TYPES OF BARGAINING THEORY

by

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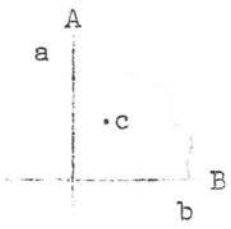
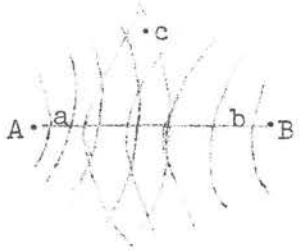
that looks promising. In this way each confirmation or disconformation of a hypothesis will not just sit there, as in Young's book, but will have some definite implication for one or more explicit (or perhaps undeveloped) bargaining theories. I suggest that we use Snyder's suggested list as a start and add hypotheses related to theories we wish to develop. If the list gets too long some can then be left out through a little tacit bargaining.

II. Utility models (Siegel and Fouraker, Boulding Ch. 1, Kent, Iklé). These models treat bargaining as a process of deciding on a distribution of utilities between two parties. It is supposed that the two parties each have interests or wants or demands; the interests of each party are internally harmonious, but are partly in conflict and partly not in conflict with the interests of the other party. This means formally that bargaining takes place in a two-dimensional utility space, which looks this:



Kent, Siegel and Fouraker

or like this:



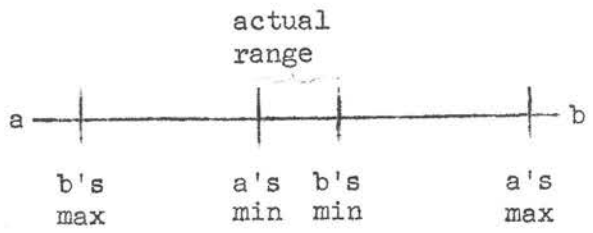
Boulding

The lines A and B are set at right angles to indicate that A's and B's utilities are partly opposed and partly not opposed. This means that there are two kinds of bargaining moves, one which increases utility for both A and B, and one which increases one utility and decreases the other. The former is represented by a shift from point c toward the bargaining line ab; the latter

is represented by shifts along the line ab. If one wishes to study only the second kind of move, the bargaining space becomes one-dimensional, as in Iklé's version (Iklé and Leites, 1964:247):

a——————————————————————————b

A one-dimensional bargaining space is subdivided into several segments: A's estimated bargaining range, B's estimated range, and the actual range. A's estimated range stretches between his minimum disposition, namely the settlement that he regards as no better than complete disagreement and breakdown, and his maximum hopes. The actual bargaining range stretches from A's minimum disposition to B's minimum disposition.



If an actual range exists, the final bargain must lie within it, since at all points outside it either A or B prefers no agreement to agreement. If no actual range exists, agreement is impossible.

The model does not specify where in the actual range the point of agreement will lie, though several dubious arguments have been advanced to suggest a determinate point. Kent repeats one of these, the Harsanyi-Nash argument that agreement will occur at the point where the product of the two gains is maximized (Kent, 1967: 20-29; cf. also Siegel and Fouraker, 1960).

This model is admittedly an idealization, but may nevertheless be useful in the following ways:

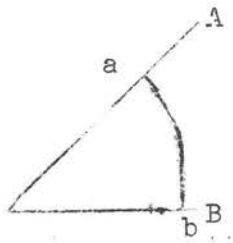
1. There may be an occasional situation which is simple enough to be essentially represented by the model, though I doubt whether we will find any.

2. It can serve as a skeleton for making improvements. For example, Kent adds threat tactics to the model, and Siegel and Fouraker suggest adding a principle of palience[5] to the model to determine where on the ab line the bargain will be struck. Another promising modification, by Tom Lewis, involves adding principles of cognitive dissonance to the model; this is intended to get some dynamics into the model and reduce its indeterminacy somewhat.

Another possible modification is to make the AB angle a variable. The AB angle measures the extent to which interests are opposed rather than harmonious: 0° indicates complete identity of interests, 180° indicates complete conflict. Such a model would be useful for studying the difference between alliance, adversary, and crisis bargaining. Presumably there are always mixed motives in bargaining, but in adversary bargaining interests are mainly opposed, in a crisis they are starkly opposed, and in an alliance they are mainly harmonious. This means that between adversaries there are few possibilities of A finding a concession that is of great benefit to B and of small or no cost to A; between allies there are somewhat more possibilities.

adversary relation

crisis situation



alliance relation

This in turn means that allies can afford to bargain according to norms of reciprocity or even generosity, because it is not too hard for B to find a return benefit for A at little cost to itself. Between adversaries however such occasions are rare, so that a generous concession is unlikely to be reciprocated voluntarily, and generosity leads to recrimination and ill will rather than gratitude. And even if a quid pro quo bargain is struck, residual conflicts are likely to undermine it.

For example, the Izvolsky-Aehrenthal bargain (Schmitt, the Annexation of Bosnia) in which Austria gets Bosnia and Russia gets free passage through the Straits fell through largely because of residual conflicts on undiscussed questions. Aehrenthal did not suppose that the particular mode of annexation would make a difference to Russia (which it did), and Izvolsky supposed that Russia's assent would occur in a general conference on Turkey, while such a conference would have been costly to Austria. The result was recriminations, threats, anger, and worsened relations.

In a crisis, where interests are in direct conflict, the bargaining space becomes nearly one-dimensional, and Iklé's model applies.

3. The utility model can be treated as an ideal type, and empirical bargaining behavior can be described as a deviation from it. This is what Iklé does. The model assumes fixed minimum and maximum dispositions; Iklé describes attempts to change the dispositions of the opponent by persuasive tactics. The model assumes perfect information; Iklé discusses the use of imperfect information and misinformation to affect the opponent's calculations. The model assumes that costs are fixed; Iklé discusses ways of changing costs, by threats, etc., to put some unevenness into the smooth bargaining space. Thus Iklé solves the bargaining problem by saying that the actual bargaining space may not even exist initially or may not be known

to exist. The bargaining process is a process of changing minimum and maximum expectations through persuasion and threats until a tiny bargaining space is known to exist, whereupon agreement occurs. Consequently Iklé's model cannot describe any of the actual bargaining process, but only present static snapshots of the situation at selected points in the process. I think we can do better than that.

Another possible deficiency of this family of models for our purposes is that it is designed for situations in which both bargainers win an advantage from a bargain, and the bargaining problem is noe of determining the relative benefits to the two bargainers. Crises, however, are usually situations in which things are desperate or even intolerable to both parties, and the bargaining problem is one of finding a way out. Consequently, models involving the search for or construction of a single acceptable outcome are more appropriate than models describing a choice from a whole range of mutually acceptable outcomes. Concepts of relative advantage and maximum goal achievement are more appropriate to pre-crises situations in which new and enthusiastic foreign ministers plan great achievements that will bring their countries prosperity and themselves a place in history.

On the other hand 1) there may be aspects of a crisis amenable to treatment in terms of overlapping utilities, and 2) there is some question of how different maximization behavior and disaster-avoidance behavior are. C. Stevens and Boulding have emphasized the difference, but they may have exaggerated.

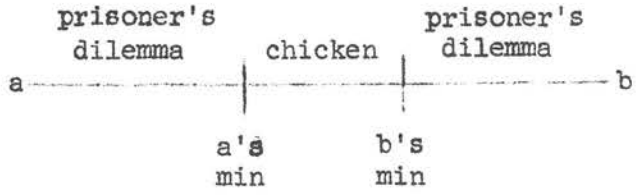
III. Models of strategic interaction. Since the chief shortcoming of the utility model is its static character, we now introduce dynamics into the model. In a one-dimensional bargaining space,three movements are possible for A: move toward B, hold firm, and move away from B. The same three movements are possible for B. The 3rd of these, move away, is rare so we disregard it for now.

This leaves us with a 2 x 2 matrix of possible movements:

A		B: accommodate	B: hold firm
	accommodate	compromise	B wins
	hold firm	A wins	No agreement

The result is a strategic interaction model, which deals with the outcome of strategic choices by each player. The choice between accommodating and holding firm is a strategic choice, and when each player has two possible strategies there are four possible outcomes.

The above model is either Chicken or Prisoner's Dilemma, depending on where in the bargaining space the "hold firm" point is located. It is a mild chicken, since the penalty is merely no agreement.



There are several types of strategic models.

A. Normal form, 2 or 3 x 2 or 3. For example, the above model. In this model one focuses on the basic strategic choice and leaves out all details. The whole temporal development of a crisis is ignored and with it all moves, communications, and particular decisions. One considers only the choice each party makes between accommodating or holding firm.

The advantage of this model is that it may be able to bring out the basic structure of some crises; the disadvantage is that it leaves out all details, including even the actual strategies used if they are other than the simplest ones. The model can also be used like Iklé's model, to classify particular acts which depart from or change the model. This is how the "critical risk" model would be used.

B. Extended form. This is a detailed model in which specific choices are laid out in time sequence. A chooses one of several alternatives; this choice leaves B with several alternatives, from which he chooses one; then A chooses again, and so on. Each choice can be called a move, a move being anything that changes the real alternatives available to the other player. This model is useful for describing the sequence of choices and their consequences during a crisis; it is good for a detailed description, but consequently loses the larger picture. It raises the empirical problem of locating or classifying discrete moves, that is choices which change the alternatives available to the other parties. Not every official and unofficial act is a separate move, since several acts can be grouped together as having a combined effect. Some communications are moves, since they change the value or the probability of some outcome attached to an alternative. However, one might wish to distinguish moves which select an alternative and thereby change the situation (basic moves), from moves which change values or probabilities associated with a pre-existing alternative (communication moves) (Snyder, #2).

In an extended form model all moves are sequential. Simultaneous moves can be modelled by having two or more diagrams, one for each party, and listing each move as it becomes known to that party. Thus each diagram will

have a somewhat different form; this allows one to describe crossed communications and misinterpreted communications, as well as differences in perception of available alternatives.

The disadvantage of an extended form is that nothing can be mathematically deduced from it; in other words by capturing the details it loses the basic structure of the situation. This sort of model is therefore useful for description only; it may well be our basic descriptive model. As a descriptive model it has the advantage that all other Type III and IV models can be translated into it; it is a lowest common denominator.

C. Expanded normal form, m x n, (Nardin, Hamburger). Again one abstracts from time, but instead of simplifying to 2 or 3 alternatives one includes all the available strategies for each party. This can only be done if there are at most three players, since otherwise the outcome matrices get impossibly complex. The strategies are arranged in order of decreasing utility to the opponent.

"Strategy" is here not defined in the normal sense of a complete set of contingent choices for all conceivable moves of the opponent, but in the simpler sense of a point on the give in--hold firm--get tough continuum, or in other words a rung on Kahn's escalation ladder (1965). The continuum runs from greatest concessions at one extreme, through lesser concessions, no concessions, to greater and greater demands backed by more and more force. In the Cuban crisis the U.S. strategy set included: do nothing, seek a conference in hopes of buying some control over the missiles, exchange removal of missiles bases, blockade to stop increase of middiles, bomb missile sites, limited ground raid, full invasion and occupation, etc.

This type of model has the advantage of summarizing the whole situation without losing too many details. It also enables one to bring in time and communication indirectly. Communication moves can be described as conditional undertakings to choose or persist in a certain strategy, and basic moves can be described as partial but revocable choice of a strategy. Each basic move then represents either an escalation or a de-escalation. In this way one can reconstruct something of the bargaining sequence that is laid out in extended form models. However, none of the sequence actually appears in the expanded matrix, though it is described by reference to the matrix. The advantage of this way of describing the bargaining sequence is that it distinguishes (as extended form models do not) escalatory moves, de-escalatory moves, and continuation of a strategy and thus puts more order into the otherwise interminable sequence of moves. Also it relates each move to the total picture, thereby clarifying both the detail and the total picture.

One particular expanded model should be of special interest to us. That is expanded chicken, which has a very interesting mathematical property--its upper left hand corner is Prisoner's Dilemma (cf. Hamburger, 1969). As one moves down the main diagonal the submatrices rapidly shift to chicken, thus providing a continuum between the two types of game. For example:

A \ B	I	II	III	IV	V	VI
I	2 2	-1 3	-4 4	-7 5	-10 6	-13 7
II	3 -1	$-\frac{1}{2}$ $-\frac{1}{2}$	-4 0	$-7\frac{1}{2}$ $\frac{1}{2}$	-11 1	$-14\frac{1}{2}$ $1\frac{1}{2}$
III	4 -4	0 -4	-4 -4	-8 -4	-12 -4	-16 -4
IV	5 -7	$\frac{1}{2}$ $-7\frac{1}{2}$	-4 -8	$-8\frac{1}{2}$ $-8\frac{1}{2}$	-13 -9	$-17\frac{1}{2}$ $-9\frac{1}{2}$
V	6 -10	1 -11	-4 -12	-9 -13	-14 -14	-19 -15
VI	7 -13	$1\frac{1}{2}$ $-14\frac{1}{2}$	-4 -16	$-9\frac{1}{2}$ $-17\frac{1}{2}$	-15 -19	$-20\frac{1}{2}$ $-20\frac{1}{2}$

Here the I, II submatrix is PD and from III on the dynamics are chicken. In normal times the players would be at II, II, the "DD trap", or would oscillate within the submatrix. However, the model offers a way out of the DD trap that looks more immediately rewarding than the "martyr route" of playing I. Either player can escalate or threaten to escalate to III or IV, thus provoking a crisis. This looks rewarding because there is not only an immediate small gain from escalation, but also the prospect of additional large gains as the other player cuts his losses by moving to I. However, instead of submitting, the threatened player can counter-escalate at slight additional penalty to himself and can impose great damage on his opponent; and so on down to VI, VI and disaster. From IV, IV on the motive for escalation is no longer that of getting an immediate gain, since further escalation is self-punishing; it is rather the prospect of forcing the other to submit and thereby retrieving a large win out of the crisis. However, the opponent always has the option of upping the stakes at slight additional cost to himself and great additional cost to the other. Near VI, VI or in general near m, n the motivation probably shifts to that of pulling the opponent down to mutual disaster: "We may be destroyed, but England shall at least lose India." I would never want to play this fiendish game.*

For another example, consider an expansion of Snyder's Chicken model (#4, p. 2), where the upper left submatrix is an asymmetrical PD.

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cf Dean Pruitt

*Maybe we can get Terry Nardin to run some expanded chicken experiments, using our more obstreperous philosophy students as S's.

A \ B	I	II	III	IV	V	VI
I	0 0	-1 1	-2 2	-3 3	-4 4	-5 -5
II	2 -2	0 -1 3/5	-2 -1 1/5	-4 -4/5	-6 -2/5	-8 0
III	4 -4	1 -4 1/5	-2 -4 2/5	-5 -4 3/5	-8 -4 4/5	-11 -5
IV	6 -6	2 -6 4/5	-2 -7 3/5	-6 -8 2/5	-10 -9 1/5	-14 -10
V	8 -8	3 -9 2/5	-2 -10 4/5	-7 -12 1/5	-12 -13 3/5	-17 -15
VI	10 -10	4 -12	-2 -14	-8 -16	-14 -18	-20 -20

At a normal II, II position, player 2, the weaker, has an incentive to induce a cooperative shift to I, I. Player 1 has no incentive to cooperate or to reciprocate a martyr move, but has an incentive to use his superior strength to threaten III. At III, II player 2 can cut his loss by submitting and moving to I, in hopes that player 1 will generously return to II. But he can also escalate to III or IV at very slight additional cost to himself and can punish 1 severely. At III, IV player 1 is in a chicken situation where he can either submit and move to I, allowing player 2 to win, or can in turn escalate at slight additional cost; and so on to VI, VI and disaster.

The numbers in the matrix are significant only in sequence, not individually; they express rates of increase of cost or benefit, not absolute quantities. All the sequences together represent the dynamics of the model; the straight lines are the dynamics of unilateral escalation, and the main diagonal is the dynamics of mutual escalation, the "slippery slope to destruction".

$d<0, d^2<0, d^3=0$

The slippery slope is always a curve with $\Delta < 0, \Delta 2 < 0$, and $\Delta 3 = 0$.

Δ^2 Δ^3

The dynamics of the model depend on three parameters: 1) rate of increase of escalation benefits, the sequence from I, I to n, I; 2) rate of increase of submission cost, the sequence from I, I to I, n; 3) rate of increase of escalation cost, the sequence from I, n or m, I to m, n. Parameter no. 3 determines the crucial d^2 of the slippery slope, including how rapidly the initial PD shifts to Chicken. When this parameter is extreme, as in the example below, the PD submatrix appears only in a further expansion of the I-II submatrix and is very weak. This game is less frightening than the previous two.

1	1	0	2	-1	3	-2	4	-3	5
2	0	$-2\frac{1}{2}$	$-2\frac{1}{2}$	-7	-5	$-11\frac{1}{2}$	$-7\frac{1}{2}$	-16	-10
3	-1	-5	-7	-13	-13	-21	-19	-29	-25
4	-2	$-7\frac{1}{2}$	$-11\frac{1}{2}$	-19	-21	$-30\frac{1}{2}$	$-30\frac{1}{2}$	-42	-40
5	-3	-10	-16	-25	-29	-40	-42	-55	-55

It is not to be expected that an empirical instance of expanded chicken will be mathematically regular; the slippery slope has bumps and plateaus in it. In other words, the strategy set or "rungs on the escalation ladder" will be irregularly spaced and will contain salient thresholds (Kahn, 1965). One would expect that these irregularities in the three parameter sets would determine the detailed bargaining dynamics.

D. Supergame ~~or metagame~~ models. (Amnon Rapoport, 1967, 1969). These consist of a set of 2 or 3 x 2 or 3 matrices arranged in a larger matrix or vector. Each matrix has different payoff properties, and the changes of pay-off properties form regular sequences in the supermatrix. Each pay-off

has two parts, an immediate payoff and a probability of moving to a different game in the supergame. The games represent various power or interest relations between the players, and a move to a different game represents a change in the relationship.

This sort of model is especially useful for representing cumulative power shifts in international relations. To a large extent nations get into crises not for the fun of it, that is not for immediate expected payoff, but as a way of improving their power or security position. Caplow observed long ago (1956) that in interpersonal bargaining the payoffs are not intrinsic utilities but changes in one's dominance relations, and the same is true between nations. For example, Hitler wanted Czechoslovakia not for the pretty scenery but because its munitions industries and natural resources would put him in a stronger position in the fight for Poland; Poland in turn would strengthen him enough to take Romania, the Ukraine, etc. The Austrian attack on Serbia in 1914 had no intrinsic expected payoff but aimed only at reducing permanently an opponent's relative power. This emphasis on cumulative shifts in power relations cannot be included in any of the models I have discussed up to here, except in extended form models indirectly. A supergame might look something like this: Player A is France and England, Player B is Germany. Strategy 1 is yield, strategy 2 is stand firm. Note the double payoff in each cell. Game 1, not shown, is called Occupied Germany; Game 8 is called Occupied France.

Game 2
Rhineland

	Yield	Stand Firm
Yield	0,0 --- stay	0,1 --- go to game 3
Stand Firm	0,-1 ---- stay	-2,-10 ------ go to game 1

Game 3
Austria

0,0 stay	0,1 game 4
0,-1 stay	-5,-10 game 1, 80% stay, 20%

Game 4
Czechoslovakia

0,0 stay	0,1 game 5
0,-1 stay	-10,-10 game 1, 50% stay, 50%

Game 5
Poland

Yield Stand Firm

0,0 stay	0,1 game 6
0,-1 stay	-10,-5 game 1, 20% stay, 30% game 8, 50%

Game 6
Ukraine

0,0 stay	0,1 game 7
0,-1 stay	-10,-2 game 8

Game 7
France

0,0 stay	-5, 1 game 8
0,-1 stay	-10,-1 game 8

The whole series might be called Superchicken. Viewing the immediate payoffs only, each component game is chicken; but if one computes the total payoff with some appropriate discount rate for future effects, only games 6 and 7 are chicken for player 1, and only games 2, 3, 4 are chicken for player 2. Game 2 is chicken for player 1 only with 85% or more discount for future effects per year. There is a name for such a discount rate.

IV. Communication and information-processing models.

All type III models, though they contain some dynamics, are still static in the sense that they describe the bargaining situation before and after some decision, but do not describe how the actual bargaining decisons are made. Instead, they assume that the bargainers are rational, that is that they will always automatically make the best possible choice. Type IV models drop this assumption and focus on the bargaining process, that is the process of deciding on successive moves. These models are therefore more complex than type III models; they gain in realism but pay for it by greater complexity.

A. Models which treat each bargainer as an integrated, conflict-free entity (Coddington, Jervis). Each bargainer is represented by a single distinct set of routines; the routines would look something like the following,

in outline: 1. An incoming signal or index observation or direct communication is interpreted. This is done by matching it with successive items on an interpretation list until a satisfactory match is found. The list is a list of possible actions the opponent (or partner) is expected to take, arranged in order of decreasing probability or decreasing danger or decreasing desirability or according to some other principle. For example, when Rusk heard the report of the Soviet missiles in Cuba his first response was "Tell me your personal opinion. Is this it?" "It" was the top item in Rusk's list of possible Soviet actions.

2. The interpreted signal or observation or communication is used to revise or confirm the list of what the opponent is up to and the list of possible actions he could take.

3. If the list of what the opponent is up to is revised, current policy toward the opponent is checked to see whether it is still satisfactory. The expected outcome is revised and then checked against the level of aspiration list. If the policy is satisfactory, it remains in force. If it is not, then

4. The policy is divided into parts and the most unsatisfactory part is improved. This is done by running through a list of mechanisms--commitment, warning, decommitment, coupling, decoupling, threat, etc.--until an appropriate one is found. For example, on July 29, 1914 the most unsatisfactory part of German policy was its possibility of bringing Britain into the coming war, and mechanisms were selected to reduce this possibility.

5. Improvement continues a part at a time, until the policy is satisfactory. The revised policy is then out put as signals, bids, etc.

A great many details remain to be specified, and most of these could be tailored to fit the procedures of a specific decision-maker at a specific time. This type of model may be too complex for our available data and computational abilities, but if we can manage it, it would be a good one. I hope to work out more detailed routines on this model during the next month.

B. Models focusing on the group decision-making process. These models drop the assumption that a government is perfectly conflict-free and deal with the process by which conflicting opinions and responsibilities are integrated into decisions. The same effect can be achieved indirectly by type IV A models by increasing the number of bargainers . Instead of having one set of routines for Germany, 1914, we would have three: one for von Moltke, one for Bethmann-Hollweg, and one for William II. This would be complicated, but so are IV B models.

A decision-making model would have at least three or four units--one military, one or two diplomatic, one chairman--each with an assigned weight representing influence. Interpretations and suggested policy changes, each with its assigned weight, would go through specified channels and combine into a decision by some procedure. This would be output, then the weights would be changed by comparing each suggestion with the final decision. Those whose suggestions were farthest from the final decision would suffer reduced weights--for example Stevenson, 1962--and those closest would get increased weights. Or some other measure could be used to redistribute influence.

This model would probably be too complex for our data in most cases and might take us too far away from the international interaction process. Yet it should be kept in mind as an alternative line of explanation if the lines we take do not work well.

V. Slippery slope or cataclysmic models. Type III and IV models assume that crisis bargaining moves along through a series of decisions or moves, each one preceded by some sort of deliberation. In such models a catastrophe could occur only through misunderstanding or miscalculation, because no bargainer wants catastrophe and therefore will always choose to avoid it when it becomes possible. For example, Snyder observes that in nuclear chicken (Type III A) "As in any bargaining situation, if either party can commit itself absolutely and irrevocably to 'standing firm' and communicate this commitment, the outcome is clear--the other party must comply." (#4, p2).

Type V models focus on the opposite aspect of a crisis, namely the possibility of things getting out of hand. The basis for this possibility is the various automatic, pre-programmed military responses that are set up by the military planners. For example, in 1914 things got out of hand because of the automatic mobilization plans which could not be stopped once started, the nearly automatic need to counter-mobilize to avoid military defeat, the existence of only one German attack strategy, which meant that war with Russia would automatically mean an attack on France through Belgium, the Austrian attack strategy through Bosnia which made the British suggestion of a halt at Belgrade impossible. Similarly, in 1962 an air strike on Cuba would have required an invasion to follow, which in turn would have activated Soviet military plans.

Cataclysmic models deal not with payoffs and alternatives as do choice models, but with transition probabilities. I offer one example, a Markov chain with the following transition matrix.

x indicates a significant probability, > 20%

blank indicates a smaller probability

e indicates a tiny probability

0 indicates a zero probability

	acquiesce	compromise	confront	limited action	mobilize	localized war	. . .	nuclear war
acquiesce	90		x			e		0
compromise		80 x	x					e
confront (Blockade)	x	x	70 x	x				
limited action local invasion				50 x	x			
mobilization ultimatums	e				40 x	x		
localized war	0	e				30 x	x	
. . .	0	0	e				x	x
nuclear war	0	0	0	0	0	0		0 x

Probabilities gradually rise between the "0" regions and the "x" region.

The area above the main diagonal is the accidental escalation zone; the area below is the de-escalation zone. There is one absorbing state, nuclear war; there is one semi-independent sub-matrix at upper left. Note that in this model nuclear war is inevitable sooner or later. See Kahn, 1965, for details in the area of the three dots. The numbers in the main diagonal represent an additional mechanism for getting out of the Markov chain; they represent the probability of re-asserting deliberate control. Apart from this mechanism, the model is a stochastic Richardson process model.

I believe some model of this sort is a necessary accompaniment to types III and IV models. Part of the threat in stand-firm and escalation strategies is not just the immediate cost, but the probability of moving on to the slippery slope whence few return. This is a "threat that leaves something to chance", ~~but not~~ of the sort Schelling had in mind. This probability can be included in our Type III and IV models as numbers in the various cells. The idea of a probabilistic shift to a slippery slope model is realistic; decision-makers in a crisis do not seem to know just when they have gotten on to the slope, but keep making decisions and sending signals, more and more frantically, as though they were still in control.

The Markov model looks superficially like expanded chicken, type III C. Both are escalation models, and indeed the same names may appear in the strategy sets. However, an expanded chicken model assumes that each move results from deliberate rational decision, while a Markov model assumes relatively automatic links in which the accompanying decisions, if any,are mainly ineffective rituals and the signals are screams of despair.

The main difficulty with this model is that I cannot tell what mathematical manipulations, if any, are possible with it. However, with more exact numbers manipulations become possible.

VI. Quasi-functionalist theories (C. Stevens, A. Douglas, Walton & McKersie, McKersie et al, Kelley).

A. Non-Temporal. I classify a bargaining theory as quasi-functionalist on two main criteria, namely holism and problem orientation. By "holism" I mean an attempt to develop a single unified picture of a total situation, a total system-in-environment, or a total process. By "problem orientation" I mean that the bargaining process is seen as an attempt to solve a problem or set of problems. The problems are set by the goals of the parties and by the maintenance requirements of the bargaining relationship.

It turns out that the maintenance requirements (the functional requisites or prerequisites) of a bargaining relationship or indeed of any social system are internally contradictory. That is, activities or subsystems directed toward satisfying one maintenance requirement conflict with activities oriented to a different maintenance requirement, and even intensify the second requirement. Consequently every bargaining process and indeed all social processes are involved in dilemmas or internal contradictions of some sort. Social systems have evolved several standard types of solution to the persistent dilemmas of self-maintenance and goal achievement. One solution is phase movement, a cyclical process of attending first to one maintenance task, then a different one, and so on around the cycle. Another solution is task specialization, either by informal leaders or by different levels of a hierarchical organization. Still another is specialized subsystems and

specialized mediating processes between the subsystems. For example, one simple phase movement has frequently been cited in the labor bargaining literature: first the parties engage in hard distributive bargaining, which raises tension, strains relations, and uses up goodwill and energy; then toward the close of a session they joke and engage in pleasant rituals which emphasize common interests and restore good will.

Holistic, problem oriented theories accordingly have several distinguishing characteristics. First, they are likely to be divided into several parts, each devoted to one self-maintenance requirement or to one specialized subsystem or subprocess. The parts may be quite different in style and content; one may be heavily mathematical, another non-mathematical, one may draw on economic concepts, another on anthropological or psychological concepts. Second, they are likely to be dilemma-oriented. For instance, Walton and McKersie state, "We shall be particularly interested in discovering and enlightening the most important dilemmas produced by the conflicting demands of the several sub-processes." (p.10). The Kelley article deals entirely with dilemmas, with minimal discussion of the systemic framework that produces them. Third, the theories are likely to make few specific predictions, since human beings can solve problems in many different ways and even invent new solutions. They are likely to delineate the stresses and strains resulting from certain specific kinds of solution, without predicting whether the solution will be tried.

The most complete theory of this type is the Walton and McKersie (1965). The theory is divided into four parts, since the authors hold that labor negotiations are comprised of four systems of activity or subprocesses, each

with its own function for the interacting parties (p. 4). A final chapter synthesizes the interrelations between the parts. The four subprocesses are: distributive bargaining, dealing with conflicting interests; integrative bargaining, dealing with shared interests; attitudinal structuring, dealing with maintaining the relationship between the parties; and intraorganizational bargaining, dealing with the organizational context of the bargaining process. These four subprocesses match rather well Parsons and Smelser's account of the four functional prerequisites of the labor contract (1956:114-119). Distributive bargaining performs the G-function; integrative bargaining, the G-function and a little bit of the I-function; attitude structuring, the L-function; intraorganizational bargaining, the A-function.

B. Temporal or stage theories. Since one standard way of solving an internally contradictory set of problems is to attack them in sequence, it is possible to treat bargaining as a sequence of stages, each focused on one problem. C. Stevens, McKersie et al., and A. Douglas I believe, are of this type. In Stevens' theory there are two stages, one of exploration and attitude structuring ending with the specification of a bargaining range, and one of distributive bargaining within the range. In McKersie et al. there are four empirically discovered stages (p. 468). A stage theory can readily be combined with a non-temporal theory of the total bargaining problem, since movement through stages is one way of solving the bargaining problem.

Functionalist theories have two main disadvantages for us. 1) they are large and complex, requiring on the empirical side detailed and intimate familiarity with a case. 2) they are least applicable to crisis bargaining of

all the types of bargaining, since in crises the problem is not one of maintaining a long-term, advantageous relationship but one of surviving for a few more days. It is noteworthy that all the functionalist theories deal with labor-management or interpersonal relations, where they are highly appropriate. If they are applied to crises the result will be many negative statements about the absence or near absence of various essential processes; see for example, Walton and McKersie's discussion of the Cuban crisis, esp. pp.388-389.

My own guess is that III C and IV A models will be most interesting and appropriate for us, being midway between the extremes of abstract simplicity and empirical complexity. We will need III B as a common denominator, and some of us may want to work on III A, V, or even VI theories.

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