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## CHAPTER 5: EXERCISING THE S-DIAGRAM \*

*Howard Margolis*

*\*This is a draft chapter from Cognition and Extended Rational Choice  
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**[[FIGS. 5.1 & 2 HERE**

Chapter 5. Exercising the S-diagram

Figure 5.1 is the S-diagram developed as Fig. 4.6 in Chapter 4, reprinted here for convenience. The prospect for shifting the status quo will vary with the size of the adverse region (the hump) between  $Q^-$  and the tipping point ( $t$ ). Recall that the diagram lines up choosers in order of readiness to cooperate. So at each point along the x-axis to the left of the tipping point, the depth of the hump indicates how big a gap in motivation must be bridged to move the marginal individual at that point to participate. The span of the hump indicates how large a fraction of the community must be moved to enlarge participation enough to get from  $Q^-$  to the tipping point. The bigger (in depth and span) the hump, the harder it will be for circumstances, or activists, or (usually) interaction between that pair to yield emergence of a high level of cooperation. And when the situation starts from the high equilibrium at  $Q^+$ , the bigger (similarly defined) the cushion, then the more stable a high level of cooperation will be.

But the S-diagram is a snapshot of some moment in time, as pointed out in the caption for Figs. 5.1 and 5.2. An opportunity can open, or opportunities arise for forcing a window open. Or a reservoir of potential support for change, or to suppress change, may be close at hand but not yet visible. I comment first on the general prospects, then consider some characteristic particulars.

As I write, at the end of 2006, the Democrats have just won control of both houses of the US Congress. This looks like a consequence of a gradual erosion of support for Republican control of Congress, not a tipping point result. We do have tipping point effects within the Houses of Congress, where a switch of one vote can yield a huge shift in power across the two parties. In the Senate a fractionally tiny shift in the voting in either of two states (Virginia or Montana) would have left the Republicans in control. But the tipping point here is governed by the legislative rules and has nothing to do with the tipping point in the S-diagram. So not all shifts in social equilibrium involve tipping points, nor do all shifts in social equilibrium that do involve tipping points involve the dynamics captured by the S-diagram. But as I will be trying show, the range of cases that do is large.

Tipping point phenomena of another kind arise through the social contagion treated in Gladwell's *Tipping Point* (building on academic work by writers like Granovetter, Kuran and Schelling). As described in Chapter 4, in the context of fads and fashions, this yields a version of the S-diagram. Parallel effects on ideas and passion would reinforce the NSNX effects as discussed in Chapter 4. But the explicit concern here will be with the intrinsically NSNX tension between social and self-interested motivation, which can generate tipping points in the S-diagram entirely aside from social contagion.

What we see will always be generated at least partly by quirks of circumstance. Things happen which no one controlled, and in particular things happen not within the control of some agent seeking that result. But ordinarily what is fortuitous will be pushed along or exploited by activists seeking to move from  $Q^-$ , or by opponents of an existing mode of cooperation pushing the situation back from  $Q^+$ . Shocks to any system are bound to occur, so that agents seeking to upset the status quo, and agents committed to defending the status quo, will seek to exploit whatever circumstances provide to them.

We might want to ask (if we see the high equilibrium) how the seed was established, how cooperation got over the hump, whether its cushion could collapse, and various more detailed questions that concrete situations will prompt. Or, seeing only some modest seed, or even seeing no seed but noticing that conditions in this context look favorable for the emergence of a seed, we can ask what deters its development, and what might reverse that.

Consider what would happen if the curves in Fig. 5.1 shift. Movement *down* by the  $G'$  curve, or movement *up* by the  $WS'$  curve would shift both equilibria (low at  $Q^-$  and high at  $Q^+$ ) to the left. But the tipping point at  $t$  would move in the opposite direction, to the right. So you can see that a change in the situation that would shift the  $G'$  curve down all across the diagram, or shift the  $WS'$  curve up, would shrink the seed, expand the hump that needs to be gotten over to get from  $Q^-$  to  $t$ , and it would deflate the cushion that could protect the high equilibrium were that to be managed anyway. With sufficient movement down of the  $G'$  curve, the diagram would lose the tipping point entirely, hence also lose the  $Q^+$  high equilibrium, and eventually lose the explicit low equilibrium at  $Q^-$  as it

becomes an invisible equilibrium too close to the vertical axis to be seen. And converse possibilities would arise from a shift up in the  $G'$  curve or down in the  $WS'$  curve.

But since the chooser at any particular point along the horizontal axis is the marginal chooser at that point, there is no reason to expect a uniform shift across the diagram. An action or event that increases  $G'$  for choosers just beyond the seed might decrease  $G'$  for potential choosers further out on the  $x$ -axis. What is a call to action that might engage a chooser just beyond the seed might seem reckless and perverse to another chooser far from being ready to join in.

So there is much room for complications and subtleties to arise beyond the simple story of shifting  $G'$  or  $WS'$  curves I've sketched to this point. The  $S$ -diagram nevertheless implies quite a bit which does not depend on explicit attention to the always-present heterogeneity across choosers. I run through what seem to be the salient points about the tactics and possibilities that an agent seeking change, or seeking to block, that change, might be able to exploit. Most of this can be seen in a first-cut discussion neglecting complications. I start with a particularly important type of situation which requires only the general discussion already in hand.

Suppose the equilibrium were at  $Q^+$ . What sort of developments could lead to collapse off the status quo? For this context (overthrowing an existing high level of cooperation), we need to read the diagram from the right. And although this kind of case does not arise only in the context of political revolutions, that does provide the most striking cases. In this context of political revolutions, people to the right of  $Q^+$  are not last holdouts against the social order but the seed of an effort to overthrow the social order. Those to the left of  $Q^-$  would be those who would be the last holdouts to a successful attempt to overthrow the existing order. But for that to occur, some combination of shifts in the situation must deflate the cushion sufficiently to allow some final push to move the situation back to the left of  $t$ . That has been seen repeatedly in recent decades.

Sometimes it has been a conservative regimes that falls (Batista in Cuba, the Shah in Iran). From the other side of the political spectrum, an avalanche of collapse spread across the communist regimes in Eastern Europe, climaxing with the shattering of the

Soviet Union itself. But the classic case came much earlier, with the fall of the Ancien Regime in France, memorably analyzed by De Tocqueville. It was Tocqueville who first pointed to what has turned out to be a characteristic feature of abrupt revolutionary shifts. Think of the threatened regime as being at  $Q^+$  (an unpopular but functioning regime is in place). For this context, as mentioned earlier, the seed is on the right of the S-diagram. Opponents here hope to push cooperation with the regime back to the point where the regime will collapse. In terms of the S-diagram, opponents hope to push cooperation with the regime back from  $Q^+$  to  $t$ .

But an explicit S-diagram is not something that either activists or the regime can see. They cannot know where  $t$  is located, even if they have an intuitive sense of something like the S-diagram, nor can they see the size of the cushion between  $Q^+$  and  $t$ , though inferences can be made about how things are changing (in the formalism, comparative statics inferences can be drawn). But it is the existing prevalence of compliance that is salient. That can be directly seen. This invites an interpretation of a repeatedly noticed odd feature of the collapse of regimes, which is that it is commonly the case that not only the regime but its opponents are taken by surprise by the suddenness of the collapse.

For right up to the moment of collapse the regime will have possibilities both for offering rewards and for tightening coercion. For an indefinite (but not infinite) period, drawing on those possibilities can keep compliance from visibly deteriorating. So the situation can be kept looking no worse or at least not much worse than it has for some time. Yet moves which may indeed serve to keep the location of  $Q^+$  from visibly deteriorating will usually compete with moves that might halt the deeper deterioration of support for the regime. In terms of the S-diagram, minimizing any visible adverse shift of  $Q^+$  (to the left in the S-diagram) might entail a harder to notice adverse shift of the  $G'$  and  $WS'$  curves which enlarges the seed, shrinks the hump, thins the cushion, and moves the tipping point to the left, even though the location of  $Q^+$  does not visibly change.

Reforms may be instituted that at one time would have significantly reduced  $G'$  (here, social value of ending the regime) but now are seen as much as evidence of weakness that raises hope the regime can be supplanted entirely. Or the regime may become ever more focused on its most immediate concern -- the level of visible

compliance -- to the disadvantage of changes needed to reverse the less easily noticed inframarginal deflation of the cushion between  $t$  and  $Q^+$ . In particular, the regime may be cautious about reforms that might offend its dwindling base of active support, such as disciplining the police or army.

As a regime comes to rely more heavily on coercion to keep compliance high, or on rewards to active supporters which in fact aggravate underlying resentment outside that core of support, cooperation is becoming increasingly dependent on coercion. And recalling the discussion of negative incentives in Chapter 4, the effectiveness of coercion depends on a high level of success to remain potent. But relying on coercion to maintain at least pro forma cooperation with the regime will almost always aggravate the regime's unpopularity. The cushion will be getting thinner, and the tipping point will be sliding closer to  $Q^+$ . With no immediately apparent loss of control by the regime, a shock no worse than others that have repeatedly been weathered turns out to be fatal -- and unexpectedly, since compliance can be observed, but thinning of the cushion and a shift in the tipping point cannot.

At the moment of actual collapse the curves in the diagram over the range of the cushion are likely to be inverted, with  $G'$  for cooperation with the government negative. Then, as shown in the discussion of negative  $G'$  in Chapter 1, cooperation with the regime could be sustained only if  $S'$  was also negative (the "cost" of cooperation is actually a gain). Cooperators in that critical range would increasingly be those for whom coercive threats for failure to cooperate are so severe or rewards for continued cooperation so generous that the cooperation leaves the individual chooser enough privately better off to at least stave off defection. But then we are dealing with people ready to revolt even if for the moment kept at bay.

But the opposite sort of situation may follow the collapse of a regime. What had been a beneath-the-surface simmering of resentment against the old regime might then be replaced by enthusiasm for the new regime among most of the public which allows, without prompting resentment, severe measures against opponents or even potential opponents. A regime lacking confidence that it has a robust cushion might then seek to entrench its position by harsh measures that intimidate or destroy its potential enemies. But success with such measures is most likely for a new regime which has some prospect

for credibly claiming that what is being done is justified by the need to preserve the social gains so recently achieved, not by a faltering corrupt regime long in power.

From the point where a seed is substantial enough to be easily seen, it certainly does not follow that it will triumph. More often an incipient movement dies out, though often with some remnant remaining which may later re-emerge. If we were trying to trace a major shift in social equilibrium, we would need a series of S-diagrams where  $Q^+$  of one context (for example, a particular faction wins control of a revolutionary movement) becomes  $Q^-$  for a new phase. For a successful case, at each phase a further segment of the community joins in, becoming part of the enlarged seed for the next phase. I am not proposing to push use of the S-diagram to anything like degree. I am only interested here in extracting what is available from thinking about the S-diagram without a huge amount of elaboration, which could turn what seems to me a useful heuristic device into a burdensome contraption.

Establishing and expanding the seed is a matter of "retail" promotion. The initial steps turn on a very small cluster of activists... at the very beginning perhaps a single idiosyncratic individual, but more likely a coalescing across a few individuals or small groups with similar ideas. But to become socially significant, this must arouse the sympathy and interest and eventually a commitment from enough of these particular individuals, or small groups of individuals to provide resources (of varying kinds, not just money) for reaching a much wider public. But at the very beginning that initial cluster must recruit, one by one, others who look especially promising, through some combination of how easy they might be to recruit and how valuable they would be if recruited. The recruitment device might be broadcast (a speech, an article, today very possibly a blog), but the recruits come one at a time, and then perhaps a few at a time. But we would still be dealing with the specially accessible segment of a much larger public discussed in Chapter 4 as likely members of the seed. And they would be conscious of that. They can see they are taking up something that very few others are, and they would see their role as agents for promoting change not as part of a general movement towards effecting change.

These "retail" conversions are analogous to the first discoverer and early converts

to a radical idea in science (Kuhn's initiators of a revolutionary paradigm shift). The analogy with science is limited but worth pursuing for a few lines. In that context (of a scientific revolution), the curves in the S-diagram would need a different interpretation. Instead of a tension between group-interest and self-interest, there would be tension between "economy" (favoring a new idea that in fact works better) and "comfort" (favoring what is familiar). So in a diagram for such an episode, the equivalent of the WS' curve here would be a curve for discomfort with the novel idea and the G' curve would capture the economy of a new idea that can explain a lot. The tipping point now occurs where enough converts are on board that anyone active in the field becomes repeatedly exposed to the main arguments, which will also mean that the mere tendency to social conformity will make all but firmly committed opponents open to the possibility that the new idea may in fact be right. So an advantage in economy becomes easier for a new convert to grasp, and the discomfort wanes as the idea becomes familiar and widely held. The Copernican case, about which I happen to have written for reasons tangential to the NSNX argument, may have some extra relevance here, beyond the sheer contagion parallel available with the tipping point cases of fashions and epidemics. I provide a bit of detail in the note./1

. General points about earliest recruits were taken up in Chapter 4. I continue the story here assuming a seed has been established. From the low equilibrium at  $Q^-$ , we want to consider how activists might seek to move the situation in ways favorable to reaching  $Q^+$ . The diagram suggests why the set of tactics sketched next can be recognized across a wide range of empirical examples of activists seeking social change, from evolution of novel social norms to political revolutions.

*Vertical* tactics aim to shift the curves up or down, with the effects considered earlier in this chapter -- shrinking or enlarging the hump, and so on. Shifts in the curves might come by way of (1) changing *beliefs* (persuasion) or (2) changing *incentives* (rewards and punishments, as discussed in Ch. 4), or (3) changing the *saliency* of various issues at stake, so that evaluations of a situation may change a great deal even if beliefs about the issues have not changed at all. And (4) what can be interpreted as a larger-scale version of a change in the saliency of issues occurs when there is a change in *identification*, so that a person who responds as, for example, a Canadian is somehow

nudged over to respond as a member of a particular Canadian political faction or region or religion... or the reverse so that larger concerns dominate more parochial ones. A change in the salient identity guiding a person's responses would not necessarily involve any change in beliefs but nevertheless can easily yield a wholesale change in issue salience, and through that a radical change in response. In NSNX terms, this involves a shift in the group to which, in the choice at issue, a person's sense of group loyalty is directed.

But another set of tactics -- what I will call *horizontal* tactics -- might shift the prospects of reaching a tipping point even if there were no change at all in the categories of I have just introduced as vertical tactics. In practice, the two kinds of tactics are never entirely separate. And there will always be some interplay with serendipitous events (*shocks*) which in one way or another affect the plans and opportunities of active Agents.

Start with horizontal tactics. I will label three ways that an agent might deal with the problem of shifting participation beyond the tipping point (getting over the hump): (1) top-down, (2) partition & coalesce, and (3) intensity/prevalence tradeoffs.

#### *Top-down*

The most common form of successful promotion of a new form of cooperation occurs in so routine a manner that nothing worth noticing is apparent. A functioning authority simply asserts what is to happen with respect to some matter. Everyone knows that overwhelmingly people already in the habit of obeying this authority can be expected to comply with a new regulation. The situation can go immediately from a seed consisting of a few well-placed experts and officials to high compliance where even people unhappy with the novelty judge it prudent to go along. Ordinarily, when a source of authoritative decisions exists whose choices are routinely obeyed there is no "getting over the hump" problem. Cooperation, backed at least potentially by what is seen as the legitimate coercive powers of established authority, is what is taken for granted, so of course cooperation is what ordinarily occurs.

But top-down effects are sometimes far more interesting. Sometimes there is resistance. A seed forms which opposes what authority prescribes. Sometimes even established authority confident that it will be obeyed follows a more cautious route, since

leaders are commonly constrained by considerations of maintaining morale and conserving political capital even when they have no doubts that people will follow the leadership's move. This prudential behavior makes it uncommon to see cases where an authoritative policy decision is widely resisted. But of course in the aggregate many cases of resistance occur, and sometimes with severe consequences for the authoritative Agent, since successful resistance prompts the thought that further resistance might also succeed. And general resistance can be sometimes be seen, sometimes immediate, sometimes through a gradual erosion of compliance (as with prohibition in the 1920's).

But top-down effects commonly play a role in cases where the seed does not (yet) include people in a position of authority. For the most obvious tactic for getting over the hump would be to seek to win sufficient support among those who already enjoy authority in the society to enable top-down tactics by sheer authority. Except where there is simply no prospect of top-down support, a salient focus of promotion will be winning support, or at least softening opposition, among those who can ordinarily determine what will be accepted as legitimate social choices. A spectacular exemplar is provided by the conversion of Constantine to Christianity, and a millennium later by the choices of sovereigns in northern Europe about whether the populations under their control would be Protestant or Catholic.

A memorable example was the remarkably uneventful and rapid (on the scale of major social change) collapse of segregation in public accommodations in the Old South after the Civil Rights act of 1964 mandated it. But top-down effects are routinely crucial at some stage even when that is in opposition to established authority. For at some stage leaders within the seed are likely to call on sympathizers to act. If action in concert by sympathizers is sufficient to get past a tipping point and if the call is obeyed (neither guaranteed), large consequences follow.

A major episode on the way to the Civil Rights act was the Montgomery bus boycott. A boycott sharply exhibits the incentive features discussed in Chapter 4. Participation by only a few accomplishes very little at a substantial cost to the boycotters. In Montgomery it invited the antagonistic attention of the city police, which could be focused on the few "troublemakers". But overwhelming participation makes selective punishment ineffective, imposes large costs on the target of the boycott, and subjects

people who break the boycott to humiliation and shunning by the participating majority. The woman whose act sparked the boycott, though, seems to have no such ambition. Rosa Parks was actively involved in the civil rights movement, which surely contributed to her on-the-spot decision to refuse to give up her seat to a white man who demanded it, but at the moment (as she reported when people complimented her for heroism) she was just thinking how tired her feet were. But the leadership of her community, sensed the depth of outrage on news of her arrest and correctly judged the moment right to call for the boycott which had been long-discussed, with memorable results. This was a top-down move: the mass refusal to ride the segregated buses any longer was not spontaneous./2

*Segment & coalesce*

NSNX equilibrium will be higher -- relative to the mass of potential cooperators, nearly all of whom are still passive -- within a small vanguard group that fosters identification as a special group. Within that small group (where everyone knows everyone else), social pressure will be especially effective and social cohesion especially strong. So there will be conspicuous private costs for a free-rider. From the first point (as discussed in more detail in Chapter 4)  $W$  is smaller. The salient reference group consists just of people likely to be actively engaged, so a person contributing does not feel exploited relative to "people like me". From the second point  $S'$  will be smaller (for the multiple reasons noticed in the *seed* discussion of Chapter 4) And I have already mentioned (again in Ch. 4) some reasons why  $G'$  will tend to be larger as well. So the equilibrium commitment (where  $W = G'/S'$ ) may be large enough to allow a substantial seed to emerge.

Often these effects will be most striking when that initial effort is not focused on a special subgroup within a large population, but on a subgroup which is a localized subgroup of people who live or work together, often with significant kin relations as well. All this favors solidarity among otherwise typical choosers. Then a local effort may succeed when an immediate effort at large scale (what I will call "global" as opposed to "local") cooperation would be hopeless. But if the activity is global in its aims, or in its consequences, or even merely in its potential, then local successes can coalesce into a global movement. That might have been intended from the start, but even if not it will

occur as similar local movements, partly inspired by the existence of local success elsewhere, perhaps with material support and routinely with moral support and advice, recognize in each other both common elements and potential gains from mutual support.

Exemplars of this process are easily noticed. For activities as diverse as the origins of national labor unions, to the recent spread of recycling and of smoking restrictions, many activities can be found where *segment & coalesce* effects are an essential part of the story. Sometimes this will be spontaneous (global ambitions were not an element at first). But often it reflects a tactical judgment that it would be best to segment the effort. Both strands can be seen especially clearly in the origin (always intrinsically local) and contagion (often local as a tactic) of what have come to be vast religious movements, most strikingly Christianity and Islam.

### *Intensity/prevalence*

One dimension of participation is prevalence. How large a fraction of potential cooperators are in fact cooperating? But another dimension is intensity. Among cooperators, how much is each contributing? This offers a third tactic for getting beyond a tipping point, since ordinarily reducing the contribution required will reduce  $S'$  proportionately more than it will reduce  $G'$ .

As noticed in passing in Chapter 1,  $G'$  and  $S'$  are each defined as finite quantities, so  $G'/S'$  is not the ratio of infinitesimals.  $S'$  is the finite private cost of participating,  $G'$  the finite social value of the contribution, each as seen by the chooser, and net of side-effects as discussed in Chapter 4. Suppose that cooperation at a high level of intensity risks provoking a costly reaction that would harm the individual cooperator or that would harm the group, but the more modest level of intensity does not. Then unless there were increasing returns to scale for spending on  $G$ ,  $G'$  at the lower level of intensity would be higher relative to  $S'$  at that level, since the individual cost would not be augmented by the adverse response, nor the social value diminished. It is easy to envision situations in which that would hold, harder to envision the opposite.

So in general, with a reduction in how much is asked of cooperators, the  $WS'$  curve shifts down relative to the  $G'$  curve, favorably affecting the prospect that participation will get beyond a tipping point. But once prevalence is high, activists can

try to increase intensity, but now starting from a status quo which is at  $Q^+$  (beyond the tipping point) rather than starting on the wrong side of the hump, at  $Q^-$ .

Here is another, slightly different, way to look at the *intensity/prevalence* tradeoff. Suppose that at a certain stage, the challenge for promoters of some social change is not to persuade people that cooperation on what is at issue would be good if achieved. A substantial value for  $G'$  (for cooperation on the matter at issue) is widespread. But widespread actual cooperation does not follow from that.  $G'$  may be large, but with participation still low, since beyond the seed  $W$  will be high. If cooperation entails a substantial private cost, people feel closer to equilibrium by waiting to see when others will act. So almost nobody acts. We are at  $Q^-$  in the diagram, facing the problem of getting over the hump.

But if the costs of cooperation are substantial, so that few people can be moved to cooperate unless they believe that almost everyone else will, then a possible tactic is to ask less of cooperators. But since lowering the cost of participation will ordinarily shift the  $WS'$  curve down more than it shifts the  $G'$  curve down,  $\Delta$  increases -- it is not as negative -- moving  $Q^-$  to the right, moving the tipping point to the left, and deflating the hump. The private cost of cooperation, by definition, is now less; and although the social gain from cooperation is also less, the social gain per unit of resources committed is not likely to be less. That effect will be magnified by effects on expectations. A person's expectation of how far others in fact will cooperate will increase (when cooperation seems cheap). Risk-averse concerns about the costs of cooperation if others turn out not to join in will be less. Consequently  $W$  must become smaller.

So the propensity to contribute increases across the community. In the  $S$ -diagram,  $WS'$  shifts down proportionately more than  $G'$  does, increasing  $\Delta$ , moving  $Q^-$  and  $Q^+$  to the right (higher participation) and moving the tipping point to the left, shrinking the hump and enlarging the cushion, as illustrated in the contrast between figure 5.2 and figure 5.1. Contingent on elasticity, the total amount of contributions from all choosers might either decrease or increase. But since every chooser's individual equilibrium condition shifts to favor participation, participation necessarily increases whether aggregate contribution immediately does so or not.

This has a paradoxical character that warrants a little thought to get straight. You

learn it costs only \$5 to join (rather than \$10). This increases your willingness to join. Your NSNX individual equilibrium has shifted to the right (higher social spending) relative to the \$10 cost which exceeds your equilibrium by enough to prompt you to free-ride when prevalence is low. But increasing prevalence will reinforce the propensity to cooperation (from Rule 2, by decreasing  $W$ ). If high prevalence is established (if the prevalence grows sufficiently to get over the hump), what had before (at low prevalence) seemed more than a chooser was ready to spend might now be acceptable. You might now be willing to contribute \$10 after all. This is aside from a second effect likely to be important. For seeing what look like social gains from the more modest level of participation might enlarge  $G'$  as well as shrink  $W$ . A modestly credible conjectured social gain from cooperation might be turned into a convincing visible social gain.

Kuran (1997), from another perspective, draws on this possibility in pointing to ethnic solidarity of individuals at first promoted by increasing commitments to mere tokens of ethnic identification (dress, and so on), only later escalating to overtly political commitments.

Top-down tactics by definition always involve overt agency. But intensity/prevalence effects, and also segment & coalesce effects, can occur spontaneously not as conscious tactics promoted from a seed. But it is often hard to distinguish active agency from spontaneous cases, since what begins spontaneously is almost always sooner or later promoted as well, as agents notice something they would want to encourage. An activity (like recycling) might begin in a particularly favorable locality, which is only after-the-fact noticed by agents interested in promoting the novelty on a wide scale. But activists then consciously choose *segment & coalesce* tactics, focusing initial effort on other particularly promising localities.

Similarly, even when visibly promoted, it will be ordinarily be hard to judge how far an active agent actually played an essential role or was merely imagining he was controlling a bandwagon on which he was really only another passenger. Often it will be clear that agency appears (but then may be crucial in shaping the climax) only after the bandwagon had gathered momentum. The collapse of regimes -- most spectacularly, the collapse of the Soviet Union -- commonly begins with spontaneous intensity/prevalence effects. People begin to just barely grumble about the regime, make slightly sarcastic

remarks, and if (in contrast to earlier times) this does not generate looks of concern or disapproval, such comments spread so widely that there is no way for the regime to crack down since everyone is guilty. And the grumbles becomes bolder, the jokes less good-natured. A process of this kind led eventually to the collapse of the Soviet Union, extending over a long period before overt agency plays any visible role, gradually growing into a general reluctance to cooperate with the regime even among many inside the regime.

## 2. Vertical tactics

The horizontal tactics already reviewed deal with how Agents might seek to reach a tipping point even taking preferences as given. Vertical tactics seek to shift the preferences, hence directly changing the vertical relation between them.

The discussion in Chapter 4 noticed that the curves can be shifted without challenging underlying beliefs and commitments by changing *incentives* (rewards and punishments). Or beliefs themselves might be changed by *persuasion*. Or  $G'$  might be changed aside from either incentives or persuasion by shifting the *salience* of a particular component of belief, which is easier and often more important. And changes in  $G'$  can also occur wholesale, by shifting the salience not of beliefs but of *identities*, which when successful can create large shifts in both the  $WS'$  and  $G'$  curves. For that would shift both the reference group for "people like me" (affecting  $W$ ), and the group to which group-interested commitments might be made (affecting, possibly very radically,  $G'$ ). Each is the concern of a large body of work in psychology and the social sciences. I will comment just briefly on each.

*Incentives* (positive and negative: rewards and punishments) were reviewed in Chapter 4. This noticed, in particular that individual rewards (positive incentives, reducing  $S'$ ) will usually exhibit decreasing marginal returns as the level of cooperation increases, but negative incentives (penalties, increasing  $S'$ ) will usually increasing marginal returns (as least up to some very high level of cooperation).

NSNX adds the possibility of group reward and punishments to Olson's selective incentives to individuals. In Olson's analysis, where only self-interested motivation is in play, extension from individual to group incentives would not be consequential. If self-

interest alone governs choice, a chooser would care about reward or punishment of a group only to the extent that his individual incentive would be altered (his own reward enhanced, his own punishment mitigated). The effect of a group incentive on an individual might be large. If every member of the group is threatened by a severe fine unless cooperation within the group is high, there is a strong incentive to each individual to hope cooperation is high. But discounted by the ordinarily microscopic effect of an individual choice on group-level effects, no marginal incentive of consequence may remain. But in a NSNX world group reward or punishment sometimes will be crucially relevant, on an argument that does not need to be spelled out here, since (as mentioned in Chapter 4) it exactly parallels the discussion of voting in Chapter 2.

But how that will be judged also is subject to tactical effects. *Rewards or punishments* shift the curves by adding (or changing) the side-effects of choice, so that net G' and net S' may yield a value ratio very different from what they would otherwise be. *Persuasion, salience* and *identity* tactics each shifts the G' curves directly (and less often for the concerns here, S'), but in entirely different ways. Arguments are always important, but good arguments (arguments that people not caught up in the passion of the moment would on reflection judge to be good arguments) are not always as important as rational creatures would want them to be. As often has been noticed, good arguments are often hard to sell and bad arguments hard to put down.

Outside settings make careful, detached attention to arguments a strong norm, and indeed if situations are examined closely, even within them, persuasion is never simply by argument (uninfluenced by slogans, analogies, symbols, authority, loyalty, social pressure, all mediating visceral feelings). And persuasion is always slow unless powerfully encouraged by the parenthetical extra-logical elements. Zajonc (1982) appears to be correct in his claim that "emotions come first": our response to whatever comes to attention is colored by an automatic, subjectively immediate affective response which establishes a presumption leaning one way or another, which sometimes can be overcome but not easily or quickly. In the long run, careful argument is enormously powerful. Every theorem established in Euclid by careful argument almost 2500 years ago is unchallenged today. But in the short run, good arguments alone are never sufficient to do more (referring now back to the brief earlier discussion of paradigm shifts

in science) than establish a seed which over time might win out.

When the circumstances are right, persuasion by the various extra logical means noted parenthetically (aided by slogans, analogies, symbols, authority, loyalty, social pressure) can be fast, but persuasion by argument itself is always a process, and a slow process typically requiring many iterations before a novel claim takes hold. A window of opportunity (see *shocks*, below) may open the door to the means of rapid persuasion, but since persuasion by argument is slow it needs to be well in place among some key members of the community before a window of opportunity opens, at which point potential sympathizers may quickly see a point that did not at all reach them before.

But *salience* and *identity* shifts, relative to persuasion (changing beliefs) can be rapid. An effective argument (here including the effects of slogans, etc. which may facilitate or even preempt argument) needs to be focused on some particular point of belief. The starkest case is a mathematical argument, focused on a particular proposition. Sometimes a particular point casts a wide shadow. If the point is that your current leadership is incompetent or cannot be trusted, or has betrayed you, then that particular point of persuasion will make you ready to believe many other arguments adverse to that leadership. So persuasion on one point has contagion effects on other points. Nevertheless changing belief (persuasion) does not have the immediate wholesale effects of a shift in *salience* which immediately crowds out rival beliefs without needing the slow process of directly changing beliefs. And shifts in *identity* can have even more powerful effects, since here the shift may immediately prompt wholesale shifts not only on priorities (salience effects) but on a person's entire sense of what would be socially valuable, since the sense of what group my loyalty concerns can be radically changed. A person does not abruptly shift from conservative to liberal. But he may quite abruptly shift from salient high level, usually national concerns to salient local concerns, or sometimes the reverse, as conspicuously in the U.S. for some time after 9/11.

Identity effects turn on how an individuals' sense of loyalty is governed in contexts where there are competing cues to what is "my group". Sometimes sharp gestalt-like shifts occur. The most famous case is still that of ardent international socialists who in 1914, after many passionate discussions of the need for socialists to stand aloof from imperialist wars, discovered themselves in August, 1914 to be patriots. On this, and on

many less discussed cases we can see sudden shifts in G' for some sort of social action that reflects a gestalt-like shift in the focus of group-loyalties.

### ***III Shocks***

"Stuff happens" as Mr. Rumsfield remarked: sometimes unanticipatable, sometimes only unanticipated, and often enough actually foreseen but neglected nevertheless. Even the last come as shocks because the targets of tactics that the shock brings into play did not recognize what would happen (even if an agent considering what to do could), or hoped that what seemed likely to happen would somehow not happen after all, or because it is so hard to make even the foreseeable effects of a foreseeable shock sufficiently vivid to move people. The "emotions come first" point of the discussion of persuasion tactics is especially important here. If appeals to logic are rarely effective unless there is an emotional anchor, and in particular when they require displacing an adverse emotional anchor, then until a potential shock is actually shockingly evident it will rarely be playing a prominent role. But with more qualifications the same holds for the other aspects of vertical tactics (persuasion, salience, identity), and then the points becomes relevant indirectly for the horizontal tactics (top-down, intensity/prevalence, segment & coalesce) since what might look promising to agents as horizontal tactics will be contingent on their sense of the vertical situation and its stability.

But the S-diagram, returning now to recall the discussion in Chapter 4, is a special case of the general social phenomena captured by such now familiar language as "tipping points", "cascades", "critical mass". The S-diagram captures one especially important class of tipping point situation, where the issue is the success or failure in organizing cooperation for some social end, hence activating NSNX motivation. But then a component entering the dynamics of an S-diagram will be cascade effects from social contagion, which become a source of unforeseeable shocks to the system.

I will return to that in the concluding chapter.