Health Psychology

In trying to define health psychology it is necessary to first try and define the word 'health'. The most common quoted is provided in the Constitution of the World Health Organisation (WHO,1946)

Health is a state of complete physical, mental and social well-being, and not merely the absence of disease or infirmity. Although this definition has been criticized by Banyard (1996) on the grounds that it shows a state of complete health is very difficult to achieve in reality (Curtis, p2) ,it does take a holistic perspective towards health. It challenges the predominant medical model of health, and suggests health is a interaction of biological, psychological and social systems (Heinemann, p. 78). However, for the past 300 years our attitude towards health has relied on the medical model.

The Medical Model

The medical model assumes there are known and knowable physical causes for disorders (Curtis, p3). Specifically, germs, genes and chemicals all contribute in different ways to the causes of disorders. Treatments are based on physical interventions (surgery, drugs). The roots of this approach date back to the 17th century and Cartesian dualism, when Descartes proposed a separation of mind and body. The body is a biological machine and can be understand as such.

However such an approach is considered reductionist ie, reducing explanations of illness to germs/genes/chemicals and ignoring wider social and economic factors. The model clearly has also been criticized for emphasizing illness over health, focusing on treatment rather than prevention.

The Biopsychosocial model.

We have not eradicated illness as the table below shows. Acute (ie.sudden-onset) infectious diseases such as influenza and tuberculosis have been replaced by chronic (ie. Slow-onset, long term illnesses) such as heart disease, cancer and diabetes, which despite advances in medical science cannot be cured, only managed. In order to manage our health therefore, we need to look at broader causes of illnesses

Table 1.1 Comparison of leading (physical) causes of death, 1900–2006 (England and Wales)

Rank	1900	1995	2000	2006
1.	Influenza and pneumonia	Cancer	Cancer (all)	Cancer (all)
2.	Tuberculosis, all forms	Heart disease	Heart disease	Heart disease
3.	Gastroenteritis	Stroke	Pneumonia	Pneumonia
4.	Heart disease	Pneumonia	Stroke	Stroke
5.	Stroke	Chronic lung disease	Lung disease	Chronic lung disease
6.	Kidney disease	Accidents	Accidents	Accidents
7.	Accidents	Suicide	Suicide	Liver disease
8.	Cancer	Diabetes mellitus	Liver disease	Diabetes
9.	Diseases of infancy	Liver disease	Diabetes	Suicide

- 1900 data from World Health Organization, www.who.int/countries/gbr
- 1995 and 2000 data from Department of Health, *The Nation's Health*, www.doh.gov.uk
- Only gender difference in 1995 is suicide 7th in males, liver disease 7th in females; in 2000 is reversal of diabetes and suicide ranking in women, i.e. diabetes is 7th.

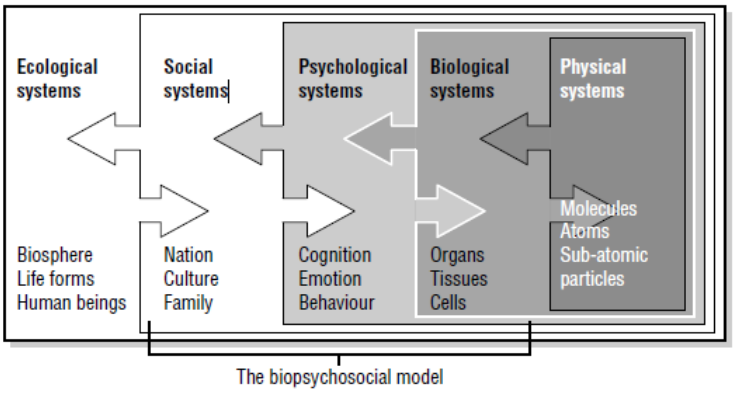
and consider prevention as much as treatment.

Health Psychology adopts a biopsychosocial model of health. In contrast to the medical model, the biopsychosocial model is not reductionist. Instead it looks at all levels of explanation from the micro-level (for example, changes in body chemicals) to the macro-level (for example, the culture that someone lives within). The biopsychosocial model does not look for single causes but starts from the assumption that health and illness havemany causes, and also produce many effects. The model does not make the distinction between mind and body but instead looks at the connections between mental events and biological changes. Finally, the biopsychosocialmodel is concerned as much with health as it is with illness.

The biopsychosocial model is a **systems theory**. This means that it recognises there are a number of different systems at all levels of organization and these systems are linked. At one end of the scale we exist within an ecological system which includes the planet we live on, the life we have developed from and the species we are part of. At the other end of the scale we are made up of the basic units of the universe – molecules, atoms and various sub-atomic particles with a range of dodgy names.

In between these two systems, the biopsychosocial model looks at three systems which are all separate from each other yet are also connected to each other – systems within systems. We live within a *social system* that includes our country our culture and our family. We also experience a *psychological system* of cognitions, emotions and behaviour and we are affected by a *biological system* of organs, tissues and cells.

One biological system that has received a lot of attention from psychologists and physicians is the **immune system** which is a collection of responses that allow the body to neutralise, eliminate or control the factors that produce disease. It seems possible that there are connections between the immune system and the experience of stress, which would fit into our psychological systems. The experience of stress is also affected by the social systems we live in, for example our family. When we look at it this way, we can see there is no *single cause* for ill health that brings out a *simple response*, but instead there are a mass of connections that create a complex series of changes within us. The development of this biopsychosocial view of health and illness moves the emphasis away from traditional Western medicine and towards psychology.

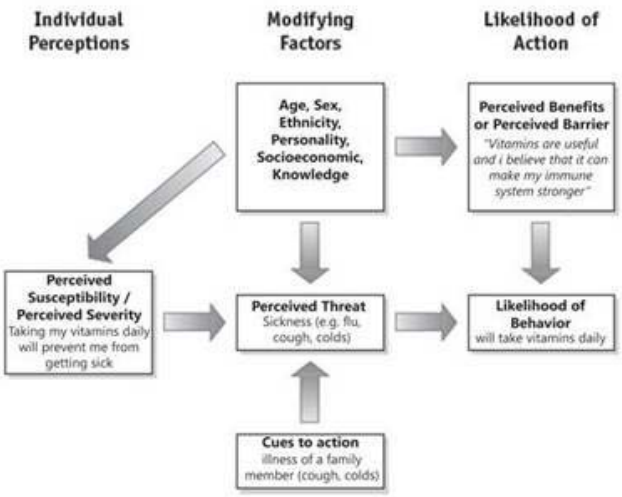


• **Figure 0.2:** Systems

	Biomedical model	Biopsychosocial model
What causes illness?	Diseases come from outside the body, invade the body and cause physical changes within the body, or originate as internal involuntary physical changes. Such diseases are caused by a number of factors, including chemical imbalances, bacteria, viruses and genetic predisposition.	Human beings should be seen as complex systems and illness is caused by a multitude of factors and not by a single causal factor. Health psychology therefore tends to move away from a simple linear model of health and claims that illness can be caused by combination of biological (e.g. a virus), psychological (e.g. behaviours, beliefs) and social (e.g. employment) factors. This approach reflects the bio psychosocial model of health and illness, which was developed by Engel (1977, 1980). The bio psychosocial model represented an attempt to integrate the psychological and the environmental into the traditional biomedical model of health as follows: the *bio* contributing factors included genetics, viruses, bacteria and structural defects. The *psycho* aspects of health and illness were described in terms of cognitions (e.g. expectations of health), emotions (e.g. fear of treatment) and behaviours (e.g. smoking, diets, exercise or alcohol consumption). The *social* aspects of health were described in terms of social norms of behaviour (e.g. the social norm of smoking or not smoking), pressures to change behaviour (e.g. peer group expectations, parental pressure), social values on health (e.g. whether health was regarded as a good or a bad thing), social class and ethnicity.
Who is responsible for illness?	Illnesses arise from biological changes beyond the patients control; individuals are therefore not seen as being responsible for the illnesses. They are regarded as victims of some external force causing internal changes.	Illnesses regarded as the result of a combination of factors, the individual is no longer simply seen as a passive victim.
How should illness be treated?	Treatment is in terms of a vaccination, surgery, chemotherapy, and radiotherapy, all of which aimed to change the physical state of the body.	The whole person should be treated, not just the physical changes that have taken place. This can take the form of behaviour change, encouraging changes in beliefs and coping strategies, and compliance with medical requests.
Who is responsible for treatment?	The responsibility for treatment rests with the medical profession.	The patient is in part responsible for their treatment. This may take the form of responsibility to take medication, responsibility to change beliefs and behaviour. They are not seen as a victim.
What is the relationship between health and illness?	Health and illness are seen as qualitatively different-you are either healthy or ill, there is no continuum between the two.	Health and illness are not qualitatively different, but exist on a continuum. Rather than being either healthy or ill, individuals progress along this continuum from health to illness and back again
What is the relationship between the mind and the body?	The mind and body function independently of each other. The mind is incapable of influencing physical matter. The mind is seen as abstract and relating to feelings and thoughts, and body is seen in terms of physical matter such as skin, muscles, bones, brain and organs. Changes in the physical matter are regarded as independent of changes in state of mind.	There is an increasing focus on an interaction between the mind and the body. This shift in perspective is reflected in the development of a holistic or a whole person approach to health. The mind and body interact. The mind and body are considered as separate but there is interaction between distinct structure
What is the role of psychology in health and illness?	Illness may have psychological consequences, but not psychological causes. For example, cancer may cause unhappiness but mood is not seen as related to either the onset or progression of the cancer.	Psychological factors are seen as not only possible consequences of illness but as contributing to it's aetiology.

Other important and applicable concepts

The health belief model (HBM)



This model was first developed by Rosenstock (1966) although it has been modified and [improved over the years by different researchers. It rests on the assumption people will engage in healthy behaviour if they understand that a health problem will arise if they do not. For example: if people are made aware of the health dangers of eating too much (e.g. type 2 diabetes or reduced lifestyle choices), they will be motivated to eat less.

People will first evaluate a threat to their health (e.g. fast food) and then engage in a cost-benefit analysis of what actions to follow to either counter the threat or ignore it. Evaluations and cost-benefit analyses of this kind are examples of cognitive processes which the model is trying to influence to cause a change in behaviour.

However, there are a number of key problems with this model.

1 The HBM assumes people are rational when the evidence is sometimes to the contrary. Consider the following accepted narratives in Western culture:

- processed fast food loaded with chemicals is unhealthy and leads to obesity
- smoking causes cancer
- binge-drinking poses health risks ranging from death and liver damage to injuries from falls and other risk-taking behaviour such as unprotected sex

- poor food served in schools contributes to bad behaviour and childhood obesity and negatively affects grades
- unprotected sex spreads STDs.

And yet people still eat cheap, highly processed food in increasing quantities, smoking is still relatively popular (although declining in the UK), binge-drinking is a major social concern, schools still serve poor food to students and people still engage in unprotected sex. In this way, the HBM fails to consider how people often ignore commonsense solutions to everyday problems and willfully engage in behaviour that risks their health. This may be partly due to the notion of positive illusions (Taylor and Brown, 1988) whereby people tend to be more optimistic than pessimistic about the world. Positive illusions are an example of optimism bias and encourage people to be over-optimistic about the outcome of their health-risking behaviour.

2 The HBM assumes people care about their health or the health of those they care for. Health apathy can be defined as an absence or suppression of emotion, feeling or concern towards matters pertaining to personal health or to the personal health of people for whom individuals are responsible. This would explain why people still engage in unhealthy behaviour such as eating poor food when they are obese, and feeding poor food to others who are also obese.

3 The model ignores physiological determinism. Kessler (2010) argues that food is deliberately designed with the use of chemical enhancers to make it compelling and create a bliss point for the consumer. Therefore, positive rewards are artificially instilled in the food to encourage consumption above and beyond the need to eat for energy intake

4 The HBM approach assumes people are active thinkers able to make choices within the realm of freewill. However, it ignores the levels of aggressive marketing that food corporations engage in, including establishing habits and tastes in young children so as to maintain their buying behaviour into adulthood. Alternative voices promoting a healthy, nuanced lifestyle (e.g. grass-roots campaigns) cannot match the advertising budgets of the multinationals aiming to promote a single product in a positive way. This is because a nuanced, healthy lifestyle cannot be tied to a single product whereas processed food is image-marketed with role models, movie tie-ins and other social learning theory techniques (e.g. playgrounds and free toys).

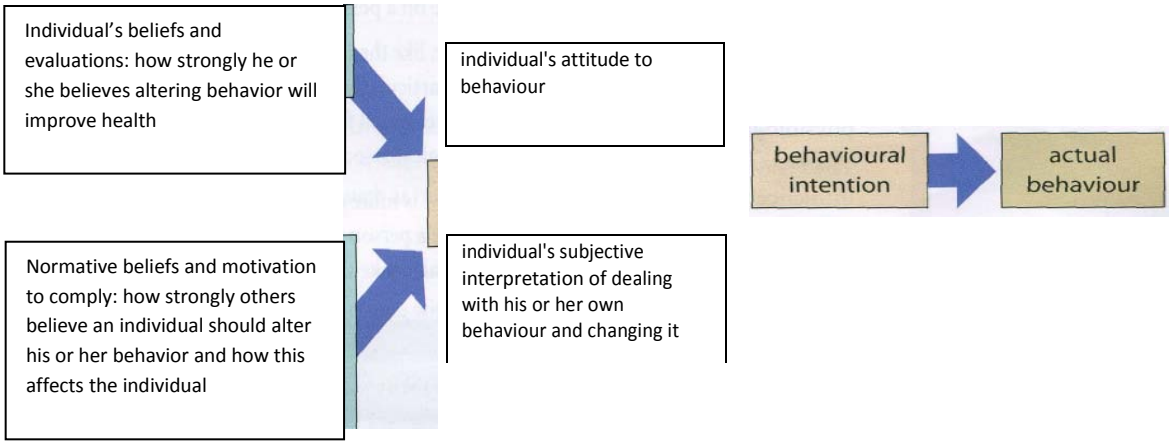
Ofcom is an independent telecommunications and competition regulator in the UK. Their research shows that TV advertising is one of a range of factors which influence food consumption by children. However, it had a 'modest direct effect' on children's food preferences, consumption and behaviour although it led to pester power as children tried to persuade parents to buy certain products (2003).

Healthier choices are less widely advertised. This dominance of the cultural landscape by food corporations renders people less inclined to make healthy choices. Otto and Aratani (2006) demonstrated how the banning of soft drinks, junk foods and sweets from school vending machines and cafeterias has improved the health of students in LA. However, this was achieved only in the face of determined resistance from food manufacturers.

5 The HBM considers only perceived obstacles to effective health regulation, not practical obstacles. Mair et al. (2005) cite Ashe et al. (2003) to show how fast-food outlets are often in abundance in poor neighbourhoods where people are less likely to have personal transport for ease of access to a wider range of food choices. The report of the Institute of Medicine of the National Academies (2005), *Preventing Childhood Obesity: Health in the Balance,* argues that local and state governments should work with communities to support partnerships and networks that expand the availability of and access to healthful foods removing real obstacles to healthy food and lifestyles.

Theory of reasoned action (TRA) / Theory of Planned Behaviour

Some of these criticisms are addressed by the TRA theory developed by Fishbein and Ajzen (1975). The key assumption of this theory is people's behavior is determined by their intentions; in other words first we decide to do something and then we do it. Intention to behave is determined by two factors; individual attitude and subjective norms.



- Individual attitudes – this is the individuals personal beliefs about the possible consequences of the behavior. For example if an individual believes that taking more exercise is good for him, then he is more likely to take exercise
- Subjective norms – this represents social influence (which is not considered by the health belief model), and consists of the individuals beliefs about other people's attitude to the behavior. For example an individual may well take family member's opinions into account when deciding whether to give up smoking.

Theory of planned behaviour (TPB)

Ajzen (1985) modified the TRA into the Theory of planned behaviour when he added a third and very important concept - perceived behavioural control. Including self-perception in this way strengthens the original theory as it adds another layer of a person's own interpretation when assessing the likelihood of a planned behaviour being followed. For example if a person feels confident that he can give up smoking the he is more likely to decide to

try. This belief, which is very similar to the notion of self-efficacy, is based on past experiences and also on the individuals perception of possible obstacles that might crop up in the future. Perceived behavioural control not only affects the intention to behave but can also have a direct impact on whether the behaviour is actually carried out. Someone with high perceived behavioural control is likely to try harder to convert his intention to behave into actual behaviour.

The TRA and TPB have been used to predict numerous health behaviours, including smoking, alcohol consumption, contraceptive use/safer sex, health screening attendance, exercise, food choice and breast/testicle self-examination. Overall, the evidence suggests that TRA and TPB do contribute to our understanding of the antecedents of health relevant behaviours

Self-efficacy theory (SET)

Another important influence was the concept of **self-efficacy,** originating from Self-efficacy theory (SET) put forward by Bandura (1977). Bandura argued that expectations such as motivation, performance and feelings of frustration associated with repeated failures influence how an individual approaches a problem. Bandura further divided expectations into two distinct areas:

- self-efficacy - the belief one can successfully engage in a behaviour to produce the desired outcomes (e.g. eat healthily and exercise regularly)
- outcome expectancy - a person's estimation that a given behaviour will actually lead to those desired outcomes.

Bandura notes people with a strong sense of self-efficacy:

- view challenging problems as tasks to be mastered
- develop deeper interest in the activities in which they participate
- form a stronger sense of commitment to their interests and activities
- recover quickly from setbacks and disappointments.

People with a weak sense of self-efficacy:

- avoid challenging tasks
- believe that difficult tasks and situations are beyond their capabilities
- focus on personal failings and negative outcomes
- quickly lose confidence in their personal abilities.

(cited Bandura, 1994).

According to Bandura, self-efficacy is the most important condition to enact behavioural change. TPB explains volitional behaviour, that is, behaviour we intend to engage in, as it maps out variables that influence our decision to perform. The TPB is useful as a tool to design psychological research into

intention and action. For example, Conner et al. (2003) used it to help them construct questionnaires to uncover motivations for dietary behaviour because they found a disparity between nutrition and health needs and the use of dietary supplements. The model aided their deconstruction of social, psychological, knowledge and economic factors in investigating the phenomenon. They found health supplement users and non-users perceived the media (including books and magazines) to be a powerful influence on a person's decision to use additives to aid good health.

However, like the HBM, it does not address the effect of conditioning on behaviour. This is particularly pertinent to the food industry because it uses social learning theory techniques to sell food as well the deliberate engineering of the product to produce positive physiological associations and repeat buying.

The HBM is more descriptive in that it explains the forces in the environment which influence a person when they make a decision, whereas the TPB tries to explain why individuals make the choices they do on an individual level.

Topics;

- **Stress**
- **Pain**
- **Adherence to medical advice**
- **Practitioner – Patient relationship**
- **Health Promotion**
- **Health & Safety**

1. Stress

Definition of stress

One of the first things to do is to define our terms. As ever in psychology, this is not an easy task, but it is helpful to distinguish between stressors, stress response AND stress.

Stressors are the events the individual perceives as endangering his or her physical or psychological well being. Stressors are not necessarily the same for all people; what appears stressful to one is merely a challenge, or all-in-a-day's-work, for someone else. Stressors can be;

-*external*, for example, environmental changes such as heat, crowding, or noise.
- *internal* eg. Pain
- *social* eg. Delivering a speech, arguments etc

The **stress response** is the reaction to such events and may include bodily changes that prepare the body for an emergency (the flight or fight response) as well as psychological reactions such as anxiety, anger, depression, cognitive impairment etc

Stress itself is the state that occurs when people perceive these events, usually when individual feels that the demands placed upon them exceed their perceived ability to deal effectively. In summary, stress is a state caused by stressors, resulting in the production of stress responses designed to cope effectively with an unpleasant situation.

These stressors usually bring out a relatively stereotyped set of biological and psychological responses –

The relationship between stressors, the stress response and our experience of stress is not straightforward. We might suggest that heat is a stressor that will bring out a stress response and make us feel under stress.

Sarafino (1994) defines stress as:
... the condition that results when the person/environment transaction lead the individual to perceive a discrepancy – whether real or not – between the demands of a situation and the resources of the person's biological, psychological and social systems.

Causes/sources of stress

Physiology of stress

A number of models of stress have been produced to explain and describe what happens to an individual in a stress state. We will examine some of these, commencing with a physiological model, which explains the body's responses to stress, but does not differentiate responses to specific stressors.

Physiological model

Physiological changes in response to stress are similar, although not identical, in all individuals. These changes were identified by Selye (1956), who called them the general adaptation syndrome (GAS). He identified three stages of response (see Figure 11.3). When a stressor occurs, the body's resistance initially drops, then rises sharply. It stays high throughout the second stage of the response, but ultimately can be sustained no longer and falls in exhaustion. If a second stressor is added to the first (see lower dotted curve), resistance is lower throughout and exhaustion reached sooner.

Stage 1: Alarm

The body's `fight or flight' responses are activated against the perceived threat. The hypothalamus sends impulses to the sympathetic division of the ANS, which increases heart rate, respiration rate and blood pressure, dilates pupils, releases glycogen, and brings about GSR (galvanic skin response: the electrical conductivity of the skin) changes through sweating. The hypothalamus also prompts the endocrine system,via the pituitary, which releases ACTH (adrenocorticotrophic hormone). This travels to the adrenal glands,which release adrenaline and noradrenaline, thus perpetuating the responses implemented by the sympathetic division of the ANS. The corticosteroids(cortisone and hydrocortisol) are also released from the adrenals. These are also involved in the stress response, maintaining the body's responses.

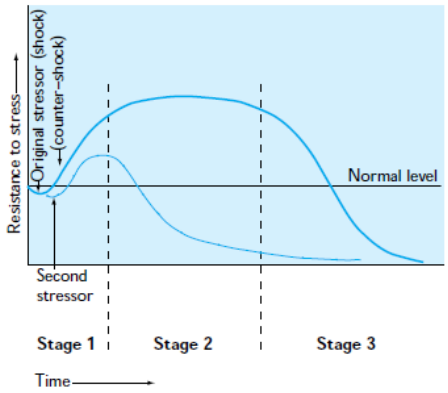


Figure 11.3 The general adaptation syndrome (GAS)

GLOSSARY

General adaptation syndrome (GAS) Selye's (1956) three-stage model, which describes the body's physiological responses to stress.

Stage 2: Resistance

If the stressor is not removed, some of the immediate responses decrease in intensity. Sympathetic activity declines but maintains a level of constant readiness. Adrenaline levels remain high, however; the physical activity of fighting or running away has not been consummated, although the individual may perform other actions that are ineffective. High adrenaline levels are instrumental in depressing the body's immune responses. The immune system is responsible for warding off attack from external sources. Chronic (long-term) stress leads to a depletion of the body's resources and a reduction in the effectiveness of the immune system. The number of white blood cells (lymphocytes), which are essential to the

immune system, is reduced under stress. Schleifer et al. (1979) reported that men whose wives had died from breast cancer showed depleted counts of lymphocytes within a month of the spouse's death, these remaining low for the following year.

Health problems that have been indicated as resulting from or being linked with stress include cancer, heart attacks, ulcers, colitis, asthma, hypertension (high blood pressure) and rheumatoid arthritis. In addition, depletion of the immune system leaves the body susceptible to attack by bacteria and viruses, which may cause a variety of illnesses (see Box 11.3).

Stage 3: Exhaustion

The body's resources are depleted; blood glucose levels drop because the stores of glycogen have been used, and the individual is probably eating inadequately to replenish them. The depletion of the immune system results in disease, which may lead to the psychosomatic illnesses outlined above (psychosomatic illnesses are physical illnesses that are rooted in psychological problems). Death of the individual from one of these causes may be the result.

This depressing picture of stress responses is not an inevitable and unchangeable sequence. In the majority of people, the stressor is dealt with during Stage 1 or early Stage 2, and bodily responses return to normal. Frankenhauser (1983) suggests that there are gender differences in stress responses, in that women's responses show a higher increase than males', but return to baseline more quickly. This could be one of the factors underpinning the differences in results and illnesses; men show a higher incidence of cardio-vascular disease than women, which has been linked to long-term stress.

This was a highly influential model at the time of its proposal, and was the first link found between stress and illness. It is however a reductionist perspective on stress – ignoring psychological and social factors. A further problem for the GAS model is that some stressors elicit a stronger emotional response than others do but GAS incorrectly assumes that all stressors produce the same physiological reactions

Effects of stress on health: Stress and the immune system

A relatively new area of research centres on psycho-immunology - the study of the effects of psychological factors such as stress on the body's immune system

The immune system produces specialized cells known as lymphocytes which move through the bloodstream protecting the body from `foreign bodies' such as bacteria, viruses and cancer cells. It affects the extent to which we are prone to infectious diseases, allergies, cancers and many other illnesses. It is not at present possible accurately to assess the overall efficiency of an individual's immune system, or immune-competence. It is a very complex system with many interconnecting components.

However, research has been carried out which suggests that stress can affect the ability of the immune system to protect the body against illness.

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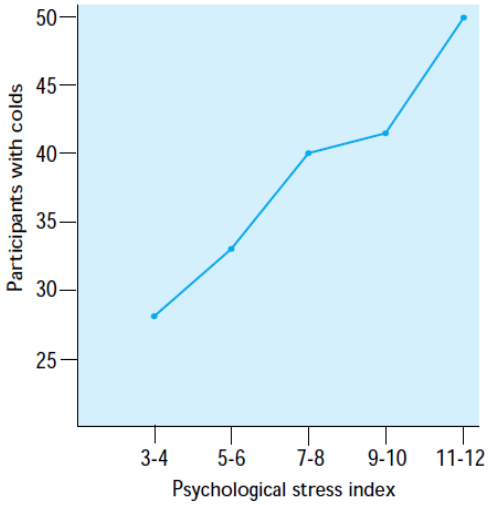


Refer to your study notes on; Kiecolt-Glaser et al., (1984) (1995) (2005) and Cohen (1991)

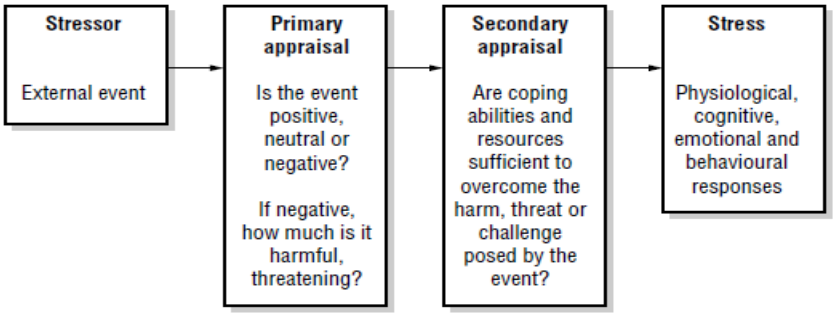
Lazarus and Folkman (1984) Transactional / Cognitive theory model of stress

Other models of stress focus less on the physiological process involved in stress, and more on the cognitive (psychological) factors involved in stress, specifically an individual's perceived ability to cope with stressors.

Lazarus and Folkman (1984) argue that the existence of stress may be less important to an individual's well-being than how the individual appraises and copes with stress.

It is the interaction of the person and environment that creates a felt stress for the individual. Lazarus and Folkman call this interaction a transaction, and suggest that when we encounter certain stressors we make two cognitive appraisals: first, whether the stressor or event poses a threat (the primary appraisal), and second, whether we will be able to cope with it (the secondary appraisal)

Cognitive appraisal processes can influence both the stress and the emotional experience for example, one person coming across a poisonous snake might be frightened whereas another person, who studied poisonous snakes, would be excited.



• **Figure 4.1:** The experience of stress

Individual differences (personal qualities) and individual circumstances

Our appraisal of stress can be affected by our personal qualities, our personal circumstances, and also by the type of event that is causing the stress. The following factors (and supporting studies) can affect our experience of stress

Life Events (Holmes & Rahe)

Events that happen in our lives can also produce stress. Holmes and Rahe (1967) investigated the relative strengths of a number of these life events and produced a rating scale (the Social Readjustment Rating Scale (SRRS), equating numerical values with a range of life events, from the most severe (death of a spouse) to lesser events, such as a change in eating habits. You may not rank these in the same order, but, on the whole, consensus is high (Holmes and Masuda,1974).

To calculate the amount of stress experienced by an individual, over a given period of time (usually between six months and two years), the rank value of all that person's reported life events is totalled. This gives a life change score, which can be examined in conjunction with the individual's physical and mental well-being. Investigators have found that a high life change score is often followed by physical illness or psychological problems a year or two later (Rahe and Arthur, 1977). Presumably, the stress induced by life changes lowers the functioning of the immune system, causing illnesses to be contracted more easily.

Criticisms of the SRRS life events scale point out that it is difficult to separate other variables, which may be causes of the ill-health, from the apparent effects of life changes. For example ,death of a wife may cause a man to change his lifestyle, to adopt an unhealthy diet, to drink and smoke more; it may be these variables that actually produce the breakdown in health.

Other critics suggest that the gradual breakdown in health may be the cause rather than the effect of the life events. Poor health may induce absenteeism or inefficiency at work, which may result in the loss of a job. There is also a `correlational effect' attached to mental ill-health: depressed people tend to report more negative events. It is difficult to say whether the depression or the reporting of the events is the cause or the effect. In addition, the scale does not allow for the fact that people's circumstances vary widely. What may be a traumatic event for one person may be a release for another; for example, individuals' responses to divorce vary widely.

Daily Hassles

Hassles and uplifts Lazarus (1966) suggested that daily hassles cause more stress problems than do life events. Small daily problems can summate until we feel we cannot cope. DeLongis et al. (1982) found that daily hassles were a better predictor of ill-health than were life events. Lazarus also suggested that the effects of hassles were offset by `uplifts' ± good events that happened in our day. These were balanced by the individual, providing an overall `feel' to the day

Work stress

Johansson et al (1978) studied a small group of 14 workers in a large sawmill in Sweden. Their job was ‘finishers’, i.e. they were the final link on a conveyer belt system. The high-risk group was 14 workers who had to work at a set pace. Their job was complex and they were responsible for their own and their team’s wages.

Aim

- To measure the psychological and physiological stress response in two categories of employees.

Method

- A quasi-experiment where workers were defined as being at high risk (of stress) or in a control group.
- T he high-risk group was 14 workers who had to work at a set pace
- The control group was 10 workers who were cleaners or maintenance men.
- An independent design with participants already working in one of the two categories, so no manipulation of the independent variable.

Procedure

Each participant was asked to give a daily urine sample when they arrived at work and at four other times during the day. They also gave self-reports of mood and alertness plus caffeine and nicotine consumption.

- The baseline measurements were taken at the same time on a day when the workers were at home.
- Catecholamine (adrenaline) levels were measured in the urine.
- Body temperature was measured at the time of urine collection.
- Self-rating scales of words such as 'sleepiness', 'wellbeing', 'irritation' and 'efficiency' were made on scales from none to maximal (the highest level the person had ever experienced).
- Caffeine and nicotine consumption were noted

Results

- The high-risk group had adrenaline levels twice as high as their baseline and these continued to increase throughout the day. The control group had a peak level of 1½ times baseline level in the morning and this then declined during the rest of their shift.
- In the self-report, the high-risk group felt more rushed and irritated than the control group. They also rated their wellbeing lower than the control group.
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Conclusion

- The repetitive, machine-paced work, which was demanding in attention to detail and was highly mechanised, contributed to the higher stress levels in the high-risk group.

Hardiness

Among the personal qualities that psychologists have studied include how hardy we are. Kobasa (1979) suggested that we can identify personality characteristics that separate out people who get ill under stress and people who remain healthy. She called the collection of these characteristics **hardiness**. Some individuals seem to cope well with one stressful event after another, while others break down under very little pressure. Researchers have attempted to verify why this should be so; personality characteristics is one area of study.

Kobasa (1979) gave questionnaires to 600 executives or managers, asking them to itemize illnesses and stressful events they had experienced in the previous three years. Personality questionnaires were also completed. From the responses, Kobasa analysed two groups of responses. Both groups had scored above average on stressful events, but one group scored below average on illnesses, while the other group scored above average.

From the analysis it was found that the group of high stress/low illness group felt more in control of their lives, were more actively involved in their work and social lives; and were more oriented towards challenges and change.

Critics of this study suggested that these characteristics could be the result, rather than the cause, of illnesses; for example, it is hard to become totally absorbed in your work or social life if you are ill. Subsequently, a longitudinal study (Kobasa et al., 1982) monitored executives for two years and identified that those who set out with positive attitudes were the ones who suffered fewest illnesses. The personality characteristics of these hardy individuals include control, commitment and challenge. Control has been demonstrated as a buffer to stress. Commitment may typify those with firm social support systems around them, while challenge involves cognitive appraisal of situations in order to reassess them benignly.

However, is this type of hardy personality available to everyone? If you have a low-interest job, you probably feel little commitment to it; it provides you with little challenge, and you almost certainly have no control over your area of work. You may argue that the essential characteristics could be assembled in to interests outside work, but a 40-hour week at a boring job leaves people feeling stressed and therefore too tired to undertake challenging outside interests. It must be remembered that Kobasa's work was undertaken with executives and managers, who do not have exclusive rights to feeling stressed.

Personality Types A/B

Type A personality was the phrase coined by Friedman and Rosenman (1974) to describe certain behavior patterns displayed by patients in the USA who had developed coronary heart disease. Studies indicated that men who exhibited these patterns were two and a half times more likely to develop heart disease than were men who did not show these behaviours (Type B).

Type A behaviours include being ambitious, competitive, alert, impatient and aggressive. Their speech is hurried, they gesture frequently and they have difficulty letting others finish what they want to say before interrupting. They are always in a hurry, to the point of appearing `driven', showing chronically high levels of arousal. They exhibit `deadline urgency'(having to get things done by a certain time) and extreme competitiveness, even in leisure pursuits.

Type B personalities may be equally ambitious, but do not appear `driven'. Their job ambitions do not dominate their entire lives. They find time for family and friends, and tend to choose leisure pursuits that are less competitive than Type A's choice. Type A people are often highly successful in their jobs, so their activities are not discouraged at work.

The type A personality may be at greater risk of heart disease than other people Type A personality A pattern of personality characteristics, for example competitiveness, impatience, time-urgency, aggressiveness, which have been linked in the USA with the incidence of heart disease.

Ganster (1986) suggested that Type A behaviour may promote the risk of cardiac disease because it involves the system in the stress response. Organizations should weigh this risk against the desire for high performance from its Type A employees. Other studies have found that the Type A personality appears to be involved in cardiovascular disease but is not a reliable predictor for this (Matthews, 1988).

These studies have all looked at men's responses partly because at the time they were conducted, there were fewer women in executive and managerial positions and fewer women exhibiting cardiovascular disease. Currently, the incidence of both of these has risen, although women still lag behind on the managerial and heart disease fronts. The rises may not be directly correlated because there are other confounding variables. For example, more women have taken up smoking, which is a known causal factor in cardiovascular problems. Women maybe resistant to`executive stress', but if they smoke, it could be this which is causing the rise in heart disease, which maybe wrongly correlated with stress.

However health is rarely that simple and the interaction of stress with physiological, psychological, social and cultural factors cannot be reduced to two simple behaviour patterns.

Measures of stress

There are two reasons why it is useful to be able to measure people's levels of stress, first it may help with clinical diagnosis and second it is necessary for carrying out research into the causes and effects of stress, and the effectiveness of specific coping techniques. Stress can be assessed either by measuring the stressors themselves or measuring the effects of stress.

Measuring stress responses can be done by looking at the;

- Physiological effects of stress (either by measuring these directly or asking people to report on their perception of how aroused they feel.
- Psychological effects (by using self report measures to assess mood and attitude)

Physiological measures

The flight or fight response consists of increased physiological arousal triggered by hormonal changes. This leads to two different approaches to measuring stress physiologically;

- Using blood or urine samples to measure hormone levels in the body (refer to Johannssen's study above)
-

- Using a polygraph to measure physiological arousal (a polygraph measures blood pressure, heart rate, respiration rate and galvanic skin response)

Evaluation/ Advantages

- These are reliable and objective and produce quantitative results.

Disadvantages

- Expensive, require specialist equipment and trained personnel
- Demand characteristics. The act of being tested may create a stress response which can bias the results. This is why lie-detector results are not admissible evidence in British courts.
- Generalisability: bodily arousal can come from many non-stress causes, weight, activity, drug consumption. Also it is possible to feel stress without having physiological arousal.

Life Event	Mean Value
Death of Spouse (Significant Other)	100
Divorce	73
Marital Separation	65
Jail Term	63
Death of Close Family Member	63
Personal Injury or Illness	53
Marriage	50
Fired at Work	47
Marital Reconciliation	45
Retirement	45
Change in Health of Family Member	44
Pregnancy	40
Sex Difficulties	39
Gain New Family Member	39
Business Readjustment	39
Change in Financial State	38
Death of a Close Friend	37
Change to Different Line of Work	36
Change in Number of Arguments with Spouse	35
Mortgage or Loan for Major Purchase (home. etc.)	31
Foreclosure of Mortgage or Loan	30
Change in Responsibilities at Work	29
Son or Daughter Leaving Home	29
Trouble with In-Laws	29
Outstanding Personal Achievement	28
Spouse Begins or Stops Work	26
Begin or End School	26
Change in Living Conditions	25
Revision of Personal Habits	24
Trouble with Boss	23
Change in Work Hours or Conditions	20
Change in Residence	20
Change in Schools	20
Change in Recreation	19
Change in Church Activities	19
Change in Social Activities	18
Mortgage or Loan for Lesser Purchase (car, tv,etc.)	17
Change in Sleeping Habits	16
Change in Number of Family Get-Togethers	15
Change in Eating Habits	15
Vacation	13
Christmas	12
Minor Violations of the Law	11

Psychological Measures (self – report tests)

Psychological measures are self-report measures using psychometric tests.

Life events

One technique for assessing the stressors in an individual's life is to look at their social environments. Someone who has financial difficulties, a stressful job and home problems is likely to be experiencing stress. However this does not enable us to examine in detail the specific circumstances of a particular person. A more specific, individualist approach would be to ascertain how many stressful events have taken place over a certain period of time, on the assumption that certain events in people's lives are going to cause them stress and the more of these events that occur, then the more stress there will be.

The earliest attempt to create a life events scale for measuring stress is the Social Readjustment Rating Scale developed by Holmes and Rahe (1967). They looked at what events and experiences affect our level of stress, and they developed a scale to measure this. The scale looks at the stress caused by major life events (the sort of events that we experience as difficult to deal with) and is based on previous research which found that some social events that required a change in lifestyle were associated with the onset of illness. They developed the scale by asking nearly 400 adults to rate 43 different life events for the amount of adjustment needed to deal with them. From their responses they developed the Social Readjustment Rating Scale.

The researchers compared the responses of the different groups of people within their sample and found a startling degree of agreement. They compared the responses of different age groups, men and women, Catholics and Protestants, and in all cases found very high correlations in their ratings of stressful events.

The one exception was the correlation of the responses of black participants with white participants which, although still quite high, was much lower than the other correlations.

To measure your personal stress score with the Social Readjustment Rating Scale, tick off the events that have occurred to you in a given time, usually 12 months or 24 months, and add up the readjustment values. According to Holmes and Rahe, the higher the number you end up with, the more chance you have of developing an illness.

A number of studies, by Holmes and Rahe in particular, have shown a connection between high ratings and subsequent illness and accident, though according to Sarafino (1994) the correlation between rating and illness is really quite weak (r = 0.3). The stressful life event approach to stress and illness generated a considerable amount of research, not least because the Social Readjustment Rating Scale developed by Holmes and Rahe provides a relatively straightforward way of measuring stress. It also conforms to everyday notions of the effect of dramatic events in our lives. In accounts of personal experience recorded in news reports it is not unknown for people say how a particular event, such as unexpected bereavement, or desertion by a loved one, has 'shattered my life'.

Some criticisms are;

- major life events are quite rare and many people will score near to zero
- some of the items in the scale are vague or ambiguous
- There are large individual differences in our ability to cope with stressful events
- Ethnocentricity: items on the SSRS assume American norms and values. There are large cultural and sub-cultural differences in our experience of events
- The value of events changes with time and changing social customs
- The Scales lack validity because it doesn't find out about the real meaning of these events which could vary – bereavement after a long illness is felt differently to premature bereavement.

- Retrospective data: Information about life events is usually collected at least 6 months and often 18 months after the events happened. This presents further problems of validity – people may interpret past events in the light of present illness (or health).

Daily Hassles

Kanner *et al.* (1981) challenged the life events approach to measuring stress, arguing firstly that the correlation between life events and stress – related illness is not as strong as some people claim. They also argued that that the minor stressors of everyday life might have a more significant effect on health than the big, traumatic events assessed by the Holmes and Rahe scale, particularly in view of the cumulative nature of stress. They called these demands 'daily hassles' and developed a scale that measures stress by asking people to rate how annoying or irritating these hassles are to them.

Kanner et al also recognized that certain everyday events can have a positive effect on stress and they called these daily uplifts.

Study: Comparison of two modes of stress measurement: daily hassles and uplifts versus major life events

Kanner et al (1981)

Aim: to see if daily hassles and uplifts scales are more accurate in predicting stress than the SSRS

Sample

100 participants (52 women, 48 men; all white, well-educated and well-off) in Alameda County (San Francisco).

Method:

Kanner devised a list of 117 hassles and 135 uplifts. Participants were asked to circle the events which they had experienced in the previous month and then rate each according to severity (for the hassles) and frequency (for the uplifts). Each participant was tested once a month for ten consecutive months using the two stress measures together with another two psychometric tests for psychological well-being.

Results

The researchers found that the hassles scale tended to be a more accurate predictor of psychological problems than the SRRS. Uplifts had a significant effect on stress levels of women, but not men.

Evaluation

The daily hassles scale has most of the same problems as the SRRS. The link between hassles and psychological and physical disorders is correlational. For example, the increase in hassles preceding a cold

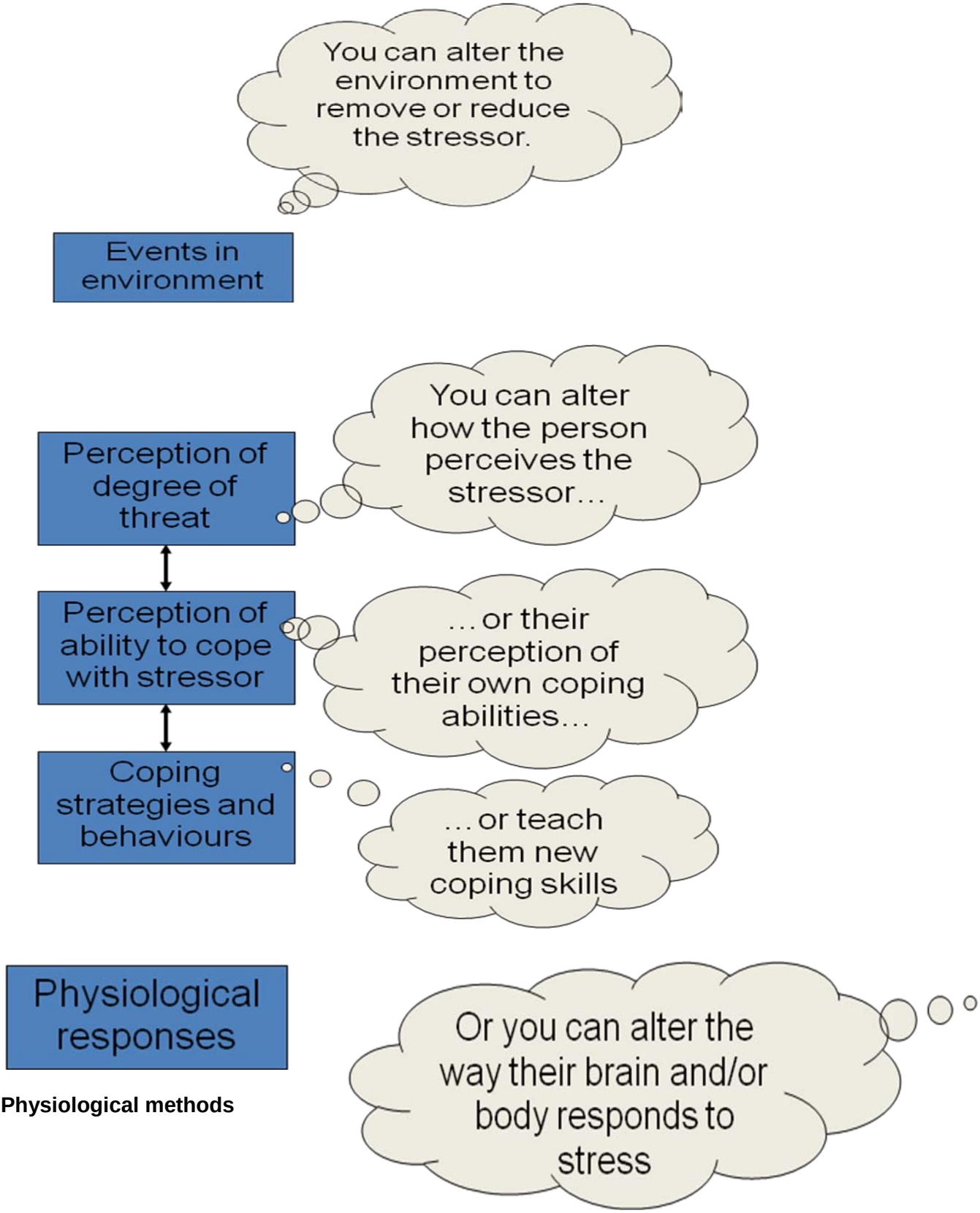
may be due to feeling rundown as a result of the early stages of the illness. Because of this, situations which people would normally take in their stride are interpreted and experienced as hassles.

Life events and hassles and uplifts measures continue to be used in health research and produce mixed results about the effects of these stressors. For example, a study of 73 adults with psoriasis (a serious skin condition) compared their stressful life events scores with patients with skin conditions other than psoriasis. The strongest predictor of developing the disorder was a family history of it in parents or siblings. The study also found evidence that stressful life events are a predictor of the disease (Naldi *et al.*, 2001). In contrast, a study of over 400 people aged 32 or 33 looked for a connection between stressful life events, uplifts and hassles, and the biological risk factors for coronary heart disease (CHD). Although the uplifts were found to be related to positive lifestyles, no relationship was found to the key biological risk factors for CHD (Twisk *et al.*, 2000)

	Daily Hassles		**Daily Uplifts**
1	Concerns about weight	1	Relating well to spouse or partner
2	Health of a family member	2	Relating well to friends
3	Rising price of common goods	3	Completing a task
4	Home maintenance	4	Feeling healthy
5	Too many things to do	5	Getting enough sleep
6	Misplacing or losing things	6	Eating out
7	Outside home maintenance	7	Meeting your responsibilities
8	Property, investment or taxes	8	Visiting, phoning or writing to someone
9	Crime	9	Spending time with the family
10	Physical appearance	10	Finding your home a pleasant environment

Managing Stress

Medical techniques (e.g. chemical). Psychological techniques: biofeedback (e.g. Budzynski et al., 1973) and imagery (e.g. Bridge, 1988). Preventing stress (e.g. Meichenbaum, 1985)



Physiological methods

There are two types of drugs that ca be used in stress management; benzodiazepines (BZs) and Beta-blockers. BZs are a group of drugs that are commonly used to treat anxiety. BZs slow down the activity of the central nervous system. This is done by enhancing the activity of the natural biochemical substance called GABA. GABA is the body's natural form off anxiety relief. This enhancement is achieved in several ways. One such way is that GABA slows down nerve cell activity. It allows chloride ions into neurons, slowing the activity if the neuron which causes relaxation. Another way is that GABA also reduces serotonin activity. Serotonin is a neurotransmitter that has an arousing effect people who are depressed have low levels of serotonin and one form of treatment is to take drugs. People with anxiety need to reduce levels of serotonin which is done by GABA, which then decreases arousal of neurons, causing reduced anxiety. BZs imitate the activity of GABA and therefore reduce arousal of the nervous system and reduce anxiety.

Beta-blockers act on the sympathetic nervous system rather than the brain. Stress leads to the arousal of the sympathetic nervous system and this creates increased blood pressure, heart rate, elevated levels of cortisol etc. These symptoms lead to cardiovascular disorders and reduce the effectiveness of the nervous system. Beta-blockers reduce the activity of the sympathetic nervous system and reduce the associated undesirable symptoms. A benefit of beta-blockers is that they have psychological as well as physiological effects. The individual may feel calm and relaxed as a result of suppression of the sympathetic nervous system. However large doses of beta-blockers can sometimes lead to depression and impotence (Taylor, 1995).

In general the strengths of such drugs is that they have a high success rate. One way to assess the effectiveness is to compare outcomes when anxious patients are given drugs while others are given a placebo – a substance that has no pharmacological effects. Patients are given the medication but do not now if it is the real thing or the placebo. This enables the determination of whether the effectiveness of drugs is due to pharmacological properties or to something psychological. Kahn et al (1986) followed nearly 250 patients over 8 weeks and found that BZs were significantly superior to placebo. Another strength is that using drug treatment for stress requires little effort from the user. All that needs to be done is the remembrance of taking the drugs. This is such easier and takes less time and effort than other techniques such as biofeedback.

BZs have been found to be addictive. Patients taking even low doses of BZs show marked withdrawal symptoms, Ashton (1997) recommended that BZs should be limited to a maximum of 4 weeks use. In addition to this there are many side effects including drowsiness, dizziness, tiredness, weakness, diarrhoea and more seriously seizures, irregular heartbeat that require immediate medical attention. Drugs may be effective at treating symptoms but not the causes . Most causes of stresses are psychological, therefore physical measures do not address the real cause of the problem

Psychological methods

Biofeedback

Biofeedback is a psychological/ physiological technique in which people are trained to improve their health by using signals from their own bodies. This is based on the idea that autonomic nervous system reactions are partly under voluntary control (Miller, 1969). So giving a person information about the state of their body (for example blood pressure readings) provides them with the potential means to control it.

Biofeedback training is done in the presence of qualified biofeedback therapists. An individual is attached to a monitor that produces feedback about their physiological activity - such as their blood pressure, heart rate and muscle tension. This feedback comes in either a visual or auditory form. For example, there may be an auditory signal that changes in pitch depending on changes in heart rate. The individual is taught to use meditation or muscle relaxation in order to control the pitch of the signal and consequently control their heart rate. With practice an individual should eventually learn to control their bodily processes without the use of the monitor.

Biofeedback is therefore designed to target the symptoms of stress, though it does not tackle the stressor itself which will remain present in the individual's life. However, it does give people a feeling of control and it may be this, rather than biofeedback itself, that results in beneficial effects. Other critics suggest that it is the relaxation training and the commitment and motivation required that is effective in reducing the symptoms of stress.

Research indicates that biofeedback can be effective. For example, Bradley (1995) cites a study in which college students suffering from tension headaches were given seven 50-minute sessions using biofeedback based on muscle tension. They were also encouraged to practice bringing the muscle tension under control when free of headaches and at the first sign of a headache. Compared with a similar group of students who were given no treatment until the study was over - and another group that engaged in pseudomeditation (what they thought was a meditation procedure but was in fact a procedure made up by the researchers), the biofeedback produced significant reductions in muscle tension and headaches.

Evaluation

Extensive research has been conducted into biofeedback, which suggests it has produced significant reductions in stress in everyday life, though it is hard to interpret the beneficial effects of biofeedback. Relaxation training is often given along with biofeedback, making it hard to tell whether it is the biofeedback or the relaxation training that is more effective. Biofeedback may lead to benefits by producing a sense of control rather than purely physiological mechanisms. Holroyd et al.91984) found that biofeedback providing information about muscle tension was associated with a reduction in tension headaches. However, they also found that participants who falsely believed they reducing muscle tension through biofeedback experience fewer headaches. The technique is supported with a well known study by Budzynski (

Budzynski (1973)

Lab experiment to see if biofeedback was effective in headaches or really just a placebo effect.
18 ppts who responded to an Ad. All suffered from headaches and underwent medical exams and psychiatric tests to screen for other factors.

Randomly assigned to 3 groups
1.Biofeedback sessions & relaxation training
2.Psuedo biofeedback + relaxation training
3. Put on 'waiting list'

PPts gave headaches rating every 5 hrs. After 3 months groups 1 & 2 were given EMG test and questionnaire. Results showed that Group A's reported less muscle tension and headaches, suggesting actual biofeedback sessions and not placebo accounts for results.

Guided Imagery

A therapeutic technique in which a facilitator uses descriptive language intended to psychologically elicit mental imagery, often involving several or all senses, in the mind of the listener. Mental imagery involving tranquil natural scenes is commonly used for stress reduction. In this type of visualization clients are instructed to close their eyes and follow a series of suggested scenes during which they access and utilize the cognitive skills of imagination. Natural scenes are selected because they simulate locations where people typically vacation to escape stress. Seeing the image, hearing the sounds, feeling the warmth of the sun can create powerful scenes. By accessing the imagination of these senses clients go from being a passive observer to an active participant in their images, thus feeling a state of calm as if actually there.

How guided imagery induces this state of mental calm is unclear. It is commonly understood that the brain's visual cortex, which processes images, has a powerful connection with the autonomic nervous system, which controls involuntary activities such as pulse, breathing, and physical responses to stress. Soothing, uplifting images may slow pulse and breathing and lower blood pressure, as well as help trigger the release of hormones such as endorphins.

A further explanation may be seen in the recent work at the **University of Sheffield in 2010.** They utilised the fact that waves breaking on a beach and traffic moving on a motorway produce a similar sound, perceived as a constant roar, and presented the participants with images of tranquil beach scenes and non-tranquil motorway

scenes while they listened to the same sound associated with both scenes. Using brain scanning that measures brain activity they showed that the natural, tranquil scenes caused different brain areas to become `connected´ with one another – indicating that these brain regions were working in sync. However, the non-tranquil motorway scenes disrupted connections within the brain.

Progressive muscle relaxation

The PMR procedure teaches you to relax your muscles through a two-step process. First you deliberately apply tension to certain muscle groups, and then you stop the tension and turn your attention to noticing how the muscles relax as the tension flows away.

Through repetitive practice you quickly learn to recognize—and distinguish—the associated feelings of a tensed muscle and a completely relaxed muscle. With this simple knowledge, you can then induce physical muscular relaxation at the first signs of the tension that accompanies anxiety. And with physical relaxation comes mental calmness—in any situation. A study by Baird & Sands, 2004 supports the use of guided imagery and PMR as effective relaxation techniques.

Evaluation

Baird & Sands (2004)

They conducted a study to determine whether Guided Imagery (GI) with Progressive Muscle Relaxation (PMR) would reduce pain and mobility difficulties of women with Osteoarthritis. 28 patients were randomly assigned to either the treatment or the control group. The treatment consisted of listening twice a day to a 10-to-15-minute audiotaped script that guided the women in GI with PMR.. Results showed that the treatment group reported a significant reduction in pain and mobility difficulties after 12 weeks compared to the control group

Whilst numerous other studies support the use of such relaxation techniques require time, and PMR requires space. Neither technique may be possible or convenient when one is actually feeling stressed. Both chronic and acute stressors may require more than non-specific relaxation, which neither targets the causes nor provides long term relief.

Stress inoculation Training (Cognitive approach)

Some medical treatments give people weak versions of a disease in order to encourage the body to develop defences against the full-blown version. This is called inoculation. A form of cognitive therapy uses a similar idea as a preparation for a stressful event and it is called, not surprisingly, **stress inoculation**.

It was developed by Meichenbaum (1977) and it is designed to prepare people for stress and to help them develop skills to cope with that stress. The inoculation programme involves three stages:

1. *Conceptualisation* **–** the trainer talks with the patient about their stress responses, and during this phase the patient learns to identify and express feelings and fears. The patient is also educated in lay terms about stress and the effect it can have.

2. *Skill acquisition and rehearsal* – the patient learns some basic behavioural and cognitive skills that will be useful for coping with stressful situations. For example, they might be taught how to relax and use self-regulatory skills. The patient then practices these new skills under supervision.

3. *Application and follow through* – the trainer guides the patient through a series of progressively more threatening situations. The patient is given a wide range of possible stressors to prepare them for real life situations.

Evaluation

- It is very flexible – tailored to the needs of the individual
- it can be used to deal with many types of stressors (read the article on sports performance)
- It may less effective in highly stressful situations, when using coping statements may be difficult to apply
- It takes time and money, not suited to all lifestyles
- Supported by Meichenbaum (1973)

Meichenbaum (1973)

- **Aim**: To compare SIT with standard systematic desensitisation **(NB**: systematic desensitisation is an behavioural approach to exposure to a hierarchy of stressful situations)
- 21 students aged 17-25 responded to an advert with anxiety …
- Matched pairs with random allocation to 3 groups

- Using self reports & grade averages before & after
- Each participant tested using test anxiety questionnaire
- Told they would be doing IQ tests and assessed using Anxiety Adjective Test which gave baseline score. Put into 3 groups
- SIT group received 8 therapy sessions; given positive statements to say to overcome negative thoughts
- Systematic desensitisation group given 8 therapy sessio0n with relaxation training
- Control group told they were on waiting list

Results & Evaluation:

Results showed SIT group showed most improvement in anxiety levels

- Cognitive approach; insight into control of stress but changes in thinking about stress can only be inferred
- High in ecological validity student coping with real stress but low on control – extraneous variables? Social desirability bias? Demand characteristics? Effective baseline

Causes of Stress

Evidence	✓
Kiecolt-Glaser et al (1984+)	
Rahe et al (1970) (Life events)	
DeLonghis et al (1982) (Daily Hassles)	
Johansson et al (1978) (Work stress)	
Friedman & Rosenman (1974)	
Kobasa (1979) (Hardiness)	

Measuring Stress

Evidence	✓
Geer & Maisel (1973) GSR & ECG	
Holmes & Rahe (1967) (SRRS)	
Johansson (1978) (Combined approach – urine & self report)	

Managing Stress

Evidence	✓
Bradley (1995) Biofeedback)	
Budzynski (1973)(Biofeedback)	
University of Sheffield (2010) – Guided imagery	
Baird & Sands(2004) GI and PMR	
Meichenbaum (1972) (SIT)	
Waxler & Morrison (1993) – social	

Pain

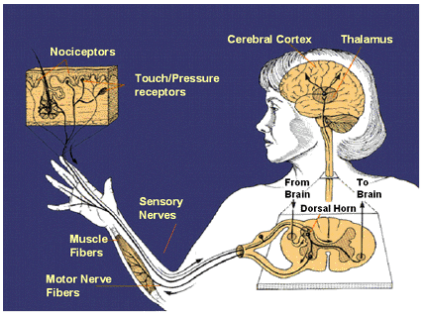
We have all experienced pain in our lives of varying intensity and duration. In some cases we may not be aware of the pain until after the episode, and in other cases we may aware of the pain but feel unable to control or reduce it. We may experience long lasting pain. Our different experiences of pain suggest that it has a psychological as well as a physical dimension.

It is important to understand pain; according to Karoly it is “the most pervasive symptom in medical practice, the most frequently stated “cause” of disability, and the single most compelling force underlying an individuals choice to seek or avoid medical care “ (1985, p. 461).

What is pain?

Pain can be defined as ‘... an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage’ (Merskey and Bogduk, 1994). This definition carries with the idea that pain is always subjective and always unpleasant (hence an emotional experience). It helps our understanding of pain to divide up the experience into four components (Loeser and Melzack, 1999):

1.**Nociception**



Nociception is the term used to describe the perception of physical pain. More specifically, it is defined as the neural processes of encoding and processing “noxious stimuli”.

Nociceptors (or pain receptors) are the free nerve endings located just underneath the skin (to detect cutaneous pain), in tendons and joints (to detect somatic pain) and in organs (to detect visceral pain). They are stimulated by mechanical (crushing, tearing, etc.), thermal (hot and cold) and chemical (eye discomfort while chopping onions) changes in the body above a set “threshold”. Once activated, a nociceptor sends a signal up the spinal cord to the brain, which results in the sensation of pain.

While a life lived completely free of physical pain sounds great on paper, nociception is a crucial evolutionary mechanism that helps us learn to avoid dangerous situations, prevents further bodily damage and promotes healing. In fact, people who are born without the ability to feel physical pain must be extremely vigilant about avoiding physical injury and have a lower life expectancy than the general population.

2. Perception of pain: our sense of pain. This can be caused by injury but, as shown above, it can occur without it.

3. Suffering: a negative response brought on by pain, and also by fear, stress and loss. Not all suffering is caused by pain, but with our medical view of the world, we commonly describe suffering in the language of pain, and so sometimes mislead the doctor and patient about the cause of the suffering.

4. Pain behaviours: the things a person does or does not do that can be put down to pain. For example, saying 'ouch!', or grimacing or playing dead. We observe these behaviours and use them to make

Types of Pain

Pain is not just a simple sensation; it can vary in quality, intensity, duration location and frequency. The type of pain a person experiences will differ according to the origin and duration of the pain. In describing different types of pain, people often refer to the distinction between organic and psychogenic pain, and between acute and chronic pain. Pain can either be organic or psychogenic, and at the same time it is either acute or chronic.

- Organic – pain that is obviously related to tissue damage and when the pain is largely caused by that damage
- Psychogenic – pain whereby the underlying causes seem to be largely psychological
- Acute pain – more or less intense pain that lasts until healing has begun for example the pain of appendicitis or of a broken limb
- Chronic pain – is much more persistent. It can be constant or intermittent and pain is said to be chronic if it has lasted for three months or more.

Most researchers recognize that organic and psychogenic factors play an important role in the experience of most pain. The absence of an obvious cause does not imply that the pain is not real and this is important to recognize. A study by Gilmore & Hill (1981) showed that nursing students were seen to react less favorably to the pain of patients ho did not have a specific diagnosis, in other words, they valued a medical diagnosis more than the patients subjective experience. Chronic pain often increases or maintain high levels of anxiety. When medical treatment has not helped, the pain takes over the lives of those who suffer from it, and people with chronic pain can develop a sense of desperateness and hopelessness. Acute pain, which describes temporary pain, is distressing but the worry will reduce as the condition improves.

1. **Injury without pain**
   This may take the form of either episodic analgesia or congenital analgesia.

- Episodic analgesia – Occurs when a person injures themselves but does not feel pain for some minutes or hours afterwards. Carlen et al (1979) carried out a study of Israeli soldiers who lost limbs in the Yom Kippur war. They did not feel any pain from these injuries until many hours after they had been wounded.
- Congenital analgesia – a very rare condition in which some people are born without the ability to feel pain at all.

2. **Pain without injury**

   There are several examples of pain where there is no obvious physical causes

- Neuralgia is a shooting or stabbing pain along the pathway of a nerve
- Causalgia is described as a severe, burning pain.

  Interestingly both neuralgia and causalgia develop after the wound has healed and, although not constant pains, can be triggered by environmenta stmuli (eg. A stressful episode).

- Headaches – (eg. Tension headaches. Migraines) are surprisingly difficult to explain, particularly since early explanations in terms of muscular contractions do not adequately account for all types. Indeed common explanations of migraine, which refer to the dilation of blood vessels have been largely discounted since research suggests that changes in these blood vessels are more likely to be a result of headache than a cause (Melzack & Wall, 1991)
- Phantom limb pain – A interesting phenomena whereby a person who has lost or limb (or even born without a limb) may experience all

Melzack (1992) argues this could be explained by the fact that the brain contains a network of neurons (or, neuromatrix) that not only responds to sensory information but generates a characteristic pattern of nerve impulses that indicate that the body is ‘whole’. This iscalled a ‘neuro-signature’ and is considered to be largely pre-wired or innate. The neuromatrix continues to generate nerve impulses from the lost limb, even in the absence of sense data.

Theories of Pain

Early pain theories desrcibe pain within a biomedical framework. These theories work on the assumption that there is an automatic response to pain. Descrates was one of the earliest writers on pain. He believed that there was a direct pathway from the source of the pain to an area in the brain that detected the painful sensations.

Specificity Theory

This theory argues that there are separate receptors for perceiving touch, heat and pain. So stimulation of specific pain receptors (nociceptors) sends direct messages (impulses) along specific pain receptors and fibres (A-delta fibres and C-fibres) through the spinal cord to specific areas of the sensory cortex of the brain which causes the individual to feel pain (Adams and Bromley ,1998). This theory suggest that there is a strong link between pain and injury and that the severity of injury determines the amount of pain experienced by the person (Brannon and Feist , 2000). The problem with the approach, as Melzack and Wall (1988) point out, is that the specialized receptors respond to certain unpleasant stimuli (a physiological event), but this does not mean that we always feel pain (a psychological experience). The examples of injury without pain, described above, show that there is not a direct connection between stimulation and pain. This point is reinforced by the evidence from neuralgia

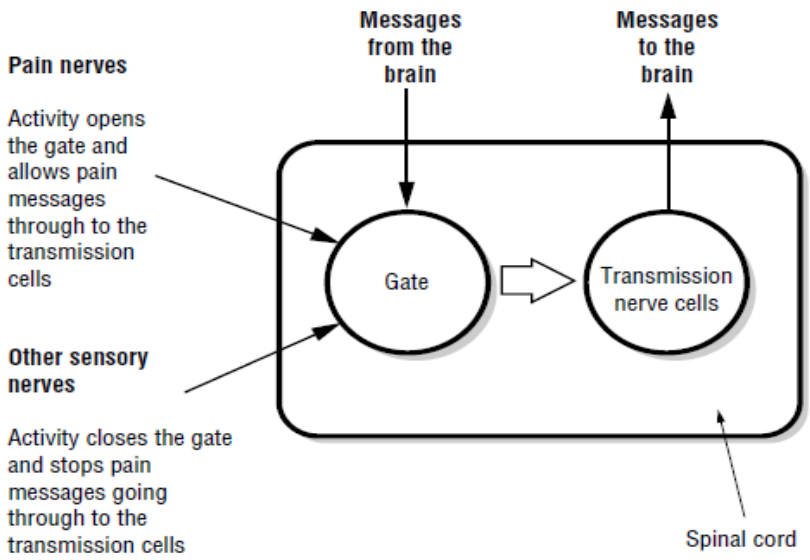
Pattern Theory

This is based on similar assumptions of the relationship between the stimulus and the response. However pattern theory argues there are no separate systems for perceiving pain and that the receptors for pain are shared with other senses such as touch. Pain and non-painful sensations are transmitted by nonspecific receptors over a common pathway to higher centers of the brains Too much stimulation can cause pain.

Gate Control theory

This theory combines the medical approach of the previous theories, with the more recent biopsychosocial model of health. It considers the interactionof biological, psychological and social factors in pain, and not simply medical factors alone. The theory suggests that there is a ‘gate’ in the nervous system that either allows pain messages to travel to the brain, or stops those messages.

The model is biologically complex and It is very difficult to build up an accurate ‘wiring diagram’ of the nervous system and to identify all the active bits of it. There is however a general belief that there are three types of receptor cells and nerve pathways that are important in pain. First, there are nociceptive cells that respond to pain but not to other stimuli. Second, there is another class of cells that respond to intense stimuli (in other words, pain) as well as weak stimuli like touch. Third, there is a class of cells which respond just to touch and not to pain. So how do we make sense of all this nervous system information and feel pain? This brings us to the best current model of the phenomena – the gate control theory.



• **Figure 3.1:** The gate control theory of pain

The theory describes in some detail which nerves produce what reaction in the nervous system, and proposes a model for the control of the transmission of pain messages up the spinal cord to the brain. According to the theory, the gate is in the spinal cord and the factors that open or close it are:

1. *Activity in the pain fibres* – this is the 'specificity' part of the theory, and suggests that activity in the small specifically to pain, will open the gate.

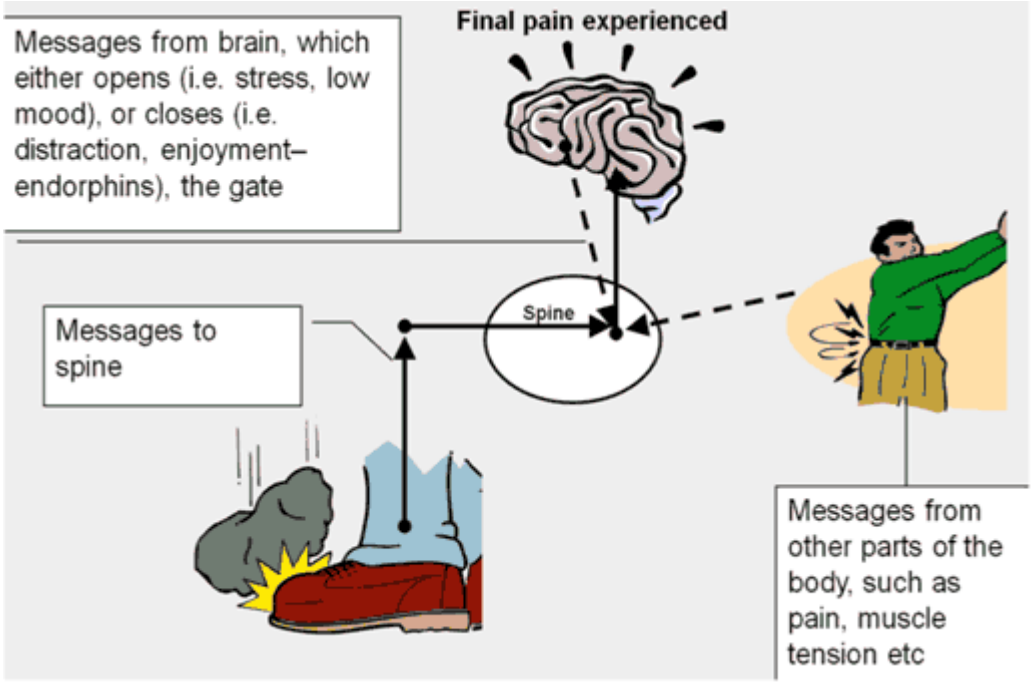
2. *Activity in other sensory nerves* – this is the 'pattern' part of the theory and refers to the large diameter nerves that carry information about harmless sensations such as touching, rubbing or scratching. Activity in these nerves will close the gate – this goes along with the observation that light rubbing around painful areas will reduce the pain.

3. *Messages from the brain* – this is the central control mechanism and it responds to states such as anxiety or excitement to open or close the gate. The idea that the brain can influence the experience of pain explains why why distracting people can help them not to notice the pain so much.

There are a number of factors that act to open or close the pain gate;

Conditions that open the gate	Conditions that close the gate
Physical conditions	**Physical conditions**
● Extent of the injury	● Medication
● Inappropriate activity level	● Counterstimulation, e.g. massage
Emotional conditions	**Emotional conditions**
● Anxiety or worry	● Positive emotions
● Tension	● Relaxation
● Depression	● Rest
Mental conditions	**Mental conditions**
● Focusing on the pain	● Intense concentration or distraction
● Boredom	● Involvement and interest in life activities

• **Figure 3.2:** Conditions that can open or close the pain gate (Source: Sarafino, 1994)



Evaluation of gate control theory

- The model has received much empirical support from a range of studies, although the exact mechanisms involved in the pain process are still not known.
- There remains no direct evidence of either the gating transmission or the transmission cells (T- cells) although it assumed that these exist in some form in the nervous system

- The model is the best available for explaining many of the above puzzling characteristics of pain by recognizing the need otinclude psychological factors (eg. Cognition, emotion) and not simply physical factors in understanding pain.

Socio-cultural influences on pain

- Pain experience is expressed differently across cultural groups.
- Social learning influences pain tolerance levels, communication about pain, pain behaviours and the meaning of pain.
- Cultural influences may encourage avoidance or acceptance of pain, demonstrable pain behaviours or stoic concealment.
- It may also affect the treatment received within healthcare systems in terms of cultural expectations and communication traditions.
- Further research is needed on the influence of social factors and discrimination on the experience of pain treatment for minority groups.

Measuring Pain

Our perception of pain is affected by a wide range of situational, behavioural and emotional factors making it an especially subjective experience. This means that other people's pain is very difficult to assess. However, the assessment of pain is important for research and as a diagnostic tool for medical treatment.

One approach to pain measurement is that of Karoly (1985) who suggests that we should not just focus on the immediate experience of pain but should examine all the factors that contribute to pain.
Karoly identifies six key elements:

1. *Sensory* – for example, the intensity, duration, threshold, tolerance, location.
2. *Neurophysiological* – for example, brainwave activity, heart rate.
3. *Emotional and motivational* – for example, anxiety, anger, depression, resentment.
4. *Behavioural* – for example, avoidance of exercise, pain complaints.
5. *Impact on lifestyle* – for example, marital distress, changes in sexual behaviour.
6. *Information processing* – for example, problem-solving skills, coping styles, health beliefs.

The methods that psychologists can use to collect information about pain include;

- physiological measures
- Self report measures / Psychometric measures eg. McGill Pain Questionnaire (MPQ)
- Behavioural observation e.g. UAB

Physiological measures of pain

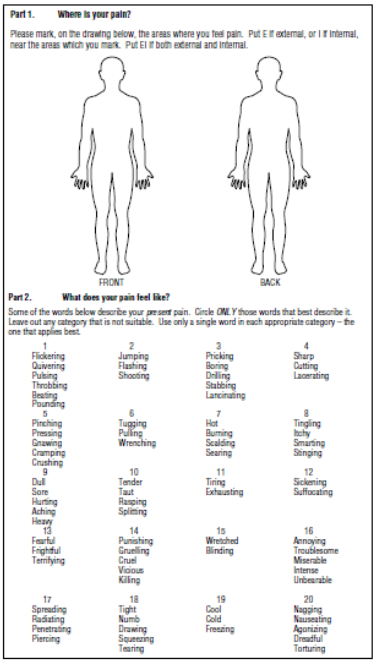
The most obvious way to measure pain physiologically is to assess the extent of the tissue damage or injury, that is, the more injured someone is, the more pain they must be in. However, as mentioned above, the relationship between tissue damage and the subjective experience of pain is very complex and this is not a valid way of assessing pain.

Muscle tension is associated with painful conditions such as headaches and lower backache, and it can be measured using an electromyograph (EMG), which measures electrical activity in the muscles. Some link has been established between headaches and EMG patterns, but EMG recordings do not generally correlate with pain perception (Chapman et al., 1985) and EMG measurements have not been shown to be a useful way of measuring pain.

Another approach has been to relate pain to autonomic arousal (i.e. the 'fight or flight' response). By taking measurements of pulse rate, skin conductance and skin temperature, it may be possible to measure the physiological arousal caused by experiencing pain.

Finally, since pain is perceived within the brain, it may be possible to measure brain activity, using an electroencephalograph (EEG), in order to determine the extent to which an individual is experiencing pain. It has been shown that subjective reports of pain do correlate with electrical changes that show up as peaks in EEG recordings; moreover, when analgesics are given, both pain report and waveform amplitude on the EEG are decreased (Chapman et al., 1985). However, the correlation between subjective experience of pain and EEG measures is relatively weak, and so this is not a completely reliable technique.

The advantage of physiological measures of pain is that they are objective. On the other hand, they involve the use of expensive machinery and trained personnel. Their main disadvantage, however is that they are not valid. For example, autonomic arousal can occur in the absence of pain; being wired up to a machine may be stressful and can cause a person's heart rate to increase. A person's perception of their pain may also affect their level of arousal; if someone is very anxious about the process of having his or her pain assessed, or else is worried about the meaning of the pain, this will cause physiological changes not necessarily related to the intensity of the pain being experienced.



Part 1. Where is your pain?

Please mark, on the drawing below, the areas where you feel pain. Put E if external, or I if internal, near the areas which you mark. Put EI if both external and internal.

FRONT BACK

Part 2. What does your pain feel like?

Some of the words below describe your *present* pain. Circle *ONLY* those words that best describe it. Leave out any category that is not suitable. Use only a single word in each appropriate category – the one that applies best.

1 Flickering Quivering Pulsing Throbbing Beating Pounding	2 Jumping Flashing Shooting	3 Pricking Boring Drilling Stabbing Lancinating	4 Sharp Cutting Lacerating
5 Pinching Pressing Gnawing Cramping Crushing	6 Tugging Pulling Wrenching	7 Hot Burning Scalding Searing	8 Tingling Itchy Smarting Stinging
9 Dull Sore Hurting Aching Heavy	10 Tender Taut Rasping Splitting	11 Tiring Exhausting	12 Sickening Suffocating
13 Fearful Frightful Terrifying	14 Punishing Gruelling Cruel Vicious Killing	15 Wretched Blinding	16 Annoying Troublesome Miserable Intense Unbearable
17 Spreading Radiating Penetrating Piercing	18 Tight Numb Drawing Squeezing Tearing	19 Cool Cold Freezing	20 Nagging Nauseating Agonizing Dreadful Torturing

Figure 3.3: Extract from The McGill Pain Questionnaire

Self-report measures / Psychometric Measures

The more common way of obtaining information about pain is to use questionnaires and visual rating scales such as the McGill Pain Questionnaire (Melzack,1975). This questionnaire has questions that refer

to sensory elements of pain, emotional elements, evaluative (cognitive) elements and miscellaneous elements. The first 20 questions on the McGill Pain Questionnaire (MPQ) consist of adjectives set out within their sub-classes, in order of intensity. Questions 1 to 10 are sensory, 11 to 15 affective, 16 is evaluative and 17 to 20 are miscellaneous. Patients are asked to tick the word in each sub-class that best describes their pain. Based on this, a pain rating index (PRI) is calculated; each sub-class is effectively a verbal rating scale and is scored accordingly (that is, 1 for the adjective describing least intensity, 2 for the next one and so on). Scores are given for the different classes (sensory, affective, evaluative and miscellaneous), and also a total score for all the sub-classes. In addition, patients are asked to indicate the location of the pain on a body chart (using the codes E for pain on the surface of the body, I for internal pain and El for both external and internal), and to indicate present pain intensity (PPI) on a 6-point verbal rating scale. Finally, patients complete a set of three verbal rating scales describing the pattern of the pain.

The MPQ has been extensively used and extensively researched. It is seen as being generally reliable and valid (Karoly, 1985) but it is not without some criticism. There are some questions about how well it can distinguish between different types of pain, and it is also possible to criticise it for the language it uses and the different ways that different people will interpret it.

Behavioural Observations of pain behaviours

People tend to behave in certain ways when they are in pain; observing such behaviour could provide a means of assessing pain. Turk, Wack and Kerns (1985) have provided a classification of observable pain behaviours.

- Facial/audible expression of distress: grimacing and teeth clenching; moaning and sighing.
- Distorted ambulation or posture: limping or walking with a stoop; moving slowly or carefully to protect an injury; supporting, rubbing or holding a painful spot; frequently shifting position.
- Negative effect: feeling irritable; asking for help in walking, or to be excused from activities; asking questions like 'Why did this happen to me?'
- Avoidance of activity: lying down frequently; avoiding physical activity; using a prosthetic device.

A commonly used example of an observation tool for assessing pain behaviour is the UAB Pain Behaviour Scale designed by Richards et al. (1982). This scale consists of ten target behaviours and observers have to rate how frequently each occurs. The UAB is easy to use and quick to score; it has scored well on inter-rater and test-retest reliability. However, correlation between scores on the UAB and on the McGill Pain Questionnaire is low, indicating that the relationship between observable pain behaviour and the self-reports of the subjective experience of pain is not a close one. This is perhaps not surprising given the number of social and psychological factors that can affect what people say about their pain (for example, anxiety, depression, the need to let others know how ill they are and so on). Furthermore, Behavioural assessment is less objective than taking physiological measurements, because it relies on the observer's interpretation of the patient's pain

behaviours (although, in practice, this can be partly dealt with by using clearly defined checklists of behaviour and carrying out inter-rater reliability, that is, using two independent observers and comparing their findings).

Turk et al. (1983) describe techniques that someone living with the patient (the observer) can use to provide a record of their pain behaviour. These include asking the observer to keep a pain diary, which includes a record of when the patient is in pain and for how long, how the observer recognised the pain, what the observer thought and felt at the time, and how the observer attempted to help the patient alleviate the pain. Other techniques are to interview the observer, or to ask the* observer to complete a questionnaire containing questions about how much the pain interferes with the patient's normal activities and social life, the effect of the pain on family relationships and on the moods of both patient and observer.

Measuring pain in children

An interesting problem with measuring pain is how to do this with children. It seems that even very young children experience pain in much the same way as adults, but the fact that they have limited or no language abilities creates difficulties in assessing their pain.

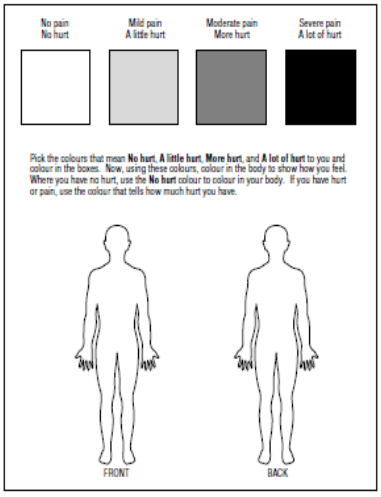
As children mature, they experience an increasingly wide range of physical sensations and learn to describe the various dimensions of the experience of pain in language that is used by those around them, i.e. family, friends, what appears on TV.

When questioning young children about their pain, it is important to use vocabulary they are familiar with and to take into account the developmental stage they are at. A 3-year-old would be unable to complete the McGill Pain Questionnaire not only because of the sophisticated vocabulary, but also because the child may not have learned, for example, to distinguish between internal and external pain.

Observing pain behaviours is a valuable way of measuring pain in children, particularly if they are too young to communicate through the use of language. Such pain behaviours include crying and moaning, flailing about and grimacing (although these behaviours are also carried out in the absence of pain).

Specific scales have been developed for recording pain behaviour in infants, both by parents and health care professionals in a clinical setting. Most ways of assessing pain in children consist of interviews or behavioural assessments, but researchers are now developing appropriate self-report methods. It is possible to ask children about the pain they are experiencing once they have reached a certain age, but certain specific skills are required. It is very important to establish a good rapport with the child and this may be especially difficult if he or she is suffering. Questions have to be asked in the right way, using terminology and concepts that the child is familiar with, and the interviewer has to ensure that the child does indeed understand the questions being asked. Difficult or upsetting questions should be interspersed with easier ones. Finally, the answers given by the children need to be interpreted correctly.

An increasing number of self-report scales for use with children are being developed. Children are able to report how much and what kinds of pain they are experiencing, but the scales used must be appropriate to their developmental level and their language abilities. For example, instead of asking young children to rate intensity of pain on a scale from 1 to 10, they can be presented with a set of line drawings of faces displaying increasingly severe expressions of pain.



• **Figure 3.4:** Extract from the Varni-Thompson Paediatric Pain Questionnaire

The Varni/Thompson Pediatric Pain Questionnaire is an example of a self-report scale specifically designed for children (McGrath and Brigham, 1992).

This includes visual analogue scales, colour-coded rating scales (in which the children have to pick colours that represent 'no hurt', 'a little hurt', 'more hurt' and 'a lot of hurt', then colour in a body chart) and verbal descriptors to provide information about the sensory, affective and evaluative dimensions of the pain.

The questionnaire also asks parents and doctors for information about the child and the family's pain history (including pain relief interventions) and about socio-environmental factors that might affect the pain.

The use of pain behaviour scales with children needs to be treated with caution; behavioural ratings do not always relate exactly to experienced pain intensity. Children can exhibit distress for emotional reasons, even when they are not in pain; some children can be very stoical and calm even though they are suffering. It is important to know the child well when interpreting her pain behaviours as signs of suffering.

Managing and controlling pain

Pain management is an area of research that has grown considerably in the last 20 years. Carroll (1993b) argues that this has lead to considerable change in the clinical practice of pain treatment. It is still very common for pain relieving drugs to be the main focus of treatment, especially with acute pain, although drugs are also often used for chronic pain without proper pain assessment. There are obvious reasons for this, when time and money are in short supply, and patients often have a long wait to be referred to a specialist who might use other methods to control and manage their pain. Attitudes to pain have changed and the idea that pain is to be 'expected' or is 'natural' is outdated. It is now considered that 'patients have a right to no pain' Carroll (1993a, p. 1). Pain relief in childbirth is a good example of this, where epidural blocks are widely used in contemporary maternity units. Some of the methods for controlling and managing both acute and chronic pain are considered below.

Medication (Chemical/Drugs)

The most common form of treatment for both acute and chronic pain is medication:

- peripherally active analgesics (e.g. aspirin) act at the site of the pain
- centrally active analgesics (e.g. morphine) act within the central nervous system
- local anaesthetics (e.g. novocaine) act to block all messages from the site of the pain
- indirect drugs (e.g. anti-depressants) work by improving mood (and closing the 'gate').

The main ways of administering drugs for acute pain are either through injection or pills. One technique for giving intravenous painkillers is through patient-controlled analgesia. This involves the use of an infusion pump where the patient can press a button to administer a dose of the drug. The doses are regulated by amount and frequency to prevent overdose. Using patient-controlled analgesia avoids the delay in treatment of pain by busy ward staff, and can also give patients a greater sense of control over their pain. Citron et al. (1986) looked at the effects of patient-controlled analgesia on a group of male cancer patients with severe pain. Citron found that their rate of morphine use declined dramatically over a period of two days, when they were able to dose themselves.

Surgical methods

Surgery is used, for example, in the treatment of trigeminal neuralgia where the nerve transmitting the pain messages is actually destroyed by means of a heated needle inserted into the face. The problem with this type of treatment is that it can cause numbness in the face around the site of the nerve, and occasionally can cause paralysis. Another more successful treatment for pain is synorectomy, where the surgeon removes inflamed membranes in arthritic joints. However, these procedures are usually only used as a last resort if all other methods have failed.

Psychological techniques:

Cognitive approaches to pain

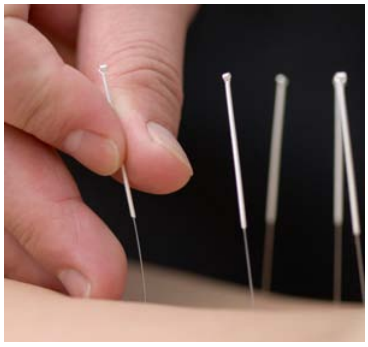
Redefinition is a process that involves a person replacing fearful or distressing thoughts about pain with more positive or realistic thoughts (Fernandez, 1986). Explaining clearly what causes a chronic pain or giving accurate information about a procedure that has not yet taken place can help patients redefine how they feel about the experience when it happens. Reducing anxiety may reduce the expectation of pain and therefore the experience of it (Anderson and Masur, 1983).

Distraction is a method where those in pain focus on a non-painful stimulus in their immediate environment. Doctors' treatment rooms often have pictures on the walls (especially for children) to distract attention away from any uncomfortable or painful procedure. Magazines and books also help to focus attention away from the cause of the visit. Beales (1979) described the use of distraction in a study that looked at how nurses distract children with conversation while a doctor is stitching a wound. Often children noticed no pain until the doctor commented on some aspect of the procedure, at which point Beales points out the children start to notice the pain.

Patients can learn to use imagery by focusing on an image that is incompatible with or unrelated to the pain. This is sometimes referred to as non-pain imagery or guided imagery (Sarafino, 1994). An example of this might be a warm relaxing image, such as a beach or other place that the patient might enjoy. Imagery works well with mild to moderate pain, rather than strong pain (Ralphs, 1993).

It is important that distraction is realistic and credible; asking someone to carry out a pointless task to distract his or her attention may not work. Something more meaningful, however, such as reading a book or watching a film might give more lasting relief. Similarly, a limitation of the use of imagery is how well a person is able to use his imagination, as some people are better than others at this technique. Cognitive approaches, such as pain redefinition, require patients to be articulate and willing to think and talk about their pain. This means that well-educated people are likely to find this type of therapy more useful than other people.

Alternative techniques: Acupuncture



Acupuncture is the ancient art of sticking needles into specific points on the skin and then continuously stimulating them, either electrically or by manually twirling the needles. There has been considerable scepticism in the West about this Eastern treatment, but it is now accepted as a treatment for pain, and there are examples of its successful use on people with chronic pain.

In a study on hospice patients where weekly acupuncture treatments were given over a six-week period, patients reported an excellent or good response to the acupuncture in over 60 per cent of the cases, and the majority of patients had no adverse effects (Leng, 1999). Also, a review of acupuncture use for recurrent headaches found that it had some use, although the quality of evidence was not fully convincing (Melchart *et al.*, 1999). Melzack and Wall (1982) found acupuncture to be more effective than a placebo in producing pain relief and, since it can produce analgesia in both dogs and monkeys, cannot be explained by the placebo effect alone.

Other review studies have also found this mixed evidence for the effectiveness of the treatment. Some studies on chronic pain found acupuncture provided some relief, but again the evidence was not convincing (Smith *et al.*, 2000, Ezzo *et al.*, 2000). The problem with the evidence is the lack of controlled trials which compare acupuncture with sham acupuncture – placebo controls where you presumably stick needles in anywhere rather than in the acupoints. Although acupuncture often seems effective compared with no treatment at all, it does not do so well when compared with placebos.

Alternative techniques: Transcutaneous electrical neural stimulation (TENS)

TENS treatment has been successfully used since the early 1970s, most notably with arthritis patients and for childbirth pain relief. Electrodes are placed on the surface of the skin (covering about 4 cm of the skin surface) and are then electrically stimulated. Many of these units are portable and run on re-chargeable batteries. Patients can control the strength and duration of stimulation to suit their needs. Results show that pain relief is not only achieved during stimulation but also persists for hours after stimulation has ceased. This technique has been used effectively to treat both acute and chronic pain.

The use of TENS has not been reliably demonstrated to be more effective as an analgesic in pain relief compared with drug therapy or surgery, although TENS patients did request fewer doses of drugs to control their pain and were discharged sooner from hospital compared with standard post-surgery care (Nelson and Planchock, 1989).

Comparison of TENS with placebo control trials (in which patients are led to believe that they were receiving pain relief but in fact there was no active agent) showed no significant differences in pain relief for pregnant women during the first stage of labour (van der Ploeg *et* a/., 1996). This suggests that there may be aplacebo effect involved (e.g. expectation of relief may have contributed to observed effects). However, a review of the use of TENS with arthritis patients by Melzack and Wall (1982) showed that TENS produced significant pain relief. It was also considered to be effective for patients who had not received relief following other treatment methods, including surgery.

Summary

We have seen that the measurement of pain is a difficult issue. A range of physiological measures have been developed which appear to measure some aspects of pain, although these may be questioned in terms of their reliability and validity. Behavioural assessment of pain is a complementary measure that focuses on the pain behaviours of the pain patient, and uses behaviourist theory to suggest how pain behaviours may be reinforced in the patient. Self-report measures of pain include rating scales and pain questionnaires. We have also seen how varied the medical and psychological treatments for pain can be, depending on the type of pain experienced and the theoretical position adopted. Most pain conditions are now treated with a combination of medical and psychological approaches, making this distinction now less appropriate. The wider acceptance of the biopsychosocial model of health together with the use of multimodal approaches in treating pain and the growth in pain clinics all support this initiative.

Adherence to medical advice:

Types of non-adherence and reasons why patients don't adhere

Adherence to medical advice refers to how far people follow the advice of a doctor or health worker. Although you would assume medical advice would automatically be followed, surprisingly it would seem that many people just do not do what the health professional has asked of them. Studies have suggested that about half the patients with chronic illnesses such as diabetes and hypertension (high blood pressure) are non-compliant with their regime. Implications of non-adherence include prolonged illness, extra visits to doctors and hospitalization.

Some researchers refer to compliance to medical requests and others refer to adherence. Compliance seems to imply that a patient might be going along with the doctor's wishes against their own better judgment. So the modern preferred term is adherence which implies that the patient is going along with what the doctors says from a point of willing agreement.

Examples of and extent of non-adherence

- Taylor (1990) suggested that 93% of patients fail to adhere to some aspect of their treatment whereas Sarafino(1994) argued that people adhere reasonably closely about 78% of the time for short-term treatments and 54% for long term chronic illnesses. The differences in such figures illustrates both different definitions of adherence, and the difficulty in actually measuring adherence.

- A study by Sackett (1976) found that 50% of patients in America did not take prescribed medications according to the instructions and scheduled appointments for treatment were missed 20-50% of the time. .
- McKenny (1973) looked at hypertension. He studied 50 patients for 7 months. He found that only 65% of pills were taken. Only 20% of the patients took as many as 90% of the pills and that after the detection of High blood pressure only 50-70% sought treatment. 33% of those who sought it dropped out.

- A study by Becker (1972) looked at whether a prescribed anti-biotic was being taken halfway through a 10 day treatment programme in young children. Over half the mothers had stopped giving the medicine at this time.
- Banyard (p 44) suggests that compliance varies with the nature of the request: Short term regimes with simple treatments have a higher rate of adherence. The more complex and longer the regime the less likely the patient is to adhere fully.

The reasons why people do not adhere are complex and may be multi-dimensional. We will look at the following causes of non-adherence;

Rational non-adherence

One of the most obvious reasons why patients do not comply with health requests is that they do not believe it is in their best interests to do so – the patient is making a rational decision not to comply - such as concerns about the possible side effects of their treatment. Adherence decreases if the treatment seems worse than the illness, and this is particularly true if it affects cognitive functioning. Patients are prepared to suffer some physical discomfort as a side effect - nausea, for example - but are less willing to suffer problems with concentration, visual disturbance or sense of balance (Kent and Dalgleish, 1996).

Related to this is the idea that the diagnosis or treatment may be wrong. While the majority of patients have to trust their doctors, whom they accept must be more knowledgeable than themselves, doctors still need to convince their patients that they know what they are talking about (they must be credible), and that the treatment they are suggesting is the best one for that particular patient. Non-adherence may become a problem if the patient does not believe in the effectiveness of the treatment offered.

For example, a study by Bulpitt (1988, cited in Kaplan *et al.,* 1993) on the use of treatments for hypertension found that the medication improved the condition by reducing the symptoms of depression and headache, but it also had the side-effects of increased sexual problems such as difficulty with ejaculation and impotence. For some men this would not be a price worth paying. It would therefore be a rational decision to decline to take the medication.

Studies on adherence rarely consider the negative outcomes of the treatment that the patient is being asked to follow, and the costs of adherence are rarely calculated. Various studies, however, have found that treatment programmes often have serious side-effects. For example, Williamson and Chapin (1980) suggest that 10 per cent of admissions to a geriatric unit were the result of undesirable drug side-effects. So if we are looking at adherence we should also consider the negative effects of the treatment and the preferences of the patient.

Customising treatment

Individuals have their own way of doing many everyday tasks. They may like to eat their food in a particular way, keep certain photos with them all the time, or organise their living room just as they want it. They are not fussy, they are just customising their lives. In a similar way, people also seem to **customise** their treatment programmes. They might consult their GP but they probably also take advice from family and friends. They might pick up health tips from magazines and television and may well choose to buy some over the counter medicines (which are not under the control of the doctor) to add to their customised healthcare programme. Older people tend to be more proactive in their healthcare and make a lot of use of over the counter medicines. A study of elderly patients in Britain suggested that their purchase of these medicines
fell into four categories (Johnson and Bytheway, 2000):

• prevention and maintenance, which are mainly nutrition supplements like vitamins or products that are ‘good for the blood’
• alternatives to going to the doctor, for conditions such as indigestion, skin irritations, or headaches
• supplements or replacements for prescription medicines, such as painkillers or other medicines recommended by the doctor
• items to counteract the side-effects of prescription medicines, for example laxatives to counteract the constipation caused by many painkillers.

So if we take this customising of treatment into account, are these people adhering to the health requests or not? In the strictest sense they are not, but they may well be following a programme that is right for them and makes best use of the available information.

The complexity of the message

The complexity of the instructions that patients have to follow can have a marked effect on their ability to understand and remember what they must do. One of the most straightforward problems for patients is remembering what doctors have told them to do, and it is important not to underestimate the importance of this simple problem, as it can seriously undermine adherence in spite of the best intentions a patient may have. Kent and Dalgleish (1996) cite studies that have found that patients forget what doctors have told them within a very short period of time. Different studies have found that patients can forget up to 50 per cent of what they were told almost immediately after their consultation.

People can also be easily baffled and intimidated by technical terms. This is particularly true in the area of health where are there numerous big words for relatively simple procedures. If you look at the following commonly used medical terms, are you confident you know what they refer to?

protein
haemorrhoid
antibiotic
virus
anti-emetic
insulin
enema

If you take the term ‘virus’ then this is something we might refer to in everyday conversation. ‘I’m not going to work today, I’ve got a bit of a virus.’ What does it mean to ‘have a virus’, and do we know what a virus is and how we should treat it?

McKinlay (1975) carried out an investigation into the understanding that women had of the information given to them by health workers in a maternity ward. The researchers recorded the terms that were used in conversations with the women and then asked them what they understood by 13 of these terms including: *breech*, *purgative*, *mucus*, *glucose* and *antibiotic*. On average, each of the terms was understood by less than 40 per cent of the

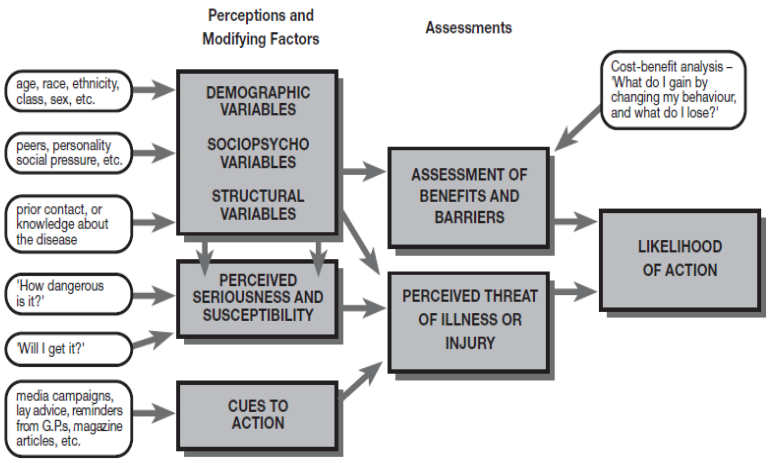
women. Even more remarkable were the expectations of the health workers who used the terms. When they were asked whether they expected their patients to understand these terms their estimates were even lower than 40 per cent.

It seems that the health workers did not expect their patients to understand what they were being told, so why did they use the difficult terms? The likely answer is that medical language probably makes the health worker appear more knowledgeable and more important, and it might also make the conversation brief because the patient will not be able to ask any questions without the fear of appearing stupid. The problem is that if patients do not understand the information, or are unable to remember it, then they have little chance of adhering to the treatment programme.

Psychological / Cognitive reasons for non-adherence

- Health Belief Model
- Locus of control
- Self efficacy

The **Health Belief Model** (Becker and Rosenstock, 1984) suggests that the likelihood that a person will carry out a behaviour that will protect their health depends on two assessments:



Evaluating the threat

When we are confronted with a health risk we evaluate our personal threat by considering how serious the condition is (*perceived seriousness*), and how likely we are to get it (*perceived vulnerability*). For example, if a person is overweight they might be in danger of developing a heart condition. The person would probably recognise this as a serious condition, but they might believe that because they are still quite young they are unlikely to develop this problem just yet. Therefore they might judge the threat as relatively low. Even if we judge the threat to be serious, we are only likely to act if we have some cue to action. This cue might be a physical symptom like developing chest pains, or it might be a mass media campaign, or it might be the death of a colleague with heart disease.

Cost – Benefit analysis

The other assessment is a cost–benefit analysis which looks at whether the *perceived benefits* of changing our behaviour exceed the perceived barriers. The barriers might be financial, situational (difficult to get to a health clinic), or social (don't want to acknowledge getting old). The benefits might be improved health, relief from anxiety, and reduction of health risks. Using this health belief model people can decide whether to follow or not follow medical advice, depending on how they feel about these issues concerning their health.

The model has attracted a large amount of research and much of it is supportive of the basic theory. However, there is no standard way of measuring the variables in the model such as **perceived susceptibility**.

Locus of Control

Psychologists believe that the amount of control that we *perceive* ourselves to have is very important to us. Rotter (1966) first described the concept of **locus of control and** refers to the sense of control a person feels over their situation. He suggested that people differ in the way they experience their locus of control – in other words, where the control over events in their life comes from. Some people experience themselves as having an *external locus of control*, which means they do not feel in control of events. They perceive their lives as being controlled by outside forces; in other words, things happen to them. On the other hand, some people experience themselves as having an *internal locus of control*, which means they experience themselves as having personal control over themselves and events; in other words, they do things. The more a person feels in control of their health and their treatment, the more likely they are to comply with the treatment programme.

Self-efficacy

The belief that you can perform adequately in a particular situation. Your sense of personal competence influences your perception, motivation and performance. Bandura (1977) suggested that self-efficacy beliefs are important to us, because they are concerned with what we believe we are capable of. If we believe that we are able to engage in certain types of actions successfully, then we are more likely to put effort into carrying them out, and therefore we are more likely to develop the necessary skills. It seems likely that beliefs about our self-efficacy will affect how much effort we put into any activity. In the area of health, if we do not believe that we can change our lifestyle and, for example, give up smoking, then we will probably not even try. If we want a patient to follow a treatment programme then we need to ensure that they believe that they are capable of carrying it out.

Measuring adherence/non-adherence

It is important to develop reliable ways of measuring adherence, and Cluss and Epstein (1985) suggest that the following methods can be used:

1. *Self-report:* Ask the patient and they may tell you how adherent they have been. This however presents three problems;

- It is a consistent research finding that patients overestimate their adherence to the treatment programme, perhaps because they know they "should follow doctors orders'.

- Another problem with self report data is that it is open to various forms of bias including lying and wishful thinking. One of the reasons for this is to present a good impression to the health workers. This can be very important, since the patient might well believe that they will only receive the best treatmen tif the health staff believe that they are carrying out their instructions. An extreme example is of smokers who have been refused treatment if they admitted that they were still smoking.

- The types of people that respond to self report measures (eg. questionnaires) are the people that are more likely to adhere to treatment plans or medical advice. For example a study by Riekert & Drotar (1999) compared two groups of adolescents with diabetes. One group participated in the questionnaire (returners) and the other group didn't) non-returners. Despite being similar demographically, non-returners had significantly lower treatment adherence scores and tested their blood sugar less frequently than the participant (data available from clinics). Therefore researchers can only measure adherence from those that make themselves available for research

Pill and bottle counts: If we count the number of pills left in the bottle and compare it with the number that ought to be there then we should patients can throw the pills away, and unless we have random, unexpected raids on bathroom cabinets by crack teams of experimental psychologists, we are not much further forward than the method of self report. A study in London used an electronic device (TrackCap) on the medicine bottle which recorded the date and time of each use of the bottle (Chung and Naya, 2000). The patients were told that adherence rates were being measured, but were not told about the details of the TrackCap. The medicine was supposed to be taken twice a day, so a person was seen as adhering to the treatment if the TrackCap was used twice in a day, 8 hours apart. Over a twelve-week period, compliance was relatively high (median 71 per cent), and if the measure was a comparison of TrackCap usages with the number of tablets then adherence was even higher (median 89 per cent). Track cap is an ecologically valid way of measuring compliance, as the patient does not have to depart from normal routines. However, they knew they were being monitored so demand characteristics are high - patients can easily throw the pills away.

3. ***Biochemical tests**:* It is possible to use blood tests or urine tests to estimate how adherent a patient has been with their medication. For example, it is possible to estimate adherence with diet in renal patients by measuring the levels of potassium and urea in their blood when they report for their next session of dialysis. However whilst urine and blood samples are accurate ways of checking on compliance a patient could easily take the required dose just before the appointment with the doctor. Also one has to take account of a patient's metabolism or biochemical response to the prescribed drugs.

4.***Repeat prescriptions*** Another study on asthma medicines, this time inhalers, checked for adherence by telephoning the patient's pharmacy to assess the refill rate (Sherman *et* a/., 2000). They calculated adherence as a percentage of the number of doses refilled divided by the number of doses prescribed. This study of over 100 asthmatic children in the USA was able to compare pharmacy records with doctor's records and with the records of the medical insurance claims for treatment. They concluded that the pharmacy information was over 90 per cent accurate and could therefore be used as basis for estimating medicine use. They also found that adherence rates were generally quite low (for example 61 per cent for inhaled corticosteroids), and that doctors were not able to identify the patients who had poor adherence. Sherman's study of measuring by checking against the dispensing record reduces demand characteristics whilst retaining high ecological validity. Also, checking the dispensing records against medical records and insurance claims is known as checking for concurrent validity.

Improving adherence

As well helping us to understand why people do not adhere to medical advice, Psychology can help us improve adherence to medical treatment programmes. Some strategies are;

1.Providing accessible information

The study by **McKinley (1975)** mentioned earlier shows that medical language can be confusing and intimidating. People will be more likely to follow the instructions for their treatment if they understand what they have to do and why they have to do it. One of the important factors here is the quality of the communication between health worker and patient .

A range of training programmes for health workers has been used to improve this communication and Sarafino (1994) summarises the general findings from these studies:

• verbal instructions should be as simple as possible and should use straightforward language:
• instructions should be specific rather than general
• break complicated treatment programmes down into a series of smaller ones
• key information should be emphasised
• use simple written instructions

• get the patient to repeat the instructions in their own words.

2. Improving memory – clear, structured information

One of the problems for patients in a medical consultation is **remembering** what they have been told by the health worker. We are not very good at remembering detail at the best of times, and it is even harder to remember material that we do not understand or material that is new to us.

Do people remember information from consultations? Ley (1988) investigated this by speaking to people after they had visited the doctor. They were asked to say what the doctor had told them to do and this was compared with a record of what had actually been said to them. Ley found that people were quite poor at remembering medical information. In general, patients remembered about 55%of what their doctor had said to them, but the inaccuracies were not random ones.

Ley found the following patterns in the errors made by the patients:

• they had good recall of the first thing they were told (the **primacy effect**)
• they did not improve their recall as a result of repetition – it did not matter how often the doctor repeated the information
• they remembered information which had been categorised (e.g. which tablets they should be taking) better than information which was more general they remembered more than other patients if they already had some medical knowledge.

In a follow-up to the study, Ley prepared a small booklet giving advice to doctors on how to communicate more clearly with their patients. Patients whose doctors had read the booklet recalled on average 70 per cent of what they had been told, which was a significant increase on the previous figure.

Structured information improves recall

In an earlier study Ley *et al.* (1973) investigated how accurately people remember medical statements. Patients attending a general practice surgery were given a list of medical statements and were then asked to recall them. The same list was also given to a group of students. The statements were either given in an unstructured way, or were preceded by information about how they would be organised. For example, a structured presentation might involve the researcher saying something like, ‘I’m going to tell you three things: firstly, what is wrong with you; secondly, what tests we will be doing, and thirdly, what is likely to happen to you’.

When they were tested to see how much they remembered, Ley *et al.* found that structuring the information had made a very clear difference. The patients who had received the information in a clearly **categorised** form remembered about 25 per cent more than those who had received the same information in an unstructured way. This study however, lacks ecological validity as it was based on learning list, and not information given in a genuine medical consultation.

Behavioural strategies

Many behavioral strategies have been found to be successful in increasing adherence with medications. **Behaviourism** is one of the main approaches in the history of psychology. It developed from the writings of John Watson (1913) and incorporated the early work of Skinner, Pavlov and Thorndike. It focuses on what people do and looks to explain it terms of the stimuli that precede the behaviour and the rewards that follow it. The theory has developed over the last 100 years and there are many behavioural interventions that are still used. There are a number of effective behavioural approaches to adherence including:

Feedback: where the patient gets regular reports on the state of their health, and so is reinforced for their adherence behaviour.

Self-monitoring: where the patient is encouraged to keep a written record of their treatment, such as their diet or their blood–glucose levels (diabetics).

Tailoring the regime: where the treatment is customised to fit in with the habits and lifestyle of the patient. Taylor (1986) suggests that the health worker is a very credible source who can tailor the health message to the individual needs of the patient and thus encourage adherence. The face to face nature of the interaction between patient and health worker tends to hold the attention of the patient and allows the health worker to check that the patient understands what they need to do. The health worker can also enlist the support of other family members and increase the level of social support available to the patient. Finally, the health worker has the patient under partial supervision and so they can monitor their progress and encourage them to continue with the treatment.

Purpose: The purpose of this study was to evaluate the efficacy of the telephone as a tool to improve adherence to a cholesterol-lowering diet.
Method: Subjects were randomized to a control group and to a treatment group. Usual care for the control group consisted of follow-up physician visits and/or lipid measurements every 3–6 months. Subjects assigned to the treatment group received the intervention described in the following text.
Sample: The study enrolled 65 men and women diagnosed with hypercholesterolemia, who were considered nonadherent to a cholesterol-lowering diet.
Intervention: Members of the treatment group were required to participate in six intervention sessions delivered every 2 weeks via telephone. Telephone interventions were individually tailored and designed to focus on methods of managing eating behavior in difficult situations.
Results and Implications for Nursing Practice: There was a significant difference in total and saturated fat, dietary cholesterol adherence, and serum low-density lipoprotein cholesterol (LDL-C) between the control group and the intervention group. This behavioral intervention enhanced adherence to the recommended cholesterol-lowering diet. Implications are as follows: In light of the difficulties patients often face when attempting to follow a therapeutic eating plan, healthcare providers must rely on methods of improving adherence that have proved successful in similar situations.

Source: Burke, L.E., Dunbar-Jacob, J., Orchard, T.J., et al. (2005). Improving adherence to a cholesterol-lowering diet: A behavioral intervention study. *Patient Education and Counseling, 57*(1), 134–42.

Prompts and reminders:

Something that helps the patient to remember the treatment at the appropriate time, for example setting an alarm timer or receiving a reminder phone call. The study by Burke (2005) opposite demonstrates the efficacy of telephone reminders. A new strategy – the use of text messaging to adolescents with diabetes increased adherence to medical regimen

Contingency contract: where the patient negotiates a contract with the health worker concerning their treatment goals and the rewards they should receive for achieving those goals.

Modelling: where the patient sees someone else successfully following the treatment programme and imitates that behaviour.

Social Support

A final intervention found to be quite successful in improving and maintaining high levels of adherence to medical recommendations is that of social support, either from a health care professional or within one's personal environment. Factors that increase adherence include perceived support from the provider, patient satisfaction with the medical visit, and the support of family members in the home environment. The supporter can reinforce treatment by actually being involved in the administration of the medication or monitoring the patient's use. Support groups can also play an important role. Support groups for particular illnesses often encourage coping strategies and can offer help and guidance about treatment and medication.

Psychologist Nessman et al (1980, cited in Cluss and Epstein, 1985) looked at compliance and ways in which to improve it. They looked at the effectiveness of group sessions in patients with hypertension. They found that their experimental group improved their compliance from 38% to 88%. However, there were problems with the finding as the researchers were only able to persuade 56 people to take part in the study out of a possible 500. So,

similar to Reikert & Drokar's (1999) study it is more likely that the volunteers were more motivated than the people who declined to take part and the positive result could be explained by their motivation rather than the group sessions.

Improving adherence for children

Parents play a very important part in their child's health; their attitude about illness and treatment will affect a child's attitude to it..Parents can reinforce adherence to medical treatment by giving rewards. Medical equipment such as inhalers for asthma can be personalised with stickers of their own. The study below demonstrates one attempt to improve adherence among children.

Watt et al, 2003

Aim: To see if using a Funhaler could improve children's adherence to taking asthma medication

Method: A Field experiment with a RMD, Each child was given the standard inhaler for the 1st week and the funhaler for the 2nd week.

Sample: The participants were 32 Australian children (10 boys and 22 girls) with a mean age of 3.2 (between 1.5 and 6years old). They had all been diagnosed with Asthma and their parents had given informed consent.

Procedure: Parents completed a questionnaire at the end of the second week.

Findings: 38% more parents were found to have medicated their children the previous day using the funhaler compared to the standard inhaler.

Conclusions: Making a medical regimen fun can improve adherence in children.

Evaluation:
• Social Desirability - Parents completed the questionnaire
• Cannot generalise - Only conducted within Australia, Unrepresentative only children used

The Patient – Practitioner relationship

Underlying many of the factors affecting levels of adherence is the relationship between the doctor and the patient. This topic examines the communication between and the style of interaction of both the doctor and the patient. It also looks at some of the ways patients can abuse health services.

Practitioner and patient interpersonal skills

Interpersonal skills are very important in shaping doctor-patient interactions. The information that is gained during the consultation is of vital importance in the diagnosis and treatment of any condition, since in order to carry out diagnostic testing a doctor must first understand the nature of the problem. A successful interaction will depend on how effectively the doctor communicates with the patient.

But how do you **measure** the success of a relationship? One way is to look at **patient satisfaction.** A study of 800 patients by Sommers (1985) revealed that 24% were grossly dissatisfied, 11% noncompliant and 38% only moderately compliant. Reasons for patient lack of satisfaction included lack of friendliness, failure to consider the patient's concerns and the use of medical jargon

Practitioner and patient interpersonal skills

Non-verbal communication

One area of communication that has attracted the attention of psychologists is **non-verbal communication which is** a general term used to describe communication without the use of words. NVC can include tone of voice, facial expressions, body posture, gestures, dress and physical proximity.

This is very important in any social interaction and some psychologists (for example Argyle, 1975) suggest that it is four times as powerful and effective as verbal communication. So whilst a doctor might say the right words if we might sense from the non-verbal aspects of his/her communication that he/she is uninterested or not empathic. Non-verbal aspects may affect our trust of the doctor and our satisfaction with the consultation. A number of studies have looked at some non-verbal aspects of the consultation. One aspect is dress.

McKintsry & Wang (1991)

Aim: Impressions from dress

Procedure: They showed pictures of doctors to patients attending surgeries. The pictures were of the same male and female doctors dressed either formally, very informally (jeans, open necked, short-sleeved shirt). Patients were asked to rate how happy they would be to see the doctor in the picture and how much confidence they would have in the doctor's ability. Results showed that the traditionally dressed doctors received higher preference ratings than the casually attired ones, particularly on the part of older and professional-class patients

• **Figure 1.2:** Acceptable dress for doctors: Which of these people would you accept as a doctor and which would you be cautious of?

Verbal Communication: Use of jargon and technical language

Many studies suggest that patients understand relatively few of the complex terms that doctors use. It is estimated that a newly registered GP will probably have acquired more than 13,000 new words or terms that may confuse the patient during interview.

Bourhis et al (1989)

Aim: Bourhis *et al were* interested in finding out what factors affect communication between hospital staff and their patients. Their aims were to examine the relationship between:

a)the use of language between health professionals and their patients

b) the motivation either to change or to maintain the type of language used

c) the norms of communication in a hospital, and

d) the status and power differences that categorize patients, doctors and nurses

The sample included 40 doctors, 40 student nurses and 40 patients. All respondents were asked to complete a written questionnaire about the use of medical language (ML) and everyday language (EL) in the hospital setting. The questionnaire consisted of 4 sections. The first section asked about the amount of medical and everyday language the respondent used in the hospital with members of the other groups in the study. The second section asked the respondent to estimate how much ML and EL other members of their own group used with the other groups in the study. The third section asked the respondent to evaluate (on a 7-point scale) the appropriateness of the use of ML and EL among the study groups in the hospital setting. The fourth section asked the respondents for background information and about their attitudes to various communication issues in the hospital.

Results: Doctors' self-reports of their efforts to use EL with their patients were confirmed by other doctors but not by patients or nurses. Patients' self-reports stated that they themselves used EL, although those with limited knowledge of ML used this to try to communicate better with doctors. Doctors, however, did not encourage the use of ML by their patients, and reported the strongest preference of all the groups for patients to use EL. Nurses were reported to have a very particular role by all three groups in their use of both EL and ML. They were seen as 'communication brokers' between the EL of the patient group and the ML of the group of doctors. The nurses were perceived as being able to mediate between the doctors and their patients. All three groups agreed that EL was better for use with patients, and that use of ML often led to difficulties in communication.

Conclusion: One of the overall conclusions drawn from the results of the study was that doctors used ML as a way of maintaining their status in relation to their patient group. Their use of ML was also interpreted as a way of maintaining the power and prestige accorded to doctors within society as a whole. Therefore there is a strong motivation for them to maintain (or even increase) their use of ML. The fact that nurses were prepared to 'converge' with the doctors and patients is taken as an indication that they are less status conscious than doctors, as they are trained to know ML, just as doctors are. Bourhis *et* al suggest that the results show that experienced doctors and nurses, as well as students, might benefit from courses focused on effective communication between hospital staff and patients. They also note that a better understanding of the motivation behind the use of language may help to avoid communication breakdown between health workers and their patients

(see also McKinlay, 1975)

Improving communication

In order to improve communication it is important to have some understanding of the kinds of communication problems patients have. As mentioned in the previous section Ley found memory for the consultation to be quite poor. He made the following recommendations to improve communication and memory.

- Give instructions and advice early in the interview
- Stress the importance of the instructions and advice you give
- Use short words and sentences
- Arrange the information into clear categories
- Repeat advice
- Give specific, detailed, concrete advice rather than general recommendations

Di Matteo et al (1986): Physicians non-verbal communication (eye-contact, posture, nods, distance, communication of emotion through the voice and face) is positively related to patients satisfaction

Wasserman (1984) analysed effects of supportive statements made to mothers during paediatric visits. They found that empathic statements led to increased satisfaction and a reduction in maternal concerns. Encouragement (eg acknowledging coping efforts and appropriate self care) led to increased satisfaction and higher opinions of clinicians

Patient and practitioner diagnosis and style

One factor in the relationship between doctor and patient is the preferred **style** of the doctor. An issue here concerns the extent of involvement a patient wants. Some people prefer the doctor to take the lead, to ask questions, diagnose and provide a solution. Others have a need to be involved more in the process and particularly to feel that they have had a full opportunity to speak and to be heard.

Historical view

Medicine has traditionally been disease- and doctor- oriented relying on a narrow dualistic, reductionist biomedical model of health and illness. In other words it has had a view of the person as a machine to be fixed. With this model the patient is passive and ignorant and the doctor is the expert. The doctor is also seen as objective and able to make a rational diagnosis based on the facts as presented. Traditionally a doctor's training focused almost entirely on the view of man as a machine to be fixed and on the necessary knowledge and skills for doing that. Little or no attention was given to communication skills and empathic listening.

However, as we now acknowledge that health is a complex thing closely related to a person's lifestyle, attitudes and beliefs this old view of the doctor-patient relationships is no longer sufficient. Good communication skills become vitally important. Research has shown that up to 85% of patients are distressed and 75% have psycho-social problems requiring attention. Even more seriously as many as half of patients have significant psychiatric problems which go undetected.

• **Table 1.1:** Doctor-centred and patient-centred communication styles (adapted from Edelmann, 2000)

DOCTOR-CENTRED	PATIENT-CENTRED
Doctor's approach is based around status and control	Doctor aims to find out the patient's concerns and needs and adjust their responses to match
Doctor mainly gathers information	Doctor listens and reflects
Doctor asks: direct questions closed questions about medical 'facts'	*Doctor acts by:* offering observations seeking patient's ideas encouraging clarifying indicating understanding
Doctor acts by: making decisions instructing the patient	*Doctor acts by:* involving the patient in the decisions
Patient is expected to: be passive ask few questions not influence the consultation	*Patient is expected to:* be active ask questions influence the consultation

Interactions and diagnosis can be affected by the communicative style of the doctor. One way to categorise such interaction is by using terms – doctor-centred, and patient-centred.

Byrne and Long (1976) tape recorded 2,500 medical consultations in several countries including England, Ireland, Australia and Holland. Most styles were doctor-centred. Physicians asked questions that required only brief replies

(e.g. yes no, etc.). Focus was on the first symptom or problem that was reported by the patient. Doctors often ignored attempts by patients to mention other symptoms.

Bertakis et al (1991)

In a large study conducted over 11 sites in the USA, Bertakis et al. (1991) content analysed 550 physician-patient interviews. The interviews were tape recorded and patients completed a post-visit questionnaire. They found that physician questions about biomedical topics were negatively related to patient satisfaction while physician questions about psychosocial topics were positively associated with patient satisfaction. In addition, those patients whose physician dominated the interview reported less satisfaction. Bertakis et al. concluded that 'patients are most satisfied by interviews that encourage them to talk about psychosocial issues in an atmosphere that is characterized by the absence of physician domination' The Bertakis study however seems to contradict the study below.

Savage & Armstrong (1990)

In this study carried out in an inner London general practice patients were subjected to either a docor-centred or patient-centred style of consultation. The style was determined by the random selection of a card by the doctor which indicated the style he was to use. Doctor-centred style included statements like “You are suffering from…….” “You should be better in……” “ It is essential that you……..” Patient-centred included statements such as “What do you think is wrong?” “When would you like to come and see me again?”

Afterwards patients were given a questionnaire to measure satisfaction. Highest satisfaction was actually reported by those who received the directive approach. However there may be a number of possible confounding variables. The following evaluative points may apply;

- Self-reports – social desirability, demand characteristics, etc
- Ecological Validity/Generalisation/Control – realistic study but only using inner city London patients. Each patient and doctor interaction will be unique, so therefore the study loses control. Cant be generalized to the wider population, including those who are highly sensitive or seriously ill
- Ethics – lack of confidentiality owing to voice recordings – protection of participants (most serious cases or most sensitive patients excluded).
- Confounding variable – Doctor’s acting ability – but independent assessor checked.
- Possibly Ley’s model can be applied here. Perhaps the directed consultation was easier to understand and memorise and this produces satisfaction.

General evaluative points

In evaluating work in this area there are a number of issues you could consider:

- **Assumptions** about the nature of the relationship. Traditional models see the doctor as the expert with information to communicate with the patient. There is also an assumption that the doctor is an objective outsider to the situation. However, he will often have his own views on the nature of health and illness. Some studies have shown that doctor knowledge is not always what we might expect it to be!
- **Generalising** can be difficult because of doctor variability and also because of individual differences and preferences in patients.
- There are always big **ethical** issues in studying this area. There is the problem of confidentiality and informed consent. Of course informed consent may affect the way people behave if they know they are being studied. This then leads to bias as a consequence of **demand characteristics.**
- There is the problem of getting a representative **sample.**
- There may be issues of studies being **ethnocentric**. Different cultural groups may have different expectations of the relationship and different expectations of the role of the patient. In some cultures it might be difficult for a female to communicate with a male doctor.
- There are problems of **measurement**. How can you measure the success of a consultation? Is patient satisfaction enough? Is it a question of recovery, rate of recovery? Is it measured by compliance rates?

Practitioner Diagnosis: Heuristics

Given that a main part of doctors role is to diagnose illness we need to be aware of how they do this and the impact it has on the patient-practitioner relationship. Conclusions about illnesses can be affected by a number of factors including personal views about health and illness and any attitudes or biases s/he may have.

It has been found that doctors use a number of heuristics to aid in their diagnosis. Heuristics are a psychological concept that refer to shortcuts or ‘rules of thumb’ we use in our thinking and decision-making. Whilst useful in everyday thinking, they can lead to serious errors in judgment (wrong diagnosis) if doctors rely on them. There are two types of heuristics relevant here;

1.Representativeness. This happens when your thinking is overly influenced by what is *usually* true. Doctors will sometimes look at a set of symptoms and say that they're usually typical of condition X, because when they see those symptoms, patients usually have condition X. This is useful, because it allows doctors to

shortcut a whole in-depth examination of each individual patient. But it can cause them (and us) to overlook rare or unusual conditions that don't fit expectations. In other words it can lead to a type I error (false positive) – assuming there is an illness when there might not be one.

Example 1: Knowing a patient is a smoker, the doctor may be more likely to apply the 'representative heuristic' and diagnose a smoking related illness.

Example 2: A patient presents with newly diagnosed high blood pressure. He is obese, 60, and there is a family history of hypertension. On further questioning, he also reports night sweats and episodes of flushing. Knowing that these are symptoms of pheochromocytoma, a curable cause of high blood pressure, the physician orders an extensive, expensive, and invasive evaluation for that condition. However, night sweats and flushing are very common in the general population, and the likelihood of pheochromocytoma is very low (< 1% in newly diagnosed hypertensives). The doctor may have diagnosed a condition the patient doesn't have.

2. Availability. When doctors are influenced by what they have seen recently or what comes to mind more easily they are using the availability heuristic. Things that are familiar to you are more likely to influence your decisions than things that may be less familiar. Doctors who have recently seen a lot of cases of infection Y are more likely to diagnose infection Y, even if a patient has condition Z. What's immediately available to you in your mind and memory are just more present, tangible, and influential than more distant experiences. This can lead to a type II error (false negative). The doctor may have missed a serious diagnosis.

Example: A physician in the emergency department is evaluating a patient who presents with shortness of breath and a slight cough in the middle of a flu epidemic. He has correctly diagnosed influenza in eight patients today. He assumes she also has the flu, and misses a case of pulmonary embolism (blood clot in the lung).

Patient communication

Like doctors, patients have different ways of communicating that either help or hinder the doctor. For example;

- Patients with the same conditions may well focus on very different symptoms and describe these to the doctor.
- Patients attribution style – how they think about their health (see Kessler, 1991 study below)
- Patients may find it difficult to express their symptoms clearly, or may be embarrassed to self –disclose (see Robinson & West, 1992 study below)

- Language, cultural and gender barriers might make communication or self disclosure difficult

Patient disclosure

A lot of our information about health comes from the **self-reports** of patients and health workers. The questions that need to be addressed are how much we can rely on this information, and what are the factors that affect the accuracy of these reports? One of these factors is the features of the person who is asking the questions. The following study shows how we give different information about our health depending on who asks us about it. To make a diagnosis a doctor needs to know the symptoms – but do we always give the health worker a full account of our symptoms? The knowledge of the doctor and health worker can appear intimidating to the patient and make them reluctant to disclose symptoms.

Kessler et al 1999

Aim: To investigate how a *patient's* style of behaviour can intervene in the doctor-patient relationship to the extent that it results in misdiagnosis

Method: A quasi-experiment utilizing a cross-sectional survey to gather data

Sample: 305 patients (225 women, 80 men), aged 16-90 years (mean age = 44 years), from a GP surgery in Bristol, consisting of eight doctors. Patients who attended both daytime and evening surgeries were included and were drawn from each of the eight doctors' panels. Informed consent was obtained and 26 patients declined taking part in the study. 24 participants failed to complete the surveys, so their data was discarded

Procedure: Prior to their appointment with their GP, participants were asked to complete two questionnaires. The first was a 12-item general health questionnaire, which has been validated as a measure of psychological disorders. In particular, it is a valid tool for identifying the presence of depression and anxiety, where a score of three or more indicates the respondent has symptoms related to these two disorders

The second questionnaire was the symptom interpretation questionnaire, which consists of 13 common physical symptoms, accompanied by three possible causes, one from each of three categories. Depending on the number of choices made from each category (seven or more from one category), the participants were classified as having one of three attributional styles: psychologizing, somaticizing and normalizing. Both questionnaires are self-administered.

Following this they were seen by their GPs, but told not to discuss the questionnaires with them. At the end of the surgery, the doctors, who were blind to which attributional category the patients were in, were asked

to identify which patients they had noted as showing anxious and/or depressive symptoms and whether or not this was a new diagnosis

Results: 157 (52 per cent) of the participants scored three or more on the general health questionnaire, indicating the presence of depressive and/or anxious symptoms. The GPs diagnosed these symptoms in only 71 (24 per cent) patients, 57 (19 per cent) with depression, and 14 (5 per cent) with anxiety. There were 14 false positive results - patients who were diagnosed by the GP as having depressive and/or anxious symptoms, but who scored less than three on the general health questionnaire. 50 per cent of these had a previous diagnosis of depression and were undergoing treatment at the time of the study.

Conclusion: Comparisons of the doctors' diagnoses with the patients' attributional style found that doctors were far more likely to identify psychologizers as having depressive/ anxious symptoms and far less likely to identify the same symptoms in normalizers. Thus the patients' way of thinking about their health (their attributional style) can affect the way they interact with their GP and, therefore, the diagnosis that is given

Robinson & West (1992)

Aim: They were interested in the amount of self-disclosure people make when they attend a genitourinary clinic (a clinic which specialises in venereal disease).

Procedure: Before they saw the doctor, patients were asked to record the intimate details of their symptoms, previous attendances and sexual behaviour on a questionnaire administered either in a written version or on a computer.

Results: The results of the study showed that people were prepared to reveal significantly more symptoms to the computer than they would put on paper or tell the doctor. Also, they made more disclosures about previous attendances to the computer than to the doctor. This result seems a little strange since the information you give to the doctor is personal and private, but when you are responding to a computer you have no idea how many people have access to the information. It might be that the impersonal nature of the computer allows us to come out with information of a highly personal nature. Alternatively, it might be that when we communicate with a machine we are less worried about social judgement of our sexual behaviour.

General evaluative points

In evaluating work in this area there are a number of issues you could consider:

- **Assumptions** about the nature of the relationship. Traditional models see the doctor as the expert with information to communicate with the patient. There is also an assumption that the doctor is an objective outsider to the situation. However, he will often have his own views on the nature of health

and illness. Some studies have shown that doctor knowledge is not always what we might expect it to be!

- **Generalising** can be difficult because of doctor variability and also because of individual differences and preferences in patients.
- There are always big **ethical** issues in studying this area. There is the problem of confidentiality and informed consent. Of course informed consent may affect the way people behave if they know they are being studied. This then leads to bias as a consequence of **demand characteristics.**
- There is the problem of getting a representative **sample.**
- There may be issues of studies being **ethnocentric**. Different cultural groups may have different expectations of the relationship and different expectations of the role of the patient. In some cultures it might be difficult for a female to communicate with a male doctor.
- There are problems of **measurement**. How can you measure the success of a consultation? Is patient satisfaction enough? Is it a question of recovery, rate of recovery? Is it measured by compliance rates?

Using and misusing health services

Countries differ to the degree in which they offer public health services or encourage private health care. Countries such as the UK have traditionally been proud of their public health services, but increases in life longevity and aging populations put a strain on healthcare provision, and funding is tight and services overstretched. It important then not to mis-use health services either by seeking treatment that is not needed, or delaying treatment which ultimately costs more in the long term.

Overusing health services

Some people worry a lot about their health and it is estimated that worried people, some who are well and some who are ill, place high demands on the health services (Wolinsky and Johnson, 1991). At the extreme end of the scale there are a few people who continue to visit their doctors even though there are no obvious signs of illness, and even when the doctor has taken all reasonable steps to reassure the patient.

McCrae & Costa (1980)

These patterns of abnormal illness behaviour are commonly given ‘disease’ labels such as hypochondriasis. This label, however, is commonly used in an informal way and not based on recognised tests and procedures. It is based on the health worker’s belief that the patient’s complaints are exaggerated or unfounded. Sadly, on some occasions, the label is made incorrectly when the health worker cannot find any explanation for the illness behaviour and comes to the conclusion that it is ‘all in the patient’s head’. Costa and McCrae (1980, 1985) have demonstrated an important link between hypochondriasis and emotional maladjustment/neuroticism. These researchers tested about 1,000 normal adults, using two self-report scales: (1) the Comell Medical Index to

assess the Ps' "somatic complaints," that is, medical conditions or symptoms, and (2) the Emotional Stability Scale to measure neuroticism. The Ps were in generally good health and ranged in age from under 20 to over 90. Analysis of the questionnaire responses showed that somatic complaints increased with neuroticism; individuals who scored high on neuroticism reported two to three times as many somatic complaints as those who scored low on neuroticism

Munchausen syndrome

A small number of people seek out excessive medical attention, often going from city to city to get new diagnoses and new surgical interventions. This is a very rare condition which is sometimes diagnosed as an illness itself – Munchausen Syndrome. The condition may arise from an extreme need to seek attention. Another explanation is that as a result of past experience the patient has made a classical conditioning association between being card for by medical staff and some kind of positive affect.

In very exceptional circumstances, individuals seek excessive and inappropriate medical contact through the 'illness' of a relative such as a child. This can be seen as a form of child abuse, where the parent (usually a mother) exaggerates, fabricates or induces illness in their child. The main motivation is believed to be that the parent wants to show herself to be an exceptional mother. This condition is referred to as 'Munchausen by proxy'. **see case study by Aleem & Ajarim, 1995) http://www.kfshrc.edu.sa/annals/old/154/94280/94280.pdf**

Under using health services

A much bigger problem for health services is people who delay seeking treatment when they are genuinely ill. Such delay, can, of course have serious consequences for health of the individual plus incur more lengthy and costly treatment – thus adding to the strain on health services. For example people who experience the symptoms of heart attack commonly delay before seeking help. A study of heart attack survivors in Glasgow found that only 25 per cent had called for help when the symptoms started, and 60 per cent waited four hours before calling (MacReady, 2000). In fact, 12 per cent of the patients waited a full day before seeking help.

Delaying seeking help - Samet et al (1988)

A study of 800 elderly patients with newly diagnosed cancer found that 48 per cent had sought help within two months of noticing the symptoms, 19 per cent had delayed for over three months, and 7 per cent had delayed for a year. However, Samet's sample of elderly people can't be generalized to other age groups or types of illnesses.

Numerous other studies find similar results for a range of conditions, many of them life-threatening. It has to be said that delay is often an appropriate option since many symptoms disappear quite quickly, so it is difficult to know when to seek medical advice.

The classic study by Safer et al (1979) below examines the psychological processes in seeking help.

Safer et al (1979) *Determinants of three stages of delay in seeking care at a medical clinic*

Aim: Previous studies on delay in seeking medical help have focused on the total time from when a symptom is first noticed to the time that treatment starts. Safer et al. argue that different factors will affect delay at different times, and it is more useful to break down total delay into three sequential stages:

- Appraisal delay: the time taken for the patient to recognise a symptom as a sign of illness.
- Illness delay: the time taken from deciding that one is ill to deciding to seek medical care
- Utilization delay: the time taken from deciding to seek medical care to actually getting it.

This study aims to discover which psychological factors affect delay at each of these three stages.

Sample: The study was carried out in the waiting rooms of four clinics in a large inner-city hospital in the USA. Interviewers approached patients who were there to report a new symptom or complaint and asked them a series of questions that took about 45 minutes. A total of 93 patients were interviewed, with an average age of 44 years. 60 per cent of the sample was black. A black, female nurse and a white, male undergraduate interviewed them.

Method: Participants were asked about when they first noticed the symptom ('What was your very first symptom or sign that you might be sick, and when did it first occur?'), when they decided that they were ill ('Was there some point when you began to feel you were really sick?') and when they decided to seek medical help ('At what time did you decide to see a doctor'). They were also asked a range of other questions, some open and some closed, aimed at discovering the factors that may have contributed to the decisions involved in getting medical help.

Results:

- There were no statistically significant correlations between appraisal delay, illness delay and utilisation delay, implying that the factors that contribute to delay at each of these three stages operate independently from each other.
- The mean total delay was 14.2 days (statistically adjusted to reduce the impact of outlying values).
- Three variables correlated significantly with appraisal delay: the presence of severe pain, whether the patient had read about his symptoms, and the presence of bleeding. This implies that pain and bleeding are the two key symptoms that make people think they are ill, and that reading about symptoms actually has the opposite effect. Safer et al. explain this last finding by describing reading about symptoms as passive monitoring (as opposed to active monitoring which involves self-examining the symptom or looking for other symptoms) and that this activity is likely to be time-consuming and to lead to further

information searching rather than decision-making, thus increasing appraisal delay. .

- Three distinct variables correlated significantly with illness delay: whether the symptom was new or had been experienced before, whether the patient imagined negative consequences of being ill, and gender. Patients experiencing old symptoms spent longer deciding that they needed to seek medical help, as did patients who were reporting more negative imagery. Females had longer illness delays than males.
- Three variables correlated with utilisation delay: patients who were concerned about the cost of treatment delayed for longer, patients with a painful symptom delayed for less long, as did patients who believed that their illness could be cured.
- Finally, there was one other variable that was found to correlate with total delay but not with anyone of the three stages: patients with personal problems in their lives (at work, within the family, etc.) had a longer total delay.

Conclusions: The authors conclude that different factors mediate delay at each of three different stages, and that there is little point carrying out research that simply looks at total delay.

Evaluation

Although Safer et al.'s study (1979) nay be useful in helping to understand the complexity of the "reasons why people delay seeking medical attention, it is not widely generalisable because the study was only carried out in four clinics in one inner city hospital in the USA.

There are number of other factors that have been found to affect delay in seeking help, including;

Characteristics of the patient

For example, age, gender and culture. Age can have an effect because elderly people may interpret their symptoms as being part of the ageing process. When people attribute their symptoms to ageing they are more likely to delay in seeking treatment (Prohaska *et al.* 1987). Some symptoms may also be less obvious in older people. For example, they report less pain than younger people with angina, and as a result might not seek help for an underlying heart condition (Day *et al.,* 1987).

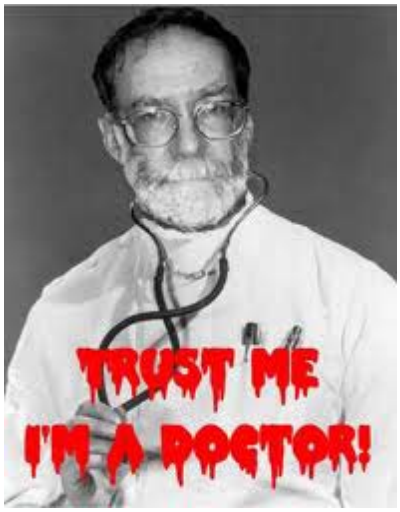
Health beliefs

For example, the frequency with which women examine their breasts for possible cancer is affected by their beliefs about the seriousness of the disease and their personal susceptibility to it (Ashton *et al.,* 2001). The Health Belief model can be applied here.

Abuses by the health services

Iatrogenesis

It is worth pointing out that the misuse of health services is not all one-way.There is an argument to be made that medical services can be bad for your health. In its extreme form this argument suggests that the major advances in life expectancy and good health are much more to do with the rise in living standards and public sanitation than to do with medics. Illich, in his book *Medical Nemesis* (1975), suggests that 'the medical establishment has become a major threat to health' (p.11). In fact, it is recognised that one of the most likely places to catch a new illness in the UK is in hospital (Plowman *et al.,* 2000) and **iatrogenic** (doctor-made) illness is a major cost to the health service. It is clearly not the aim of hospitals to make people ill, but Illich's argument is that the power of the medical profession makes us helpless about our own health, and gullible to intrusive treatments that have only marginal benefits or no benefits at all.



Abuse by Dr. Harold Shipman

On a less philosophical but more chilling note, the power of doctors can also be abused. Most famously there is the example of Harold Shipman, the Yorkshire GP who murdered an unknown number of his elderly female patients before being convicted in January 2000. He was able to operate unchallenged for many years despite there being evidence of anomalies in his death rates, a personal history of drug abuse, and a series of complaints made against him (Ramsey, 2001). The question that arises is 'how could this happen?'. Although there are no easy answers, two of the contributing factors might be the trust invested in doctors by their patients, and the lack of monitoring within the health service and its professional associations.

Abuse by Nurse Beverly Allit

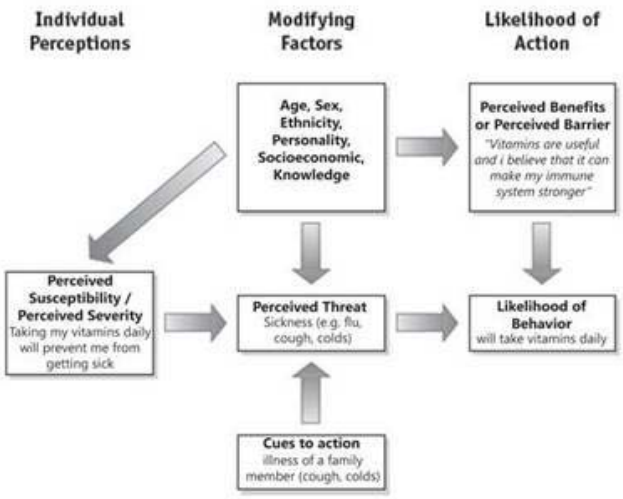
The most famous case of this in the UK was the nurse Beverley Allitt. Between February and April of 1991 there were 26 unforeseen failures of medical treatment and unaccountable injuries on Ward 4 of Grantham and Kesteven General Hospital. In total four children died and nine were injured. Investigations found that nurse Beverley Allitt had altered critical settings on life support equipment and administered lethal doses of potassium and insulin to children in her care (The Allitt Inquiry, 1991). She was diagnosed as suffering from Munchausen syndrome by proxy and was sentenced to thirteen concurrent life sentences.

Although these are extreme and very rare cases of abuse by the Health Services they remind us of a) the power of practitioners and b) the vulnerability of us, the patients

Health Promotion

Methods for promoting health

Fear Arousal



Many health promotion campaigns rely on the Health Belief Model to attempt to create the perception of risk/threat by presenting information about how serious/severe the threat is. So the obvious function of fear arousal in a health campaign is to increase people's perceived threat by making the outcome of a particular behaviour seem very frightening. However, this doesn't always work.

1.Janis and Feshbach (1953)

For their study they prepared three 15-minute illustrated lectures on the dangers of tooth decay and the need for good oral hygiene. The main difference between the three recorded talks was the amount of fear they were designed to create.

- The *strong fear appeal* emphasised the painful consequences of tooth decay, diseased gums and other dangers such as cancer and blindness that can result from poor oral hygiene. This appeal also included pictures of diseased mouths.
- The *moderate fear appeal* described the same dangers, but in a less dramatic way and using less disturbing pictures.

- The *minimal fear appeal* talked about decayed teeth and cavities but did not refer to the serious consequences mentioned in the other appeals, and used diagrams and X-ray pictures rather than photographs.

The results showed that the strong fear appeal did its job and created most worry in the students who received the talk. Also, the strong fear appeal talk was rated as more interesting than the other two talks and the pictures for this talk received a higher rating than the pictures in the other two talks. On the other hand, the strong fear appeal talk also received high negative ratings, with a third of the students saying the pictures were too unpleasant. Overall then the strong fear appeal produced a strong reaction.

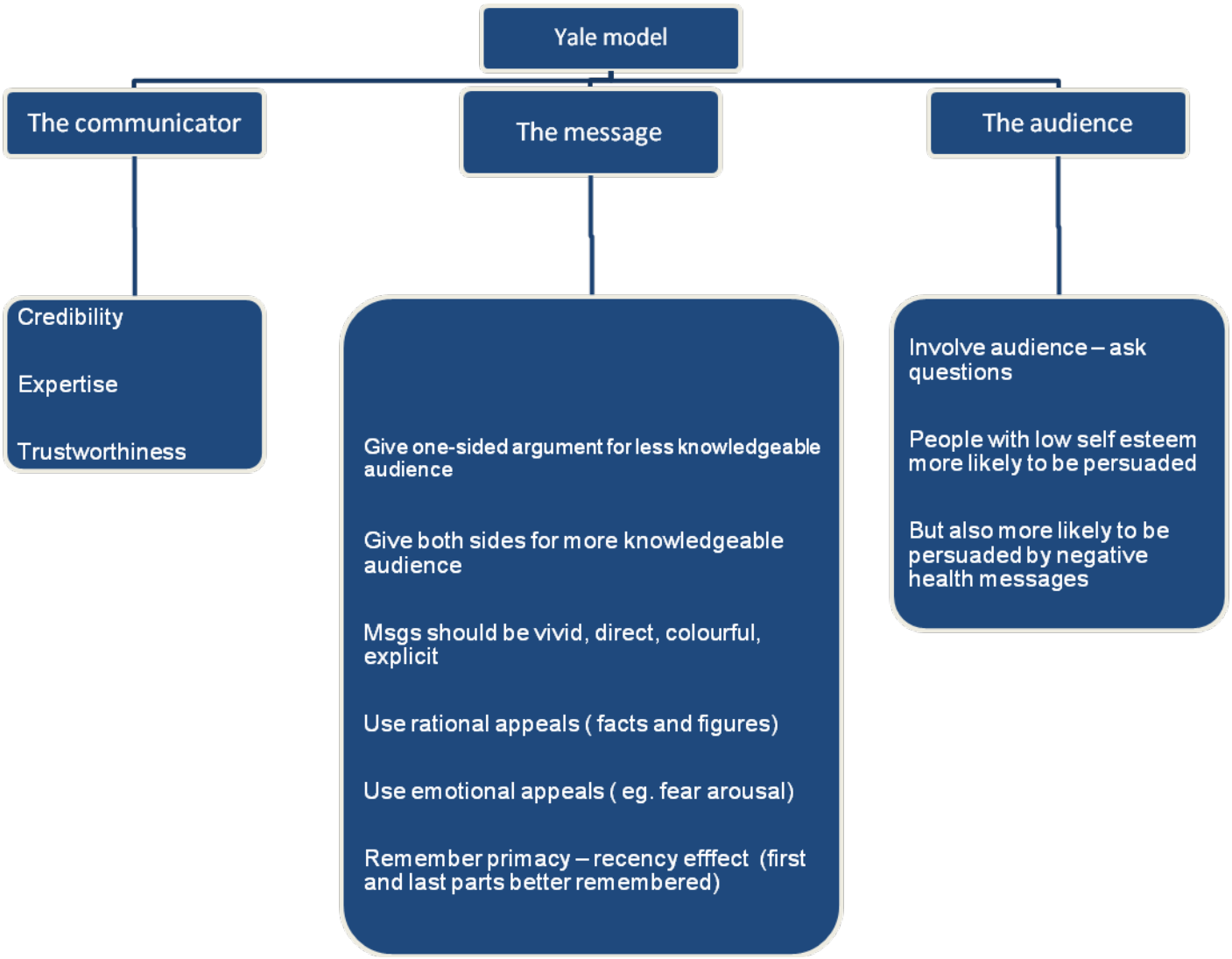
However, did it also lead to the biggest change in behaviour? Janis and Feshbach interviewed the students to discover their oral hygiene habits and gave them a 'conformity score' to show how much they had changed their behaviour to follow (conform to) the advice of the talk. The results showed that the minimal fear appeal created the greatest increase in conformity (36%) and the strong fear appeal created the least (8%).

How can this be explained ? Fear appeals could lead to the person putting up a resistance to the message. If a fear arousing message is so frightening it can be counter-productive. It may create a degree of emotional tension that the individual will use defence mechanisms to cope. This study can be criticised on ethical grounds for potential distress to the third group.

The Yale model of communication

This model was developed in the 1950s in America by a number of psychologists including Carl Howland, who investigated the features of a communication that make it persuasive.

The work is often summarised as the **Yale Model of Communication**, named after the university where much of the research was carried out. It sets out supposed rules about the relationship between communicators and their audience, especially in situations where the communicators are trying to persuade the audience to change their behaviour – and can be applied to health education and promotion



The above shows a brief outline of the model which identifies the important features to consider when preparing a message. These features are: the source of the message (or the persuader), the message, the medium that the message is presented in, the target audience, and the situation in which they will receive the message.

The work on fear arousal and message design is still relevant today, though arguably the Yale Model is more effective than fear arousal as it considers wider factors, particularly social factors such as target audience. The Yale model could be considered ethnocentric as it takes a Western perspective on message delivery, audience and the mass media.

Increasing self-efficacy

Recall that self-efficacy is the belief *one can* successfully engage in a behaviour to produce the desired outcomes. Some health promotion campaigns, while based on communication, are so simple, that anyone can practice them. Many health promotion campaigns involve difficult decision making processes, and are hard to put into practice in spite of good intentions. Others however need no more than a very easy change in behaviour that can give the people carrying them out a sense of efficacy, as there is no sense of difficulty or failure.

A good example of one such campaign is the Department of Health's campaign to reduce cot death. The campaign lists six straightforward steps to reduce cot death. The most simple of these is to put the baby to bed on its back. Other campaigns that might be compared to this include a campaign to reduce chip pan fires. Although many people do not feel confident in tackling fires, the simple message that everyone could put into practice was that chip pans should not be more than half full (this prevents the majority of fires from starting) – see below . Fear arousal ads have found to be more effective if used inconjunction with self efficacy.

- **Self & Rogers** (1990) found that increasing the level of threat strengthened intention to moderate alcohol consumption *only if people believed they could cope* with the threat
- If people did not believe they could effectively cope with the threat, increases in threat produced more intentions to consume alcohol

Providing Information

A third way of promoting health is to provide information. People who want or need to lead health lives need to know what to do, and when and where to do it. In reducing dietary cholesterol people need to know what cholesterol is and that it can clog blood vessels, which can produce heart disease. They also need to know where they can have their blood tested for cholesterol levels, what levels are high, how much cholesterol is in food and which foods might be good substitutes.

1.**Mass media**

TV and billboard etc can play a useful role in promoting health by presenting warnings and providing information such as helping people to stop smoking.

Numerous studies have investigated the effectiveness of these ads. Flay et al (1980) demonstrated that the media can promote and maintain health behaviors. Goldman and Glantz (1998) found that large-scale, paid tobacco-control were effective in reducing cigarette consumption.

Others, however, have found that PSAs (public service announcements) are not an effective means to decrease smoking (Wallack & Corbett, 1987). One reason reported for limited success is people often just don’t want to, and so will be immune to TV ads.

Mass media might be helpful for people *who have already decided they do want to quit*. A comprehensive Tv programme – called Cable Quit was a 6-week, community cable television smoking cessation program, with 13 x 30-min "live" sessions, each followed by a 30-min "live" telephone call-in support segment.Of those who started the programme, 17% continued to abstain from smoking a year later (Valois et al, 1996)

2. Internet

Interest in the Internet as a tool for health-related information and communication has grown immensely in recent years. Today, not only is there an extensive amount of medical information and interactive services available through the Internet, but also an increasing number of health sites focusing on 'healthy lifestyle' issues. Such general health sites appeal to the public in general, providing a wide range of information on different health topics, 'Ask an Expert' services, tests, discussion boards, etc. In an earlier review of the accessing of health information on the Internet, Cline and Haynes, 2001 reviewed the accessing of health information on the internet and found both benefits and pitfalls associated with health advice on the Internet. They found that widespread access to health information, interactivity, information tailoring and anonymity were all obvious benefits. Conversely, inequity in access, navigational challenges, poor quality of online health information, often based on lack of empirical research were found to detract from the value of the Internet as a health promotional tool.

3. Information in medical settings

A third source is the use of information is that provided in medical settings, such as clinics and hospitals. The advantage of this is that people who most need healthcare advice often visit such settings, and respect health care workers as experts. Especially important is to provide information that challenges misconceptions about health issues.

For example, research has found that women who had more knowledge about breast self examination (to detect early signs of breast cancer) were more likely to practice self examination. According to Murray & Mcmillan (1993) women who were more confident about how to undertake BSE were also more likely to practice it. Thus emphasing the role of self efficacy in health promotion, and the role of providing information in enabling self efficacy.

A successful attempt to help cardiac patients reassess their cardiac misconceptions was the Heart Manual (lewin, 1992). In a randomised controlled trial patients either worked through the Heart Manual with brief phone support from a health worker or received a bundle of literature about heaert diseasem diet, smoking and exercise etc. At 12 months people who had worked through the Heart Manual wre eless anxious and depressed, had a better quality of life and had been admited to hospital only half as often as the leaflet information

patients. The *Heart Manual* has now become the UK's leading home-based rehabilitation programme for patients recovering from acute myocardial infarction.

4. Screening

A final source that health care workers are increasingly using is offering individuals who are are risk from certain illnesses the opportunity of periodic screening

For example in the UK, the first national screening programme for breast cancer began in 1988. However, although mass screening programmes for breast cancer were welcomed for health promotion purposes, they are not always attended by those women most in need (Faithfull 1994). There may be psychological risks for people who undertake screening. Women have been found to be very anxious before screening tests (Lerman et al, 1994). Plus the implications of false positives, and test that reveal symptoms can sometimes be distressing that not knowing.

Health promotion in schools, worksites and communities

There are many different settings in which health promotion can take place, for example, in schools, in workplaces, in local communities, in hospitals and other health care places or in the mass media. The characteristics of a successful health promotion programme will depend largely on its setting.

Health promotion in schools

Many health-related behaviours become habitual at a fairly young age, and teenagers in particular begin to behave in ways that can cause serious problems later on. For example, very few people take up cigarette smoking if they have not already done so by the age of 18, and young people are particularly vulnerable to the dangers of substance mis-use and unsafe sex. Therefore, it makes sense to start health education as early as possible, and schools seem to be an ideal setting for this; there is a captive audience, already studying in an educational environment, and teachers can be specifically trained to provide high quality health education. In fact, various government publications (ranging from national curriculum subject orders to the non-statutory framework for teaching personal, social and health education) suggest that the following topics could be taught in schools:

- substance use and mis-use
- sex education
- family life education
- safety
- health-related exercise
- food and nutrition
- personal hygiene
- environmental aspects
- psychological aspects.

Are school programmes effective ? Some have been.

Walter et el, 2005

An experiment in 22 American primary schools introduced a carefully designed curriculum with emphasis on nutrition and physical fitness. The schools were randomly assigned so that their students either participated in the programme or served as a control group for that year. Relative to the control subjects, the children who participated in the programme showed improvements in their blood pressure and cholesterol levels.

SEE TAPPER et al (2004)

Health promotion in the workplace

There are two reasons why the workplace is a useful setting for health promotion: first, it is a good way to gain access to a large captive audience and second, many behaviours linked to ill health occur within the workplace. This is underlined by the following figures published by the Health Education Authority in 1997

- 18 per cent of deaths in the UK are work-related
- 6 per cent of adults suffer ill health associated with work
- 15 million working days are lost every year in the UK as a result of work-related illness or injury (including stress-related illness).

There are several ways in which health promotion can occur within the workplace, including:

- adequate health and safety policies
- occupational health, e.g. first aid and medical treatment, health screening
- health education, e.g. advice about healthy lifestyles
- provision of facilities and services such as gyms, stress counselling and so on
- creating a healthier environment, for example, by providing a healthy diet in the canteen or by banning smoking (see Parry et al., 2000).

KEY STUDY

Out of sight, out of mind: workplace smoking bans and the relocation of smoking at work

Parry, Platt and Thomson (2000)

Aim and background: To evaluate a smoking ban implemented at a Scottish university in 1997.

Method: The university implemented a policy of a complete smoking ban, a policy that is accepted by many workplaces and colleges around the country.

Results: At first sight, it seems reasonable to ban smoking from public places: it makes it harder for smokers to smoke, meaning that they may cut down on their daily cigarettes; it protects non-smokers from environmental tobacco smoke; and it keeps the place cleaner. Comments from non-smokers at the university before the smoking ban was implemented seemed to back this up. They said '... we should be much more concerned about air quality and not exposing non-smokers to carcinogenic fumes' '... the university should do nothing to make life easier for those who want to inflict toxins on people around them and who have no choice but to breathe in their effluent'.

An alternative to banning smoking completely is to create dedicated smoking areas, but this was also unpopular among non-smokers, who said things like '... I see no reason why the university should be forced to provide dedicated areas'.

Once the ban was implemented it seemed to be accepted by university staff, and led to some reduction in levels of smoking and a reduction of environmental tobacco smoke inside the buildings. However, the smoking ban also led to a number of unintended consequences:

- environmental tobacco smoke shifted from inside the buildings to just outside, as smokers congregated around the entrances
- smokers at the university became more visible and gained a higher profile
- there was an accumulation of smoking debris in certain areas outside the buildings
- sympathy for smokers actually increased as they were perceived to be discriminated against.

Conclusions: The authors conclude that, while smoking bans are successful in reducing smoke pollution in workplaces, they do not really solve the problem of smoking at all. Banning smoking from inside buildings simply shifts the problem elsewhere (in fact, many smokers reported that they had started smoking more outside working hours as a result of the ban). The authors do not support the idea of designated smoking areas on the grounds that it is difficult to ensure that smoke pollution does not leak out from such areas, and that this, while appearing to condone smoking, also serves to ghettoise smokers and render them invisible. They recognise that the main aim of smoking bans is to reduce environmental tobacco smoke, but argue that the only long-term solution to the problem is to provide help for smokers to cut down or quit smoking

OR USE JOHNSON & JOHNSON

Health promotion in the community

Community-based health promotion is based on the assumption that social and environmental factors play an important role in people's health, and that it is possible to modify social structures in ways that encourage people to lead healthier lives. The key environmental and social change needed to improve health is to reduce poverty, as negative social conditions are the most important contributors to ill health. However, this involves political activity that is beyond the scope of most health promotion professionals, who consequently attempt to make whatever changes they can within the current sociopolitical climate. Specific examples of health promotion in the community include:

- local environmental campaigning (for example, against road pollution, for safer roads and more green spaces)

- 'social' campaigning (for example, for better quality housing and adequate policing against racist attacks)
- improving local services (for example, adequate provision of public transport, shops, post offices, health services and community centres)
- improving the social environment (for example, encouraging community or voluntary organisations and self-help groups)
- encouraging specific behaviour (for example, getting shops to ask for ID before selling cigarettes to young people and encouraging people to check up on elderly neighbours).

Stanford Three Community Study (Farquhar et al, 1977)

Several community-based programmes have produced good results in prevention of heart disease smoking and alcohol problems. The mass media play an important role in these campaigns but within the framework of community level involvement and support. A classic example of a comprehensive community approach is the Stanford Three Community Study (Farquhar et al, 1977), which tested the impact of a mass media campaign to reduce cardiovascular disease among groups of adults living in Stanford.

In the 'treatment community' the researchers used a variety of mass media strategies for 2 years to create problem awareness, to market the project's key messages and to teach cardiovascular reduction skills. Specific target behaviours included reduced dietary fat consumption, smoking cessation and increased physical activity. The Mass media campaign included over 50 television spots, over 100 radio spots, weekly newspaper columns and billboard posters etc. In a second, highly similar community, the media campaign was combined with behavior modification techniques (eg. Stress- management techniques) and guided practice. A third community – where no intervention took place – was the control site. People from each community were interviewed before and after the campaign to assess behavior and knowledge and individual risk for cardiovascular disease.

Results showed that during the four year study cardiovascular disease increased in the control group, but decreased significantly in the other two groups, with longer term effects being seen in the group that had the combined media/behavioral intervention.

One criticism of this study however was the difficulty of generalizing from the longitudinally followed study groups to the entire community, individual differences in behaviours and demand characteristics. It was an expensive project and community-based borad interventions such as this are still rare.

Promoting health of a specific problem

Example: Davis, Kirsch and Pullen (2003)

Here the authors describe and evaluate a school-based programme in the USA aimed at persuading children to wear bicycle helmets. Approximately 500 000 children visit the hospital or the doctor every year in the USA as a result of cycling injuries, and head traumas account for 140 000 of these visits. Every year 252 children die from cycling crashes, and 97 per cent of these were not wearing helmets. Since children suffer higher rates of death and injury from cycling accidents than other groups, and wearing a helmet is thought to reduce the risk of serious injury, it makes sense to design a health promotion programme aimed at persuading children to wear cycling helmets.

Davis Kirsch and Pullen (2003) describe a school educational programme named Safety Central, launched in 1997 and aimed at 4th-graders. The programme had two key approaches;

- to increase children's levels of self-efficacy: this was done by improving their skills (practising fitting and wearing a helmet), providing them with an experience of success (through an activity sheet) and persuasion (being encouraged by valued others, e.g. parents and teachers)
- to increase children's fear arousal by showing them a video that was designed to increase children's perceptions of their susceptibility to an injury and by sending a letter home to parents aimed at increasing parents' perception of the severity of a cycling accident. They also made the health behaviour easier by providing each child with a free helmet.

Davis Kirsch and Pullen (2003) evaluate the effectiveness of the Safety Central programme through the use of a questionnaire and by direct observation.

Aim: To evaluate the effectiveness of the Safety Central programme, initiated by the Center for Childhood Safety in the Pacific North West of the USA in 1997

Sample: Five schools chosen to represent the demographic make-up of | the community (involving a total of 11 teachers and 284 children aged 110-12 years; 51 per cent were girls); all five schools had been using the Safety Central programme during the previous two years. Four observation sites were chosen: two schools which had taken part in the Safety Central initiative, and two which had not, to serve as controls; observations were carried out in and around the schools and in nearby parks.

Method: Each child was given a 14-item questionnaire to complete. Children from two of the schools, and from another two control schools, were observed in and around the schools. The observers recorded the date, time and weather; the gender, ethnicity and approximate age of the children; whether they had a helmet and whether they were using it properly; and whether they were alone or with others.

Results: 84 per cent of the children had been in the participating schools during 4th grade, when the Safety Central programme was taught and 16 per cent came from schools that did not participate in the programme.

- 90 per cent of children reported owning a bicycle helmet.
- 74 per cent said they had worn a helmet on their last cycle ride; significantly more of these were female, and the older the children were, the less likely they were to have worn a helmet.

- Children who had been in the 4th grade of a school that used the Safety Central programme were significantly more likely to wear helmets.
- 55 per cent were able to identify correctly three checkpoints for proper helmet fit.
- In response to the statement 'I am a good bike rider so I don't have to wear a helmet', 82 per cent said this was 'not at all like me'.
- 50 per cent responded 'a lot like me' to the statement 'I know how to fall so I don't get hurt'.
  - Unfortunately, the observation data were not useful, as very few cycle riders were seen in the observation sites.

Conclusions:

The authors conclude that the Safety Central programme is effective in teaching safety messages to children, and that knowledge retention and safe behaviour was evident over a 1-2 year period. They suggest that a booster session should be introduced at grade 6 (two years after the original programme), to re-fit the helmets and to reinforce the message about susceptibility to injury. The authors also express concern that 50 per cent of their sample believed that they could avoid injury by 'knowing how to fall'. They suggest that initiatives aimed at encouraging children to attribute cycling injuries more externally by stressing the limited control held by individuals in an accident would be useful. Finally, they stress the importance of reducing the costs of the health behaviour they are trying to encourage, by making low-cost, 'cool' looking helmets readily available.

One methodological criticism of this study is lack of a proper control group, It may have been better to use five schools that had taken part in Safety Central and compare them to five schools that had not, rather than rely on children who had come from other schools as the control group. Another problem is the fact that they did not collect enough observational data to draw any conclusions (although the two observers reached 100 per cent agreement on the data that they did collect); the researchers only allowed one day's observation for each site.

Safety Central was based on two cognitive theories of health behaviour which can be used for comparison. the Theory of Planned Behaviour which incorporates the notion of perceived behavioural control, or the individual's beliefs about her ability to succeed. Bandura (1986) refers to this as self-efficacy.

Health and safety:

Accidents are a major cause of death and illness in the UK. Some groups are more vulnerable than others. Children, people with disabilities and the elderly are particularly vulnerable to accidents, and men are more likely to die from accidents than women. Accidents are the most common cause of death in people under 30 years of age.

Health and safety initiatives are aimed at reducing the frequency and severity of accidents. This final section will examine;

- Accident statistics
- The definition of 'accident'
- Types of accidents
- Example of accidents
- Causes of accidents – most accidents are the cause of human error, but what causes human error ? – two approaches to understanding human error have been identified – the person approach and the systems approach.
- Ways in which accidents can be reduced

ACCIDENT STATISTICS IN THE UK

Road accidents

During 1999 there were just over 235,000 accidents causing personal injury, which caused 320,000 casualties including 3,600 deaths. This actually shows a marked improvement over the last twenty years, as deaths and serious injuries have reduced by 36 per cent and 48 per cent respectively since 1981 (DETR, 1999).

Accidents in the home

Around 4,300 people are killed each year in home and garden accidents, and about 170,000 suffered serious injuries that required inpatient treatment in hospital. Home accidents also led to 2.84 million visits to accident and emergency departments. Some accident figures leave you asking 'why?' and 'how?' For example, according to the Department of Trade and Industry (DTI, 2001), the number of accidents caused by tea cosies is rising (up to 37), though sponge and loofah accidents are in decline (down to 787). They report that the number of people hospitalised after accidents with articles of clothing is 5945 for trouser accidents and 13,132 for socks and tights.

Accidents at work

Surveys indicate that about 1.5 million people each year are hurt at work and treated in casualty departments. Many of the injuries are minor and so are not reported. In 1998/9 there were just under 53,000 major injuries reported, of which 24,000 were to members of the public (RoSPA, 2001a).

All in all, there are millions of accidents each year that require the attention of health workers. Some of these accidents could be avoided, so it is useful to consider the major causes and see what can be done to improve our safety.

Definition and statistics (UK)

The first issue to consider is what we mean by the term **accident**. One definition is;

- *An unplanned, uncontrolled event that could result in harm, injury, damage, or loss.*

Of course this is problematic because we could argue that no events are out of our control (except natural ones). And therefore there is no such thing as an accident – only human error. Many factors play a role in how we assign attributes to behaviors. Obviously our view of the world, our previous experience with a particular person or situation, and our knowledge of the behavior play an important role. However there are two important errors or mistakes we tend make when assigning these attributes.

Human error and the Fundamental Attribution Error

This refers to the tendency to over estimate the internal and underestimate the external factors when explaining the behaviors of others. For example, the last time you were driving and got cut off did you say to yourself "What an idiot" (or something similar), or did you say "She must be having a rough day." Chances are that this behavior was attributed mostly internal attributes and you didn't give a second thought to what external factors are playing a role in her driving behaviour. So, with respect to accidents, we may attribute other people's accidents to internal characteristics – lazy, clumsy, forgetful, selfish etc

Human error and the Self Serving Bias

We tend to attribute our successes to internal factors and our failures to external factors eg. If *we* cause a car accident we might attribute it to poor weather conditions (external factors). If we pass our exams we might attribute it to intelligence and hard work (internal factors)

The point is – a definition of an ‘accident’ is incomplete because it depends how far an event is within our control. And even if we accept as within our control – as a human error, we are quick to;

- Blame others (FAE)
- Blame the circumstances (SSB)

In other words, it really is hard to know what an accident is and how it happens.

Therefore it is not helpful for psychologists to study accidents, particularly if one has a fatalistic approach to them. It is easier to study human errors

Human error

One way of categorising errors is suggested by Riggio (1990) who identified four types of error that can lead to accidents:

• *Errors of omission*: failing to carry out a task
• *Errors of commission*: making an incorrect action, for example, a health worker giving someone the wrong medicine (see example)
• *Timing errors*: working too quickly, working too slowly
• *Sequence errors*: doing things in the wrong order.

Not all errors lead to accidents and we often make minor errors of judgement without any unfortunate consequences. Sometimes, however, these errors do lead to an event that we call an accident. If we want to reduce accidents, the obvious thing to do is to examine the errors that people most commonly make, and then change the working practices so that the chance of error is reduced. But what causes this human error in the first place ?

Causes of accidents

In some respects all accidents are unique, but it is also possible to see some common contributory causes. Reason (2000) says that the problem of human error can be viewed in two ways: t**he person approach, and the systems approach**. Each way has its own model of the causes of error and suggestions of what is to be done about it. The example below of giving the wrong medicine highlights these two models.

Mail Online

Police were today called in to investigate the death of an 18-year-old leukaemia sufferer who died after doctors wrongly injected a powerful anti-cancer drug into his spine. Wayne Jowett, an apprentice heavy goods vehicle mechanic, had been receiving treatment at Nottingham's Queen's Medical Centre for leukaemia.

But on January 4 doctors injected *Vincristine* into his spine despite it being clearly marked for intravenous use only.Despite instantly realising their mistake Mr Jowett, who was said to be in remission from the cancer which attacks the white blood cells, almost immediately became critically ill and was treated in the hospital's intensive care unit until he died this morning. There is no known cure or antidote to Vincristine being administered in this way. It leads to a creeping paralysis of the body with the heart finally stopping.

Two junior doctors said, by the hospital to have been involved in the fatal incident, have been suspended.Today Mr Jowett's parents, Wayne and Stella, said in a statement: "Our son Wayne Matthew died today at the University Hospital in Nottingham where he had been seriously ill after doctors mistakenly injected an anti-cancer drug into his spine instead of into a vein. "We now wish to be allowed to be left to grieve in peace." Paul Balen, the family's solicitor said: "My clients have been appalled to learn that so many other families have suffered as a result of similar mistakes."He said Wayne had been remission at the time of the hospital blunder.

The chief executive of the Queen's Medical Centre, John MacDonald, today admitted his staff and the hospital had let the Jowett family down. Mr MacDonald said: "We have failed Wayne and his family and for that we are deeply sorry."We apologise unreservedly to the family and would like to express our deepest sympathy."He added: "A serious mistake was made when Wayne's drug treatment was administered wrongly.A drug that should have been used intravenously was given intrathecally - into the spinal cord."In spite of immediate action being taken, it proved impossible to save Wayne."

Mr MacDonald said staff had been reminded to follow strict protocols and procedures for administering such drugs to patients. He said: "A full internal inquiry has already been started to discover what went wrong. And if there are any lessons to be learnt from this then they will be." A spokesman for the QMC said an apology for the mistake had already been given to the family.

Nottinghamshire police said they had been called in to investigate the circumstances surrounding Mr Jowett's death.A spokesman for the force said: "We have been asked to investigate by the coroner and a report will be prepared."

A Department of Health spokesman said: "We are very sorry to hear of the tragic case of this young man.This is a rare and catastrophic event which has happened in this and other and other countries over the last 20 years. It is potentially avoidable and a major new initiative is being taken to try to address a problem which has not been solved by previous action." The new initiative includes introducing a mandatory system for reporting medical mistakes.

Mr Jowett's death today came just a day after the inquest on a 23-year-old Northamptonshire woman who died after a doctor in Leicester made a similar mistake. Donna Horn, who had also been receiving treatment for leukaemia, was injected in the spine with Vincristine by Dr Peter Greally. He admitted at yesterday's inquest: "It was a genuine mistake from a lapse in concentration."

Recording a verdict of accidental death, Coroner Anne Pember said: "It seems the only way to avoid human error is to make it impossible to attach these syringes to a lumber puncture needle. "I implore the medical profession to pursue as a matter of urgency the obtaining of an alternative syringes to avoid such a repetition."

How could this happen? How could two experienced, specialised doctors make what appears to outsiders to be such a basic error? The inquiry into the accident (DoH, 2001d) highlights how professional mistakes (personal causes of error) and the procedures and equipment (system causes) contributed to the death. It was already known that there was a danger of giving Vincristine into the spine because it had happened before.

As a result it was part of good practice at the QMC to give the two treatments – one into the spine and one into a vein – on different days, but this procedure was not always followed, especially when patients had a history of missing appointments.

Also, the manufacturer of Vincristine provided labels to be attached to the syringes which said 'Not for intrathecal use – For intravenous use only'. However the QMC staff did not use these labels because they believed they had the potential to confuse people. The inquiry also noted that the syringes for both injections looked very similar and that the labels were both in black type. Although these system explanations do not explain the accident, they do give some pointers to the ways in which similar mistakes can be avoided. We will go on to look at some examples of how the relationship of people with equipment can lead to accidents.

The Person Approach

The person approach is the dominant explanation of accidents, especially inmedicine (Reason, 2000). Among the advantages of this approach is the satisfying option of naming and blaming people. Individuals are seen as being free agents with the option of choosing between safe and unsafe behaviours. If something goes wrong, it is obvious that it must be the fault of the individual. Taking this view is clearly in the interests of managers and institutions if they want to avoid institutional responsibility.

Early research into industrial accidents tended to focus on individuals,rather than on systems and practices of operation. Greenwood and Woods (1919) performed some of the earliest research into industrial accidents for the Industrial Fatigue Research Board during World War I (1914–19). As part of their study, they explored the idea that some individuals are **accident-prone**, or more likely to have accidents than others. They found statistical distributions of accidents, which seemed to support the idea of accident proneness, and gradually this became accepted as a stable characteristic of certain individuals.

As research developed during the 20th century, the idea of accident- proneness was challenged. Some researchers (for example Arbous and Kerrich, 1951) argued that the initial research had failed to distinguish adequately between the different levels of risk run by people in different jobs.

Other researchers performed their own studies and found different outcomes. For example, Adelstein (1952) studied accident rates among railway shunters and found that accidents seemed to occur to anyone and there was no evidence for an accident-prone personality.

Because accidents can occur in all shapes and sizes it seems unlikely that that we can define a single personality type that makes an individual more likely to experience all of them.

The way to look at the issues around the personal approach might be to identify the behaviours or personality traits that are most associated with errors and accidents.

Type A behaviour pattern

One of the personality characteristics that has attracted some attention is the **Type A behaviour pattern.** (It might be that the time urgency of the Type A pattern leads people into risky situations. The existence of the Type A person is very controversial, though some people believe that the Type A is more disease prone and more likely to have accidents (Suls *et al.*, 1988).

There has been some work looking at whether Type A behaviours in drivers increase their accident risk – for example a study of Italian police drivers (Magnavita, 1997) found that drivers with the Type A behaviours had a greater risk of traffic accidents.

An examination of the Type A behaviour pattern raises the question of whether accidents can be reduced by careful personnel selection. Jones and Wuebker (1988) describe how a personnel inventory can be used to predict a number of accident-related events. Using the questionnaire they were able to identify high-risk individuals on the basis of their attitudes and personality, and to place them in less hazardous positions, or send them on special safety training programmes.

Introversion and extroversion

Injury data collected over a 12-year period from 171 fire-fighters from a city in the US found that personality traits, including **introversion**, were related to higher injury rates on the job (Liao *et al.*, 2001). They suggested that introverts were less likely to call for assistance, and as fire-fighting requires a high degree of teamwork, it might be that the less integrated and sociable members of the team exposed themselves to greater personal risks. Another finding of the study was that women fire-fighters reported 33 per cent more injuries than their male colleagues, although they returned to work more quickly after injury than the men. The research points to another factor that might contribute to accidents, and that is male culture. They suggested that within groups of male fire-fighters there is a strong cultural norm for not reporting minor injuries because it might be seen as a sign of weakness.

The study of the fire-fighters is particularly interesting because the general view in psychology is that extroversion is the characteristic that is associated with accidents. Extroversion is associated with being impulsive and this has

been found to be a feature in people who have car accidents, and accidents at work (Furnham and Heaven, 1999). These apparently contradictory findings illustrate how personality characteristics can interact with the situation someone is in, and the type of task they are asked to carry out, so as to produce an unsafe environment.

Alcohol and substance abuse

The most commonly cited cause of accidents is alcohol or **substance abuse**. When chemicals impair our judgement we are more likely to underestimate the risks of a situation, and overestimate our ability to deal with it. A study of over 500 people attending accident and emergency departments in Scotland examined levels of alcohol (Simpson *et al.*, 2001). About 25 per cent of the attendees showed signs of alcohol. It was especially noticeable in people attending for reasons of self-harm (95 per cent), collapse (47 per cent) assault (50 per cent), and in those who were subsequently admitted to the hospital (50 per cent). These figures suggest that alcohol might well be a factor in a range of accidents that lead to serious injury. A less well researched area is the effect of prescription drugs on performance. Barbone *et al.* (1998) looked at the medical records of drivers in Scotland involved in their first car accident over a three-year period to identify how many had been prescribed psychoactive drugs such as tranquillisers (for example, benzodiazepines) and antidepressants. There were 19,400 drivers involved in accidents in that period, of which over 1,700 were on some form of psychoactive medication, most commonly benzodiazepines. They concluded that users of benzodiazepines had a 60 per cent higher risk of having a first traffic accident and should be advised not to drive.

Lack of sleep

It is a robust finding from sleep research that **sleep deprivation** affects people so that they (a) make more errors, and (b) need longer to complete a task (Asken, 1983). One particular area of concern is sleep-related vehicle accidents (SRVAs). A substantial survey of 4,600 UK drivers found that 29 per cent admitted to having felt close to falling asleep at the wheel during the previous 12 months (Maycock, 1996). Sleepiness is brought on by long, undemanding, monotonous driving, such as on a motorway. It is also, not surprisingly, affected by the time of day, as our bodily rhythms affect our level of arousal and alertness. One of the problems for drivers who are feeling sleepy is they are often not aware of dropping off for a few seconds. It is a general finding from sleep research that people who are woken within a minute or two of falling asleep commonly deny having been asleep (Horne and Reyner, 1999).

Evaluation of person approach

Some accidents can be put down to human error or carelessness or whatever, but many cannot, and following this approach does not offer much advice on how to improve accident rates. Research into quality lapses in the maintenance of aeroplanes found that 90 per cent of them were blameless. If we want to reduce risk, it is important to encourage a culture where errors, slips and near-misses are reported, and a culture where people are named and blamed is not likely to do this. It is believed that the absence of a reporting culture in the Soviet

Union contributed to the Chernobyl disaster in 1986. Two explosions blew the 1000-tonne concrete cap off one of the nuclear reactors and released molten core fragments into the surrounding countryside and radioactive material into the atmosphere. This entirely manmade disaster killed more than 30 people at the time, damaged the health of thousands, and contaminated over 400 square miles (Reason, 1990).

Another weakness of the person approach is that two features of human error tend to be overlooked. First, it is often the best people who make the worst mistakes (Reason, 2000). Second, mishaps are not random but tend to occur in patterns. If we go back to the accident at the QMC (see above), then we observe two specialist doctors making a fatal mistake, and this is not the first time that people in that position had made such a mistake. Naming and blaming the doctors is a good course of action if we just want to see people punished for their mistakes, but a bad course of action if we want to stop similar mistakes from happening again. If we really want to identify the accident-prone person then, on the basis of psychological research, we are looking for a person who tends towards impulsiveness (except in situations that require co-operation), has a sense of time urgency, has taken alcohol (and possibly benzodiazepines) recently. He or she is not happy at their job, is a bit short of sleep and is either a child or a retired person. This is everyone and no-one, so it is probably not very useful to try and identify a type of person who is accident-prone.

The systems approach

Deskilling of workers

A source of error in the relationship between operators and machines is the **de-skilling** of the workers. Bainbridge (1987) referred to this as the irony of automation. She pointed out that designers view human operators as unreliable and inefficient, and try to replace them wherever possible with automated devices. Yet this policy often leads directly to an increased number of errors and accidents. The paralysis of the London Ambulance Service, a direct result of the introduction of an automated emergency call routing system in 1993, was a classic example of how this type of problem happens. There are two ironies here: the first is that many mistakes come from the designer's initial errors – systems are introduced which have not been properly worked out and which are actually unable to do what is required of them. Second, as Bainbridge points out, designers still leave people to do the difficult tasks, which cannot be automated so easily.

Cognitive overload

The study of **selective attention** highlights some limitations on our ability to process information. An example of this problem was reported by Barber (1988), in a description of an aircraft accident in the area of Zagreb which was then part of Yugoslavia. A British Airways Trident collided with a DC-9 of Inex Adria Airways, resulting in the loss of 176 lives. One of the factors identified as leading to the collision was the cognitive overload of the air

traffic controller responsible for the sector the planes were flying in. At the time of the accident the controller's assistant was missing, there were eleven aircraft in his sector, he was in simultaneous radio communication with four other aircraft, and he was taking part in a telephone conversation with Belgrade concerning two further aircraft. The controller had received very short notice of the arrival of the DC-9 into his sector and it appears that the short notice and the overload of information contributed to the final error. Nevertheless, he was prosecuted and jailed. This is a graphic illustration of the limitations of our information processing capacities, and shows that the public response to disasters is often to blame individuals, when it is the systems within which the individuals are working which are actually at fault.

Equipment design

An illustration of the problem of equipment design occurred during World War II (1939–45), and it came about because the US airforce had concentrated on training pilots to fly aircraft rather than designing aircraft that could be flown by pilots. They discovered, however, that even very experienced pilots were prone to make errors with the poorly designed control systems. For example, similar looking controls operating the landing gear and the steering flaps on some B-25 bombers were placed next to each other. The unfortunate consequence of this was that several B-25s were brought into land without the landing gear in place, and so landed on their bellies. The pilots believed that they had activated the landing gear, but in fact they had just steered the plane (Mark, Warm and Huston, 1987). Observations like this have led to thedevelopment of aircraft controls that more nearly match the capabilities of pilots

Reducing accidents and promoting safety behaviours

Accident reduction at work

Health promotion can be used at work to reduce accidents.

One way of reducing accidents is through incentive programmes. Fox *et al.* (1987) looked at the effects of a token economy programme at open cast pits. Employees earned stamps for working without time lost for injuries, for being in work groups in which none of the workers had lost time through injury, for not being involved in equipment damaging accidents, for making safety suggestions, and for behaviour that prevented injury or accident. They lost stamps for equipment damage, injuries to their work group and failure to report accidents and injuries. The token economy produced a dramatic reduction in days lost through injury and reduced the costs of accidents and injuries. These improvements were maintained over a number of years.A relatively simple intervention to

reduce fatigue and accidents in logging workers involved encouraging them to take regular fluids. Sports science has shown that the use of regular fluid intake is one way to reduce the sense of strain in a task and delay the onset of physical and mental fatigue. A study of loggers in New Zealand **(Paterson *et al.*, 1998**) looked at the normal performance of the loggers and compared it with performance when they were taking a sports drink every 15 minutes. In the normal condition, the loggers lost on average about 1 per cent of their body weight during the working day, but in the fluid condition they maintained or increased their body weight. Also in the fluid condition, the heart rate was lower, and the loggers reported feeling fresher, stronger, more alert and more vigorous. Reducing fatigue and strain can reduce errors so it is a useful intervention to keep a worker properly hydrated.

Other methods of reducing accidents at work include *poster campaigns* to raise awareness of hazards and encourage a realistic assessment of risk, *staff training* and *organisational review*.

Media Campaigns

Public information films on television often tell us to do very sensible things like dip our headlights or fit smoke alarms. They might well affect our **attitudes** to these procedures and products but do they affect our behaviour? In the field of accidents it is possible to estimate changes in behaviour by comparing accident rates before and after an advertising campaign. This discrepancy between attitude (what we think) and behaviour (what we do) is illustrated in a report by **Cowpe (1989).** This report looked at the effectiveness of a series of advertisements about the dangers of chip pan fires. Before the advertisements, people were asked about this hazard and most of them claimed that they always adopted safe practices. However, the statistics from fire brigades about the frequency of chip pan fires and the descriptions by people of what they should do suggested that their behaviour was not as safe as they thought. A television advertising campaign was developed and broadcast showing dramatic images of exactly how these fires develop, and how people should deal with them. The adverts ended with a simple statement, such as ‘Of course, if you don’t overfill your chip pan in the first place, you won’t have to do any of this’.

By comparing fire brigade statistics for the areas which received the advertisements, and those for the areas which did not, the advertisers found that the advertisements had produced a 25 per cent reduction in the number of chip pan fires in some areas, with a 12 per cent reduction overall Surveys taken after the series of advertisements showed that people had more accurate knowledge about what they should do in the event of a chip pan fire than before. The implication from this report is very clear. Public information films and health promotion advertisements are most effective if they contain information about what to do rather than what to think or what to be scared of.