frequency of rounds played and lengthens the duration of the overall interaction. If any one small round can be driven to a cooperative outcome, both sides risk losing gains already made and risk forfeiting future gains if they fail to continue to cooperate in subsequent rounds. Thus, changing the game into an assurance or conditional game, where A commits to cooperate conditional on B's cooperation and vice versa, will assist in bringing about peace. This is the theoretical side of the practice of confidence-building measures (CBMs). Alexrod refers to this repeated, small-step interaction as a "lengthening the shadow of the future." The more people can be brought to see the "light" of the ultimate goal by taking small steps instead of premature giant leaps, the more likely it is that they will succeed. This also applies to intergenerational conflict. Surely, the present generation in Angola would benefit if the future generation of Angola had a more peaceful, secure, and economically productive life. But as it is, the present generation not only denies peace to future generations but denies itself a better future life.
5. **THE PRINCIPLE OF VALUE-FORMATION.** Formation of common tastes or preferences produce voluntary aggregations of "like-minded" individuals to play cooperative games for mutual benefit. This applies to teenagers sharing particular musical tastes or trends in fashion as it applies to hobbyists (e.g., scuba divers, aficionados of classical guitar music, short-wave radio operators) and to nation-states (e.g., the EU, Arab League, ASEAN). This also accounts for the remarkable proclamations of former enemies who during intense negotiations learn that they personally share values such as leadership, political savvy, and care for their respective citizens, and end up with personal respect, even friendship, for each other.

This principle also explains why "like-minded" nations tend to cooperate well, disagreements notwithstanding. Similarities in political and economic systems, religious beliefs, language, cultural heritage and so on tend to forge reliable bonds across nation-states to form a cluster of cooperative behavior. Large group size by itself will not necessarily make collective action impossible, and neither will small group size always promote it. Especially in civil war situations, the number of contestants is usually small but disagreement exists over shared values.

6. **THE PRINCIPLE OF DEMOCRACY AND AUTHENTIC AUTHORITY.** Democracy means that those affected by collective action decisions such as peace must have a voice in shaping the decision. (This is true of individuals within groups, as it is of groups within countries, as it is of countries within the world system.<sup>2</sup>) This principle includes people's right to organize and to address and solve their own problems and conflicts and search for and find indigenous solutions to what may be unique problems. In the absence of voice, peace may not be stable. Disaffected groups – splinter rebel groups – may continue to fight if they believe that their concerns have not been heard. The principle of democracy also allows for gradual and continuous “self-transformation” of institutions as old problems disperse and new problems arise that the affected communities need to address.
7. **THE PRINCIPLE OF SUBSIDIARITY.** Subsidiarity means that problems be addressed at the minimum necessary level of the affected population and that higher-level, external involvement not be automatic (local governance rather than global government). Many conflicts can best be resolved at the local level without necessarily involving a government or outside nation-state or group of nation-states. Only if it becomes clear that the structure of the game and payoffs lead to mutual defection within the affected groups might outsiders take a vested interest as for instance in the case of Congo. In the case of internal dissension, one would expect that the nation-state would have a vested interest in its own continued coherence and viability as the nation-state. For example, in the current conflagration over the introduction of Islamic law in some Nigerian provinces one can well make the argument that Nigeria as a nation-state has the obligation to intervene in the provinces before the conflicts grow out of hand and lead to major civil war. That is, inasmuch as the religious conflict in the provinces affects a community beyond these provinces, the principle of subsidiarity would counsel that the larger community get involved.

The principles of democracy and subsidiarity, if applied, virtually guarantee continued, gradual “self-transformation” of collective action institutions at the relevant decision-making level. For example, if a conflict over grazing rights is resolved by groups A and B, then a further, future conflict over water rights involving group C can also be resolved because democracy guarantees each group a voice and subsidiarity extends the reach to include group C.
8. **THE PRINCIPLE OF CONFLICT RESOLUTION MECHANISMS.** There must be speedy, low-cost access to dispute resolution venues. Peacemaking and peacekeeping rest on agreements but disagreement over the agreements frequently arises. To keep these from escalating, ways must be found and stipulated by which to handle follow-on conflicts. For example, ordinary business relations depend on contracts but frequently disagreement of the precise meaning of certain contract clauses arise. The parties must therefore have recourse to conflict resolution mechanism such as mediation, arbitration (binding or non-binding), a system of courts, and so on. The absence of such mechanisms to address grievances and conflicts portends weak peacekeeping and the eventual breakdown of peace.
9. **THE PRINCIPLE OF INFORMATION AND MONITORING.** Information reduces uncertainty, can help create shared values, and leads to better forecasts of expected benefits and costs. By the same token,

misinformation can create uncertainty, false certainty, or division of values. (Indeed, players sometimes have a vested interest in creating misinformation to win the game played within their own group.) The modern news and telecommunication industry can be of tremendous assistance to peacemaking. But since this industry is caught in its own subgames (of profitability for example) and therefore broadcasts what is in its own rather than the public interest, there is an opportunity for very wealthy individuals (such as billionaires Bill Gates and Ted Turner) to subsidize independent agencies for the reporting and disseminating of high-quality, accurate local, regional, and world news. The advent and spread of the Internet permits those with access to collect information about any topic from anywhere in the world, and this is a hopeful sign.

Monitoring refers to the ability to collect, process, and verify information. It is the ability to effectively, efficiently, and accurately monitor the actions of the other player. This ability requires funds, skills, and skill development. On occasion, advanced, industrialized countries have shared results of their satellite monitoring with other countries. But such government monitoring is excludable. In contrast, for a fee commercial satellite and intelligence networks could monitor troop and equipment movements in places such as Sri Lanka that would probably guarantee continued battle deadlocks and thereby force both sides into negotiation as their wars cannot be won when perfect information about the other sides' strength and movements is readily available. Existing peace research and strategic studies institutes form a valuable information function but one that could be expanded and be made much more useful by subsidizing satellite fees.<sup>3</sup> The objection that this would help entrench repressive governments or help guerilla movements overthrow legitimate governments does not hold when this principle is combined with others such as changing payoffs, creating vested interests, democracy, and accountability.

Monitoring and monitors must be accountable to the affected population. One way to assure this is to permit conflicting parties to select jointly approved monitors (rather like defense and prosecution agreeing jointly on a set of jurors in the US justice system).

Information processing is largely an aspect of education and institutional capacities within the affected players. Verification depends on technology, processing, and some degree of access to the other player. Where the principle of effective, efficient, and accurate monitoring does not apply one would predict more ready breakdowns in peace.

10. THE PRINCIPLE OF ACCOUNTABILITY. Information has the decided advantage of naming individuals responsible for war actions. Nowadays it is virtually impossible for leaders to remain anonymous in making war. With that comes accountability before the court of world opinion. Mere knowledge of who did what is not sufficient. Accountability requires a court, such as a permanent International Criminal Court with powers of enforcement. As before, the establishment of an International Criminal Court creates its own game but it is not impossible for a small set of like-minded nations to create one and be prepared to hold trials. Under ancient Roman law, the head of a household had absolute authority over his family. He could sell his children into slavery or kill them and the state had no right to intervene in this "internal affair." Today we consider that notion absurd. Similarly, if a government massacres its own people, it has no right to hide behind a misapplied concept of absolute state

sovereignty.

An International Criminal Court, even if started by only a few countries, would be better than the uncertainty involved in whether or not the UN *might* create a special tribunal as new violent conflicts erupt. The principle of reciprocity and clarity would apply so that any future war-maker knows ahead of time that s/he will be called to personally account for his/her actions.

Accountability has another side to it. One way to frustrate peace negotiations and to prolong war is to send junior officials or constantly changing representatives who cannot make or are not authorized to make credible, binding commitments. There must be insistence on continuity in representation precisely so that a small set of persons can be held accountable even for their actions in negotiations.

11. THE PRINCIPLE OF SELF-POLICING ENFORCEMENT. There are two types of enforcement, external policing and self-policing. External policing generates its own prisoners' dilemma and free-rider problems. It is costly and thereby diminishes the net benefit from collective action. For example, UN peacekeeping forces are financed on a mission-by-mission basis, are often too late and too feeble to effectively intervene in conflicts as one UN member waits on another member to commit troops or funds to the mission at hand. For these reasons, a self-policing enforcement is, where possible, preferable. Self-policing is closely linked to monitoring. If monitoring shows that player B defects, a self-policing agreement will induce player A to also defect and thereby withhold future gains from B. In this regard, it is thus generally more efficient and effective to supply parties with the ability to monitor each other than to rely on external monitoring. Exceptions occur when economies-of-scale make it worthwhile to out-source at least part of the monitoring function (in which case that part can be offered to the parties at cost).
12. THE PRINCIPLE OF NESTING. Economies-of-scale, of learning, and of scope may favor the nesting of institutions. The current UN system serves as an example of economies-of-scope as a large variety of specialized functions are more or less loosely organized under the auspices of a joint umbrella organization. Peacemaking negotiations are unlikely to show economies-of-scale but peacekeeping would, for instance a ready, standing UN peacekeeping force or, at any rate, a force under UN auspices (utilizing, for example, private military companies that already protect humanitarian aid workers).

## 5. Conclusion

Systems control theory can tell us what kind of institutions are needed to prevent war and foster peace (goals, feedback, and corrective institutions) and collective action theory can provide some principles that should be observed when constructing these institutions. If these principles are followed, the prospects for peacemaking and peacekeeping increase; if these principles are violated, the prospects for peace diminish.

## Notes

1. These institutions need not be global. Indeed global institutions can be inimical to achieving certain outcomes (see, e.g., Sandler, 1999, pp. 38-40). The principle of subsidiarity, explained later in the text, addresses this point.
2. It is ironic that nation-states that deny their own citizens effective voice demand it all the more in international settings.
3. John Pike, of the Federation of American Scientists, recently used commercial below 1-meter resolution satellite pictures to challenge US presumptions about North Korean missile abilities. See also *The Economist*, 6 May 2000, pp. 71-73.

### **Bibliography**

Axelrod, Robert. *The Evolution of Cooperation*. New York: Basic Books, 1984.

Ferencz, Benjamin B. *New Legal Foundations for Global Survival: Security Through the Security Council*. Dobbs Ferry, NY: Oceana, 1994.

Fischer, Dietrich. "Strengthening the United Nations and its Family of Organizations." Paper presented at the Session on "Global Governance in the 21st Century" at the Symposium of Economists Allied for Arms Reduction United Nations University, Tokyo, October 22, 1996.

Hardin, Russell. *Collective Action*. Baltimore: The Johns Hopkins University Press, 1982.

Hirshleifer, Jack. "From Weakest-Link to Best-Shot: The Voluntary Provision of Public Goods." *Public Choice* Vol. 41, No. 3 (1983), pp. 371-386.

Ostrom, Elinor. *Governing the Commons: The Evolution of Institutions for Collective Action*. Cambridge: Cambridge University Press, 1990.

Sandler, Todd. "Intergenerational Public Goods: Strategies, Efficiency, and Institutions," pp. 20-50 in Inge Kaul, Isabelle Grunberg, and Marc A. Stern (eds.) *Global Public Goods: International Cooperation in the 21<sup>st</sup> Century*. New York: Oxford University Press, 1999.

Sandler, Todd. *Global Challenges: An Approach to Environmental, Political, and Economic Problems*. Cambridge: Cambridge University Press, 1997.

Sandler, Todd. *Collective Action*. Ann Arbor, MI: The University of Michigan Press, 1992.

Schotter, Andrew. *The Economic Theory of Social Institutions*. Cambridge: Cambridge University

Press, 1980.