April, 1997. Vol 10, No 4, 16-20

THE FAILSAFE MECHANISM AND THE ISS

The Davies have made their book Humankind the Gatherer-hunter available to members of ASCAP, and so readers may already be familiar with their concept of the failsafe mechanism. However, it is only a minor part of their thesis, and is embedded in much other material, and so, during the course of a delightful lunch meeting near Eastbourne, I persuaded them rather against their inclination to allow the section on the failsafe to be reproduced in ASCAP; and Michael Davies has helpfully added some further commentary. I would like to explore some similarities and differences between the failsafe mechanism and our idea of the Involuntary Subordinate Strategy (ISS) (Price et al., 1994; Gardner and Price, in press). The quotations are taken either from the Davies' book or from Michael Davies' commentary.

The failsafe over-rides the operator

"...involuntary patterns of behaviour act to curb prolonged excessive effort on the part of individuals".

The failsafe is an automatic, unconscious, non-rational mechanism, which operates at a different level from the brain processes which are pursuing ongoing, voluntary activity. The failsafe is built into the machine, and is different from the operator of the machine. The operator may want the machine to work harder, and to exceed its design limits, but the failsafe overrides this aspiration, and leaves the operator helpless to get more out of the machine.

This ties in with what we know about human competition. That competitor wins who goes all out and does not think of the possibility of losing. We have seen the hype that boxers put out before a fight, and that politicians put out before an election. There is irrational optimism, and the possibility of losing or failure is laughed at. Not only must the fighter convince his followers, he must convince himself. He will not win if he is constantly worrying about whether his exertions in the contest are making him exceed his design limits. For this reason, the failsafe needs to come in at a different level of function, and to be impervious to the hype which characterises the competitive struggle higher up in the system.

The failsafe takes the form of physical illness

"...the failsafe would create an incapacity which would be acceptable to everyone, including the invalid, as sufficient reason for inaction. For this reason, the failsafe symptoms would tend to exhibit the known characteristics of a recognised incapacitating illness."

I think it is reasonable to assume that in the EEA, our ancestors had concepts for physical illness and concepts for madness, but it is unlikely that they had concepts for neurosis or depression, at least in a form which would provide a socially acceptable reason for being off work. Therefore, depression probably took the appearance of physical disease, as it does today in many cultures. The idea of being off work with depression is an achievement of Western medicine, and even in our culture the diagnosis is resisted vigorously by many patients. In your EEA designed brain, you can only be off work with physical illness or madness, and if the doctor tells you that you must be off work but are not physically ill, the implication is obvious.

In a recent paper, we suggested that the message of the ISS might be conveyed using the metaphor of physical illness, saying to competitors "I am too sick to be a threat to you" and to supporters "I am too sick to go into the arena and fight on your behalf" (Price and Gardner, 1995).

The higher level de-escalating option is blocked

"...in Western industrial society, the voluntary abandonment of excessive undertakings might be unthinkable. The moral, social, financial or legal pressures might impose a wholly unavoidable duty. In these circumstances, the mild neurosis or failsafe might be rendered self-perpetuating, and the sufferer might never fully recover."

This echoes our point that a common cause of the involuntary yielding of the ISS is "blocked voluntary yielding". If you give way with good grace, you don't need an ISS. We have used the analogy of shivering to illustrate the clinical approach to blocked voluntary yielding. If you want to stop shivering, you do not treat the shivering muscles themselves, you choose an alternative response at a higher level, like putting on more clothes, or turning on the central heating. You ask, "Why has the central heating not been turned on? Are they too poor, or too proud of their resistance to cold, or is the mechanism broken, or has someone forbidden them to turn it on?" Likewise, if you want to stop being depressed, you look for situations in which voluntary yielding has been blocked for some reason, and then you deal with that problem at the higher level, by giving in, or fighting harder and winning, or leaving the field, or reframing, or in some rational way dealing with the impasse (see the case of Albert Squires in Stevens & Price, 1996). When stubborn pride or dire necessity prevent any resolution at the higher level, the ISS/failsafe can be very intense and prolonged, as illustrated so vividly by Anthony Trollope in his novel He Knew He Was Right.

The failsafe is a graded strategy

"A relatively mild form would limit activity without interfering with the capacity to lead a normal life....nevertheless, the external or self-imposed exigencies might be so compelling that mild symptoms would be insufficient to hold back the zeal of an overconscientious or overenthusiastic group member. When the point was reached that survival was threatened, the offender would be incapacitated by a significantly more severe syndrome. The individual would become an invalid and a burden to the group but would cease to be an overt risk."

We agree that there are a number of reasons why there should be variations in the intensity of the ISS. One is the intensity or importance of the struggle which preceded the ISS. Leon Sloman has pointed out that you probably get a mini ISS after something as mild as losing a game of tennis. There is a slight lowering of self-esteem, a slight reduction in braggadocio, and a slight downward readjustment of tennis-related goals. These slight changes favour the new cognition of "He (or she) is a better player than I am". If the struggle has been more important, like a parliamentary election, the ISS is likely to be more severe. The higher you rise, the harder you fall.

Also, the ISS may be superimposed on a lifetime low self-esteem or ISS strategy (Price et al., 1994). In that case, it might appear mild, and the individual not much different from before, but an ISS in someone playing a lifelong high self-esteem strategy might need to be more severe (presenting as psychotic depression, with delusions about past status and competence).

And, of course, the ISS can be expected to get more severe, the longer there is a failure of voluntary subordination.

There is no doubt that a moderate degree of ISS, enough to cause symptoms, is compatible with normal life and work. What is particulary inhibited in the ISS is social initiative (aggressive and sexual). The dysthymic person makes a good servant.

The failsafe may take the form of chronic fatigue syndrome

"...features of a viral illness could be artificially prolonged."

I would agree that the ISS is one cause of chronic fatigue syndrome (ME). There is presumably a centre somewhere in the brain whose activation makes you feel ill, and it is normally activated by interleucins or some other product of infection, and its adaptive value is to keep you out of harm's way until you are better. It is likely that this mechanism has been recruited by the ISS, and is part of the mechanism of the metaphor of physical illness.

The failsafe influences higher mental function

"...eventual, voluntary rejection of unrealistic targets would be the function of the failsafe."

Yes, we think the original function was downgrading of RHP (self-esteem), because targets for active competition depend on an evaluation of relative RHP. There is also a reduction in self-assertion (except to dependents and loved ones) but this is secondary to the reduction in RHP, since assertion is proportional to RHP. There is also signalling of low

RHP to rivals and supporters.

The ISS creates a mental state in which ambitious projects are abandoned. This is partly due to downgrading of RHP (lack of self-confidence), partly to downgrading of resource value (loss of interest) and partly due to the depressive lack of sense of entitlement or ownership. It is significant that these three variables (RHP, resource value and ownership) are the determinants of the decision to attack rather than flee or submit in animal contests. The ISS makes the individual behave like a loser, look like a loser and feel like a loser. This is why we think the evolutionary origin of the ISS lay specifically in social competition rather than in a more general regulation of investment, as suggested, for instance, by Nesse (1990), and I think also by the Davies.

Switching to a bottom-up perspective, the brain tracts which may be responsible for the influence of the ISS on higher level decision-making have been described by Derryberry & Tucker (1992):

> Of special interest are the extensive sets of regulatory projections ascending from the brainstem and limbic system to the cortex. Rather than conveying information, these neurochemical systems appear to be involved in cortical processing during different emotional states (Saper, 1987). Such "bottom-up" modulation provides mechanisms through which emotion might influence learning and cognition and fits well with recent findings that emotion has important effects on attention and memory (Blaney, 1986). (p. 329)

We would add that these tracts not only reflect the emotion generated by the limbic system, but also elevation and depression of mood generated in the reptilian brain (corpus striatum).

Specialists are more vulnerable

"Specialised personalities (specialists) would be at greater risk from neurosis".

We have not related specialism specifically to the ISS, but note that Arieti and Bemporad (1978) suggested that specialists might be more vulnerable to depression. They distinguished two main types of specialist:

1. Those who rely on social relationships for their support and self-esteem. At risk are those who rely on a small number of relationships. The paradigm here is the depressed widow who had relied entirely on her husband for emotional and physical support. These people are similar to Beck's sociotropic types, who tend to get depressed when they have interpersonal problems (Beck, 1987; Coyne and Whiffen, 1995).

2. Those who rely on their own achievement for their self-esteem. Specialists here are those whose goals are few in number and have little chance of being reached. These people are similar to Beck's autonomic types who get depressed when they fail to achieve.

These two types represent different competitive strategies. Some people rely on their group membership and their allies; others rely on their individual achievement and their prestige. With most people, there is a balance between the two. The principle here is that if you put all your eggs in one basket, you are at risk of being left with only broken eggs - and it is the apprehension of all one's eggs being broken that triggers the failsafe/ISS.

Differences

1. Our model sees the ISS as one of two (or possibly more) strategies in the "agonistic strategy set". The ISS is a de-escalating strategy in the sense that it de-escalates conflict by inducing the actor to give in. However, there is an alternative strategy in the form of the Involuntary Dominant Strategy (IDS) which is an escalating strategy and is the opposite of the ISS. In the IDS, RHP, resource value and sense of entitlement are all increased. If an outcome was uncertain before, the deployment of the IDS is likely to ensure that the actor wins. What we don't know is whether the strategy set is accessed in two different ways - an uncertain outcome might elicit either the IDS or the ISS in a randomised proportion, whereas a certainly negative outcome might access only the ISS. This is an empirical matter - our model merely draws attention to the problem.

The failsafe model does not have an equivalent of the IDS - it would not make sense for a machine to accelerate when its design limits are being stretched.

Why do we talk of a strategy rather than a reaction or response? We could easily say that the ISS is a response to social adversity. But this would conceal the fact that we

are dealing with a two stage process. There is accessing the strategy set, which requires one type of information, and there is selecting a strategy from the set, which requires a different type of information. For instance, when a squirrel finds a nut, it may either eat it or bury it. The information which accesses the squirrel's "nut disposal strategy set" is the presence of the nut, but this plays no part in the selection of the strategy. This requires other information, such as the time since last nut eaten.

If one wished to stick to the response model, one could say that there was an interaction effect between nut disposal behaviour and state of hunger. But one would run into difficulties with more complex situations. Crawford (1987), for instance, has pointed out that the choice of strategy may be either developmentally contingent (determined by events long before the strategy set is accessed) or concurrently contingent (determined by current information).

We think the ISS and the IDS represent one of three strategy sets at different levels of the brain, each set containing an escalating and a de-escalating strategy. This idea derives in part from the work of Paul McLean (1985, 1990) who observed that the brain contains three relatively independent "central processing assemblies" at roughly neocortical, limbic and striatal levels. The ISS and IDS are at the lowest level - the level which determines mood (depression and mania). Higher up is the limbic strategy set whose escalating strategy includes the emotion of anger, and whose de-escalating strategy contains a number of depressive emotions such as sadness, shame and guilt. At the highest level of voluntary action the escalating strategy is a determination to succeed (sometimes "at all costs") whereas the de-escalating strategy is an acceptance that one cannot get one's own way. At each of the three levels, there is a constellation of information used to decide when the strategy set is accessed, and a different constellation used to select either the escalating or the de-escalating strategy from the set. Thus, to describe the stimulus situation which determines the response to social adversity, one needs to specify six different constellations of information. I think the use of the strategy set model helps to clarify this complexity.

The reader may ask what happens when the different levels adopt conflicting strategies. We have discussed this problem with an illustrative case (Stevens & Price, 1996, chapter on Treatment). In brief, problems arise when there is escalation at the higher (neocortical) level and de-escalation at the middle (limbic) and/or lower (striatal) levels.

2. Our model is more social. The failsafe model sees the individual getting depressed when overworked, and then jeopardising group cohesion by being inefficient. Our model is concerned when people are too efficient, especially when two different people or factions in a group are being efficient in opposite directions, and pulling the group apart. This is agonistic symmetry, in the Bateson/Kortmulder sense. Our agonistic strategy set is concerned with symmetry breaking. If two opposing factions are equally efficient, the deployment of either the ISS or the IDS serves to break symmetry. It is like a group of children taking turns over some toy: the ISS means that it is not your turn; the IDS gives you centre stage and access to whatever is desirable. This is a situation in which only one child can play with the toy at once. If two powerful group members are pulling in opposite directions and are equally matched, it does not matter, from the group's point of view, whether one gets an ISS and takes to his bed, leaving the field free for the other; or whether one gets an IDS and becomes so confident, energetic and committed that he steamrollers the opposition. Of course, if both deploy an IDS at the same time, the group is in trouble - that is probably why mania is less common than depression.

Conclusion

It is reassuring when people coming from different directions describe the same phenomenon in different language but with essentially the same meaning. This happened with the concept of catathetic signals (see my review of Frank Salter's book, ASCAP ? month, 1996) which were described from the psycholinguistic perspective as Face Threatening Acts, and with the concept of R-gap which was described from the position of sociology as a difference in energy.

Now the Davies have described the phenomenon we have called the ISS, and, coming from the different direction of commerce and industry, they have used language taken from engineering. And it is a sobering thought that whereas we have been refining and elaborating our model for nearly thirty years, they have come upon it almost in its completeness as a mere by-product of their main interest in climatic change, culture and learning. They have come nearer to our model than any of those actually working in the field, such as Engel & Schmale (1972), Klinger (1975), Nesse (1990) and Powles (1992).

References

Arieti, S. & Bemporad, J. (1978) Severe and Mild Depression. New York: Basic Books.

Beck, A.T. (1987) Cognitive models of depression. Journal of Cognitive Psychotherapy, 1, 5-37.

Coyne, J. & Whiffen, V.E. (1995) Issues in personality as diathesis for depression: the case of sociotropy/dependency and autonomy/self-criticism. Psychological Bulletin, 116, 358-378.

Crawford, C.B. (1987) Sociobiology: of what value to psychology? In Sociobiology and Psychology (ed. C.B. Crawford, M. Smith & D. Krebs) Hillsdale, NJ: Lawrence Erlbaum Associates.

Derryberry, D. & Tucker, D.M. (1992) Neural mechanisms of emotion. Journal of Consulting and Clinical Psychology, 60, 329-338.

Engel, G.L. & Schmale, A.H. (1972) Conservation-withdrawal: a primary regulatory process for organic homeostasis. In (R.Porter & J.Knight eds) Physiology, Emotion & Psychosomatic Illness. Amsterdam: Elsevier.

Gardner, R. & Price, J. (1996) Sociophysiology and depression. In: Recent Advances in Interpersonal Approaches to Depression, ed. T. Joiner & J.D. Coyne. Washington DC: American Psychological Association.

Klinger, E. (1975) Consequences of commitment to and disengagement from incentives. Psychological Review 82:1-25.

MacLean, P.D. (1985) Evolutionary psychiatry and the triune brain. Psychological Medicine 15:219-221.

MacLean, P.D. (1990) The Triune Brain in Evolution. New York: Plenum Press.

Nesse, R.M. (1990) Evolutionary explanations of emotions. Human Nature, 1, 261-289.

Powles, W.E. (1992) Human Development and Homeostasis: The Science of Psychiatry. Madison (Conn.): International Universities Press.

Price, J.S. & Gardner, R. (1995) The paradoxical power of the depressed patient: a problem for the ranking theory of depression. British Journal of Medical Psychology, 68, 193-206.

Price, J.S., Sloman, L., Gardner, R., Gilbert, P. & Rohde, P. (1994) The social competition hypothesis of depression. British Journal of Psychiatry, 164, 309-135.

Stevens, A. & Price, J. (1996) Evolutionary Psychiatry: A New Beginning. London: Routledge.