CHAPTER 1

Definitions of stress

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THERE are at least three ways of defining stress, each of which contributes something to current understanding of the concept.

Ways of defining stress

A stimulus-based definition

The first definition suggests that stress results from pressure. The greater the pressure the more likely that the recipient, whether a person or a load-bearing beam, will succumb. When the (external) stimulus becomes too great, (internal) collapse becomes inevitable. This definition focuses on external sources of stress and encapsulates well its cumulative nature. Adding one more ounce to the weight on the beam may make little difference to the total load but may yet be enough to cause it to break. This is the main definition still provided in the *Oxford English Dictionary*: "to subject (a material thing, a bodily organ, a mental faculty) to stress or strain; to overwork, fatigue."

A response-based definition

The second definition focuses on stress as a response to noxious or aversive stimuli. This is the aspect of stress emphasized by Selye (1956), who measured stress in terms of physiological responses, such as those represented by sympathetic adrenal-medullary activity or by pituitary-adrenal-cortical activity. Selye observed what he called the general adaptation syndrome (GAS) during which the physiological response to stress progresses through three stages. First, the body is alerted and responds with an alarm reaction. Next, autonomic activity is triggered as the body prepares to deal with the stress. This is the stage of resistance. Finally, if the stress continues beyond the capacity of the body to respond, the system is damaged and may collapse. This is the stage of exhaustion.

This definition has contributed greatly to the thinking about stress, and it is commonly assumed that psychological responses follow a similar course, although the processes may have an insidious as well as an alarm-based onset. The duration of the stage of resistance, when the person is adapting to, or coping with, the stress depends on specific characteristics of the person suffering the stress, but the assumption is that at some stage, if the stress persists, exhaustion or collapse becomes inevitable.

Stress as a dynamic process

Purely stimulus or response-based definitions of stress have thus both contributed to understanding of the phenomenon but they both have limitations. Definitions of stress with more value in clinical practice now emphasize that stress is a dynamic process reflecting both internal and external factors: characteristics of a person and his or her circumstances, as well as the interactions between them. These newer views of stress come from greater understanding of the part played by cognitive factors (thoughts, attitudes, beliefs, images) in psychological well-being. The amount of stress experienced by individuals is determined by the perceived demands upon them as well as by their perceived resources. Cognitive factors thus influence both the stimulus and the response sides of the equation.

Lazarus and Folkman's (1984) definition of stress reflects very clearly this way of thinking. They say that stress is "a particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well being". Two implications of this definition have greatly influenced current thinking about stress and therefore should be made explicit.

Implications of a dynamic, cognitive definition of stress

The first implication is that there will be wide differences between people both in the things that are perceived as stressful and in the perception of their ability to respond appropriately. This may mean that the best judge of someone's level of stress is the person themselves. An organized, rigid business man may find that adapting to a flexible, unstructured environment taxes his resources to the limit even though his job seems to others not to be particularly demanding. Or conversely someone who regards stress as a psychological weakness to which he or she is invulnerable may misinterpret or ignore signs of stress and need others to point them out. If a housewife with young children supposes that she should be able to respond to each of the small demands made on her (sorting out washing, deciding what to eat, fetching and carrying from school), she will be dismayed to find that an additional task such as taking clothes to the cleaners feels like the last straw. But the appraisals: "nothing I do is particularly difficult", and "anyone should be able to find time for something so trivial" reveal that she may have underestimated the total size of her load, or given insufficient weight to certain types of stressors.

Thinking in terms of appraisals broadens the focus of the clinician. It clarifies how someone who apparently has too little to do may yet feel stressed. An elderly person, or someone who is unemployed, may be subject to few (external) demands but yet have to make demanding internal readjustments. The range of stress stimuli, or possible stressors, is thus greatly expanded. Feelings that cause distress can be stressors as much as the things that

provoke them (frustration, jealousy, boredom). The reaction to feeling stressed can provoke more stress, as when someone thinks that showing stress is a sign of failure or weakness. Prolonged, or chronic uncertainty, especially about major life changes, is particularly stressful (threats of redundancy, or the possibility of serious illness), but less so if it is expected and considered (appraised) as normal (waiting for GCSE or A level results).

The second implication of the definition is that stress is determined by the relative balance between two types of appraisal: perceived demands and perceived resources. If the resources outweigh the demands then the person may feel relatively un-taxed. If the person is 'in balance' then he or she should be operating at maximum efficiency. Distress, or suffering, arises when perceived demands outweigh perceived resources. 'Coping' is the mechanism that potentially provides a degree of control over the balance, and will therefore be considered next.

Coping

Folkman and Lazarus (1985) defined coping in terms of the "cognitive and behavioural efforts someone makes to manage (master, reduce or tolerate) a troubled person-environment relationship". Lazarus has distinguished problem-focused coping, which facilitates adaptation to external demands, from emotion-focused coping, which is geared towards adapting to emotional demands, or regulating distressing emotions. The distinction is useful because different stressors pose different demands on coping resources, and different ways of coping predominate in different circumstances (Rosenthal and Rosenthal, 1985; Auerbach, 1989; Fontana, 1990). Someone preparing for an examination or interview will tend to use problem-solving, coping methods if the event is a long way ahead (revising, or finding out about the job for which he or she has applied), but will shift towards emotion-focused coping immediately before the event. If the event provokes extremely intense emotions (preparing to make one's first parachute jump), emotion-focused coping occurs earlier. Otherwise the emotion may interfere with intervening activities. Some people prefer one type of coping to the other, and suffer far more from the effects of stress if unable to use their preferred strategy.

Both types of coping can be learned and people who have encountered few stressful experiences may be at a relative disadvantage when stressed. Children (and others) should be helped to develop their own coping resources rather than be protected from problems.

Individual reactions to stress and ways of coping are also influenced at least as much by the nature of the stressful situation as by personality. So a 'natural worrier' may cope extremely well when faced with a serious problem and the person who sails through problems at work may cope badly with domestic worries or physical illness. Definitions of stress cannot therefore provide clear guidelines as to who will and will not suffer from the ill effects of stress. They demonstrate that everyone is susceptible and that there are multiple sources of stress whose impact on people is both subjective and cumulative.

Different aspects of stress

Stress affects all aspects of human functioning. It is therefore not surprising that some of its aspects appear to be very general, possibly because they are not yet precisely understood. They include such things as being accident prone, failure to thrive or reduced growth rates in young children, the multiple effects of 'burnout', and poor health status. Nevertheless, the effects of stress can be differentiated on the basis of four main systems: physiological, cognitive, emotional and behavioural. Physiological aspects are considered in detail in chapter 2 and so will not be repeated here.

Cognitive aspects

Although the initial physiological response to stress is automatic, it can nevertheless be switched on by cognitive factors, for example when receiving sudden bad news. Cognitive signs of the emergency stress response involve increased concentration and decreased attention span, increased distractibility and deterioration in both short-term and long-term memory. Unpredictable response speed, increased error rate, and reduced powers of planning and organization may all follow if the stressor persists. Under conditions of chronic stress the person may become hypervigilant and constantly on the look-out for signs of stress. This increased state of arousal is extremely demanding and tiring, and may alternate with periods of being apparently quite oblivious to the stress (avoidance or even denial). Eventually, at extreme degrees of stress, thought patterns can become confused and irrational, making it difficult to function efficiently and to keep in touch with reality.

Emotional aspects

A wide range of emotions may be associated with stress in its early stages, including frustration, anger, anxiety, fear, apprehension and irritability. If the stress persists, these emotions may become confounded with others such as tension, hypochondria, depression, demoralization and helplessness. People may change in a way that appears not to fit with their previous personalities. Apparently carefree people may become over-controlled and organized, and caring people may become indifferent, as if radical solutions are being tried out. Habitual problems such as worrying, unassertiveness or hostility may become exacerbated. Sudden emotional outbursts can occur even though they are quite out of character. If such people also feel out of control, or powerless to change the situation, they may start to experience panic, hopelessness or even suicidal thoughts. If they blame themselves for the stress, or for their inability to cope, their self-esteem and self-confidence may also suffer.

Behavioural aspects

Behavioural reactions to stress also vary greatly. Some people may tend more towards the 'fight' and others towards the 'flight' response. A third group may find it very hard to act at all. Normal tasks frequently seem impossible, and when this happens a typical fighter may persist in doing more and more, becoming progressively overloaded and inefficient. Someone more inclined to flee

may avoid or escape from the difficult situation and thus miss opportunities for solving the problem. In either case other difficulties emerge if the stress persists. Interests and enthusiasms diminish and absenteeism increases. Eating patterns may change and use of nicotine, alcohol, caffeine and other drugs may all rise. Responsibilities may be shifted onto others or alternatively the ability to delegate is reduced and problems are likely to be solved at an increasingly superficial level. Speech problems such as word-finding, hesitancy or muddled articulation can become more likely; sleep patterns are disrupted, and extreme levels of fatigue are no longer relieved by brief rest periods.

Measuring levels of stress

There is no standard and accepted measure of stress, reflecting its multiple aspects, the variety of possible stressors and the part played by subjective appraisals. If possible, the physiological, cognitive, emotional and behavioural aspects of stress should be assessed in each case and the result interpreted in terms of perceived demands and perceived resources. The accuracy of these perceptions should be ascertained independently. In practice it may help to use one of the better instruments such as the ways of coping checklist (Folkman and Lazarus, 1980), or the leisure interests checklist (Rosenthal et al., 1989), which provide information relevant for planning appropriate interventions. Otherwise direct measures of stress should logically and theoretically be related to the coping tasks posed by the stressor. For workaholics, time spent on leisure pursuits, length of working day, and number of tasks delegated to others could be relevant measures. For persistent worriers it might be useful to measure their ability to distract themselves or direct their attention externally, the quality of their sleep or the extent of their involvement in pleasurable activities. For surgical patients, recovery time, anxiety, pain and compliance with exercise programmes could be relevant measures (Johnston, 1986). Indirect measures of various kinds are also helpful. These include ratings of mood, the amounts of drugs, alcohol or caffeine consumed, the extent and supportiveness of social networks, days away from work and somatic symptoms. Finally, observation and questioning to ascertain the present state of the person's coping balance, and the duration of the stress response if it is present, provide the essential background to all other information.

Working model for conceptualizing stress

The vicious circle

Most models of psychological stress regard it as cyclical. When stress is a problem it is because reactions to stress make the problem worse. People who feel under pressure at work may react by working longer hours. They become tired and work more slowly. Tension or worry increases as the work continues to build up and they find it hard to relax, sleep badly and start the day feeling tired and unable to work efficiently. As well as trying to make extra efforts at work, they may reach for the coffee, cigarettes or alcohol, or ask for sleeping tablets. The tension and failure to solve the problem may make them irritable and put a strain on family relationships. Vicious circles such as these maintain the problem.

This suggests that when stress is a problem, coping is also problematic. People under stress tend to select coping strategies that help in the short rather than in the long term, possibly because they choose emotion-focused rather than problem-focused methods. They prefer to do things that make them feel better immediately and find it hard to take a longer view. These strategies are based on the fight or flight responses which have evolutionary value. Keeping fighting or avoiding facing up to the problem and fleeing from it may both be natural adaptive responses. They will not, however, lead the person towards longer-term solutions. In order to understand the processes involved in a particular case, it is essential to identify the nature of the vicious circles involved.

Two other aspects of the model help to explain how the problem started. These concern external stress factors and internal predisposing, or vulnerability, factors.

The model and external factors

It has already been mentioned that stresses have a cumulative effect. Most people underestimate the erosive effect of small vexations and minor woes, and do not recognize additive effects of repeatedly experiencing such things. They may insist that nothing in particular has happened to explain their distress, and instead interpret their problem in terms of weakness, failure, or moral shortcoming. One implication of the cumulative view of stress is that, if major problems appear insoluble, finding solutions to the relatively minor ones is likely to be extremely valuable. It may reduce the sum total of stress sufficiently to redress the coping balance described earlier.

Events in the past can still contribute to the experience of stress in the present. Many people carry with them a burden of 'unfinished business' and this may interfere with their ability to cope with present difficulties. Assessment should therefore be very broad, including not only a person's physical status, career situation, lifestyle, social and intimate relationships, but also their value system, aspirations and subjective perceptions of their assets and liabilities.

Changes of all kinds can be stressful if they impose a demand to adapt. This means that changes usually regarded as welcome (getting married) or unwelcome (an increase in the mortgage rate) contribute to the total burden. The more changes, or 'life events' experienced over the past three years, the more vulnerable a person may be to distress. A number of scales are now available for measuring this aspect of vulnerability (e.g. Holmes and Rahé, 1967; Paykel et al., 1969).

The model and internal factors

Other more personal predisposing or vulnerability factors are also invoked to explain why someone experiences stress. Recognizing such factors should enable prediction of which kinds of events will be particularly stressful (being criticized or working in an isolated job).

In practice this is not easy because strengths and weaknesses are frequently confounded. Being persistent could be a strength until the person is brought face to face with an insoluble problem, and perfectionist high standards are helpful when dispensing medications but less so when keeping a house full of children clean and tidy.

Internal predisposing factors are not fixed and unchangeable. It is possible to learn how to strive less and relax more. Only too often people wait until a crisis occurs: they develop an ulcer or their marriage breaks down, before examining their habits and predispositions. Becoming aware of predispositions earlier, and recognizing their advantages as well as disadvantages, could open the way to more effective, and possibly preventive, interventions.

Despite much discussion in recent years about the types of people most vulnerable to stress, surprisingly few conclusions can be drawn. People with a type A personality (Jenkins, 1978; Rosenman and Chesney, 1980), which is typically hostile, aggressive, striving and competitive, may be more at risk than others of heart disease, and people with high trait anxiety may be more at risk than others in a variety of ways. Some people seem to show the effects of stress predominantly cognitively, for instance worriers, and others show them physiologically, for instance somatizers. There is, however, no evidence to suggest that either of these groups of people is more susceptible to stress than others overall.

Although few conclusions can be drawn about the role of vulnerability factors, any practical model of stress would be incomplete without them. While the vicious circle explains how problematic levels of stress are maintained, the amount of stress and predisposing factors attempt to explain why stress is experienced by this particular person at this particular time.

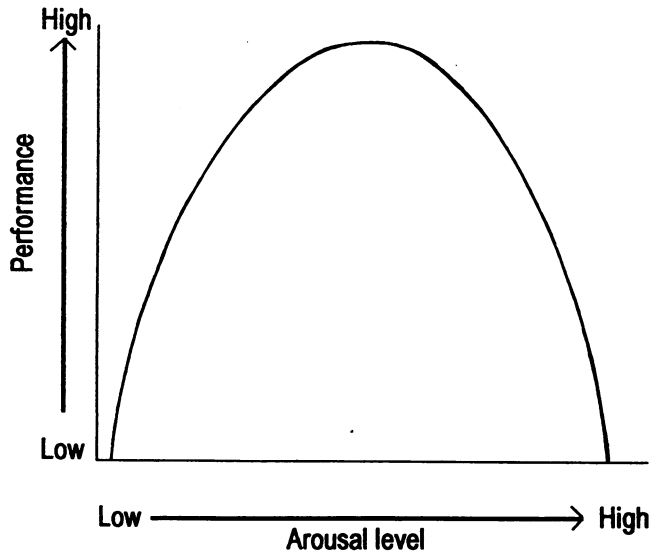

Figure 1 Performance as a function of arousal level. The inverted U curve shows how, for any individual, emotional arousal may facilitate performance up to an optimal point, beyond which further arousal, or stress, becomes disruptive.

Distress and chronic stress

It is important to be able to recognize signs that collapse or exhaustion is near. The assumption is that at some point the person's capacity to withstand the perceived demands becomes over taxed and begins to give way. This process can be explained by the Yerkes–Dodson law derived from the work of Yerkes and Dodson (1908) and illustrated by an inverted U curve (Figure 1). This reflects the relationship between arousal and performance. It shows how performance (efficiency or coping) increases as arousal (or demand) increases, but reaches a point beyond which further arousal leads to declining performance. As the sum of stressors continues to mount, a person's ability to function starts to deteriorate progressively, probably at an accelerating rate. It has therefore been suggested that "the chronicity of the composite stressors has more of a multiplying than an additive impact on net strain" (Rosenthal and Rosenthal, 1985). The source of the additional stress is irrelevant, so that the effects of physical debility, accident or interpersonal difficulties will have similar effects. How the person perceives the various sources of stress may alter the perceived weights of the individual stressors but the total effect is still cumulative.

Distress may well appear, however, before this sort of crisis is reached. Sudden severe stress, such as that of a trauma, may put someone at risk of post-traumatic stress disorder, which can be disabling, particularly when associated with distressing 'flashbacks' or nightmares. There is also a form of disabling stress that is far more common, but less dramatic than either the final stage of Selye's general adaptation syndrome or post-traumatic stress disorder. This is chronic stress which never moves beyond the second stage of 'resistance' so as to produce collapse. Persistent stress of this kind is characterized by a chronic imbalance between perceived demands and perceived resources. The threshold for triggering a stress response may then be lowered and recovery will be slower so that a weekend break is no longer sufficient to restore full functioning. Negative appraisals may become the norm and habituation to some of the symptoms of stress may result in serious damage as the sufferer ignores the warning signals. A variety of secondary characteristics develop, including fatigue and demoralization. The latter refers to a kind of hopelessness that makes it difficult to take constructive problem-solving action and reduces coping to problem limitation only. It is associated with loss of pleasure and withdrawal from demanding activities of all kinds, and occurs both in people who carry major long-term burdens, such as caring for a sick relative, and in others such as those who work in stressful and poorly rewarded professions. Habitual ways of responding make chronic stress of this kind difficult to overcome.

Differentiating between stress and other disorders

It will already be clear that the signs and symptoms of stress cut across many diagnostic categories so that stress-produced problems may be wrongly identified as

part of another clinical disorder. This is perhaps clearest in the case of anxiety. Symptoms of stress that overlap with those of anxiety include tension, chronic arousal, fatigue, discouragement, worry, 'nervousness', fidgetiness, shortness of temper and irritability, avoidance, interrupted sleep patterns and many others besides. Symptoms that overlap with those of depression are similar to those of demoralization described in the preceding section. In addition psychological factors can affect physical conditions, so that stress provokes migraine headaches or asthma attacks and exacerbates conditions such as psoriasis or premenstrual syndrome. These aspects are covered in greater detail in the next chapter.

Concluding comments

Definitions of stress provide only a snapshot of a dynamic process. In the *Encyclopaedic Dictionary of Psychology* this dynamic process is defined as "the way in which people realize and identify their problems, how they react to them and attempt to cope with them, and the 'cost' of doing so" (Harré and Lamb, 1983). This usage has not yet found its way into ordinary language, which still emphasizes the stimulus-based, pressurizing aspect of stress with the implication that stress is necessarily a problem or difficulty. The process-based definition allows the important possibility that stress is a normal state of affairs. Adjustment and readjustment, appraisal and reappraisal are constantly taking place as demands are made and resources mobilized for dealing with them. So stress is a natural and unavoidable feature of life, even to the extent that people appear to search for, or seek out, demands if they are bored or understimulated. It also has its beneficial aspects. Under some conditions stress helps people to perform better than they might otherwise. An optimal level of stress, like the optimum level of pressure in a car tyre, will help them to function at their best, to hold the road well and to carry them round the various corners and ups and downs on the way. A lower level than this, as when the tyre pressure is too low, or a greater one, when the pressure is too high, unbalances the machine and makes it hard to control efficiently in the face of hazards that may be encountered on the journey.

References

Auerbach S M (1989) Stress management and coping research in the health care setting: an overview and methodological commentary. *Journal of Consulting and Clinical Psychology* **57,** 388–95.

Folkman S and Lazarus R S (1980) An analysis of coping in a middle-aged community sample. *Journal of Health and Social Behavior* **21,** 219–39.

Folkman S and Lazarus R S (1985) If it changes it must be a process: study of emotion and coping during three stages of a college examination. *Journal of Personality and Social Psychology* **48,** 150–70.

Fontana D (1990) *Managing Stress.* London, British Psychological Society and Routledge.

Harré R and Lamb R (1983) (Eds) *The Encyclopaedic Dictionary of Psychology.* Oxford, Blackwell.

Holmes T H and Rahé R H (1967) The social readjustment scale. *Journal of Psychosomatic Research* **11,** 213.

Jenkins C D (1978) A comparative review of interview and questionnaire methods in the assessment of the coronary-prone behavior pattern. In *Coronary-prone Behavior.* Ed. Dembroski T M, Weiss S M, Shields J L et al. New York, Springer-Verlag. pp 71–88.

Johnston M (1986) Preoperative emotional states and post-operative recovery. *Advances in Psychosomatic Medicine* **15,** 1–22.

Lazarus R S and Folkman S (1984) *Stress, Appraisal and Coping.* New York, Springer.

Paykel E S, Myers J K, Dievett M N et al. (1969) Life events and depression. *Archives of General Psychiatry* **21,** 753–60.

Rosenman R H and Chesney M A (1980) The relationship of Type A behavior pattern to coronary heart disease. *Activities Nervosa Superieur* **22,** 1–45.

Rosenthal T L and Rosenthal R H (1985) Clinical stress management. In *Clinical Handbook of Psychological Disorders.* Ed. Barlow D. New York, Guilford Press.

Rosenthal T L, Montgomery L M, Shadish W R et al. (1989) Leisure interest patterns and subjective stress in college students. *Behaviour Research and Therapy* **27,** 59–64.

Selye H (1956) *The Stress of Life.* New York, McGraw-Hill.

Yerkes R M and Dodson J D (1908) The relation of strength of stimulus to rapidity of habit-formation. *Journal of Comparative Neurology and Psychology* **18,** 459–82.