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PERSON-ENVIRONMENT IMBALANCE IN AN OCCUPATIONAL
SETTING: A COMPARATIVE STUDY OF NURSING STRESS
IN SEVERAL HOSPITAL WARDS

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of the requirements for the degree of

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JOHN ALEXANDER MONRO
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ABSTRACT

The present study had three major objectives; (1) the development of a model in which to view nursing stress in terms of basic processes which underlie behaviour; (2) assessment of the levels of nursing stress in several hospital wards, including Oncology; (3) definition of the relationship of personality to the levels of perceived stress amongst nurses.

A general information processing model of behaviour, based on the central role of imbalance in process, was developed as the appropriate context in which to understand occupational stress. The sources of stress in nursing, identified in the literature, were reviewed in terms of this model.

Data reported here were obtained with a questionnaire designed to measure perceived frequency and stressfulness of job events, presence and stressfulness of job conditions, propensity to leave the job, role conflict, frequency and degree of satisfaction from a variety of sources, and other variables including a number of possible moderators of stress. Indices of stress were derived from these data and from standard measures of well-being, state anxiety and depression. The personality variables extraversion-introversion, neuroticism, trait anxiety, self esteem and locus of control were measured. Scores for stressfulness of events and job conditions respectively were factor analysed and individual factor scores obtained. Wards were compared on a number of the above variables.

Few of the events or job conditions were perceived as very stressful on average, with only job conditions related to work load rated as very stressful. Although scores of frequency and stressfulness of each event were not significantly correlated, individuals reporting high frequencies tended to also give high stress scores. Differences between wards in reported frequency of events were generally consistent with the speciality of wards involved. However, Women's Medical showed a general elevation of scores on most items relative to other wards, and on stress indices, particularly depression. Factor analysis of stressfulness scores with two factors

for both events and job conditions respectively revealed in both cases a factor which was heavily loaded on by administrative items and which also correlated strongly with measures of depression.

Scores on personality tests did not differ significantly between wards, although neuroticism, trait anxiety and self esteem correlated to similar degrees with a number of stress indices and appeared to be measuring the same trait. Extraversion-introversion and locus of control were not correlated significantly with stress.

The results do not support the prevalent view that nurses in Oncology and Intensive Care wards suffer high levels of stress compared with nurses in other wards. The methodology used in this and similar types of study is critically discussed in light of the present results, and the relevance of personality variables to stress is discussed in relation to the present findings.

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BACKGROUND

The opportunity to conduct the study described in this thesis arose in the first place from concern of the administration of the Palmerston North Public Hospital, that staff on their Oncology unit were under excessive stress. Some staff on the ward had appeared to suffer from depression, and there had been a spate of resignations. This led to a request for help from the Psychology Department, Massey University, initially in the form of a comparative assessment of stress levels in several wards, including Oncology.

From conversations with a number of hospital staff who had worked on the involved wards, and from a review of the literature it was evident that the assessment of levels of perceived stress should be made not only in terms of differences between wards, but in terms of differences between individuals. Furthermore, there did not appear to exist a readily applicable abstract framework, based on the links between occupational stress, personality and the processes which conjointly determine both of these, to allow all of the results to be interpreted in the same general terms. It therefore seemed appropriate to direct some attention to a model of interaction between occupation and person which would accommodate individual difference.

From these considerations the three major objectives of this study arose:

1. Definition of the patterns of experience of nurses with respect to setting, involving the measurement of differences between several hospital wards.
2. Definition of the patterns of experience with respect to differences in personality between individuals.
3. The development of a theoretical framework allowing interpretation of the findings in terms of the common processes underlying the behaviours which define both personality and response to stress.

INTRODUCTION

The prospect of providing a concise review of stress research is at first sight daunting, for stress involves the reaction of a whole organism to its setting, and has been the subject of research in areas ranging from endocrinology to organisational structure (Cox, 1978). Since Selye published his seminal paper 'A syndrome produced by diverse nocuous agents' (Selye, 1936), the list of stress-related publications which he has collected has grown to over 120,000 (Selye, 1979).

Many of these papers will have related to people working in particular classes of environment, which define them as 'blue collar' workers, managers, teachers, nurses and so on. But given that we use the same structures and processes for dealing with information, irrespective of the environment which is its origin, a logical way of reducing the task to more manageable proportions is to identify the principles relating to stress in any situation, and to then apply these to the particular occupation of interest. Such an approach is adopted in this thesis.

Before proceeding however, it is necessary to examine the meaning of 'psychological stress'.

A. Definitions of Stress

Definition is of paramount importance to research, as the usefulness of scientific research is a function of its ability to add systematically to a body of knowledge. For it to do so it is necessary that there be both agreement about the meaning of the concepts involved, and linked to this, consistency in the way in which they are measured, or operationally defined.

On both counts stress research can be found wanting, for definitions of stress are numerous (Cox, 1978), and debate about the meaning of the term is intense (Anisman and Zacharko, 1982).

The many definitions of stress which have been used can be placed into three general categories; stimulus-based, response-based, and interactional.

1. Stimulus-based definitions

'Stress' has been used in the sense in which it is used in the physical sciences, that is, as an external applied constraint. In this sense stress is viewed as a stimulus and an independent variable, having no explanatory power but simply denoting a category of environmental conditions.

The concept has been used in this manner in studies of human performance, and of stress in work settings, involving such variables as environmental temperature (Ramsey, 1983) and noise (Jones, 1983). It is an appealing use of the concept in its consistency with the physical sciences, but at the same time the operational definitions to which it leads are potentially infinite in number, and if the variables in use are adequately defined there is in any case no longer a need to employ the term 'stress'.

2. Response-based definitions

Stress has also been defined in the completely opposite sense, as a response to conditions, a use of the concept common in research on biochemical and physiological response to environmental manipulation. In this case stress is used as a dependent variable, and the corresponding term in the physical sciences would be 'strain'. Selye's original work on stress (Selye, 1936) within the physiological framework used the response-based definition, and such use has continued to prevail in studies of response to imposed conditions.

But like the stimulus-based definitions, those based on response are numerous, for many changes occur in the body as a consequence of environmental change. The range of parameters available for physiological measurement alone is suggested in the statement of Murison and Ursin (1982) that 'The simplest operational definition of stress is that it is the process which produces a change in your own favourite physiological parameter' (p.115).

The fact that adaptation of any organism to its environment involves a coordinated response in all its aspects, motor, cognitive, affective, autonomic and neuroendocrine, has led to the use of a wide range of variables in response-based definition of stress. At the psychological level these have included behaviour, and emotions such as helplessness and depression (Anisman and Zakarko, 1982). At the more physiological level use has been made of direct autonomic

indicators such as blood pressure and heart rate (Warburton, 1979), electrocortical activity (Warburton, 1979), and endocrine measures such as levels of plasma noradrenalin, adrenalin and corticosteroids (Henry and Meehan, 1981). In the long term physical deterioration may result from excessive neuroendocrine activation, and lead to conditions such as arteriosclerosis (Henry and Meehan, 1981), loss of immunocompetence (Riley, 1982), and stemming from the latter, a greater than average incidence of physical illness (Rabkin and Struening, 1976), all of which can be viewed as part of the syndromic response to stress.

As in the case of stimulus-based definitions, whenever such variables are used to operationalise a response-based definition of stress, they must be carefully defined and measured, and the study then becomes a study of the chosen variable, rendering the term 'stress' redundant.

3. Interactional definitions

The growing realisation of the importance of individual cognition and subjectivity in determining the stressfulness of external conditions has led to the interactional definitions, in which stress is viewed as a variable intervening between external events and reaction to them (Cox, 1978). Much of the impetus for this 'cognitive revolution' (Dember, 1974) can be traced to the work of Lazarus (1966), in whose view there can be no such thing as an objective stress, for a situation will not be psychologically stressful unless it is perceived as such.

The interactional definition takes account of the fact that the relationship of a person to the environment is unique, being dependent on that person's view of the environment, and their expectations regarding it. McGrath (1970), for instance, proposed that 'There is a potential for stress when an environmental situation is perceived as presenting a demand which threatens to exceed the person's capabilities and resources for meeting it, under the conditions where he expects a substantial differential in rewards and costs from meeting the demand versus not meeting it' (p.1352).

The interactional definitions recognise that people do not respond to the environment per se but to the processed information which the perceptual system has provided about the environment. Thus, response is not to a set of conditions as objectively defined, but to the

perceived nature of, or significance of those conditions. And in humans, where the capacity for learning and discrimination, and the range of encoded experience is relatively enormous, the variation in significance of a given set of conditions for different individuals is correspondingly large. What may be aversive for one individual may be enjoyable for another.

Problems with interactional definitions

The interactional view of stress, and awareness of the multivariate nature of response to stressful conditions, has led in recent years to models which attempt to interrelate the environment, cognitive assessment based on encoded information, and reactions - behavioural, emotional and physiological. It has therefore become common to cross the boundary from the psychological, to the level of the physiological correlates of behaviour (Cox, 1978). Variability in the effects of environmental conditions extends beyond their perception, to the complex of these reactions, which represent the response of the interdigitated elements of the whole organismic system. Unlike in studies involving laboratory animals, where subjects are often genetically homogeneous, those with humans must deal with a full range of biological variation, leading to idiosyncratic patterns of change in the complex multidimensional domain which encompasses the many reaction parameters. Thus there has been a growing realisation that when one speaks of stress, it is necessary to consider the state of a system, which in all its aspects is unique for every individual. This system is identical to that underlying any behaviour, involving exactly the same structures and processes, so that in trying to delineate a domain to which the term 'stress' can be applied one must deal with multiple continua, representing extensions of normal behaviour processes, in patterns which will differ between individuals. Any attempt to define stress in a way that is both precise and distinctive must employ quantitative cut-off points in several interrelated dimensions, and will therefore be operationally impractical as well as arbitrary.

Adequate definitions of stress therefore necessarily become models of behaviour, and any time that the concept is used in any exact manner in a research context it becomes critical to define a range of both conditions and effects, and the type of person involved. It seems that if one does this, and all relevant parameters are defined,

there is no longer any need to use the word 'stress'.

Not surprisingly therefore, there are those who regard the term 'stress' as useful only in indicating a broad area of study (McLean, 1974), and at a more extreme position, those who regard it as a useless term which should be discarded altogether (Hinkle, 1973).

The difficulties associated with attempts to verbally define stress as an interactional phenomenon can be illustrated with reference to the definitions of McGrath (1976) and Cox (1978). Both of these authors see stress as a consequence of an imbalance between demand, both external and internal, and capability in meeting demand, when coping is important (Cox, 1978). However, an interactional definition must regard stress not as a consequence, but as an intrinsic part of interaction, otherwise the definition becomes response-based. In other words stress should not be regarded as a consequence of imbalance, but as imbalance itself. Furthermore, it is impossible to distinguish imbalance from demand; they are synonyms for the state of disequilibrium preceeding reaction. Also, as importance is a function of imbalance, one cannot, by definition, have imbalance without coping being important. If reaction was not of some importance it would simply not occur. Again, there arises the problem of setting an arbitrary cut-off between what is considered important, and what is considered unimportant. One can also argue that 'demand' and 'capability in meeting demand' are inseparable, for perceived capability must be part of the information base from which demand (imbalance) arises.

Thus verbal attempts to define stress as something distinctive seem to result in entanglement and circularity. A principle reason that they run into difficulty is that they do not sufficiently take into account the identity of processes and parameters underlying stress-related and other behaviour, from which it follows that the only way to distinguish stress-related processes from other behaviour processes, is to specify quantitative criteria for distinction. They tend to imply that imbalance in the relationship between internal and external information sets is a condition specific to stress, and thereby lose contact with the central principle of all interaction - that it is the relationship between information sets which is the essence not only of stress, interactionally defined, but of behaviour in general.

Use of the term 'stress' in this thesis

Despite the difficulties surrounding definition of the concept of stress, the word has proved useful in communication as a general term directing attention towards that portion of the behavioural universe in which negative emotions, excess demand, depression, job dissatisfaction and such like are situated in loose association. Therefore, rather than discard the term as useless or redundant, it will be used in this general sense, rather than in a precise or distinctive way. And instead of interpreting nursing stress in terms of a model of 'stress' it seems more rational to do so in terms of the processes which underlie response to any class of situation, whether perceived as stressful or not.

B. Stress as Imbalance

The fundamental role of imbalance in behaviour

Interactional definitions of stress accentuate the role of imbalance, between perceived demand and capacity (Cox, 1978; Lazarus, 1966; McGrath, 1976) or similarly between person and environment (French, Rogers and Cobb, 1974). The viewing of stress in these terms is treated as an important advance in the conceptualisation of stress. Yet the role of imbalance in any system is fundamental.

Imbalance is a necessary requirement of any process, and no process can continue in a state of equilibrium. This is in fact a statement of a universal thermodynamic law governing the behaviour of matter. To say that reaction to the environment is a result of person-environment imbalance is simply a restatement of this basic axiom, which has already been applied to psychology in the guise of homeostasis - the tendency of a system to regain equilibrium from a state of imbalance.

But although stress psychology has been emphasising the need to take an interactional view of stress its approach to the analysis of work settings has not developed to account for this need. Instead, occupational studies have tended to concentrate on the enumeration and classification of external conditions in terms of their physical identity (Kasl, 1978), with little reference to their role in creation or maintenance of imbalance, and through this their connection with processes of reaction to them.

For instance, McGrath (1976) isolates three independent systems, the physical environment, the social environment and the person. These overlap in pairs to give three further subdivisions, namely, the task (physical environment-person overlap), the role (social environment-person overlap) and the behaviour setting (physical-social environments overlap). This classification therefore gives six sources of stress: (1) task, (2) role, (3) behaviour setting, (4) physical-environment, (5) social environment, (6) person.

Cox (1978) separates sources of stress into (1) internal demands, needs, values and satisfactions, (2) external demand and the work situation, (3) physical environment factors, (4) task-inherent demand, (5) role-related demand.

Both of these approaches, in separating out person in the first case, and needs and values in the second, have reduced the necessary emphasis on the fact that these must always be coupled with any other factor, if it is to produce the state of informational imbalance which underlies reaction to the environment. Yet, because imbalance is a necessary prerequisite for process, the interactional view has the potential to provide the basis on which personality, cognition, and stress, can be linked in common terms, within the general context of behaviour, and to thereby provide a psychologically relevant framework for the interpretation of work-related stress.

I will now move on to the development of such a framework, which can then be applied to the central topic of this thesis, nursing stress.

Imbalance and reaction to the environment

Two major classes of reaction to the environment - cessation of behaviour associated with the onset of undesirable conditions (the STOP reaction), and the initiation of behaviour aimed at dealing with such conditions (the GO reaction) - can each be identified with a particular form of imbalance.

The first form of imbalance arises from the disconfirmation of predictions during goal-directed behaviour, that is, from a discrepancy between internal information in the form of the predicted outcome of behaviour, and the external information input representing the actual behavioural outcome. If such a discrepancy is encountered a motor programme in execution must be halted, as no longer relevant and potentially maladaptive. Thus, signals of non-reward, punishment

or novelty lead reliably to behaviour inhibition, marked by a cessation of ongoing behaviour, increased arousal, and increased attention to the source of unexpected input (Gray, 1982).

The above observations have led to the psychological concept of a behaviour inhibition system (Gray, 1982). A good deal of evidence also suggests that it is the activity of the behaviour inhibition system that is the basis of anxiety. For instance, the behaviour inhibition, arousal increment and increased attention that result from unpredicted outcomes are all reduced by antianxiety drugs (Gray, 1982).

The role of the imbalance between expectations and outcomes in activating the behaviour inhibition system is of considerable importance to the topic of stress, because, in the words of Hamilton (1979) 'Anxiety - widely and cognitively defined - is the major and most fundamental source of strain in the person' (p.86).

The mention of cognition brings us to the second major form of imbalance, the imbalance between conditions identifying a goal and the actual goal state. The relationship between the two imbalances, assuming for simplicity that outcomes are such as to result in behaviour inhibition, is summarised in Figure 1. The imbalance between expectations (predictions) and outcomes (Imbalance I) leads to behaviour inhibition, abortion of motor programmes, and the pickup of information required for goal identification. The imbalance between conditions of goal identification and goal attainment (Imbalance II) will, on the other hand, lead to the cognition required to generate a motor programme which can bridge the gap between these two conditions. Behaviour inhibition may therefore lead on to the information processing required for the resumption of activity, so that anxiety has a cognitive component. If conditions and encoded information are such that it is difficult or impossible to generate an appropriate motor programme, so that there is an inability to control, the state of sustained anxiety and active cognition known as worry will result (Eysenck, M., 1983).

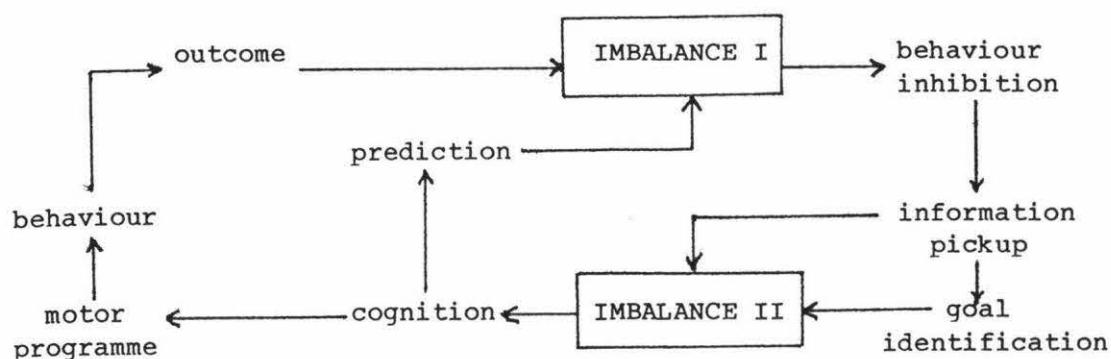


Figure 1. Relationship of imbalances to inhibition and resumption of behaviour.

The role of imbalance in behavioural and cognitive reaction to the environment is described more fully in Figure 2, which includes the information processing steps necessary for behaviour inhibition and motor programme generation. A third form of imbalance, shown in Figure 2, but not in Figure 1, is that which ensures that the information pickup necessary for adaptive interaction with the environment is maintained. Figure 2 is not intended to be a comprehensive model, but highlights those aspects of information processing most relevant to the present discussion.

An important feature of the model shown in Figure 2 is the comparator. It is essential to postulate the existence of such an entity, as a comparison of internal and incoming information sets must be made, leading to detection of imbalance, before the processes which result from imbalance, and which lead to cognitive or behavioural reaction, can be set in train. The comparator has had a central role to play in recent information processing models of behaviour (Powers, 1974; Welford, 1978), although the identity of the systems or structures which subserve the function of comparison, is at present uncertain.

Generally a sequence of behaviours is required to link an initial input to the final goal which it identifies. Under stable conditions a motor programme suitable to the environment may become established in memory and immediately available for execution, when a high degree of skill will be apparent. But more often a sequence of performances must be tailored to the environment at the time. A sub-goal must be chosen for each step in the behaviour chain required, and the performances which achieve each of these sub-goals must be stored in working memory, in the correct sequence, as the motor programme.

Before selection each of these performances must be tested internally in the process of cognition, by generating a prediction of its outcome in light of existing environmental conditions, and comparing the prediction with the sub-goal, at the comparator. If the predicted outcome and sub-goal match, the performance can be stored, with its predicted outcome (= subgoal) as part of the programme and the next sub-goal in the sequence retrieved. If they do not match another performance must be cognitively tested, and the process repeated until one which has the desired outcome is attained. The cognitive looping involved can be seen in the lower part of Figure 2.

It can be seen that the comparator acts in at least two modes; in an interactive mode during execution of motor programmes, when actual outcomes are compared with goals (equivalent to predictions during programme execution) and in a cognitive mode during generation of the goal directed motor programmes, when predicted outcomes are compared with goals.

In summary, Figure 2 outlines the way in which imbalances which reside in the relationship between information sets may on the one hand drive processes which prevent imbalance from increasing (the STOP reaction), and which on the other hand provide impetus for the processes necessary to achieve a reduction in imbalance (through the GO reaction).

Factors leading to high frequency and/or sustained imbalance

The above discussion of the model shown in Figure 2 allows us to identify, in an information processing context, the general conditions under which states of imbalance are created and sustained.

The imbalance between expectations and outcomes, responsible for behaviour inhibition and anxiety, will occur when goal-directed behaviour is inappropriate to existing conditions, and therefore leads to non-reward, punishment or novelty. It will occur when:

- (1) conditions change after programme generation
- (2) information about the environment, used as a basis for sub-goal selection and outcome prediction during cognition is either inadequate or inaccurate.

Under these circumstances the STOP condition will be imposed, and the activities necessary to identify an appropriate goal, and to generate the motor programme required to achieve that goal, will be initiated. That is, activity of the system will be redirected from

interaction to cognition.

The state of sustained cognitive imbalance responsible for worry may occur when there is an inability to identify sub-goals, or to generate predictions which correspond closely enough with selected sub-goals to achieve a state of balance. Both of these conditions will occur when:

- (1) learning has not been adequate for the conditions,
- (2) there is insufficient information available about the nature of the conditions,
- (3) when the information to be processed, or the length of the performance chain to be stored, exceeds the capacity of working memory.

Under these circumstances there will be a delay in reaching, or inability to reach the state of motor programming and predictive readiness required for the GO decision, which is necessary for reinstatement of goal-directed behavioural interaction of the system with the environment.

Individual differences and stress

Any consideration of internalised information, relationships between information sets, or reactions to these relationships, necessarily brings one to within the domain of personality.

Like stress, personality is a concept which has been difficult to pin down, and which has received a range of definitions. There is no doubt however that the idiosyncratic yet consistent way in which individuals act is the product of two interrelated factors.

- (1) Inherent difference in brain function which determines individual reactivity to informational imbalance.
- (2) Individual experiences which result in unique sets of encoded information, to serve as the template against which the comparison of other information leads to imbalance.

A large and fairly consistent body of evidence has now accumulated in support of the views of Eysenck (1967), who, on the basis of factor analytic evidence, has proposed that individual difference can be explained largely by variability along two major dimensions, Introversion-Extraversion (E) and Neuroticism (N), both considered to reflect differences in underlying brain function.

The high E/low N and low E/high N combinations have been noted to coincide exactly with the sanguine (lively, sociable, stress

resistant) and melancholic (quiet and fearful) types for whom Pavlov (1955) had postulated differences in nervous properties. Recently, measurements on individuals reliably defined in terms of extraversion and neuroticism as corresponding to the Pavlovian types, have been shown to differ in the transmissive properties of relevant central neurones (Robinson, 1982). Thus the link between Pavlovian/Eysenckian personality types and constitutional difference in brain function has been experimentally confirmed.

Gray (1981) has proposed that a range of observations can be better accommodated if Eysenck's factor analytic axes are rotated 45° to give two new dimensions, which he has termed Anxiety and Impulsivity. The anxiety dimension runs from high E/low N (low anxiety, 'sanguine') to low E/high N (high anxiety, 'melancholic'), and the impulsivity from low E/low N (low impulsivity) to high E/high N (high impulsivity).

The Anxiety dimension is considered by Gray to be a primary dimension reflecting levels of sensitivity to signals of punishment, non-reward and novelty, that is, to prediction-outcome imbalance. It thus reflects activity of the behaviour inhibition system, responsible for the STOP reaction, while impulsivity is considered to reflect responsiveness to signals of reward and non-punishment. Thus neurotic introverts can be regarded as most susceptible to behaviour inhibition, and as having a behaviour inhibition system which is relatively more powerful than the impulsivity system. In contrast to the behaviour inhibition system, the impulsivity system remains anatomically undefined (Gray, 1981).

Individual differences in reactivity are important to the information base of future response. Neurotic introverts (High anxiety) have been shown to be particularly susceptible to aversive conditioning (Gray, 1981), so that not only will their reaction to aversive conditions be intense, but they will be prone to develop a cognitive set characterised by a high loading of negative experience. This will provide a basis for prediction of negative outcomes during cognition, leading to a tendency for excessive rejection of possible coping performances (see Figure 2). The resulting tendency to inaction will lead in turn to generalised expectations of failure (non-reward), a sense of inability to control, a perception of low personal effectiveness, and to an even higher degree of behaviour inhibition, evident as learned helplessness. The latter has

consistently been shown to be associated with loss of control (Abramson, Seligman and Teasdale, 1978; Watson and Clark, 1984; Zuroff, 1980).

One can predict from this that individuals who have a tendency to experience job events and conditions as relatively stressful, are also likely to be introverted, neurotic, low in self esteem, external in locus of control, and high on trait anxiety. Trait anxiety has been described as a combination of a reservoir of potential anxiety responses accumulated through experience, with an innate susceptibility to anxiety (Spielberger, 1975).

Imbalance in an organisational context

The preceding discussion has attempted to relate person-environment interaction to the information processing required for reaction, and has placed some major general factors that act to sustain a state of behaviour inhibition, or retard response generation required for release from it, into an interactional context.

These factors reflect the nature of information processing, and as information is processed by the same brain structures and functions regardless of its origin, they are abstract, and will apply to any situation. Moreover, by being related to distinctive processes involved in the basic STOP and GO decisions underlying behaviour, they are both non-arbitrary and psychologically relevant.

In contrast, by taking the usual approach to analysis of job stress, in terms of external entities such as tasks, roles, behaviour settings and so on, one invites redundancy, because although such categories are represented by different information sets, these are however all processed by the same biological system, which itself categorises information not in terms of convenient external abstractions, but in terms of more basic criteria related to survival value. Furthermore, it is through the operation of this one system that all of the information processing which preceeds development of the stress syndrome, takes place. McGrath (1976) has himself implied the presence of redundancy in the usual approach to analysis of job stress, by saying 'It is clear that our admittedly arbitrary specification of six sources of stress is far too "neat" for sustained discussion. Our consideration of "tasks" has already spilled over into consideration of "role" and "persons" and we will find ourselves covering some of the same ground later' (p.1380).

Therefore, rather than try to analyse nursing stress solely in terms of such arbitrary groupings, it will be reviewed with reference to the basic facets of imbalance, information processing, and response generation, which cut across and operate in all settings. By concentrating on psychological process, rather than arbitrary external groupings, one retains contact with the essence of the interactional definition of stress, imbalance, and is able to work from a base on which stress and personality can be linked in the same terms.

C. Stress Amongst Nurses

Nursing has been the subject of a number of studies of occupational stress (Grout, 1980). There has grown a wide acceptance that it is a high stress occupation, in its demands for skilled performance, high work rates, intense interpersonal contact and exposure to situations high in personal meaning, usually in the context of a large bureaucratic organisation (Marshall, 1980). Attention has frequently been drawn to the high levels of absenteeism, staff turnover and burnout observed in nursing (Brief, 1976; Kramer and Baker, 1971; Nichols, G., 1971; Weiland, 1979), which are characteristic of high stress occupations (Kahn, Wolfe, Quinn and Snoek, 1964).

A good proportion of the literature on nursing stress has been based on opinion and surmise. Where measurements have been made they have relied largely on the use of questionnaires to identify and enumerate the sources of stress perceived by nurses, but there has been little subsequent systematic analysis of the way in which these relate to the underlying processes which must precede reaction to them.

A detailed exposition of the quantitative findings of previous studies is not warranted, because so many variables operate within an occupational setting that the results of each study will be rather specific to the time and the setting in which it was conducted. Results are likely to vary not only between wards, but also between hospitals, as a result of their organisational structures and climates, staff attitudes, patient backgrounds and so on (Marshall, 1980; Miller, 1976), and also temporally in relation to such factors as changes in leadership (Nichols, Springford and Searle, 1981). One must therefore be cautious in generalising, and prudent in viewing the levels of stress as probably being in a state of continual

fluctuation. However, previous studies have provided an indication of the types of situation which occur in hospital settings, and which will now be subjected to an analysis in terms of the preceeding discussion; that is, in terms of the states of imbalance which must underlie reaction to them.

1. Sources of imbalance between outcomes and expectations

The disconfirmation of expectations by job content has been recognised for some time as a source of job stress, and has been termed role conflict - the extent to which expectations associated with a role are incompatible (Kahn, Wolfe, Quinn and Snoek, 1964; Rizzo, House and Lirtzmann, 1970). Role conflict can arise either when there is a discrepancy between the expectations a person has of their job (role conception) and actual job demands, or when different job demands require the achievement of disparate goals. In either case, satisfaction of one demand requires non-satisfaction of another, or perhaps even some form of punishment, so that an element of imbalance between outcome and goals exists. This will lead to activation of the behaviour inhibition system, and thus to elevated levels of anxiety, and in turn to dissatisfaction and a propensity to leave the organisation. These effects of role conflict have consistently been shown in a number of work settings (Kahn et al., 1964; Rizzo et al., 1970).

Role conflict has been studied specifically in relation to the nursing role (Corwin, 1961; Kramer, 1970; Redfern, 1980). Corwin (1961) identified three major classes of role conception in nurses. They were:

- (a) bureaucratic, in which the overall objective is effective administration so that the hospital runs effectively as an organisation,
- (b) professional, when the emphasis is on keeping abreast of knowledge in the health care field and applying it in a flexible way to the formulation of strategies, in response to specific patient problems,
- (c) service, in which the emphasis is more on the traditional nursing-role involving direct interaction and care of the patient.

These expectation sets are largely a reflection of different emphases during nursing education, and establish a potential for disparity, because in reality nursing demands a range of behaviours,

and therefore goals, which cover all three categories.

Corwin (1961) found the greatest degree of discrepancy between ideal conceptions of a nursing role and reality to occur in the newly graduated nurse, in whom a strong professional orientation had been established. Whereas the nurse with a professional conception of his/her job values the flexible application of professional skills, and tailoring of activity to the needs of the individual patient, the bureaucratic system demands standardisation and rules. An inappropriate role conception will therefore lead to a high probability of non-reward. And consistent with this Redfern (1980) has found voluntary turnover in nurses to be positively related to role conflict, and job tension.

A second source of role conflict in the hospital can stem from multiple lines of authority (Kalisch and Kalisch, 1977; Marshall, 1980; Rizzo et al., 1970). Since authority can be viewed as a system of punishers consequent upon non-compliance, the need to choose between conflicting demands will necessarily result in threat of an aversive outcome, in the form of a punishment, from whichever source of authority has not had its demands met. The professional in organisations with multiple lines of authority frequently experiences stress as a result of being caught between the lines.

Hospitals provide a particularly clear example of multiple lines of authority. Despite the doctor and nurse having so often to act in partnership, interaction between the two has traditionally been a source of role conflict in nursing (Kalisch and Kalisch, 1977; Marshall, 1980). Although teamwork is required the doctors often act independently and with little regard to the goals and aspirations of the nurse as a professional. Furthermore, they are not subjected to the same degree of authority, which would constrain and standardise their behaviour as a congruent and predictable entity in the nurses' world.

If there is lack of clarity and agreement about the exact roles of team members, and about the final objective, there will be behavioural interference between team members, leading to frustrative non-reward, and thence to the natural consequences, anger and conflict.

At the more specific level there are a multitude of actual situations which will lead to behaviour-inhibiting imbalance in the nurses' work setting, in fact, any novel, non-rewarding or aversive input during ongoing behaviour will fall into this category.

Apart from the obstructive behavioural interferences which stem from conflicting organisational demands there are those due to uncooperative patients, interruptions, and from having to work with others who differ idiosyncratically in their approach to work, their motivation, work rate and so on.

Non-reward may also result from a failure of outcomes to materialise, such as deterioration in a patient's condition despite or because of treatment, or an inability to relieve pain.

The nurses' work environment is also full of stimuli which are likely to be aversive; vomit, excreta, mutilation and the emotional expressions of patients, such as those associated with pain or grief. The latter, as innate responses to inner states are likely to intrinsically affect those who perceive them. In units where there is a high rate of patient mortality, exposure to death and dying has been regarded to be an important source of distress, leading to feelings of helplessness and grief in the nurse (Chiriboga, Jenkins and Bailey, 1982; Steffan and Bailey, 1979).

The perception of external conditions as aversive may be modulated by the physiological state of the body. A clear example of this, of particular relevance to nursing, is the state of fatigue, motivating the person to rest, when the need of the body for recuperation will result in an aversiveness of those conditions that demand further activity. And as physiological capacity is partly a function of circadian rhythm this imbalance may be exacerbated by the need to work shifts, particularly when frequent changes in shift mean that there is little chance of synchronising circadian and job-related activity. Thus, although work-load per se is seen as a major source of stress in nursing, adjustment to shifts may also be seen as a contributor (Bailey, Steffan and Grout, 1980; Gray-Toft and Anderson, 1981; Hay and Oken, 1972; Ivancevich and Smith, 1981; Marshall, 1980).

External events may also become aversive when they lack significance and therefore fail to satisfy the basic human need for at least a moderate degree of stimulation. Repetitive jobs which lead to habituation (loss of significance) and tasks not relevant to the nurse's speciality, and which may therefore be of low intrinsic reward, may both be sources of boredom for the nurse.

Although the nurses' environment may be full of obstructive stimuli, to which attack is a natural reaction, of aversive stimuli,

to which escape or withdrawal would be appropriate, and of others such as death or separation, which may evoke reactions of grief or sadness, there is also a system of potential punishers to inhibit the expression of these options. These punishers are set by the complex system of organisational constraints which in effect lead to patterns of behaviour inhibition, directing behaviour as the organisation demands. Thus for many elements in the nursing environment for which the basic fight and flight options are naturally appropriate, there also exist constraints which act to maintain behaviour inhibition and ensure that the nurse at all times gives the impression of being committed, in control, and emotionally uninvolved, even at the cost of suppressing real feelings (Marshall, 1980).

A three-tiered set of factors may therefore act to maintain behaviour inhibition in the nursing environment:

1. The aversive situation
2. The organisational constraints preventing withdrawal (flight)
3. authority, preventing destruction of the constraint (fight)

With the fight and flight categories of response so heavily constrained the freeze option, involving withdrawal within the environment, assumes increasing importance, and the stage is set for depression. These points are summarised in Figure 3.

In actual practice however, this consequence is averted through the extensive use of a variety of coping strategies, such as denial, rationalisation, or the spreading of patient contact so that time spent with any one patient is minimised (Chiriboga *et al.*, 1983; Marshall, 1980; Maslach, 1979). However, such defenses are essentially palliative, as they have no influence on the actual sources of imbalance, and therefore may be maladaptive in the long run. Individuals who use mechanisms such as denial or repression, which evade information, generally show persistent high levels of stress (Heilbrun, 1984).

2. Imbalance between stimulus conditions identifying a goal and conditions of goal attainment.

Identification of a goal creates the imbalance necessary for response organisation, to bridge the gap between conditions identifying the goal and conditions of goal attainment, that is, of

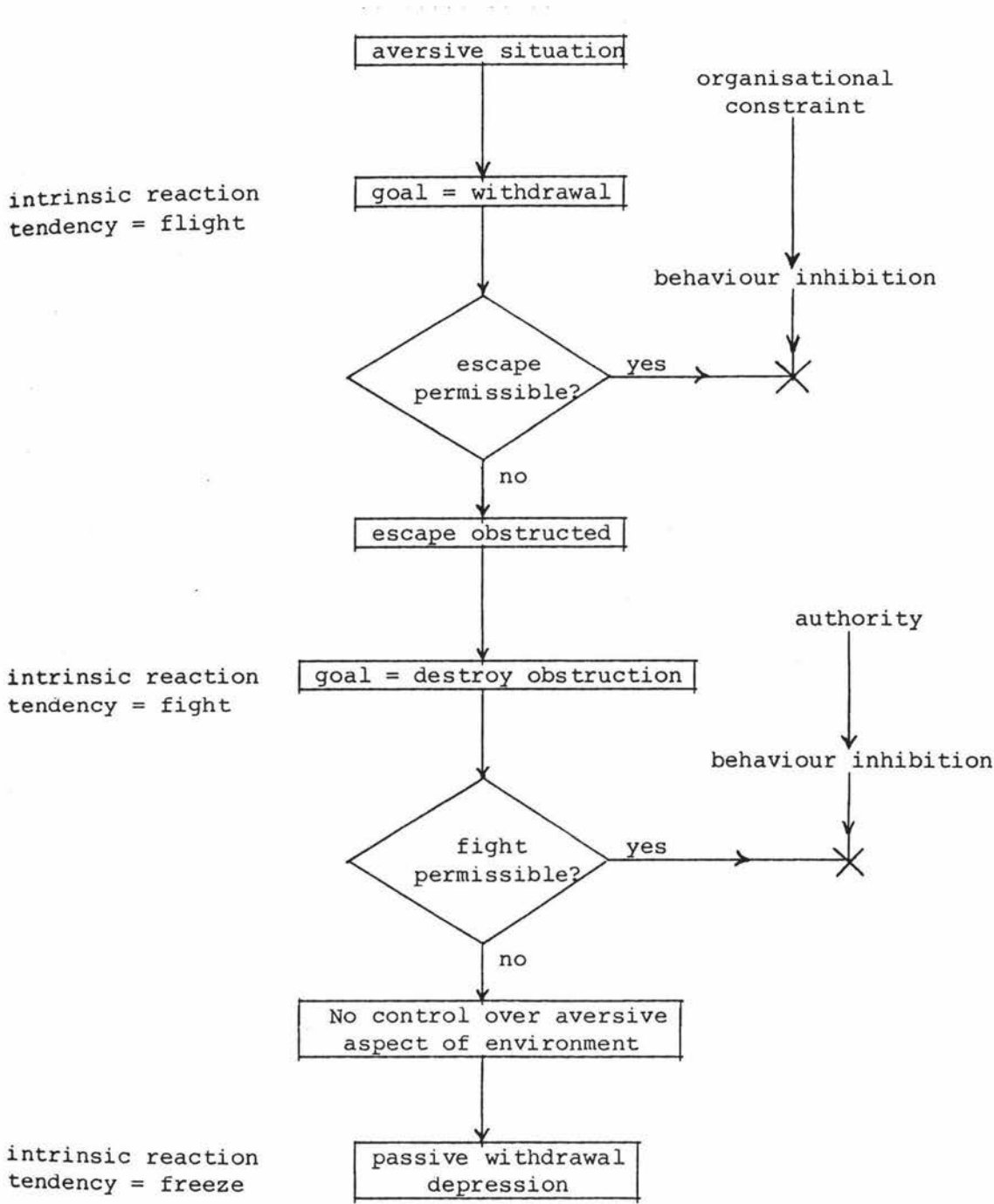


Figure 3. Role of the organisation in the maintenance of behaviour inhibition

task completion. Much of nursing education, like any occupational training, is aimed at establishing relevant motor programmes and providing the information with which these can be generated or modified to meet task demands on the ward.

When a response is not immediately available to deal with an aversive situation, the anxiety which stems from activity of the behaviour inhibition system is coupled with the active cognition required to generate a motor programme, so that a state of worry arises (Eysenck, M., 1983). The degree of worry can be expected to depend on a number of factors:

(a) The degree of aversiveness of the situation. Since degree of aversiveness and arousal will be a function of imbalance, and imbalance underlies process, highly aversive situations are likely to lead to a high level of cognitive activity where an immediate response is not available.

(b) The time within which a response must occur. When time limits for action are imposed, not only must cognition be more intense to organise a response, but the cognitive testing of predictions against goals is likely to be less complete, so that action that does result is more likely to be tinged with uncertainty - residual imbalance - and the anxiety which it generates.

(c) The need for response precision. When a high degree of correspondence between performance outcome and goal is necessary cognitive testing of predicted outcome against goal must be extended to reach the degree of correspondence representing precision.

(d) The clarity of the goal. Where the goal is unclear there will be a degree of uncertainty regarding appropriateness of the response, and thus an inability to predict the consequences of action.

(e) The availability of information about the environment in which the response must occur. If knowledge of conditions is inadequate, selection of the sub-goals and therefore performances necessary to bridge the gap between conditions of goal identification, and goal-attainment, will not be possible. Furthermore, it will be difficult to predict the consequences of action with incomplete knowledge of the conditions under which it must occur.

All of these factors are relevant to the demands for response placed upon the nurse. The consequence of non-response to a patient's needs could be death of the patient, reaction must often be immediate, involving complicated equipment and exact administration of drugs, so

that the informational basis of response may often involve considerable detail. And although nurses are trained to a high degree of skill, the performance therefore expected of them, and its high visibility, makes failure increasingly salient, not only in terms of the nurse's view of his/her own competence, but also in terms of the degree of punishment that can be expected from the hospital organisation (Marshall, 1980).

Because of the importance of processed information to immediate skilled response, and the lack of scope for trial and error learning, the nurse will often perceive various causes of unavailability of information to be sources of stress. Therefore, although emergencies, unexpected crises, critical unstable patients, difficult drugs and equipment, have been identified as sources of stress in nursing (e.g., Steffan and Bailey, 1979), a prominent position has also been given to such factors as unfamiliar situations, inadequate knowledge, decision making, lack of experience and skill, lack of continuing education, unclear requests, lack of training, too many details, confused planning, lack of communication, unclear goals, conflicting requests, and making decisions without adequate information (Bailey *et al.*, 1980; Gray-Toft and Anderson, 1980; Ivancevich and Smith, 1981). Conflicting requests from multiple authorities may also be a source of worry to the extent that there may be concern regarding the possible consequences of choice.

The importance of relevant knowledge to effective organisational behaviour, job satisfaction and stress has been a focus of role theory (Kahn *et al.*, 1964), and related to the term 'role ambiguity', which refers to a lack of information relevant to a given organisational position. Lack of clarity about work objectives associated with a role, about others' expectations of the role, and about the scope and responsibilities of a job, have been shown to be associated with lowered job satisfaction, high job-related anxiety, low self-esteem and a propensity to leave the job (Margolis, Kroes and Quinn, 1974; Rizzo *et al.*, 1970). Lyons (1971) found perceived role clarity (the converse of role ambiguity) to be related negatively to voluntary turnover, propensity to leave, and job tension, and positively to work satisfaction in registered nurses.

The treatment of physical illness will usually involve response to relatively clearly defined conditions. But there is a less tangible component to nurse-patient interaction, involving emotional demands of

the patients and their families. Emotional demands are much more difficult to respond to with confidence, because the appropriateness of response may require recognition not only of the stimulus, but also of its underlying source, for, while emotions are limited in variety, their possible causes are infinite in number. A source of worry for the nurse will therefore be identification of the sub-goals necessary to generate an appropriate response, and he/she may have to make a guess at what is relevant.

Associated with the problem of goal definition in emotional support is the difficulty of predicting the response of the patient or family to attempts to provide support.

Nevertheless, the nurse is often left to carry the emotional "can" for the doctor (Kalisch and Kalisch, 1977; Marshall, 1980), and in repeated close contact with the patients, may be forced into a position of responding in some way to their emotional demands, despite seldom having time to play a counselling role.

Given the uncertainties involved, the response of the nurse to emotional demands is likely to be tentative and tainted with anxiety. But evidence suggests that responses are more often avoidant, and although providing short-term relief for the nurse, are inappropriate for the patient. In a study of the way in which nurses reacted to a patient's wish to talk of the fact that they were dying, only 36 out of a sample of 200 responded with relevant discussion, while most adopted some sort of avoidant response such as reassurance, denial, or changing the subject (Kastenbaum, 1967).

The importance of emotional demands of patients and their families as contributors to nursing stress has received frequent mention (e.g. Bugen, 1979; Marshall, 1980; Maslach, 1979) and recent data (Gray-Toft and Anderson, 1981) indicating that these are a significant component in stress amongst nurses, supports the inclusion of items related to the nurse as a source of emotional support, in nursing stress questionnaires.

Sources of job satisfaction

The role of aversive conditioning in directing organisational behaviour has been alluded to. But direct rewards are also important in maintaining this behaviour and are the source of job satisfaction which stems from the congruence of outcomes and role expectations. Primary rewards of this type will stem from improvements in a

patient's condition and/or mood, for instance, but secondarily there is the reward that stems from patient and family gratitude (Bailey *et al.*, 1980; Marshall, 1980).

The hospital organisation can also be a source of reward, by giving positive feedback, such as recognition of the value of a job well done.

Non-reward has been identified as a condition which activates the behaviour inhibition system, so that lack of feedback from other staff to the nurse is a potential source of behaviour inhibition, and has been identified as a source of stress in work settings, relating to role ambiguity (Rizzo *et al.*, 1970). Such feedback is important not only in indicating that expectations have been met, but also in shaping the nurses' skills, and therefore the information base already identified as crucial to release from behaviour inhibition.

Personality and stress in nurses

There has been very little published on the personality characteristics of nurses in relation to stress. The few exceptions have involved measures of trait anxiety (Gentry *et al.*, 1972; Gray-Toft and Anderson, 1981; Gross and Brown, 1967; Maloney, 1982).

Gray-Toft and Anderson (1981) found trait anxiety to have a significant although modest correlation with total stress scores ($r=+.39$, $p<.01$) and with job satisfaction ($r=-.24$ $p<.01$). They suggested that differences in trait anxiety between staff on different units might be a factor contributing to differences in stress experienced on the units. Maloney (1982) found that trait anxiety was lower in intensive care than in non-intensive care nurses. Both of these studies are consistent with an earlier suggestion (Gentry *et al.*, 1972) that nurses with specific characteristics are attracted to particular types of unit. If this is the case, reported differences in the levels of stress experienced in different settings must be determined not only with respect to setting, but also in terms of the types of people which make up their staff.

If the nurses' selection of their work location within the hospital does indeed result in some sorting of personality types, it implies that in hospitals such as that studied in this thesis, where placement is largely directed by the administration, nurses are less likely to be located in an environment compatible with their

personalities. In this case incompatibility is likely to be more prevalent and personality likely to show a stronger relationship to stress, than in hospitals where nurses have some control over their placement.

In studies such as the one to be described in this thesis, where settings are compared within a single hospital, and the numbers involved are therefore low, it is imperative that variation arising from individual differences in responsiveness to aversive conditions be accounted for.

Stress in different hospital settings

Various hospital wards can be expected to differ for a number of reasons. The types of case that they are specialised to accommodate will bring their own patterns of aversive element into the environment and make their own particular demands on the nursing staff. For instance, intensive care is held to be characterised by high work loads, a high level of instrumentation, anxious families, and little in depth interpersonal interaction with patients (Hay and Oken, 1972; Maloney, 1982; Steffen and Bailey, 1979), while Oncology typically involves long term, close, interpersonal contact with patients, and a high level of exposure to the impact of dying on them (Chiriboga et al., 1982). Staff on both of these units are exposed to a high patient mortality rate, and supposedly suffer a high level of distress as a result (Chiriboga et al., 1982; Maloney, 1982), whereas those in a surgical unit would not be exposed to the same degree.

The structure of work environments will differ according to speciality, thus affecting the ease with which necessary responses can be generated to attain goals. For instance, in intensive care response may involve rather complex equipment which would not be encountered on other wards (Hay and Oken, 1972). In terms of physical layout the structure of the ward may act to impede or facilitate nursing activity. In older units a greater degree of effort may be required to complete tasks than on newer well designed units, and this may account for differences in apparent job stress observed between old and new units in one study (Gray-Toft and Anderson, 1981).

The pattern of constraint and punishment may also vary as a function of the personality of those in authority in the different wards, so that otherwise similar wards may differ considerably in their interpersonal climates (Nichols et al., 1981).

Most studies of stress in nurses have concentrated on individual units such as intensive care (Grout, 1980; Hay and Oken, 1972; Steffan and Bailey, 1979), coronary care (Cassem and Hackett, 1972), neural care (Wertzel, Volliath, Ritz and Feiner, 1977) and oncology (Klagsbrun, 1970; Newlin and Wellisch, 1978). There have been very few studies which have compared settings in terms of either experienced stress or sources of stress.

In a comparison of five units (medicine, surgery, cardiovascular surgery, oncology and hospice) in a private American hospital, Gray-Toft and Anderson (1981) found the hospice to show the lowest level of stress and medicine the highest, when stress was measured as frequency with which various situations were experienced as stressful. Differences in satisfaction between units appeared to be related to the general work environment of the unit and supervision received. Comparison of means to identify sources of significant difference were, however, not made. Three major sources of stress were identified: work load, feeling inadequately prepared to meet the emotional demands of patients and their families, and death and dying. The low levels of stress in the hospice were attributed to the fact that it was a new unit, with a high staff-patient ratio, and with staff who had been specially recruited and trained to work with dying patients and their families. Differences amongst the units suggested a need for further study of structural characteristics of units that may affect amount of role conflict and ambiguity which staff experience, and personality characteristics which may attract nurses to specific units.

Maloney (1982) compared intensive care and non-intensive care nurses, and found no difference between the two groups in overall job dissatisfaction. However, non-intensive care nurses showed a greater dissatisfaction with work load than intensive care nurses, so, in this respect the findings did not support the commonly expressed view that intensive care units typically impose higher work loads than other units.

In an investigation of distress and discontent in various types of nursing Nichols et al. (1982) compared intensive care, medical, surgical and two renal units using a short questionnaire (13 questions). Only one ward was significantly different from others, and that was one of the renal units, known to be in a state of crisis, due to changes in both medical and nursing leadership which had

occurred just prior to the study. This indicates a fluidity in stress patterns and suggests that such studies are specific not only with respect to location, but also with respect to time.

Patterns of experience in New Zealand Hospitals

There have been no systematic studies conducted on the patterns of stress encountered by nurses in New Zealand hospitals. As discussed, there have been a small number of comparative studies conducted overseas, but even so, the differences between health care systems, the administrative patterns in different hospitals, the physical structure of different wards, and the composition of their staff at any time, ensures that there is limited validity in applying the findings from one hospital to another, particularly when they are in different countries.

Scope of the present research

So far, an attempt has been made to define sources of stress in terms of the imbalances which drive person-environment interaction, thus linking them to some of the underlying processes which govern behaviour, and therefore the expression of personality difference. In doing so stress has been discussed within the framework of a general model of behaviour, which, it was argued, provides an appropriate context for the analysis of stress, because there is no fundamental difference between 'stress related' and other behaviours; they differ only in degree.

Of the three primary objectives stated at the start of this thesis, one has already been addressed, namely the development of a psychologically relevant framework in which to view occupational stress. This interpretive framework was applied to nursing, thus setting the scene for pursuit of the remaining two objectives, namely:

1. definition of the patterns of experience of nurses with respect to setting, involving the measurement of differences between several hospital wards, including Oncology.
2. definition of the patterns of experience with reference to differences in personality between individuals.

The conduct of this study was subject to a number of constraints arising from the fact that it was carried out at the behest of the

palmerston North Hospital administration.

These constraints included:

1. a need for the study to be conducted with minimum delay,
2. the need to make do with the relatively small numbers of subjects in the settings approved for study, and confined to the one hospital,
3. a requirement that the nurses' duties be interfered with as little as possible, thus preventing a thorough observer-based job analysis, extensive interviewing, or the collection of physiological data.
4. a need for much of the data to be of direct interest to the hospital administration.

Thus, although it was necessary for the study to be conducted almost entirely by questionnaire it was not possible to develop and test an instrument specifically for this research. For this reason it was necessary that some degree of job analysis and validation be built into the questionnaire. A partial job analysis was obtained by asking subjects to rate both frequency and stressfulness of events in the various settings. Validation was achieved with several standard stress-related measures (well-being, state anxiety and depression) and from intercorrelation of a number of independent stress indices derived from the questionnaire data. The methods used will be described later in detail, but in summary they included assessment of the significance of various aspects of the hospital environment as sources of stress, measured in terms of perceived frequency, stressfulness, and emotional reaction to relevant events, perceived stressfulness of ongoing job conditions, as well as in terms of role conflict. Overall reaction to various work settings was determined on a variety of measures. These included mood at shift end, propensity to leave the job, perceived overall stressfulness of the job, and other indices of stress derived from the events and job conditions data, as well as from scores on standard tests of well being, state anxiety and depression. The personality variables extraversion, neuroticism, trait anxiety, self esteem and locus of control were also measured.