

**Bangor University**

## **DOCTOR OF PHILOSOPHY**

### **Personal control, performance and health**

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*Award date:*  
1991

*Awarding institution:*  
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**PERSONAL CONTROL, PERFORMANCE AND HEALTH**

Thesis submitted to the University of Wales in fulfilment of the requirements for the degree of Doctor of Philosophy by Lawrence Smith, Department of Sport, Health and Physical Education, University College of Wales, Bangor.

July 1991



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## ACKNOWLEDGEMENTS

In some respects I feel this page to be the most important of the whole thesis and also the most difficult to write. Many people have helped me, supported me, encouraged me and sometimes pushed me during the course of completing this thesis. Some will be very aware of their contributions, others, I know, will not consider their support to have been anything of great consequence, still others will not have given much thought to how they have helped. To all, I would like to extend my sincere gratitude.

There are a few, however, to whom I would like to express particular thanks. Firstly, thanks to Lew Hardy, my supervisor. He not only had the faith in me to encourage my undertaking a PhD, but also possessed the consummate skill to guide me through the inevitable times of confusion and helped focus my attention upon the important bits. I am indebted to him for his professional and personal approach, as well as the more tangible support he gave when things were tight. Thanks Lew.

Secondly, a special thanks and love to Liz, who supported me through thick and thin. I know that without *her work* this work would not have been completed. Like so many women who work at home she does not get the recognition or rewards she richly deserves. I hope now I can contribute more to our life together. I also know Liz will not think that she has done much to help my progress. Nevertheless, I greatly value her endeavours on every plane. Now there will be more time for us all.

Thanks also to John and Della Fazey, who have been, and shall always be, friends. Their philosophy of life, expressed through their many acts of friendship, has helped me consolidate my beliefs about what is important in life.

Finally, I express my love and appreciation to my children, Mathew and Sam, for their love and all the special and wondrous things children do. They often helped keep my feet on the ground when my head was in the clouds.

I have worked hard and sometimes my personal control was not what it should have been, but I have never been helpless or hopeless. Thanks to you all for helping me to understand that seeing is not necessarily believing and that sometimes, we have to believe to be able to see.

## SUMMARY

The concept of personal control is now a major theoretical and practical consideration for many areas of psychology. Control was operationalised here in terms of Lazarus and Folkman's (1984) cognitive theory of stress and control, and Rosenbaum's (1985) theory of Learned Resourcefulness. In the first experiment a state oriented self-control inventory was developed. The psychometric properties of the scale were generally supported. Emotion focused control emerged as the most significant control response under stressful circumstances. It was suggested that certain minimal levels of emotion focused control were needed before the problem situation's demands could be addressed effectively. In the second experiment a catastrophe paradigm was adopted in order to examine performance changes and hypothesised switches in the focus of control in relation to certain "critical points" during a stressful situation. Under conditions of high cognitive anxiety and increasing goal difficulty, emotional control was greatest following a negative critical point, after which there was also a withdrawal of effort from direct problem oriented strategies. However, with goal difficulty decreasing, emotion focused control was relinquished following a positive critical point in favour of problem oriented control once the pressure was perceived to have eased. The third experiment examined the relationships between dispositional self-control and self-motivation, and health in groups differing in their stress experiences. In addition, a self-control/self-motivation model was tested in relation to coping, perceived control and mental health. Self-control was found to be significantly related to psychological health, especially under conditions of chronic stress. The proposed model suggested that high self-control coupled with extensive coping efforts was associated with greater mental well-being. The significance of personal control in stressful encounters was underlined in the above experiments.

## PREFACE

The issue of personal control has important implications for most aspects of human functioning. Many areas in psychology, such as Health Psychology, Occupational Psychology and Sport Psychology, now recognise the significance of control for functional competence and well-being. This thesis is aimed at contributing to our knowledge about the relationships between control, performance and health.

The primary objective of the review chapters is to provide an examination of the nature of personal control. Chapter 1 introduces the concept of control, considers the concepts of motivation and competence, and highlights the increasing association between stress and control. The second Chapter illustrates ways in which the control construct has been classified and goes on to suggest that 'cognitive control' is in effect a dominant unifying theme. Chapter 3 examines various models of perceived control while Chapter 4 follows with consideration of actual control models and importantly, presents a model which ostensibly combines both aspects of control. Chapter 5 further examines the hypothesised link between subjective meaning, coping, control and health. The final review chapter outlines the research questions to be addressed. It also provides an overview of the research designs employed and a discussion of the methodological

strengths and weaknesses associated with each of the studies.

In Chapter 7 the psychometric development of a state oriented Self-Control Inventory is described. The findings reinforce the pertinence of the research questions to be addressed especially with regard to the switching of the focus of control under duress. Chapter 8 represents a more empirical study based on a catastrophe paradigm. Anxiety and effort conditions are manipulated to induce performance catastrophes. Evidence for the strategic switching of the focus of control is presented. The final study in Chapter 9 examines the relationships between dispositional self-control, self-motivation, coping, perceived control and health. A self-control model, which predicts mental well-being, is proposed and tested. The general discussion provided in Chapter 10 briefly summarises the studies and presents some of the theoretical and practical implications stemming from this work. In addition, suggestions for future research are made.

## CHAPTER 1

### STRESS AND SELF-CONTROL

#### 1.1 Introduction

In virtually all aspects of human life, the degree of control exercised is a significant factor. The desire for personal control of one's internal states, environment and future is probably familiar to most people in one form or another, especially in situations which imply threat or challenge. Essentially, the psychology of control is concerned with the control of perceptions of reality and the control of one's responses to those perceptions. It is perhaps especially significant that a belief in control is apparently vital to both mental and physical well-being (see, for example, Langer, 1983).

The concept of control has gained a wide-ranging empirical operationalization and, perhaps inevitably, problems of parsimonious definition and lack of consensus have developed. Fisher (1984a) contended that many studies avoid the problem of definition and also ignore the relationship between objective and subjective reality. This latter point becomes increasingly pertinent when considering individual biases in the perception of threat, challenge and controllability, as well as intra-individual fluctuations in these perceptions over time (Fisher, 1986; Folkman, 1984; Lazarus, 1966; Magnusson, 1976).



Langer (1983) suggested a definition of control which embodies the concept of choice. She stated that control was:

"..the *active belief that one has choice* among responses that are differentially effective in achieving the desired outcome. However there *cannot* be certainty that any one response will bring about the desired outcome. It is important that there is at least some uncertainty of success, or else the behaviour could be performed mindlessly" (p 20)(1).

Choice and control will be further discussed in Chapters 2 and 4. Personal control has become strongly linked to understanding the perception of, and response to, stressful conditions (Fisher, 1984a; Folkman, 1984; Rothbaum, Weisz & Snyder, 1982; Thompson, 1981). Indeed, it is within the multidimensional sphere of stress effects that the notion of self-control approaches its most meaningful connotation. For example, in her comprehensive examination of the association between stress, control and response strategies Fisher (1986) argued that :

"In spite of considerable interest in perceived control there has been relatively little attempt to understand the relationship between stress and control in any detail and hardly any attempt to consider the psychological processes that must be involved" (p 2).

If one accepts that stress and the processes involved in personal control can inflict considerable mental demand on a person (e.g. Schonpflug, 1983 and 1988), then an examination of the possibly debilitating or facilitating effects these demands may have on preparatory,

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(1) In Chapter 4 consideration will be given to the distinction between the 'mindful' and 'mindless' exercise of control (Piper & Langer, 1984), which parallels that between voluntary control, conscious strategic control and automatic control processes (Rosenbaum, 1985).

anticipated and concurrent behaviour is required. In this sense the construct of control is viewed in relation to the cognitive and physical demands experienced by the individual under stress.

This hypothesised demand (e.g. Gopher & Braune, 1984; Mulder, 1979a; Wierwille, 1984) emanates from a number of possible origins. Initially, there may be a need to identify potential threat, hazard or challenge in a given situation. This may involve extracting relevant information in highly ambiguous conditions, e.g. evaluating the 'degraded' but vital information available while driving on a motorway in the rain at night, and may also include appraisals of a situation's controllability. Secondly, the search for, generation, and choice of, appropriate responses may create a processing load (e.g. Langer, 1983). Thirdly, mental demands may accrue because the likelihood of success, and the potential future consequences of any action taken, must be extrapolated. Fourthly, assessment of the relative cost or benefit associated with a particular response, and the possible cost of failure could place a load on the system; e.g. "Will the short-term cost of increased unpleasant arousal pay-off in terms of longer-term adaptive responses to stress?" (Averill, 1973). Fifthly, there may be the need to generate ways of making failure tolerable. Finally, there may be a need for mental activity akin to problem solving processes when avenues for alleviating or avoiding a stressor are maximally uncertain or when

obvious responses are prevented by circumstantial constraints (Fisher, 1984a; Schonpflug, 1983). What the above analysis omits, of course, are the additional processing loads associated with the actual execution of control responses, be they cognitive or behavioural, as well as the monitoring and adjustment of these responses to fit environmental contingencies.

Schonpflug (1983) proposed the operation of demand processes for stressful situations similar to those above. He suggested demands occurring under an 'orientation component' and a 'control component'. In relation to the former he identified, firstly, a problem identification process which involved scanning problem features, definition of the problem, subjective appraisal and goal setting; and secondly, a process of developing problem solving strategies. For the control component he suggested the demands of executing problem solving activity and the acquisition of new coping skills. Thus, the stress situation can be construed as a problem situation (cf. Cox, 1987; Fisher, 1986), with external and internal demands being perceived or created by the individual. Implicating intervening cognitive processes, Schonpflug (1983) contended that :

"External demands cannot operate within an individual unless they have been identified by him and internalised to become part of his set of internal demands" (p 301).

Such appraisal processes will be discussed further in Chapter 5. Schonpflug also suggested that, whilst internal and external demands are intimately related psychologically, there are demands which are primarily

internal, concerning physical, cognitive and affective status, together with a concern for well-being, all of which may be responded to without reference to the environment (Schonpflug, 1979). The preceding sources of cognitive load could be argued to be "stress-relevant" demands which may be strategically elicited and controlled (see Fisher, 1986, for a thorough account of the strategy vs structure issue).

A more negative set of demands on higher cognitive resources might include unpleasant intrusive thoughts, frightening images, preoccupation with extremely high levels of physiological arousal, or any of the other generally 'task-irrelevant' cognitions that may contribute to the subjective stressfulness of a situation. Such inappropriate cognitive responses may be associated with emotions like fear, anxiety, frustration or hopelessness. A 'vicious circle' is envisaged in the dynamic relationship between person and environment (e.g. Lazarus & Folkman, 1984), whereby these cognitions and emotional responses may in turn be stressful and then form the target for a strategic response.

Pervin & Lewis (1978) argued that, when action extends over a period of time, a continuous transaction between the individual and his/her environment will develop. It has also been suggested that stress states represent a special relationship between human beings and their environments (Lazarus & Launier, 1978), mediated by cognitive concern regarding non-optimal conditions or problems (Schonpflug, 1983). At this juncture something

must therefore be said about the way in which 'stress' is defined in the context of this thesis.

## **1.2 An Interactional Approach To Stress**

The cognitive mediational perspective on the stress-control relationship which was taken by Lazarus (1966), has greatly influenced the conceptualization of stress as an interactional or transactional variable. This approach represents a move away from stimulus-bound and response-bound approaches to the definition and operationalization of stress (Elliot & Eisdorfer, 1982; Hackett & Weisman, 1964; Parkes, 1972; Cannon, 1932; Miller, 1953; Selye, 1980). Lazarus made the point that a given situation will only be perceived as negatively stressful if a person anticipates that he/she will be unable to cope with it. In this view stress may depend on the intimate relationship between perceived subjective demand and the perception of response capability, rather than on objectively defined mismatches between demand and capacity, loss of optimal conditions or on stimulus intensity.

A number of models advocate intervening cognitive activities as important factors in determining stress (Cox 1978; Fisher 1984a; Lazarus 1966; McGrath 1974; Schonpflug 1983). A demand-capacity model which asserted that a situation is only stressful if an individual lacks the capacity to meet environmental demands was proposed by McGrath (1974). He envisaged four stages in a potentially stressful scenario.

1. The DEMAND imposed by the environment.
2. The RECEPTION of environmental information which determines subjective demand.
3. The person's RESPONSE.
4. The CONSEQUENCE of the response.

An individual's psychological status was argued to affect any of the four stages, e.g. differential sensitivity to environmental stimuli, or differential perceptions of demand, response capability or outcomes of action.

A transactional model of stress was developed by Cox (1978). The guiding principle of this approach embodied the notion that stress was :

"..a personal perceptual phenomenon rooted in psychological processes" (p 18).

His model also comprised a number of identifiable stages which succinctly described the antecedents of experienced stress. These factors were :

- 1). Psychological and physiological internal needs may determine demand, as well as the external environment.
- 2). Imbalances in the perception of demand and coping ability generate the conditions of stress.
- 3). The availability of various methods of coping influences the experience of stress.
- 4). The consequences of 'coping - here'; commitment to, and importance of, meeting demand are determinants of whether or not stress occurs; i.e. the cost of failure must be considered.

According to Cox (1978) feedback operates over the whole process in such a way that failure to meet demand affects the perception of future demand, perception of the capacity to cope, and percepts of the cost attached to

failure. In this sense feedback about action outcomes provides crucial evidence for the assessment of personal control in any given situation.

More recently, Fisher (1986) developed a model of stress based on mediating cognitive processes. This focused particularly upon the perception of personal control. The model incorporated the concepts of discrepancy reduction and cost analysis weighting. Furthermore, in her model, Fisher (1986) defined stress in terms of perceived control over unpleasant environments. Fisher's stress-control model is discussed more fully in Chapter 3. She argued that people engage in 'complex decisional processes' to resolve the special classes of problems that stressful circumstances constitute. Stress may therefore be viewed as a challenge by individuals believing themselves to possess the capability for control (cf. Lazarus & Folkman, 1984).

In the present thesis, stress is seen as a *dynamic interaction between individual and environment (internal and external), which is subjectively appraised as taxing or exceeding response resources, and potentially enhancing or endangering well-being* (adapted from Lazarus & Folkman, 1984). This viewpoint tacitly acknowledges the possibility of positive affect being associated with stressful circumstances. For some people, operating near to, or at the limit of perceived physical and mental capacity can be exhilarating (e.g. Svebak & Stoyva, 1980; Zuckerman, 1979). Stress can have both positive and negative connotations for a person and, in this sense,

perceived stressfulness is a person-situation relationship that requires or prompts some change to be generated (Jones & Hardy 1989). The following sections discuss the fundamental stress-control related issues of competence and motivation to control.

### 1.3 Competence and Control

Stress effects on human competence have been extensively examined in many contexts (e.g. Baddeley & Idzikowski, 1983 ; Broadbent, 1957; Eysenck, 1982; Fisher, 1984a; Folkard, 1983; Hamilton & Warburton, 1979; Hardy, Parfitt & Pates, 1990; Hockey, 1983; Wine & Smye, 1983). Emanating from this research and theorizing is the indication that competence often changes in stressful conditions, typically in the presence of stressors such as noise, electric shock, temperature extremes, drugs, changes in sleep patterns, incentives etc. Competence has also been studied in more ecologically valid situations such as the performance of dangerous sports and occupations; military training; competitive situations; occupational pressures; shiftwork; bereavement; surgery; examinations etc., (e.g. Baddeley, 1972b; Gal-Or & Tenenbaum, 1986; Karasek, 1980; Folkard, 1983; Janis, 1958; Liebert & Morris, 1967; Wrubel *et al*, 1983).

The perception of personally determined competent behaviour should, for the most part, contribute to greater self-esteem, self-confidence and psychological health. At an intuitive level this is quite a reasonable



assumption. Being competent implies achieving intended goals through demonstrating appropriate behaviour and perceiving the fact. Langer (1983) argues that the experience of control is dependent upon a person's awareness of control. Thus, to be aware of the effect of one's actions on the environment and appreciating this contingency may be a necessary determinant of positive affect. Competence can be viewed as achieving perceived capacity or capability which in turn elicits feelings of efficacy. It has been suggested that individuals are motivated towards achieving competence through, what White (1959) called, "effectance motivation" (see later section). Buhler (1931) coined the term "function pleasure" to denote the motivation to perform an action simply because one has the capability to do it. White (1959) noted that the capacity to derive pleasure from self determined action is extremely adaptive. The goal of the effectance motive is to deal effectively with the environment, its reward is a feeling of efficacy or intrinsic pleasure. This implies that to engage in an activity, to be competent in the control of oneself and a given situation, generates its own affective rewards. Groos (1901) commented on "the joy of being a cause" (p385), which succinctly reflects such feelings of efficacy.

Presumably, unrestrained execution of behaviour is valued because the systems to generate and operate the behaviour exist. In adults, sensation seeking behaviours

are perhaps the most obviously applicable to this hypothesis, e.g. sexual fulfilment, participation in dangerous sports; whilst in children, curiosity and the exploratory nature of their behaviours are lucid examples. Interestingly, attention has been drawn to the similarities between the concept of personal control and White's concept of competence which posits that competence is a person's "felt control" in executing organised responses, i.e. achieving perceived capability (Mandler, 1975). The implication here is in line with Lazarus's contentions regarding coping efforts, i.e. organised responses which are mobilized according to perceived capability under stressful conditions are termed successful 'coping' (and could be taken to imply competence), irrespective of objective outcomes.

### 1.3.1 Coping, and Social Competence

Two aspects of competence, subsumed under the generic term "Competence" were discussed by Wrubel, Benner & Lazarus (1983). The first, coping competence, refers to generalized skills and resources for coping and is discerned from one's history of coping effectiveness over a range of stressful encounters. Coping competence is, therefore, a summation of outcomes and as such is based on appraisals of how well one has managed the stressful episodes encountered through life. The more that is known about coping competence (and here the notion of personal awareness is important), the greater is one's knowledge about areas of personal strength and

vulnerability which in turn will contribute to self-efficacy and the realistic appraisal of self and situational controllability. In the second area of competence examined, the transactional theory of behaviour was extended to include coverage of social competence from a cognitive-phenomenological perspective. Social competence is the summation of functional effectiveness in a variety of social settings and refers to the management of social encounters, whether stressful or not. Wrubel *et al.* (1983) note that since many important, persistent and troubling human encounters are social in nature (see, for example, Lazarus & Cohen, 1977; Pearlin & Lieberman, 1977), there is a large area of overlap between the concepts of coping and social competence. The latter represents a high level of coping competence in the social arena. A good example of the transactional nature of functioning under pressure in social contexts is the manifestation of "burnout" as physical and emotional exhaustion which contributes to low morale, absenteeism and poor performance. This is usually associated with health service professionals (e.g. Maslach & Jackson, 1981; Maslach & Pines, 1978), but more recently has been examined in sports settings (Smith, 1986). Wrubel *et al.* (1983) stated that :

"Such persons were once highly competent and involved. The temporary poor functioning - incompetence, if you like - is the result of overload conditions that affect, over time, competent and committed workers, some of whom are possibly more vulnerable than others" (p 64).

Thus as Fisher (1986) stated, competence represents an important aspect of establishing control (or perhaps vice-versa).

Harackiewicz, Sansone & Manderlink (1985) reported a study examining the relationship between competence, achievement motivation and intrinsic motivation. They stated that most achievement orientation theories suggest that achievement oriented individuals should prefer situations that facilitate the self-assessment of competence (e.g. Atkinson, 1974; Kuhl & Blankenship, 1979; McClelland, 1961; Spence & Helmreich, 1983). This preference can be considered to be an outcome of control appraisals. It may be a determinant of task involvement, and might also contribute to intrinsic motivation (Revelle & Michaels, 1976; see the next section). Thus, the perception of controllability is implicated as a crucial factor in the appraisal of competence. Furthermore, the facilitating effects of increased perceived control are apparently based on the fact that the critical level of task difficulty at which a person gives up (i.e. stops instrumental, behavioural control attempts), increases with an increasing sense of control (Kuhl, 1977). Consequently, motivational deficits can operate to obstruct the utilization of one's cognitive and physical skills to their full potential, thereby reducing the expression and perception of competence.

Harackiewicz *et al.* (1985) hypothesised that the **value** placed by a person upon competence (and by

implication, control), constitutes an important mediating mechanism (cf. the meaning of control to the individual, Averill, 1973; see Chapter 2). The effect of competence information depends upon how much the recipient cares about succeeding in a particular situation - the commitment or stake they have in the outcome. Caring about competence should intensify the influence of control appraisals under potential threat or other stressful conditions. It must be emphasised, however, that percepts of competence can occur through psychologically covert achievement of less obvious goals, such as coping with emotional responses to an adverse situation (as in, for example, Wrubel *et al's*, 1983 view of coping competence). Indeed, part of the premise of this thesis rests upon the notion that mere attempts at coping with a demanding situation can be construed to constitute some measure of success, and that this has implications for the provision of mental preparation and therapeutic skills.

### 1.3.2 Learned Competence

For human beings, the reduction in negative emotional responses to recurring or chronic stressful events reflects, at least partially, a growth of competence (Frijda, 1986). The acquisition and implementation of control skills can attenuate the emotional impact of aversive events in obvious ways; e.g. learning social skills, acquiring performance skills in dangerous sports or professions. Slightly less obvious

examples include learning to suppress unnecessary cognitive anxiety, restructuring irrational beliefs and actively focusing attention on the task in hand. Enhancing coping ability and the perception of control results not only in a change in the meaning of situations, but also in increased competence through recognition that one is not at the mercy of an impinging all-powerful environment (cf. locus of control theory).

Gaining cognitive skills is a natural process of accommodation to the world and training for novel situations (Frijda, 1986; Rosenbaum, 1988). In certain behaviour therapies, the acquisition of such skills is explicitly sought; e.g. the cognitive therapies of Ellis (1970) and Beck (1976) attempt to improve competence through combatting self-defeating worries and irrational beliefs. Developing competence can change expectancies concerning both one's response to, and the outcome of, events. For example, Desensitization Training (Wolpe, 1969), Stress Inoculation Training (Meichenbaum, 1977), and Cognitive-Affective Stress Management Training (Smith, 1980), may encourage individuals to have increased feelings of competence by providing them with the opportunity to experience anxieties such as test anxiety or competition anxiety without consequent reductions in performance. A similar situation holds for people facing dangers, e.g. divers, climbers, parachutists, those in combat etc.

Frijda (1986) contends that competence gains occur through learning to endure, reduce or alter the perception of fear, pain, helplessness and even the 'pleasurable suspenses' of challenging situations. That is, through increased perception of control and actual control processes. Thus, increased feelings of competence can derive from both managing the perceived stress of situations and from actually executing the desired actions in these situations. The following point is, therefore, worth highlighting with respect to competence and self-control. Namely, it is unnecessary to observe concrete, or objective behavioural outcomes in order to infer competence (this obviously depends on the behaviour and goals targetted by the individual to denote competence). More precisely, self-control processes directed at the problem, or the possible emotional reactions, could enhance a sense of competence through perceptions of self-control. These issues will be more examined more fully in Chapter 5.

#### **1.4 Are We Motivated to Perceive Control ?**

This section examines the degree to which human beings are motivated to perceive and demonstrate control. The contention that people are motivated to expend considerable energy in attempting to master their environment has held a central importance in many theoretical treatise' (de Charms, 1968; Kelley, 1955; White, 1959; Woodworth, 1958). Social psychologists have indicated the essential nature of a controllable,

predictable world (see, for example, Abelson *et al.* 1968). Brehm (1966) in his theory of Psychological Reactance, suggested that people are motivated to believe that they are free to act. They become motivationally aroused (reactance), when exposed to constraints on their behaviour. This reactance leads to attempts to restore their freedom to control their own behaviour and thus their mastery of the environment. Mandler (1975) proposed that it was the 'interruption' of organised behavioural sequences that elicited emotional responses and signalled a loss of control, a position reiterated by Rosenbaum more recently (Rosenbaum, 1980a, 1988).

Motivation to maintain control was postulated by Kelley (1971) to have a pervasive influence on attributions of causality (see also Langer, 1975, 1983; Wortman, 1975). He stated that :

"The purpose of causal analysis, the function it serves for the species and the individual, is effective control" (p 22).

Significantly, the concept of motivation to control one's environment has laid the foundations for much of the extensive body of experimental work reported in this review. However, it is implicit in the cognitive-phenomenological outlook of this thesis that control resides exclusively in neither the person nor the environmental field, but rather is a function of the ongoing and changing relationship between them. Wrubel *et al.* (1983) echo this sentiment when they state that attributing the variable of control solely to the person or to the situation obscures the hypothesised dynamic



transaction between the two. Belief in the importance of the concept of control is wide-spread, but are we intrinsically motivated to perceive or achieve personal control ?

Motivation is reflected in the goal directedness of behaviour, individual differences in the choice of activities and in the intensity and persistence of effort. It can be conceived of as a process which initiates, guides, sustains and eventually stops a goal directed behavioural sequence (Davis, Taylor & Sluckin, 1982). Similarly, Frijda (1986) stated that motivation could be considered as the activation and operation of "behaviour systems" by appropriate stimuli or thoughts of them. Behaviour systems refer to potential overt or covert actions or sequences of such actions. Such systems comprise 'sensitivity' to conditions for the system's activation and a 'set-point' or goal at which the conditions for ending the behaviour are recognised. Motivational variables like fear, incentive, value of personal control etc, can presumably prime behavioural systems and increase or decrease the readiness or capacity to act.

It may be as Frijda (1986) suggests, that we are motivated to value and exhibit particular behaviours (e.g. instrumental attempts at control and the perception of control), simply because the systems for self-initiated action and thought exist; i.e. because we have

the capability (cf. Buhler's, 1931 notion of function pleasure).

"We do things and we like to do them because we CAN do them and hate to see them go awry" (Frijda, 1986, p 365).

This viewpoint suggests that the perception and exhibition of self-control is a fundamental human motive. Functioning effectively - demonstrating control - can be predicted, can engender pleasure, and conditions for exhibiting it can be created, or actively sought. Furthermore, perceptions of personal control are conceivably part of this process.

The probability that control is possible influences event interpretation, e.g. "is it a threat or a challenge?". Consequently, the availability of responses is appraised, and choices are made which signal that a person should progress towards a goal. So, plans and the intention to fulfil them are formulated. Alternatively, plans may already exist (automatic programs) which can be executed without higher order intentional processes (cf. levels of processing, Broadbent, 1971; Eysenck, 1982).

#### 1.4.1 Effectance Motivation

In his classic paper, White (1959), introduced the concept of "effectance motivation" which he described as "an innate need to manipulate the environment" (p 318); that is, to gain and perceive control. He maintained that effectance motivation was not subsumed under the the general category of 'drive' because it was enduring and

did not satiate, (cf. Deci's, 1975 notion of motivation to continually seek and reduce incongruities). Moreover, White stated that :

"Effectance motivation must be conceived to involve satisfaction - a feeling of efficacy in transactions in which behaviour has an exploratory, varying, experimental character and produces changes in the stimulus field" (p 329).

White's theory of control implies that exercising control enhances self-worth and self-perception (recall the competence-control relationship suggested in the previous section). De Charm's (1968) theory of Personal Causation incorporates elements of White's approach. Personal causation theory contends that individuals who perceive their behaviour as emanating from their own choices will value that behaviour and be more task motivated than individuals who perceive that external influences cause their behaviour. General feelings of competence result from percepts of personal initiation of action and thereby, personal control.

The fact that human beings strive to be self-determining and to exhibit competence in their interactions with the environment is argued by Deci and others, to form the psychological basis of intrinsic motivation (Deci, 1975; Deci & Porac, 1978; Deci & Ryan, 1985; de Charms, 1968; White, 1959). Finding and controlling "optimal challenges" satisfies a person's intrinsic need to be competent and self-determining. In terms similar to Fisher's (1986) Discrepancy Reduction theory, Deci & Porac (1978) state that these challenges

involve a degree of incongruity between an internal standard (e.g. a value, belief or commitment), and a stimulus input to the central nervous system. They suggest that there is a relatively continuous state of incongruity - in the form of internal cognitive activity or overt action, and people seek to find and reduce such incongruities; motivated, of course, by the intrinsic need to feel competent and self-initiating in thought and action.

#### 1.4.2 Intrinsic Motivation

Describing self-control in terms of intrinsic motivation represents an interesting prospect - especially since much of the control literature examines goal oriented behaviour with extrinsic and negative reinforcements contingent upon its outcome, e.g. social praise, money, pain, anxiety, etc. Perceptions of competence (felt control), and causality are said to affect intrinsic motivation in certain conditions (cf. Cognitive Evaluation Theory; Deci & Ryan, 1980). According to this theory, performance information must indicate competence, for the perceived control process to increase intrinsic motivation. Harackiewicz *et al.* (1985) argued that perceived causality (situation specific locus of control appraisal) is the more fundamental process, and thus perceived competence can only affect intrinsic motivation when behaviour is seen to be self determined. Positive performance feedback has been found to increase intrinsic motivation when it is

provided in an informational rather than a controlling manner (Deci, 1972; Manderlink & Harackiewicz, 1984; Ryan, 1982). Presumably, this encourages subjective control of encoding, organizing and recalling information during an event, which is free from external influences other than task demands.

Ryan (1982) argued that when performance feedback is accompanied by subjective pressures to perform well, or when self-esteem depends on outcomes then it can be perceived as having a controlling role. Under these conditions, especially for low achievement oriented individuals, intrinsic motivation can be subverted.

In contrast, for those high in achievement motivation, felt control is relevant to intrinsic motivation only when competence is valued. Additionally, when the initial performance expectancy of low achievers is high they benefit from competence cues made available. Thus, although control-enabling cues can enhance intrinsic motivation for low achievement motivated individuals, i.e. through the hypothesised self-efficacy process, it appears very difficult to give them competence information that does not subvert personal enjoyment and perceptions of control. Apparently, performance information provides a degree of threat to self-esteem, and cognitive appraisals may result in negative affective states. These, in turn, may lower perceptions of self efficacy and control as well as

interfere with task performance through distracting attention (e.g. Wine, 1971).

White's (1959) ideas have also had considerable impact upon other control research. For example, after a number of studies of behaviour in chance-determined situations, Langer (1975) concluded that the motivation to master the environment influences individuals to attribute greater control to themselves in chance situations than is objectively reasonable, i.e. there is an illusion of control. She reported that :

"The greatest satisfaction or feeling of competence would result from being able to control the seemingly uncontrollable"  
(p 323).

It is notable that Festinger (1957) also suggested that people occasionally engage in dissonance reduction (cognitive distortion in this case), in order to reduce the discrepancy between intention or goal and subjective reality.

The importance of personal control has been highlighted by Rodin and her associates (Langer & Rodin, 1976; Rodin, 1983; Rodin & Langer, 1977). They examined the perception of control in naturalistic settings and studied the effect this had on psychological functioning and well-being. In studies which manipulated the perception of control, decisional control and actual control in ill and aged populations, it was found that there were beneficial effects for greater decisional and actual control on a number of indices such as self-reports of increased happiness, greater alertness and

increased activity. Their findings support the notion that "control interventions", in this case giving institution-alised people more responsibility for their own daily functioning, could prove beneficial for individuals with real-life problems such as illness, career crises, disruptive irrational beliefs that cause anxieties, dangerous jobs and performance anxiety. Langer (1983) asserted that this generalizability is possible :

"..because the belief in personal control may be essential to one's sense of competence and is basic to human functioning" (p 14).

#### 1.4.3 Motivation to Control

As Schorr & Rodin (1984) have pointed out, most studies do not directly examine whether individuals are actually motivated to control the environment (or themselves), despite the fact that most of them are implicitly based on this assumption. Rodin, Rennert & Solomon (1980) studied whether subjects would expend effort to gain control of a situation. They found that subjects put more effort into a task when better performance led to them having control over an outcome than when it did not. Thus, people may desire personal control only when it increases their expectancies of being able to obtain favourable consequences, which may include perceptions of personal competence. Wrubel *et al.* (1983) and Folkman (1984) have suggested that such effective functioning (task mastery, achieving intended goals etc), is founded on the ability both to stop trying when effort is pointless, and to recognize a new

situation in which effort would be more productive. (See Chapter 5 for consideration of realistic appraisals, and Chapter 8 for discussion of the role of effort in the control process). One of the corollaries of the above viewpoint is a discordant note questioning the adequacy of the learned helplessness paradigm (Seligman 1975), under which suspension of effort is viewed as pathological while continued instrumental striving, i.e. to escape an aversive stimulus, is regarded as competent even when the situation is thought to be uncontrollable. Wrubel *et al.* (1983) pointed out that it is not particularly adaptive to continue to make effortful responses in a situation where there is perceived non-contingency between actions and outcome. Disengagement and decreased effort are better coping strategies in conditions perceived to be uncontrollable than effort consuming attempts at behavioural control such as physical escape. In this sense 'giving up' is more functionally appropriate in terms of conserving energy. It can only be construed as a maladaptive response if continued when conditions signal controllability, and that instrumental escape is once more a viable proposition.

Pervading some aspects of the control literature, therefore, is the assumption that a paucity in motivation to control is linked to maladaptive behaviour (e.g. Kuhl, 1986; Seligman, 1975). In addition, the beneficial effects of psychological therapies have been ascribed to a person's enhanced perception of control (Schorr &



Rodin, 1984). Having said this, it is appropriate to note that an exaggerated motivation for control could be debilitating; for example, when people do not possess the necessary information or skill to exercise control, or when objectively uncontrollable conditions are erroneously perceived as being personally controllable, then attempts at control may be inappropriate, wasteful and possibly harmful. An example of inappropriate control is illustrated by the person exhibiting a 'Type A' behaviour pattern (e.g. Glass & Carver 1980; Strickland 1978), whose striving for control, in association with other attributes such as a tendency towards hostility and/or irritability, may lead them to pay the price in terms of increased risk of chronic physiological disease. Type A individuals tend to react to evidence of failure (uncontrollability), by trying even harder, presumably because they find the lack of control particularly threatening (Glass, Snyder & Hollis, 1974; Krantz & Glass, 1975).

Realistic percepts of self and/or environmental control (in terms of goals achieved because of self-determined and initiated action or perhaps, merely the knowledge that problem solving processes were attempted), is conceivably a strong human motive which can be 'satisfied' by a complex array of behaviours. This notion of subjective reality is, of course, a thorny problem, and this is especially so for any approach which

considers human control behaviour; the issue is discussed more fully in Chapter 5.

### 1.5 Summary

This Chapter has reviewed a number of interrelated areas relevant to the concept of human control. Initially, a description of how stress is operationalized in this thesis was given and the way in which this construct relates to the concept of control was discussed. Secondly, the importance of perceived and actual control to competent behaviour was explored. Finally, the idea of intrinsic motivation to demonstrate and perceive control was discussed. Control is conceived of here as a dynamic process whereby, as people manage their internal and/or external environments they experience control. Consequently, rather than the degree to which certain outcomes are achieved being the criterion for the ascription of control, it is suggested that the important factor is the way in which responses are mobilized.

The following Chapter considers ways in which the concept of control has been categorised or classified. The issues of control, competence and motivation under stressful conditions are both implicit in the rationales offered for the particular conceptions of control presented, and explicitly cited as evidence for the existence of control.

## CHAPTER 2

### TYPOLOGIES OF CONTROL

#### 2.1 Introduction

Because of the hypothesised universal influence of control upon human existence (e.g. Langer, 1983), it is appropriate that coverage be given to how control has been variously defined and operationalized. The variety of theoretical perspectives and methodological approaches to the study of control have stimulated a number of reviews of the extensive stress-control literature (Averill, 1973; Fisher, 1986; Lefcourt, 1973; Miller, 1979; Rothbaum, Weisz & Snyder, 1982; Shapiro, 1985; Thompson, 1981). Primarily, concern has focused on how the availability or non-availability of objective and/or subjective control influences a person's response to unpleasant conditions. However, another important aspect has been the relationship between control, competence and health. Many reviewers have attempted to define control, citing various empirical studies in support of their different propositions about the construct. The usual dependent variables in these studies have been self-report measures, tolerance of an aversive event, concurrent or subsequent performance, and physiological responses.

The overlap with stress research and the examination of competence under stress is glaringly obvious. However, the research studies cited in this area differ in a

number of ways. Firstly, they differ in terms of what part of the stress experience is observed, i.e. the anticipatory period, impact period, immediate post impact period, or the long-term post event period (e.g. Janis, 1958; Parkes, 1978; Wherry & Curran, 1965). Secondly, threatening situations have been manipulated in controlled laboratory settings. This includes the use of different forms of pain (or fear of it), e.g. electric shock, cold water pressor, loud noise, intelligence test administration, disturbing films and photographs (Ball & Vogler, 1971; Glass & Singer, 1972; Glass, Singer & Friedman, 1969; Houston, 1972; Pervin, 1963; Rosenbaum, 1983). Thirdly, aversive situations have been studied in 'naturalistic' settings, e.g. occupational situations such as shiftwork, surgery, chronic pain, accident victims, invasive medical examination, natural disaster, combat, life changes and more recently in relation to competitive sport performance and voluntary participation in dangerous sports (Fenz & Epstein, 1967; Fenz, 1975; Hardy & Whitehead, 1984; Janis, 1958; Holmes & Rahe, 1967; Karasek, 1980; Parkes, 1978). Fourthly, there has been considerable variation in the type of reactions measured and the methods used to assess them. Psycho-physiological response measures include phasic and tonic skin conductance and heart rate, respiration rate, pupil dilation, EMG and EEG measures (Averill, 1969; Geer & Maisel, 1972; Houston, 1972; Maltzman & Wolff, 1970). Biochemical changes in response to situational controllability under stress have been indicated through

measurement of relative catecholamine and cortisol levels in the body (Frankenhauser, 1983 and 1982). Behavioural measures have included tolerance, actual performance impairment, length of stay in hospital, requests for narcotic and analgesic drugs, avoidance of threat and instrumental escape (Cohen & Lazarus, 1973; Gal-Or & Tenenbaum, 1986; Houston, 1972; Rosenbaum, 1983; Seligman, 1975). Additionally, self-report measures of pain, anxiety, distress and aversiveness have been used to index stress responses (Geer, 1965; Hardy & Whitehead, 1984; Mandler & Sarason, 1952; Spielberger, Gorusch & Lushene, 1970; Thayer, 1967). Coping competence in relation to life crises and daily hassles has also been measured (e.g. Knight, 1987; Lazarus & Folkman, 1985; DeLongis et al. 1982). Dispositional orientations to control have been indexed by locus of control scales (e.g. Rotter, 1966; Reid & Ware, 1974), and Rosenbaum's (1980a) Self Control Schedule. In a health context, Type A behaviour pattern has also been related to control (Frankenhaeuser, 1981). In most of these studies a rather negative view of stress has been taken.

Essentially, the questions addressed by the research and reviews are as follows :

1. Is the availability of control always stress reducing ? That is, are objective control and perceived control behaviourally adaptive on all occasions ?
2. Are control perceptions a crucial factor in all stress reactions ?
3. Are any benefits gained in stressful situations due to perceived control, or due to increased predictability ?

4. Do all individuals always elect to have control over themselves and their environments ?
5. Is self-control a prerequisite for control of the environment ?

(After Fisher, 1986).

The following sections of this chapter deal with a number of the major approaches to defining personal control.

They are included because they not only provide a valuable insight into thinking in this area, but because they also offer the opportunity for developing ideas about a unifying theme which links the apparently diverse interpretations.

## 2.2 Averill's Typology

The typology of control presented by Averill (1973) is probably the most widely used classification. Following an extensive review of the area, he identified three types of control - behavioural, cognitive and decisional.

### 2.2.1 Behavioural Control

This represents direct action on the environment, i.e. the availability of a response capable of directly influencing the objective attributes of an aversive situation. Two categories of behavioural control were proposed by Averill.

a) *Stimulus Modification* : This control option reflects complete avoidance of a threat; having punishment contingent upon task performance (Houston, 1972); prematurely terminating a noxious stimulus by escape

(Elliott, 1969); and modifying the threat by direct action such as attack, or limiting the intensity of punishment.

b) *Regulated Administration* : Very often there is no choice but to endure unpleasant conditions. However, subjective control may be available in terms of who administers an aversive event, the rate at which it is experienced or how it is experienced. In general, given the choice, subjects have shown a tendency to prefer self-administered to experimenter administered shock or loud noise, immediate rather than delayed threat, and signalled to non-signalled aversive stimuli (Badia *et al.* 1966; Ball & Vogler, 1971; Corah & Boffa, 1970; D'Amato & Gumenik, 1960; Haggard, 1943; Maltzman & Wolff, 1970; Pervin, 1963).

#### *The Predictability Factor*

The suggestion that it is perceived behavioural control that is the main influence in reducing stress responses (as indexed by self-report and physiological measures) is a contentious issue. Several theorists have hypothesised that behavioural control and information reduce stress reactions because they allow prediction of an imminent event, i.e. when it will occur, when it will end, and what it will feel like. Seligman, Maier & Solomon's (1971) Safety Signal Hypothesis contends that events are less unpleasant with behavioural control because subjects know when the aversive stimulus will be delivered. Therefore, they are able to 'relax' when no

stimulus is coming. Cohen (1976) suggested that predictability lessens cognitive overload. If one can predict the onset of an event one does not have to be constantly vigilant. Johnson's (1973) Incongruency Hypothesis explained the effects of information about sensations to be experienced in terms of reduced incongruency between expected and experienced sensations. Accurate information reduces this discrepancy and thus reduces negative emotional responses. The Preparatory-Adaptive hypothesis of Kummel (1965) asserts that behavioural control reduces pain and stress because it allows prediction of event impact and thus enables physiological (and implicitly, psychological) preparation for it.

Criticisms of these theories include firstly suggestions that they do not provide an explanation of why people are sometimes willing to tolerate more frequent or more intense levels of a threat, nor do they predict effects on performance in the post event period. Secondly, experiments that have separated out predictability and control have found that controllability has effects over and above the predictability it provides (e.g. Geer & Maisel, 1972).

According to Averill (1973) behavioural control appears to be the least important factor when compared with predictability or the desire to avoid an anxiety inducing waiting period. However, behavioural control can have an ameliorative effect on the stressor involved and



the stress perceived provided there is a fair degree of uncertainty inherent in a situation (Staub, Tursky & Schwartz, 1971; Stotland & Blumenthal, 1964). Where uncertainty is absent, behavioural control may have little or no effect on short-term stress responses, although it is possible that it contributes to the long-term adaptation to stress (Glass, Singer & Friedman, 1969; see also Miller, 1979). Predictability of the nature or timing of a threat may form the basis of knowledge used to assess the contingency between behaviour and environmental consequences, or as Fisher (1984a) contended :

"..it may be the brick that provides the foundation for the assessment of control" (p 22).

### 2.2.2 Cognitive Control

This involves the interpretation of potentially harmful events. Averill (1973) defined cognitive control as the processing of potentially threatening information in a way that reduces the "...net long-term stress and/or psychic cost of adaption" (p 293). This definition incorporated the idea that cognitive control could result in short-term increases rather than decreases in anxiety. Two subvarieties of cognitive control were proposed.

a) *Information Gain* : A simple situation in which information can influence the stress response is that where a warning signal is presented prior to an aversive event (in conditions where behavioural control is unavailable). Whilst warning signals have been found to increase the stress-fulness of certain situations in

animal studies, Seligman (1968) and Weiss (1970) offered evidence that signalled electric shock can lead to less distress than unsignalled shock in humans. They suggested that the warning signal predicts shock and its absence means safety (the Safety Signal Hypothesis). Conversely, a no-signal condition requires constant vigilance and the stress inducing properties of the situation may be increased.

Human experiments examining the effects of warning signals (Averill & Rosenn, 1972; Glass & Singer, 1972) have generally supported the finding that the signal has little effect on the stress experience. That is, whatever stress alleviating attributes a warning signal has are not intrinsic to the signal itself but rather a product of situational context. Monat, Averill & Lazarus (1972) found that greater anticipatory stress responses were evoked when the time of impact of a stressor was known, compared to temporal uncertainty. Indeed, waiting for the warning might be as distressing as waiting for the stressor itself.

In a number of studies examining the effects of information upon the response to loud noise and electric shocks, Epstein (1973) found that information regarding the time of impact, probability and nature of the stimulus could *either reduce or induce* anxiety responses. That is :

"..depending upon the threat value of a stimulus it is at times necessary to pay the price of a momentary unpleasurable increase in arousal if one is later to be able to respond at a reduced level of arousal" (p 105).

At a more complex level of information, Staub & Kellet (1972) found that when subjects were given information about the objective characteristics of a shock and about the sensations that would be experienced, they were willing to tolerate more intense shocks than subjects receiving either each type of information separately or no information. Thus, reduction of worry and validation by experience may be necessary before information can contribute to effective personal control. (See also the previous section on predictability).

The complexity of threatening and/or challenging situations experienced in 'real-life' must be considered when reflecting on the above evidence. The information inherent in these situations must involve far greater cognitive efforts for successful appraisal and coping to occur. In such complex or ambiguous conditions, information is not simply 'gathered up' - there is also the active imposition of meaning upon the events by the respondent.

b) *Appraisal* : Averill (1973) indicated how, in appropriate conditions, appraisals like other factors contributing to personal control may increase as well as decrease stress. He cited "sensitizing-like defense mechanisms" as exemplars of appraisals which induce short-term stress but which aid longer-term adaption. This type of personal control strategy concerns focusing attention on threatening events. Janis's (1958, 1974) conception of "worry work" describes the benefits of psychological preparation for the upcoming trauma of

surgery patients. This cognitive activity increases the tolerance level for subsequent threatening events at the cost of higher immediate anxiety (cf. Cohen & Lazarus, 1973; Goldstein, 1973).

The possibility that long-term adaptation could be facilitated by initial appraisals and high arousal or anxiety reactions to threat may be one reason for the effect of therapies requiring recipients to experience the same intensity or more intense anxiety responses related to a particular situation while attempting to cope with these in various ways, depending on the treatment. For example, Implosive Psychotherapy (Stampfl & Levis, 1967) and Integrated Cognitive-Affective Stress Management Training (Smith, 1980) both employ this strategy.

Finally, Corah & Boffa (1970) conducted an experiment, in which subjects were led to believe that they had instrumental control, or no-control, over terminating a loud noise. Subjects were divided into two groups. Firstly, a choice group, for whom emphasis was placed on the fact that they could decide whether or not they terminated the noise in an escape condition, and whether they endured it or not in a no-escape condition. Secondly, a no-choice group who were given no choice but were simply instructed to escape or not escape in the respective conditions.

They found significant differences between the escape and no-escape conditions for the no-choice group, in terms of both self-report and autonomic indices of

stress. When no-choice subjects had behavioural control (could escape), they experienced less stress than when they had no control (could not escape).

In the no-escape condition, group differences also emerged. It was demonstrated that both subjective reports and autonomic measures indicated that those with a degree of choice experienced less stress than those without choice. The condition in which there was opportunity for both escape and choice to respond or not was found to be as unpleasant as the no-choice no-escape condition. In fact, it was significantly more stressful than either the behavioural or the decisional control circumstances separately.

Corah & Boffa's (1970) discussion of their results suggested that a belief that control is possible is a determinant of the cognitive appraisal of threat (cf. Lazarus, 1966).

They stated that :

"A procedure which gives the subject choice of avoiding or not avoiding the aversive consequences of a stimulus is equivalent to giving him perceived control over the potential threat" (p 4, Corah & Boffa, 1970).

This is not to say that a perception of control necessarily reduces the stressfulness of an event, as in the case of the reported results of the escape/choice condition. Corah & Boffa's experiment has been cited as a significant contribution to the understanding of how control functions to ameliorate the stressfulness of a given situation (Averill, 1973; Thompson, 1980). However, scrutiny of their paper reveals a rather complex picture,

and perhaps more importantly, a somewhat vague and equivocal discussion of the results. Firstly, it is not clear how the choice to endure the noise, or not, in the escape condition and the choice to turn-off the noise, or not, in the no-escape condition are qualitatively different. Secondly, apart from the general statement illustrated above, Corah & Boffa's discussion fails to offer any adequate explanation as to why the escape/choice condition was significantly more subjectively stressful than either the escape/no-choice, or no-escape/choice conditions. Thirdly, these findings appear to contradict the contention that having the choice to avoid, or not avoid aversive stimuli equates with perceived control over the potential threat. This is clearly not the case, because having the greatest amount of control (escape and choice) was perceived as being as stressful as having the least degree of control (no-escape and no-choice) over the aversive noise. Note however, that in this instance, the skin conductance findings were not supportive of the self-report measures. The fact that the self-report and physio-logical indices do not tally for the escape/choice condition obviously complicates the matter, and it is notable that Averill (1973) also declined to attempt an explanation of this finding. It is possible that in the high control condition some form of cognitive conflict arose because the individuals had behavioural control anyway. Giving subjects the choice to endure the noise or not may have placed extra demands on them in what was initially a

straightforward instrumental control situation. Langer (1983) noted that having choice does not necessarily imply the perception of control (see the following section on Decisional Control).

Similar to Corah & Boffa's (1970) reported findings, Glass & Singer (1972) examined the effects of noise on cognitive performance tasks such as number comparison, addition and letter search, and found that the mere belief that there was a means for exercising control over the aversive presentation of the noise (should it have been desired), was a "sufficient condition for amelioration" of stress effects.

### 2.2.3 Decisional Control

This is defined by Averill as "... the range of choice or options open to an individual" (p 298); that is, the opportunity to choose amongst various courses of action which must include choices between the areas of one's 'life-space' in which control could be implemented, between categories of control, as well as between the variety of personal control responses that may be available. Cognitive appraisal forms an integral part of this decision making process. Intuitively, most people would probably prefer to have choice among alternative courses of action rather than have decisions made for them. However, there is also a seeming willingness in human beings to relinquish such control, "... to escape from freedom" (Fromm, 1941), and subject themselves to

external constraint (see Rothbaum, Weisz & Snyder, 1982; and Shapiro, 1985; in a later section of the present chapter). Zimbardo (1969b) argued that the freedom (to choose), derived from a lack of normal external constraints. In contrast, other theorists have emphasised the alignment of the person with whatever constraints that exist in their lives and their willingness to acquiesce, and conform, when confronted by these perceived limitations upon their behaviour, rather than attempting to forge their own destinies (Kelly, 1955; Chein, 1972).

Decisional control is experienced when superordinate systems establish goals which can subsequently be met by relevant subordinate behaviours. Thus, "... a person will experience choice when he is acting in accordance to his beliefs or doing that with which he agrees" (p 299, Averill 1973). Langer (1983) noted that at one time researchers treated control and choice as virtually equivalent concepts.

She makes the important point, however, that simply by appealing to one's everyday experiences this view can be disconfirmed. Having the opportunity to use only one course of action may make a person feel 'choiceless' but not necessarily lacking in control. Having to choose between a vast array of possible actions, i.e. having choice, may lead to the perception of no control and feelings of inadequacy. The important factor when faced by a number of alternatives is clearly to make the 'right choice at the right time' in relation to personal



context. Therefore choice and control are not interchangeable terms. It should be recalled however, that it was proposed earlier that human beings are never totally without control. Thus, even under conditions whereby too many alternatives may be overwhelming and may be ignored rather than inspire mindful choices, there is still choice between more global aspects of control.

Decisional control always exists for 'normally' functioning people. This is in fact one of the major criticisms of Averill's typology, especially his conception of decisional control which he implied to be either present or not available within a given encounter. Firstly, objectively, decisional control is always present in experimental contexts for ethical reasons; and secondly, as stated above, it could be argued that it is present in any encounter an individual has with his or her environment. Whether this control is perceived or not is an entirely different matter. This latter point will be considered further in Chapters 3 and 4.

### 2.3 Miller's Typology

In her review of the area, Miller (1979), concentrated on behavioural control. Her classification of this aspect of human control is useful but, as will be seen, it provides evidence for control functions which her typology seemingly ignores or fails to recognise. Behavioural control was subdivided into :

1. *Instrumental Control* : in which a person is able to make a response that modifies an aversive event; e.g. by

escaping, avoiding, attacking or alleviating the impact of an event through changing its probability, or decreasing its intensity (Corah & Boffa, 1970; Elliot, 1969; Gatchel & Proctor, 1976; Houston, 1972; Szpiller & Epstein, 1976).

2. *Self-Administration* : Subjects deliver an unpleasant stimulus to themselves (Ball & Vogler, 1971; Haggard, 1949; Pervin, 1963).

3. *Actual Control Equated For Predictability* : As was discussed in the previous section, controllability and predictability are often confounded. For Miller, "controllability means you can do something about an event". Presumably, this assumes that control facility must be perceived, i.e. in terms of *behavioural control* (conceivably, it is possible to be capable of doing something about an event without knowing that you have this capability). Predictability - "merely means that you know something about the event, whether or not you can do anything about it". Controllability and predictability can be kept methodologically distinct by providing an external cue which signals explicitly when the event will arrive (e.g. self-administration), when it will terminate (e.g. instrumental escape), and when it will occur or not occur (e.g. Avoidance). Miller acknowledges that others (e.g. Averill, 1973) include the concept of cognitive control in definitions of controllability, i.e. the interpretation and meaning attached to an aversive event, but views this as conceptually distinct from her perspective. Nevertheless, one might argue that cognitive

control in the above terms is an essential ingredient of ALL her categories of behavioural control, none more so than her last category, namely,

4. *Potential Control* : Here, subjects are led to believe that some control response is available but it is not actually used by them. However, there is the expectancy that control can be exercised in future if need be (Corah & Boffa, 1970; Glass, Reim & Singer, 1971; Miller *et al.* 1978).

Miller's (1979) Minimax Hypothesis proposes that perceiving control in a situation elicits the expectancy that maximum future danger can be minimised, i.e. individuals with control responses available know that the situation will not become so aversive that they are unable to cope with it - the control option can be operated before that point. When a threat is perceived as controllable, attributions of its effects are made to stable, internal sources (one's own responses), whereas when threat is uncontrollable more unstable external attributions have to be made, e.g. to luck, the experimenter, the skill of others etc. A problem arises here with regard to objective and experienced control. For example, in a behavioural control by performance experiment it may be objectively true that the subject is successfully avoiding, say, an electric shock but subjectively there could be great uncertainty about the likelihood of minimising maximum future harm. The subject does not necessarily **know** that he or she has control and may be highly anxious because no information is available

to give a basis for the perception of control. Evidently, the presence of feedback about response efficacy as well as outcome is an important element in the stress-control relationship.

Thompson (1981) stated that Miller's typology is problematic in that her "methodological distinctions lack psychological differentiation". She made a number of criticisms. For example, instrumental control and potential control are equivalent if the response option is not taken in the former condition. A further problem is that cognitive control is not included in the definitions offered even though the rationale for, and presentation of her 'Minimax Hypothesis', implicitly embodies that which has previously been described as cognitive control and cognitive appraisal. Furthermore, much of her discussion of the four categories is couched in the language of cognitive control. She refers to the *perception* of control, *feedback* from and *intention* to make a controlling response, *belief* that there is control and *anticipated* future control. This serves to illustrate the view taken here that cognitive aspects of personal control should not (and indeed, cannot) be excluded from the examination of personal responses to stressful conditions.

In conclusion, the whole of Miller's approach is, frankly, neglectful of the role of subjective meaning and cognitive control processes. Langer (1983) made a good point when she argued that there should be a differentiation between the perspective of the

'objective' observer and that of the 'actor'. From the 'outside' it is possible to talk of a person exhibiting behavioural control or decisional control without actually considering that person's conscious experience. These types of control are not experienced *unless* a person is aware of control. This argument involves the concept of subjective meaning which is discussed more extensively in Chapters 4 and 5.

#### 2.4 Thompson's Typology of Control

Importantly, Thompson (1981) proffers a general definition of control whereby controllability is conceived as a person's belief that he or she has in his/her behavioural repertoire, a response that can influence an event's stressfulness. This belief based conception casts personal control in a more cognitively oriented framework. Furthermore, emphasis is placed on state control beliefs prior to, during and following an event. Her typology comprises :

1. *Behavioural Control* : which is the belief that one has a behavioural response available that can affect a situation's stressfulness (Averill & Rosenn, 1972; Bowers, 1968; Gatchel & Proctor, 1978; Geer & Maisel, 1972; Houston, 1972; Szpiller & Epstein, 1976).

2. *Cognitive Control* : the belief that one possesses a cognitive strategy that can alter the potential threat of a situation. A wide range of cognitive strategies have been used in research. She broadly divides them into two

categories. Firstly, avoidant strategies, requiring denial, ignoring, dissociating or distracting oneself from the threat. Secondly, sensitizing strategies, which concentrate on the event by heightening sensitivity, reflecting on the threat and attempting to cope with associated physiological arousal or cognitive anxiety. A further distinction lies between those strategies which alter the perception of the stressful event, such as reappraisal of the threat, cognitive restructuring, reframing, and those that reduce or change responses to the event e.g. relaxation (Cohen & Lazarus, 1973; Holmes & Houston, 1974; Houston, 1977; Janis, 1958; Langer *et al.* 1975).

3. *Information Control* : this is a tentative inclusion because information can at times elicit feelings of controllability (see Averill's typology), although it can also result in cognitions of uncontrollability. The feeling of the present author, is that this category would be better placed in the realm of the previous definition of cognitive control.

4. *Retrospective Control* : Whereas the previous categories normally refer to beliefs about control prior to or during stressful events, this latter form of control represents beliefs about the causes of past outcomes. Appropriate attributions of control over past threat situations may lead to increased long-term coping (e.g. Bulman & Wortman, 1977; Wortman, 1976).

Thompson's conceptualization recognises the essential function of the cognitive appraisal of situational demands and potentialities, as well as the appraisal of response capabilities. It is significant that she states that the meaning of the event for the individual determines their reactions to the event and their efforts at coping with it.

## 2.5 Primary and Secondary Control

Rothbaum, Weisz & Snyder (1982) argued that extensive evidence suggests that people strongly value and are reluctant to relinquish, the perception of control. Many researchers, e.g. Learned Helplessness and Locus of Control theorists, interpret various 'inward' behaviours such as passivity, withdrawal and submissiveness as signs of relinquished control. In an innovative paper Rothbaum *et al* proposed a two-process approach to perceived control.

### 2.5.1 Primary Control

This reflects attempts made to gain control of, or master, the environment. It is, of course, the aspect of control which most discussions of the concept cover, and aligns with the theoretical views of learned helplessness and locus of control research. Put simply, this refers to changing the world to fit personal needs. Motivation for perceived control and its corollary, aversiveness of perceived uncontrollability are the foundations of the

learned helplessness and locus of control formulations (e.g. Lefcourt, 1976; Seligman, 1975).

### 2.5.2 Secondary Control

This was considered a much overlooked and underestimated aspect of control and the authors refuted the contentions of more traditional control approaches which argue that helplessness and overt giving-up responses reflect a loss of control under stress (especially when outcomes are not contingent upon the action one takes). Secondary control involves aligning oneself with environmental forces; i.e. it is an attempt to fit in with the world. Four manifestations of secondary control were proposed.

a) *Predictive Control* : This protects against disappointment through attributions to severely limited ability in situations perceived as difficult or impossible to alter. This control emanates from predicting uncontrollable outcomes and adjusting expectations accordingly. This latter point is important since unfulfilled expectations undermine perceived control.

"To expect success but instead to fail is a double defeat; one has failed not only as a performer of the task but also as a predictor of the outcome" (p 14, Rothbaum et al. 1982).

b) *Illusory Control* : This involves attributions to chance or luck which are taken to be personal characteristics (Langer, 1977), in such a way that chance is subjectively perceived as a property of the person. Rothbaum et al maintain that people who exhibit illusory



control do recognize the chance determination of the situation but also perceive chance as a powerful force with which they can align. Investing energy in these situations engenders feelings of personal control (Langer, 1977, 1975; Langer & Roth, 1975; Wortman, 1975).

c) *Vicarious Control* : Here, attributions to powerful others are made thereby enabling the individual to share in that power. Vicarious control is similar to the concepts of identification (Bandura, 1969) and deindividuation (Fromm, 1944), whereby people 'submerge' a sense of self in order to enhance a sense of close association with a more powerful entity. Bandura (1969), stated that powerful models can

".. extract subservience from others" (p 232), and cited evidence which indicated that people often identify with others who exhibit attributes that suggest control, e.g. competence, expertise, power and dominance.

d) *Interpretive Control* : In this type of control people seek to derive meaning from otherwise uncontrollable events in order to accept them. Thus, interpretive control relates to each of the other categories of secondary control. Predictive, illusory and vicarious attributions all help to establish meaning in situations, and therefore acceptance of the situation. Frankl (1963) proposed the 'will to meaning' which engenders the achievement of meaning and the freedom to choose between particular meanings. The search for meaning is argued to be particularly intense where there is little 'primary control'. It appears that people work hard to interpret

events in order to accept them, e.g. following accidents, in bereavement, persecution, natural disasters, etc.

During this process they may seem to be giving up but their "persistence at accommodation" (Janoff-Bulman & Brickman, 1980) argues against a 'helplessness' explanation. Rothbaum *et al.* (1982) stated that :

"..because considerable energy is devoted to interpretation and because a sense of mastery is associated with the understanding of and ability to accept aversive events we maintain that interpretation constitutes a secondary type of perceived control" (p 24)

They also believed that interpretive control is often intrinsically rewarding; for inward behaviour is often highly motivated and is not an indication of motivational deficit. It is an important but much underemphasised point that when attempts at mastering the environment are perceived as untenable, people do not necessarily abandon all efforts at control. Therefore, care should be taken before labelling a person as helpless or lacking in control. The approach of Rothbaum and his colleagues adds weight to the argument that higher order cognitive factors are 'prime movers' in the personal control dynamic.

## **2.6 Shapiro's Typology of Control and Mental Health**

Shapiro (1985) examined the relationship between self-control and psychological health. He identified four primary forms of control based on the positive and negative aspects of both Eastern and Western control philosophies. Eastern types of control include yielding,

letting go, acceptance and non-attachment. A Western orientation lends itself to goal directed productivity, assertiveness and instrumental activity. His four categories provide a more global view of control and its possible relationship to mental health. They are as follows :

1. *Positive-Assertive* : This form of control reflects appropriate goal oriented, self-initiated active behaviour.
2. *Positive-Yielding* : Here, appropriate self and situational acceptance and 'letting go' of control are the main features.
3. *Negative-Assertive* : This type of control involves aggressiveness, overcontrol and rigidity.
4. *Negative-Yielding* : In this category, too little control, timidity, passivity, submissiveness and following type behaviours predominate.

This is not to say that these behaviours are not directed at alleviating the stressfulness of a situation, by means of secondary control (Rothbaum et al. 1982). However, what Shapiro does suggest is that both control types 3 and 4 above are most associated with lower mental health. Shapiro (1983 and 1985) also contradicted the assertions of Mahoney & Arnkoff (1979) who suggested that self-control is viewed positively and originates from 'noble ideals'. He reported that self-control possesses both positive and negative valence. His studies also

found that appropriate active control and relinquishing of control (both positive aspects), were clearly more associated with positive mental health. Conversely, as stated above, overcontrol and too little control were linked to poorer mental health. He suggested a possible continuum of self-control, on which an inappropriate lack of control or too much control are damaging to well-being.

Psychopathology has been argued to occur if there is excessive internal locus of control resulting in the overcontrol which is a characteristic of Type A behaviour pattern (Glass, 1977; Strickland, 1978). Strickland (1978) paralleled Type A individuals with strong internals who constantly struggle for control even in objectively uncontrollable stressful encounters. Consequently, they pay the price in terms of increased risk of coronary heart disease. This contention must be moderated, however, by the knowledge that the above contention does not have the support of strong evidence. Furthermore, it is the anger/hostility/irritability aspects of the Type A pattern which appear to be the major health damaging factors (e.g. Spence, Helmreich & Pred, 1987). Alternatively, too great an external locus of control may result in erroneous perceptions of no control similar to learned helplessness, whereby no behavioural control attempts are made even though they would be effective in managing a given situation. This perceived independence between one's responses and

experienced outcomes has been suggested to lead to depression and debilitation (Klein & Seligman, 1976; Miller & Seligman, 1976). It is worth noting that Rothbaum *et al* (1982) contest this analysis and view strong externals as merely seeking another 'expression' of perceived control.

### 2.7 A Unifying Theme ?

The preceding typologies of control can be linked by a unifying and over-arching construct. All of the approaches imply or explicitly state the importance of meaning and context in the perception of control process. Subjective reality is of the essence. The stance adopted in this thesis is that higher level cognitive processes underly each of the aspects of controllability reported here. It is arguably reasonable to assume that even in behavioural control paradigms, personal responses are strongly influenced by perceptions, beliefs, goals and, therefore, the meaning attached to the particular circumstances in question. A theoretical approach to personal control based on cognitive processes such as appraisal, beliefs, and interpretations is proposed. This perspective underpins the research undertaken for this thesis and hopefully, is further borne out by the nature of the discussion in the following chapters.

## CHAPTER 3

### MODELS OF PERCEIVED CONTROL

#### 3.1 Introduction

The previous chapter dealt with the ways in which personal control has been classified in terms of the types of control which are possible in a particular set of circumstances. In this chapter emphasis is placed on theoretical models of control which implicitly incorporate these various types of self and situational control. Consistent with the ubiquitous nature of the control concept, a number of psychological models have been proposed which attempt to identify the processes involved during control. Kuhl (1986) identified two broad categories of control model; namely, models of perceived control and models of actual control. This and the following chapter not only discuss several models that fall into each category, but also highlight models which combine both these aspects of control(1). The relevant concepts of competence and motives to perceive and demonstrate control (through whatever means) are embodied in the various perspectives.

The consideration given to these models is justifiable on the grounds that a) it provides greater insight into the theoretical background to thinking in

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(1) Whilst perceived control and actual control can be considered as separate concepts they are clearly interrelated and perhaps the most useful conceptualizations are those which combine them both (see Chapter 4)

this area; and b) it helps illustrate a logical progression from 'single focus' perspectives to more realistic, eclectic models of control upon which much of the empirical work presented later is based.

Models of perceived control are based upon various types of expectancy construct, such as, subjective probability of positive or negative outcomes (Gregory, 1981), perceived non-contingency between actions and outcomes (Seligman, 1975), and perceived ability to execute intended actions which will achieve the desired results (Bandura, 1977). Actual control models are founded on conceptions of the **ability** to control and the concomitants of that ability, i.e. environmental contingencies such as support or constraints, the availability of appropriate cognitive and motor skills, and the facility to execute behavioural responses and self-regulatory skills.

Kuhl (1986) argued that the explanatory 'depth' of perceived control models appears somewhat limited. He stated that :

"The theoretical claim that people *perceive* what an external event does to them is not theoretically informative" (p 3).

He contended that what was necessary was to gain some understanding of precisely **how** the cognitive, emotional, motivational and physical effects of loss of control are mediated. For example, high physiological arousal or reduced attentional capacity may result from a perception of diminished control, or may conceivably be antecedents

of such percepts. Short-term memory may become overloaded because of intrusive or anxious thoughts about losing control. A perceived loss of control might alter the functional significance of conscious experience, or the format of information retrieved from long-term memory, or even result in attempts to ignore or disregard certain information (Fisher, 1986; Kuhl, 1986). Kuhl (1986) further argued that even if perceived low control produces detrimental effects in some people, others may not show such debilitation despite low control perceptions. Conversely, performance or self-regulatory deficits may occur even though a person perceives herself to have high personal control.

Although an important factor, perceived loss of control is not inherently essential for performance decrements to occur. For example, the impairment of actual control facilities may have this effect. Alternatively, perceived loss of control could be the long-term result of performance deficits rather than their cause. The following sections describe models of perceived control which assume that the effects of subjective loss of control are mediated by motivational processes, i.e. perceptions of non-control result in a reduced motivation to generate attempts at exerting control. This may occur despite the availability of effective control strategies. A number of models of perceived control are described.



### 3.2 Generalised Perceived Control of Outcomes

Rotter's (1966), theory of internality-externality falls under this category. Locus of control reflects individual differences in generalized beliefs about the personal controllability of reinforcing life events. Rotter's (1954), social learning theory posits that the internal-external control distinction describes only one of several determinants of a person's expectancy that she/he will obtain an outcome in a particular situation as a result of executing a specific behaviour. According to Rotter, this action-outcome expectancy, combines with the subjective reinforcement value of the outcome, to determine the potential for a particular behaviour to occur. Rotter's theory argues that in a given situation an individual's expectancy that a specific action will lead to a specific outcome is a function of both a context specific expectancy and generalized expectancies relevant to that situation. However, the influence of generalized locus of control expectancies on specific situational expectancies has also been hypothesised to decrease as a function of experience with that situation, possibly because of the increased salience of situational cues in unambiguous situations (Folkman, 1984; Kuhl, 1977; Schwartz, 1969). Kuhl (1986) noted that in spite of the theoretical and empirical limitations of using generalized conceptualizations of control to explain behavioural impairment, many theories assume a pervasive influence of generalized perceptions of control, e.g. Abramson *et al.* (1978); de Charms' (1968); Deci (1975);

Seligman (1975). See also Chapter 6 on the development of a state self-control measure.

### 3.3 The Learned Helplessness Model

This model was proposed by Seligman and his associates (Hiroto & Seligman, 1975; Maier & Seligman, 1976; Seligman, 1975) to account for frequent findings that after exposure to a number of objectively uncontrollable events or tasks (usually aversive), both humans and animals exhibit performance decrements, even on tasks very different to the ones they were induced to fail on (Overmier & Seligman, 1967). Such 'helplessness' training is said to result in perceptions of a loss of personal control which generalizes to other situations. A sense of helplessness occurs when response outcomes are perceived to be independent of the voluntary responses made. According to Seligman's model, the learning of contingencies is an important factor in voluntary learning behaviour. He proposed that in instrumental learning a subject executes an action which exerts control of the outcome. Motivationally, passivity and inertia result from a reduction in the capacity to produce voluntary responses. The cognitive component of learned helplessness manifests itself as future difficulties in learning contingencies between responses and their consequences.

In an experiment using loud noise avoidance in human subjects, Hiroto (1974) replicated learned helplessness experiments on animals. He used a finger shuttle-box

whereby a given instrumental control response would terminate noise exposure. It was demonstrated that even though the instructions given to subjects indicated that the noise could be terminated, those who had received an uncontrollable pre-treatment were slower to learn the avoidance response than those who had not. Hiroto & Seligman (1975) showed that trauma such as pain was not essential to induce helplessness in human beings - unsolvable discrimination learning tasks also produced impairment on a subsequent anagram task.

Seligman (1975) asserted that "uncontrollability distorts the perception of control" (p 37). He suggested that a negative cognitive set developed following the experience of uncontrollable events, and further claimed that the learned helplessness phenomenon provided a model of depression in human populations. Fisher (1986) also suggested that the experience of situations in which there is a low likelihood of a positive outcome 'prime' the individual to form pessimistic expectations of personal agency. Consequently, a distortion of objective reality results from uncontrollable experiences. Conceivably, the perceived information suggests that behavioural control is not possible, and this perception then generalizes to subsequent encounters with the world. Indeed, Fisher (1986) suggests that there may be no discrimination between such situations. People may not be sensitive to differences between uncontrollable pre-treatment conditions and the possibilities for control in

subsequent circumstances. Alternatively, normally effective response strategies may be considered to be unproductive because of the pre-treatment and are consequently suppressed. Uncontrollable responses may thus inhibit potentially effective responses, or as Fisher stated :

"A cognitive model would assume that any situation brings a number of potentially applicable strategies into focus. Uncontrollable experiences create low probability weightings for these useful strategies. The effective result is that they are temporarily damped and are less likely to be brought into use in new situations. Helplessness is transmitted as a low level of dominance in the memory for appropriate strategies. Therefore, the organism appears slowed, perhaps confused and learning is damped" (p 175, Fisher, 1986)

A further interesting and important point is raised by Fisher; namely, that as uncontrollable circumstances are a feature of life, why are we all not helpless and depressed ? For example, chance events are uncontrollable; however, an 'illusion of control' may be a normal helplessness resistant bias in appraisal (cf. Langer, 1975; Lefcourt, 1973; see also Rothbaum *et al.* 1982 in Chapter 2). Illogical heuristics or the abandonment of rational strategies in favour of intuitive ones, may be the order of the day in normally functioning human beings (Alloy & Abramson, 1979).

Later research and theorizing on coping with non-contingency and perceived uncontrollability led to a reformulation of Seligman's model. The revised helplessness model embodied the notion that the attributions made concerning the outcomes experienced are crucial. The concept of personal, rather than universal,

helplessness emerged. Abramson et al. (1978) argued that experiences of non-contingency are not sufficient conditions for helplessness and depression to develop. A precondition for depression is perceived personal helplessness - a product of self-blame for bad outcomes. These authors infer the importance of internal attributions which are enduring and global, in the development of depressive illness. See Fisher (1986), Chapter 10, on "Helplessness-Resistant Strategies" for a comprehensive account of the learned helplessness model.

### 3.3.1 A Perceived Contingency Model

In straightforward terms, contingency refers to the degree of relationship between any two events. Abramson & Alloy (1980) noted that when the two events are both stimuli, the relationship between them is best considered as one of predictability, i.e. the first stimulus may or may not provide information about the impact of the second (see Chapter 2). Alternatively, when events consist of a person's responses and some outcome, the relationship is one of controllability, whereby the response exerts some or no control over the outcome. One could suggest, however, that one does not have control over the outcome, but rather, control over the processes by which the outcome is achieved. Having said this, the assessment of contingency in real-life contexts is perhaps an essential factor in the perception of control. In real-life, significant events may be embedded within a particular context. Additionally, it may be necessary to

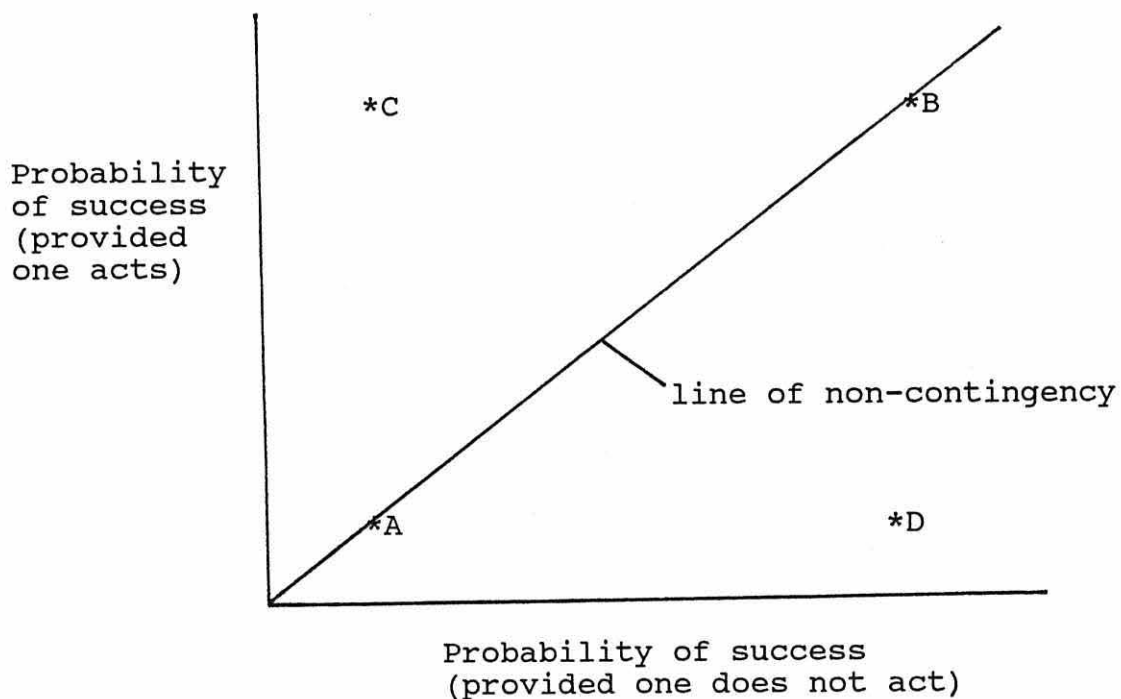
gather information regarding causal relationships over a period of time. As Fisher (1986) contends, a single case of a lack of relationship could ruin any idea of contingency where complete causal relationships are concerned, or may cause one to formulate new cognitive rules of contingency. For action-outcome situations, the action taken is compared to the outcome to indicate the contingency present and thereby the perception of control. Four combinations represent the possible associations by which contingencies must be evaluated, a) action-outcome, b) no action-outcome, c) action-no outcome and d) no action-no outcome. The assertion that organisms are generally sensitive to both variation in response and outcome probabilities, but are very sensitive to response-outcome independence forms the basis of the Learned Helplessness model previously discussed.

A substantial body of research suggests that people are generally poor judges of contingency and are very likely to rely on the frequency of positive associations rather than purely on veridical evidence (Allan & Jenkins, 1980; Dickinson *et al.* 1984; Jenkins & Ward, 1965; Langer, 1975; Smedslund, 1963). If favourable events occur then there is contingency - not much credence is given to the possibility that positive outcomes were just a matter of good fortune.

Maier & Seligman (1976) argued that perceived control cannot be reduced to an action-outcome expectancy. They suggested that it reflects a discrepancy

between two types of expectancies, namely, an action-outcome expectancy and a situation-outcome expectancy (see also, Heckhausen, 1977). A person perceives no control if the two expectancies are equal, i.e. if the perceived probability of a particular outcome occurring is the same whether or not an action is executed (Figure 3.2).

Maier & Seligman's model of perceived control includes situations in which the outcome expectancy is high and those in which outcome is just as likely to occur when no action is taken (B). Most learned helplessness research is based on the assumption that non-contingency is equivalent to low action-outcome expectancy (A).



**Figure 3.2 :** Controllability, (C and D), and Uncontrollability, (A and B), Defined By Two Types Of Subjective Probability (After Maier & Seligman, 1976).

However, Kuhl & Schonpflug (1974), Jenkins & Ward (1965) and Langer (1975) have demonstrated that when there is a high likelihood of an outcome occurring it is hard to formulate a percept of non-contingency because people show a tendency to overestimate their personal control over objectively non-contingent successes. Linked to this finding is research which has shown that generalized performance decrements can occur following a pre-treatment of non-contingent success experiences despite subjects reporting a high level of perceived control (Tennen *et al.* 1982). Kuhl (1986) contends that decrements in performance following control deprivation may be mediated by factors connected with the loss of *actual* control as well as by factors connected with loss of *perceived* control. This view will be discussed in a subsequent section.

In addition to the control deficits mentioned above (i.e. non-contingent failure and non-contingent success), Maier & Seligman's (1976) model also distinguishes between two kinds of control. The probability of achieving a given outcome through action rather than a failure to act (C), may form the basis of efficient control. Alternatively, there may be passive control of outcomes where the probability of success is lower if one takes action than if one waits for environmental provision of the outcome (D). These latter points concerning passive and active control support Rothbaum *et al.*'s (1982) primary and secondary control hypothesis, as well as Shapiro's (1985) typology of control.



Furthermore, Miller's (1979) Minimax Hypothesis also suggests both active and passive control if reframed in a cognitive light.

### 3.4 The Discrepancy Reduction Model

Fisher (1984a) developed a model of stress based on mediating cognitive processes and the perception of control. This model was derived from ideomotor theory, and presented an alternative to the assessment of contingency as the basis for perceived control(2). Two basic features of the model were subjective reality (perceived state of the internal and external world), and intention (desired state of reality). A perceived discrepancy between a person's intentions and how present reality appears to them necessitates an action to resolve it (cf. Miller et al. 1960). For example, a discrepancy is generated as soon as an individual formulates a goal, perhaps following other decisions about controllability within a particular sphere of personal agency. Uncontrollability may be perceived at an early point if a person believes that there is little that can be done about the situation, e.g. due to the overwhelmingly catastrophic nature of an event, or because of generalized personal beliefs about the nature of the world and the possibilities for control. If the discrepancy is not resolved by the action taken and if

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(2) It is believed here that, although Fisher's model is presented as an alternative to contingency evaluation (i.e. one's effects on the environment after certain behaviours have been executed), it still relies on testing contingencies albeit in a covert manner.

failure represents a high cost, then a state of perceived stressfulness will develop which has input to the physiological arousal system (Fisher 1986). Fisher asserted that following an action, reality is changed and this change in the original discrepancy is coded in memory as a representation of the action's degree of success. The implication is that reference codes of discrepancy reduction can be recalled and represented in consciousness. Action copies and their associated action-expectation codes are suggested to be available to predict real events and outcomes in advance (or in retrospect), and can evoke mental imagery in various sensory modes. Basically, this refers to mental rehearsal of an intended action and its likely consequences. Fisher (1986) proposed that "implicit plan running" is the basis of "worry work" (Janis, 1958), which involves mental rehearsal and the possible experience of associated anticipatory fear or anxiety. Such "informed worrying" may be stressful in the short-term but may be beneficial in the long-term management of stress (cf. Averill, 1973).

These codes can be called upon prior to any behavioural response. In this way, given the situational constraints which are present, likely actions are rehearsed against probable consequences. The desirability of a particular action can then be appraised. This evaluation may in turn form the basis for the modification of response selection. Perception of controllability is suggested to be based upon

manipulation of these 'mental reference codes', which implies that perceptions of control in real-life encounters involve "built-in economy in information processing" (Fisher, 1986). By referring to stored action and expectancy codes, the processing involved in the selection and execution of an action together with the consequent monitoring of contingency data may be unnecessary. More precisely, if a mentally represented discrepancy fails to decrease following an imaginary action then the intended action can be modified and rehearsed until the disparity is lessened, without the negative stress responses that perceived loss of control might normally give rise to.

Fisher's (1984a) discrepancy reduction model contains the notion that the appropriate facility to control need not be operated. The belief that an effective response is available, and could be called upon if necessary, may be sufficient for control to be perceived (cf. Miller, 1979; Thompson, 1981).

### **3.5 The Spheres of Control Model**

At a more 'macro' level of cognitive involvement, Fisher (1984a, 1986) proposed a hierarchical model of decision making leading to the perception of control. She argued that complex decisional processes are engaged to tackle stressful conditions. Paulhus & Christie's (1980) Spheres of Control derivation of locus of control theory was adopted. The spheres of control concept partitions a person's life space into primary behavioural spheres

which may influence decision making, and within which separate decisions about controllability are made (see Chapter 7). A person may have different expectations regarding control within each of their personal, interpersonal and socio-political behavioural domains. These expectancies are thought to fluctuate according to changing context. A person may fail to perceive control in one sphere but find it in another, e.g. in Chapter 9 it will be seen that nursing staff subjects perceived themselves to have no socio-political control in an identified stressful context, e.g. staff shortages, the death of patients, acute emergency etc, however, they did seem to perceive personal control within the constraints of the situation.

Figure 3.3 represents Fisher's (1984a) model of the decision making processes which are involved in the perception of control. This model incorporates the idea of 'implicit plan running' and discrepancy reduction within a decisional framework.

Fisher (1986) asserted that:

"Decision making involves two aspects: It is necessary to choose an appropriate domain and to decide about control levels within the domain selected" (p 89).

Attempts at operating control in different spheres may be part of one's response strategy for stressful events. For example, control feasibility may be evaluated in each sphere; however, there may be recognition of the fact that in a particular situation, personal control is

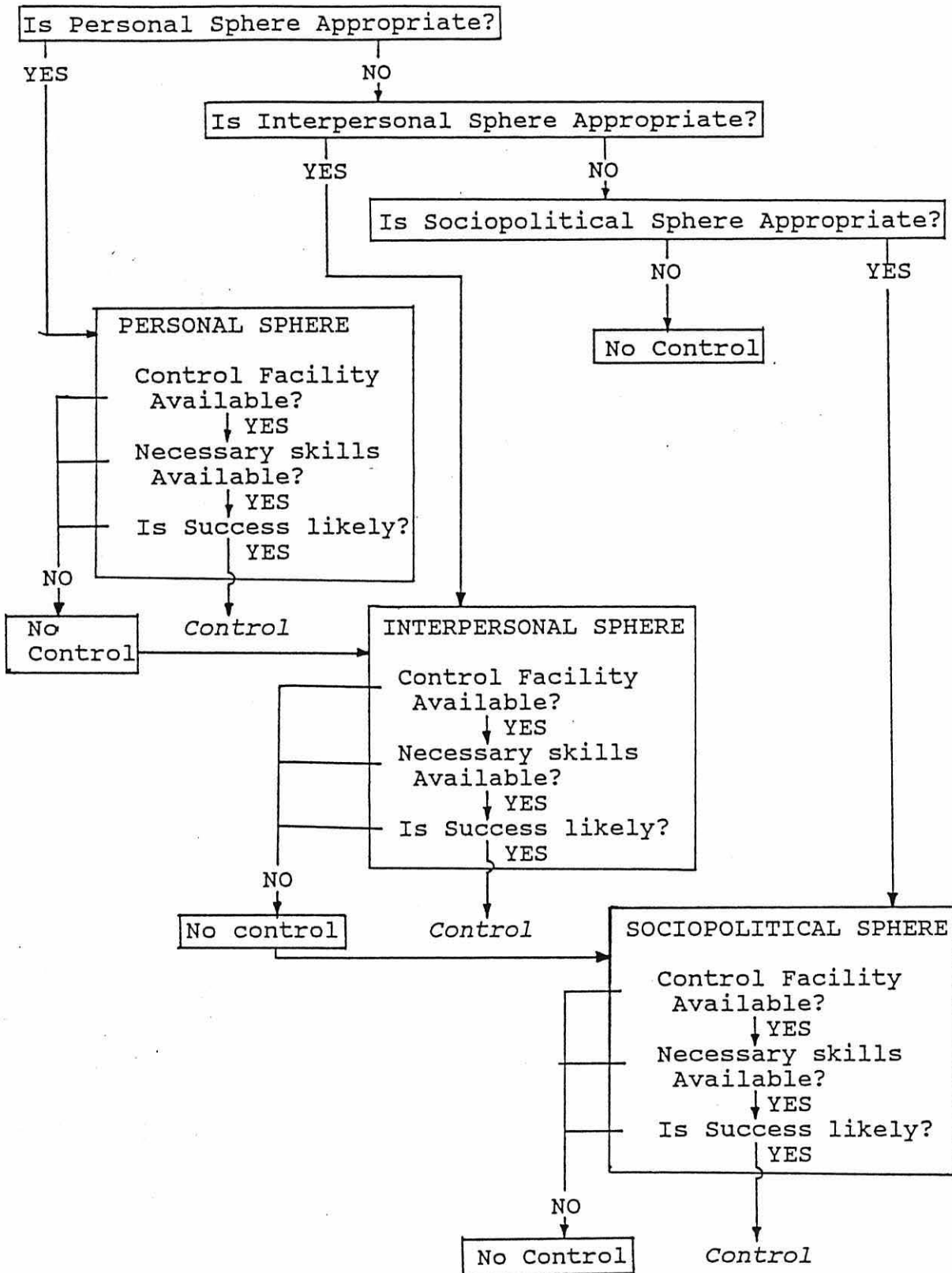


Figure 3.3 : Decision Processes In The Perception Of Control (After Fisher 1986)

impossible. In such an instance control might be sought in a more appropriate domain, e.g. using the expertise and skills of others(3) .

It was suggested that cognitive styles may develop which influence a person to prefer expressing control in a particular sphere. Fisher asserted that a major feature of the strategy used to manage a stressful encounter is the 'order' in which the efficacy of control in the various domains is appraised. Someone who prefers to operate within the personal sphere may tend to perceive control in a stressful situation only through consideration of personal action. Another person may prefer to seek the help of others. It is debatable, and perhaps a philosophical point, whether personal control is actually relinquished in such conditions since making the decision *is* effectively guiding or controlling the response to an event. All this suggests that action in one specific sphere of control could be more advantageous than action in others when solving particular stress problems. The corollary of this point is that :

"Choice of an inappropriate domain in attempting to control the situation may inevitably lead to failure" (p 91, Fisher, 1986).

For example, personal intervention may be inappropriate if potential loss of life is involved in the situation. In this sense, the choice of control domain is a crucial factor in the perception of control.

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(3)Note that the primary focus of control here is control over environmental contingencies rather than self-control. However, the two are closely linked, a point which will be expanded upon in Chapter 4.

### 3.6 Expectancy and Self-Efficacy

Bandura's (1977a, 1982a) self-efficacy theory emphasises the conceptual and functional differences between perceived self-efficacy and outcome expectancies. The former refers to the expectancy that a given behaviour is available and can be executed, whilst the latter represents an 'outcome judgement' which is the expectancy that a given behaviour will achieve the desired outcome. According to Bandura's theory, a person's motivation to execute a particular behaviour is dependent upon these expectancies. Rosenbaum (1980a, 1988) includes self-efficacy as an important personal control element in his general theory of learned resourcefulness, or dispositional self-control. Self-Efficacy theory assumes two reasons for perceptions of uncontrollability. Firstly, a lack of control may be perceived because individuals doubt that they can do what is required (i.e. because they perceive themselves to be lacking in the necessary personal attributes). Secondly, perceived uncontrollability may manifest itself because of the "unresponsiveness, negative bias or punitiveness of the environment" (Bandura 1982a) in spite of the knowledge that the required personal skills are available. For example, a shiftworker might have the knowledge and skills to construct and organize a shift system that takes less of a toll on those who have to work it, compared to an existing shift pattern. However, this worker may also recognise that management are totally unwilling to consider suggestions from the work-

force and so might perceive a lack of control with respect to her job. To remedy the first instance of perceived uncontrollability it would be necessary to develop a person's cognitive and behavioural skills and experiences so as to strengthen their self-efficacy expectations. In the second case, perceived control could be achieved by altering the environment to enable the effective mobilization of existing competencies. The above clearly implicates the utility of a spheres of control approach. The shiftworker may perceive control in terms of personal abilities but in the inter- personal or, in this instance, socio-political domains she may very well perceive a lack of controllability. In other words "I could solve the problem (personal efficacy) if only I could influence the management (socio-political control)".

Kuhl's (1986) expectancy model of control suggests that the motivation to execute an appropriate behaviour, which may produce the desired outcome and its consequences, is determined by control perceptions. If any of a number of control perceptions falls below a certain "critical value" then a decrease in motivation to act is argued to occur. For a person advised to follow an exercise programme to improve his health these negative control perceptions might include: believing that a given activity will not produce the desired result; believing that the necessary physical condition, or performance skills are not present; or that the self-regulatory



skills needed to help maintain the behaviour are not sufficiently strong.

### 3.7 Summary

This chapter highlighted a number of models of perceived control. These perspectives were based primarily on predictions regarding different types of expectancy construct. The well-researched locus of control concept was briefly covered. Perceptions of control in this instance are based upon generalised beliefs about one's agency in the world. The learned helplessness model bases perceived control upon the perception of contingency between one's actions and the outcomes experienced. Uncontrollability is perceived when consequences are appraised as being independent of possible controlling actions. A reformulation of the learned helplessness model also introduced the notion that, in addition to prospective expectancies, retrospective attributions of controllability are also important factors in the overall perception of control. Consideration of the perceived contingency/non-contingency model enlarged upon the arguments presented for the learned helplessness model, and suggested that perceived control is influenced by contingencies other than low action-outcome expectancies.

Attention was then given to Fisher's (1984a, 1986) discrepancy reduction and hierarchical decision making models of perceived control which represent a person's strategic response to stressful scenarios. The former is

implicitly embedded in the latter, and subjective meaning is a major feature of both. Finally, expectancy and self-efficacy theory were briefly discussed. It was suggested that appraisals of uncontrollability in relation to different aspects of, say, a medically prescribed exercise regime, might lead to motivational deficits to perform a desired action even if inaction was associated with dire consequences.

Having considered models of perceived control it is suggested that confidence in the perceived ability to generate an appropriate action, perform it, produce the desired outcome, and experience the desired consequences, are not sufficient for the **actual** manifestation of the desired consequences. The possession of mental and physical skills, i.e. one's behavioural repertoires (Rosenbaum, 1988) and the accessibility of environmental support may not be sufficiently well-developed for actual self and situational control to be produced. The following chapter examines models of actual control. It then progresses to a theoretical perspective of control which combines the notions of both perceived and actual control.

## CHAPTER 4

### MODELS OF ACTUAL CONTROL

#### 4.1 Introduction

In the previous chapter, it was suggested that perceived control was an important influence upon a person's motivation to manage environmental contingencies. It also emerged that *perceived* control was an insufficient condition for situational control to be manifested. Indeed, the perception of control may be erroneous and potentially harmful if deficits in actual control processes exist.

With respect to the above, this chapter will briefly consider a four-factor model of actual control proposed by Kuhl (1986). It then covers Kuhl's (1986), information processing based, Action Control model. Brief consideration is given to the information processing approach to the self-control of cybernetic systems. Finally, a model which encompasses both perceived control and actual control functions will be discussed, namely the self-control model of Rosenbaum (1985 and 1988). One point that should become clear in the earlier sections of this chapter is that even the models of actual control, which were implied by Kuhl (1986) to be conceptually distinct from models of perceived control, are nevertheless discussed very much in terms of control

expectancies and perceptions, (e.g. Carver & Scheier, 1982; Kuhl, 1985).

Actual control deficits may manifest themselves in a number of ways. The self-regulatory skills one possesses may be inefficiently mobilized (e.g. inappropriately focused) or, because of one's learning history, insufficiently developed to cope with the demands of the environment. The cognitive-behavioural components of task-relevant cognitive and motor skills may be missing, may be inadequately developed to enact the particular behaviours required, or may be adversely affected by stressful experience. Even if the requisite psychological and physical resources are present and can be implemented to produce the desired outcome, deficient environmental outcome-consequence contingencies might render actual control impossible. There may be few opportunities to execute the controlling behaviours necessary for a desirable outcome because of changes in context such as being made redundant, changing jobs to one in which less autonomy is available or expected, or because social mores define what is and is not appropriate behaviour. For example, it may be considered socially inappropriate or even embarrassing (to us !), for one's grandparents to take up skate boarding or to dress and talk in the manner of today's youth culture. Thus, the opportunity for them to be self-determining, to make choices about the challenges they experience and the control they demonstrate is suppressed.

In relation to a person's self-regulation skills, an over-supportive environment might remove the impetus or necessity to maintain active control behaviours. This may be particularly the case with institutionalized people or, for example, with overly protected children and the elderly. In such cases, if certain control functions are not operated for some time their efficiency may deteriorate to a point at which the person loses the ability to exert control even though there may be considerable motivation to do so, (the Americanism, 'use it or lose it' succinctly conveys this contention).

#### **4.2 Kuhl's Model of Actual Control**

Kuhl (1986) identified four factors that potentially influence actual control over behaviour and its consequences in a given situation. Firstly, environmental factors affect actual control functions by determining the objective difficulty of a task (i.e. the degree of effortful control required to succeed) and the degree of support available. Kuhl noted that an environment providing little intellectual challenge and no encouragement to be physically active debilitates the development and maintenance of cognitive and motor skills. Furthermore, control over the production of behavioural outcomes may exist, e.g. the ability to run a couple of miles regularly, but one of the environmental consequences needed to promote maintenance of this behaviour may be missing, e.g. there may be no social approval or attention. This, of course, implies the

importance of social support in the issue of adherence to health-related behaviours, (e.g. Fishbein & Ajzen, 1975).

In an environment that does not offer a great deal of social support it may be that dispositional self-motivation, the tendency to persevere at a task once it has been started, is crucial to adherence behaviours (Dishman, 1988; Dishman & Gettman, 1980). Conversely, as mentioned above an overly supportive environment, which encourages passivity and the 'suppression' of control functions, heightens the difficulties of using both self-regulation skills (emotion focused control), and initiating actions targeted at changing a problem situation (problem focused control). Secondly, it is not sufficient that the environment provides the person with a number of potential contingencies between behavioural outcomes and desired consequences. A further requirement is the availability of suitable executive cognitive and motor skills to attain the desired outcome. These executive skills are required because the realization of behavioural outcomes does not simply rely on an ability to 'run off' a complex skill or its behavioural components, but rather depends on the organization and coordination of these components into a strategically viable response (Anderson, 1983; Sternberg, 1969).

The third factor affecting actual control is the possession of the appropriate behavioural subcomponents of complex skills and an ability to perform them. Summers (1981) stated that behavioural components are those elements of a complex behaviour that are controlled by an

'open-loop' system, i.e. automatic operations that are run-off without recourse to the processing of feedback information. Lack of control over the environment may be due to either a fault in the mindful operation of available behavioural components, or to the unavailability of one or more of these components. The implication for intervention in the former condition is that the strategic organization and implementation of behavioural elements should be taught, whereas in the latter condition it is that the actual components have to be acquired and developed.

Kuhl's final factor relates strongly to one of the mainstays of this thesis, namely, self-regulation. According to Kuhl (1986) self-regulation is vital for other control processes to operate effectively. He defines self-regulation in terms of the processes mediating maintenance of an intention until it has been initiated and performed against pressure from competing action tendencies. Thoresen & Mahoney (1974) similarly operationalized self-control as a behavioural response pattern whose instigation was previously less probable than alternative behaviours, in conditions devoid of conspicuous external constraints. This process of self-control involves lesser or delayed rewards (Mischel, 1981), greater effort or exertion, and the experience of the aversive properties inherent in the situation.

Bandura (1982b) and Kanfer & Hagerman (1981) proposed self-regulation models which essentially suggest

that self-monitoring and the appraisal of overall controllability initiate the self-control process in response to a disruption of ongoing goal-directed behaviours, e.g. through worry about personal ability. Such concerns give rise to personal standards which must be met by coping efforts (e.g. the termination of the interruption). If these standards are regarded as being personally controllable and are met through the mobilization of self-control behaviours, then positive self-reinforcement follows and the individual is motivated to resume or perform the intended behaviour.

Within Bandura's, and Kanfer & Hagerman's framework there is an integration of subjective and objective aspects of control. However, Kuhl (1986) contended that their theorizing does not clearly separate self-regulation from performance control. This is an important observation if one considers the formulation of interventions for actual control deficits. Kuhl argued that Bandura's (1982b) approach discusses self-regulation at a rather 'molar' level of analysis and that Kanfer & Hagerman's (1981) self-regulation model fails to discuss specific self-regulation functions in any great detail. He further stated that :

"..a clinical intervention focused on the improvement of molar strategies may fail to have long-lasting effects whenever self-regulatory problems are partly attributable to more molecular processes such as a lack of self-regulatory effects on encoding, storage and retrieval of action-related information" (p 18, Kuhl, 1986).



The following section describes an information processing model of 'action control' which incorporates the notion that the efficient functioning of self-regulatory processes is a significant precursor to the effective evocation of the ensuing control processes. There is also the implication that self-regulation may impinge more directly upon the efficiency of performance.

#### 4.3 Information Processing and Action Control

Because physical, psychosocial and other environmental eventualities may impair self-regulatory control, the associated demotivation will eventually result in a decrement in basic cognitive and motor faculties. Efficient self-regulation depends both on one's self-control repertoire and the amount of self-regulation needed to complete an intended behavioural act. Kuhl (1984) argued that three factors determine such 'difficulty of enactment'. Firstly, the number and strength of other self-generated action tendencies competing with the intended action. Secondly, the degree to which the intended behaviour conforms to socially accepted actions. Thirdly, the mode of control that is currently activated, i.e. whether or not it facilitates or hinders behavioural enactment. One could also argue that the apparent contextual relevance of the self-generated action tendencies will also be influential.

Kuhl's (1985) proposed model of action control (Figure 4.1), relies on the assumption that attention devoted to processing information regarding incongruencies, or degraded cognitive representations,

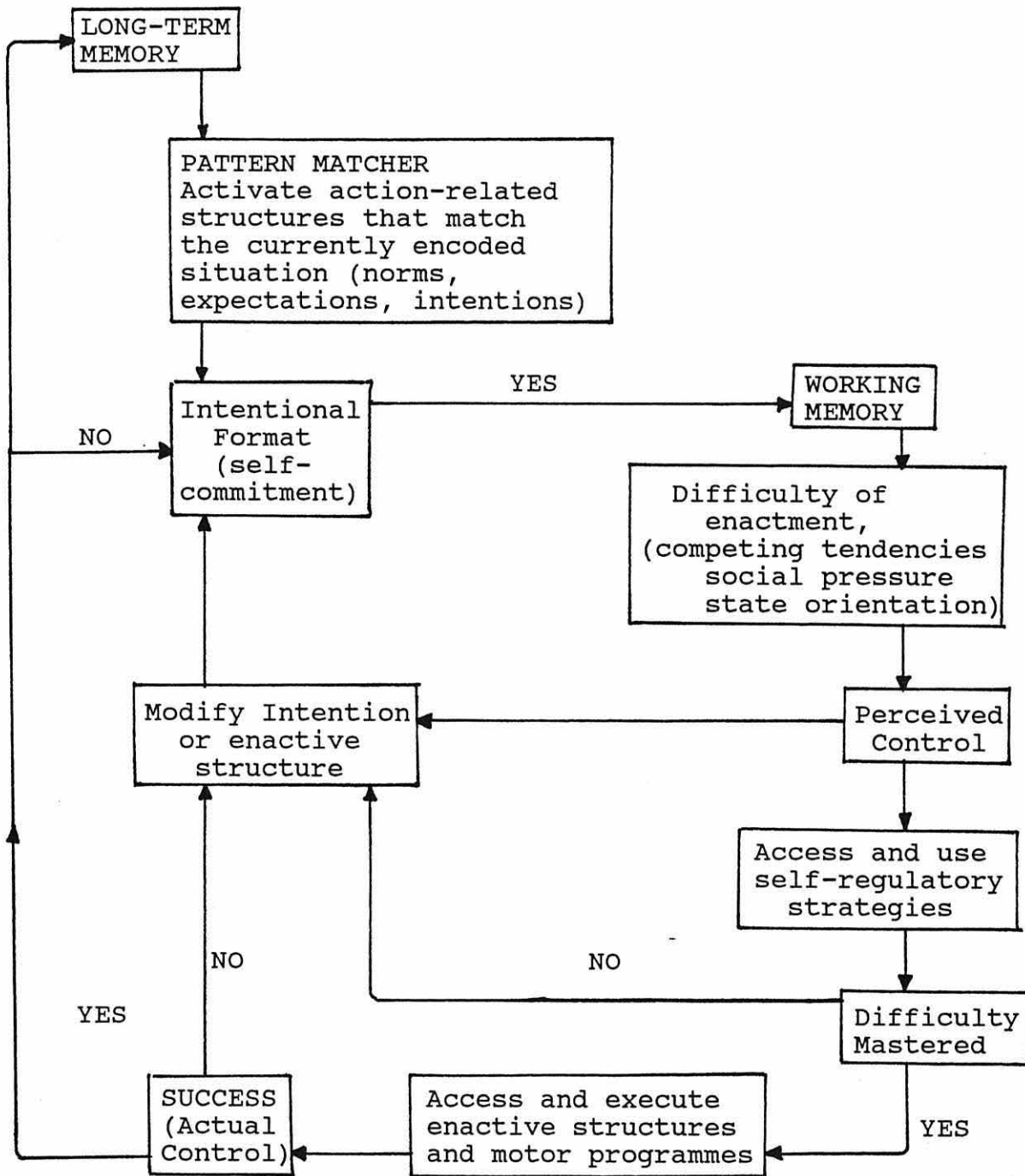


FIGURE 4.1 : A Model Of Action Control (After Kuhl, 1985)

occupies parts of working memory required to control the fulfilment of planned behaviour (cf. Davidson &

Schwartz's, 1976, reference to the 'clogging up' of limited capacity processing channels by task irrelevant cognitions and feelings). Kuhl (1986) contended that the difficulty in carrying out an intended action increases dramatically when a person becomes 'state' oriented. A person is said to be state oriented when their attention is focused on their internal or external state. This may feature enduring cognitions about past, present and future states, as well as evoked autonomic reactions. Alternatively, an action orientation is characterized by attention focused on a "fully developed action structure", i.e. an appropriately composed and organized hierarchy of superordinate and subordinate goal directed control.

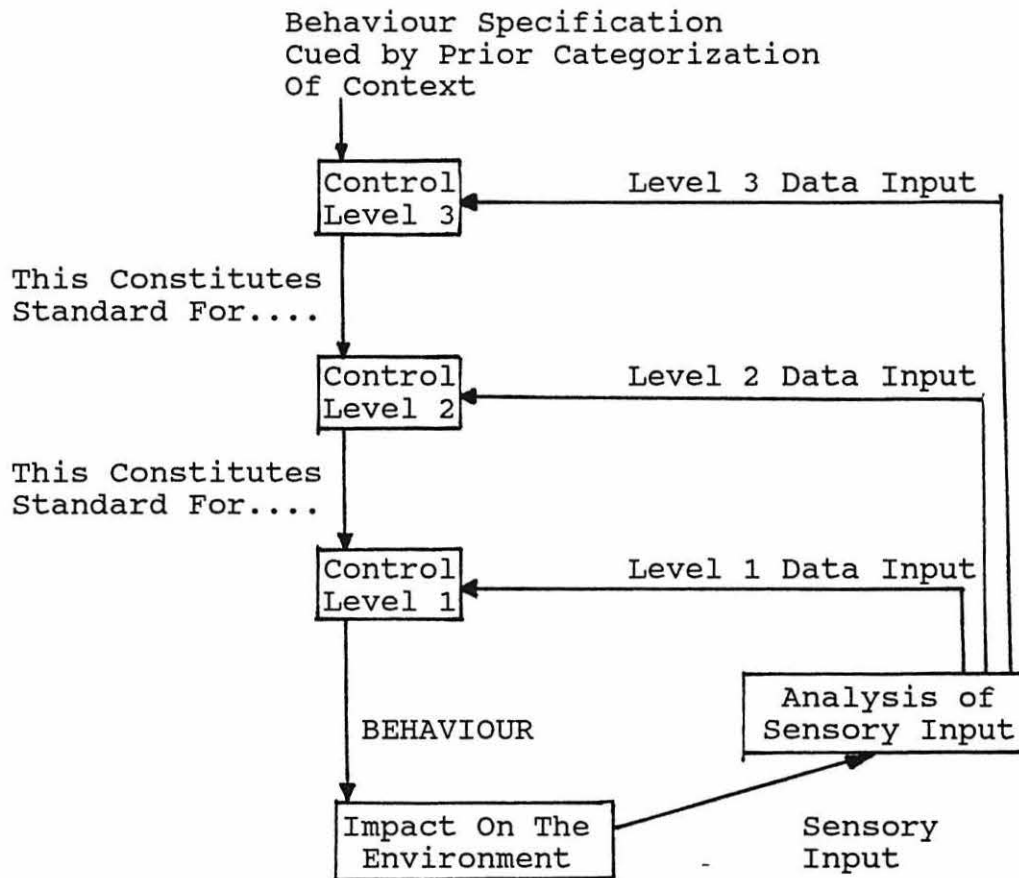
The strength of state or action orientation in a given situation was argued to depend, partly, on the degree of parity between the 'value' of an actual behaviour and some standard of comparison or higher level goal for that behaviour. Thus, the strength of state or action control relies on the discrepancy reduction properties of negative feedback loops within a hierarchically organized cybernetic system of control (Carver & Scheier, 1982; Powers, 1979). In Kuhl's (1986) terms, if the perceived disparity between expectancies and new information, competing expectancies, or between conscious and unconscious representations exceeds a certain 'critical value' then the probability of a state oriented response is increased, together with the amount of self-regulatory effort required to enable the

behavioural goal to be fulfilled. One of the significant implications of Kuhl's theorizing is that self-regulatory activity may also cause performance decrements because it uses up processing space needed for the intended behaviour. This inference supports predictions made later in this thesis, regarding the switching of attention between problem focused and emotion focused control strategies.

Carver & Scheier (1982) note the often ignored fact that people are able to execute very abstract behaviours (e.g. conceiving and writing this paragraph) by means of concrete actions which apparently have no tenable connection with the abstract goal (e.g. moving my arms over the key-board and using my fingers to press the keys in the correct sequence with appropriate pressure to create the desired pattern of words). The concept of hierarchical organization of behaviour allows this translation from high level superordinate goals to concrete action to be explained (Figure 4.2).

Powers (1979) was one of the first 'control theorists' to explicitly argue for the existence of a hierarchy of control in behavioural self-regulation. He argued that successive superordinate feedback systems "behave" via the specification of standards of comparison or reference values for the next lower level of control (see Figure 4.2). The lowest level of control comprises actual behaviour, i.e. the only overt behaviour that

exists : changes in muscular contractions. Goal attainment at each level is monitored by perceptual input



**Figure 4.2 :** Schematic Of A Three-Level Hierarchy of Control Systems (Adapted from Carver & Scheier, 1982).

relevant to that level. When a mismatch between expectancies and information occurs, attention is focused on the information eliciting the mismatch and the cognitive-emotional state which develops.(1)

The 'completeness' of the action plan invoked to achieve a desired outcome is also regarded as a

(1) Recall the definition of stress suggested in Chapter 1 which is based upon perceptions of disparities between demands and personal resources.

significant influence upon the action or state orientation of an individual. Planned actions are degraded if one or more of their elements is not appropriately represented in cognition. These 'cognitive structure' components may be incomplete with respect to personal agency in generating and executing intended actions, personal commitment to their enactment, the contextual climate, or the actions themselves (Kuhl, 1984). In a study of post-operative hernia patients, Kuhl (1983b) confirmed the hypothesis that state oriented subjects would be more inclined to engage in "simple and passive" activities not requiring much self-regulatory effort, than those with an action orientation. State-oriented patients reported greater pain, asked for more analgesics and spent more time worrying about their operation. In contrast, action oriented patients exhibited behaviours requiring considerable self-regulation such as practising to move affected limbs, planning for life outside hospital, walking round the ward etc. See Kuhl (1985, 1986) for more detailed accounts of a range of empirical studies which support his theory. For present purposes, Kuhl's theory suggests that, when under stress, passivity and performance decrements may be due to actual control deficits because of direct hit effects upon information processing rather than lowered percepts of control.

Interestingly, Kuhl also used the learned helplessness paradigm to investigate the relative contributions of actual and perceived control to

performance. In general, it was reported that, following exposure to uncontrollable failure conditions, performance decrements occurred on a subsequent task despite high perceived control and motivation to competently perform the task (Kuhl, 1981; Kuhl & Weiss, 1983). These decrements were manifest for state rather than action oriented subjects even though both groups perceived high controllability. State focused individuals were also found to possess a less well-developed constellation of self-control skills than action oriented subjects. The above findings offered important evidence because they suggested that detrimental state orientation effects can occur in the presence of perceived control. This is perhaps not quite so surprising when one considers the relatively strong motive to perceive control exhibited by 'normally functioning' human beings (e.g. Langer, 1975; Lefcourt, 1973; Rothbaum *et al.* 1982, and refer to Chapter 1).

Continuing in the information processing vein, Carver & Scheier (1982) subscribed to the notion that behaviour is guided by reference to behavioural standards and that these standards derive from the behavioural context. They reaffirmed the contention that perceptual experiences are organized into 'knowledge structures' or schemas. Schemas are developed in memory as a culmination of the process of recognizing and categorizing new perceptual information. Thus, perception is defined partly by sensory input and partly by the schema or knowledge structure through which it is interpreted (e.g.

Neisser, 1976). If a schema containing behavioural specifications is accessed, then behavioural operations are evoked, e.g. accessing the category "exercise" may elicit the behavioural specifications of changing into sports clothes and going for a run. However, depending upon the sophistication of the schema "exercise", it may also evoke the behaviour of sitting down and watching television.

Carver & Scheier (1982) pay particular attention to the effects of 'self-focus' upon the effectiveness of discrepancy reduction. When attention is *appropriately* self-directed the reference value is argued to be more salient to the individual and an appropriate comparison between one's present state and the reference standard is more likely to be induced. This self-focus induced monitoring and modification of behaviour is believed by them to underly effective human functioning. Having said this, these authors indicate that inappropriate self-focus may also exacerbate the situation because of attention to distracting or interfering cognitions (cf. Kuhl's, 1987, concept of 'state orientation' cited in an earlier section). Thus, greater self-focus is presumed to enhance positive efforts to control the situation or negative (maladaptive) disruptions of ongoing behaviour should these be perceived to be the most salient responses for the individual.

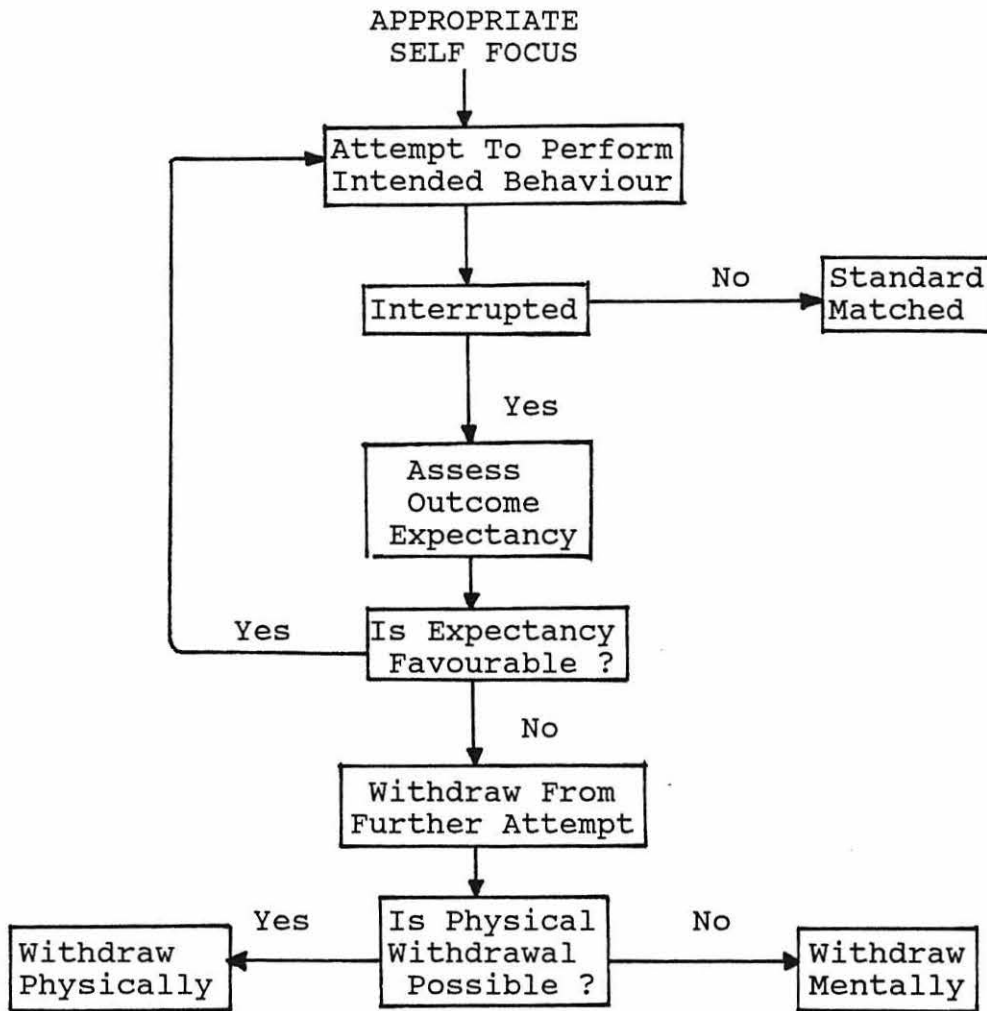
Mandler (1982) suggested that stress reactions accrue from the interruption of smooth ongoing behaviour. Carver & Scheier (1982) reiterate this point in relation



to control theory. Interruptions most commonly occur when the required self-regulatory behaviour is either missing or cannot be mobilized. Obstructions to intended actions may be external or internal. An interruption is assumed to evoke an assessment of outcome expectancy, i.e. the perceived likelihood of goal achievement within the context of the situation, and appraised personal capabilities. If the assessment of outcome expectancy suggests control the discrepancy reduction attempt is resumed. However, unfavourable expectancies elicit an impulse to withdraw from further behavioural attempts to complete the ongoing action. Carver & Scheier (1982) stated that :

"..all behavioural responses fall ultimately into one or other of these categories : renewed efforts or withdrawal" (p 113).

Greater positive self-focus is presumed to enhance these responses. Because many social and environmental situations exist which prohibit physical withdrawal, some form of mental withdrawal may be implemented. If the situation is one in which successful task performance represents the behavioural criterion then mental withdrawal may result in performance decrements. It should be explained that withdrawal in this sense includes ignoring task relevant information, dissociating oneself from the situation and the familiar negative rumination about personal competence, i.e. cognitive anxiety. Withdrawal in its more physical sense might, however, be the most adaptive response strategy to make in order that greater future harm is avoided.



**Figure 4.3 :** A Cybernetic Model of Self-Regulation of Interrupted Behaviour (Adapted from Carver & Scheier 1982).

Finally, the authors note that withdrawal due to interrupted behaviour (e.g. through rising anxiety about an upcoming examination), can sometimes be reflected by the setting and acceptance of less difficult goals than had been originally accepted. In this instance, the ultimate goal or behavioural intention might remain the same, e.g. to pass an examination, but there is withdrawal from efforts to match an earlier standard,

e.g. scoring full marks or coming top in one's class is revised to achieving the pass mark. See Hardy *et al.* (1986) for a related discussion of behavioural goal acceptance under stress.

#### 4.4 Rosenbaum's Model of Self-Control

This section gives a fairly detailed coverage of Rosenbaum's (1980a, 1985 and 1988) theory of self-control. Rosenbaum (1985) presents a model of self-control which is based on information processing ideas and as such forms an appropriate link with the preceding discussions. In concordance with the assertions of Mandler (1982) and Carver & Scheier (1982), Rosenbaum's model also postulates that self-regulatory processes are primarily targetted at eliminating potential or actual disruptions of ongoing goal-directed behaviour. As will be seen later, Rosenbaum's theory of self-control forms an integral part of the experimental and theoretical thrust of this thesis.

Rosenbaum's (1985 and 1988) theory strongly emphasises the dispositional nature of self-control. His conceptualization of personality derives from a social-behaviourist position which considers personality as a constellation of well-learned complex skill systems (Staats, 1981). A major feature of this approach is that personality reflects both behavioural cause and effect. Rosenbaum's model is therefore based on the widely accepted assumptions that human behaviour is goal

directed, and that behaviour is in reciprocal interaction with situational and personal variables (cf. Folkman, 1984). Before examining the personality repertoire of self-control, consideration is given to a number of important theoretical points that Rosenbaum (1985) raises with respect to self-regulation.

#### 4.4.1 Conscious versus Automatic Control

Rosenbaum (1985) argues that any theoretical perspective on self-control should explore the significance of consciously and unconsciously controlled behaviours. Goldfried & Merbaum (1973) are cited as being the only authors to include the concept of consciousness into a behavioural definition of self-control, they stated that :

"Self-control represents a personal decision arrived at through conscious deliberation for the purpose of instigating action which is designed to achieve certain desired outcomes or goals as determined by the individual himself" (p 12).

This suggests that to self-regulate behaviour, goals must be verbalized or imaginably represented and consciously organized in specified steps that will lead to a change in experienced disruptions and the resumption of ongoing behaviour. In other words, there is a need for 'awareness'. In contrast, unconscious determinants of behaviour lie in the psychology of automatic behaviours, thoughts and cognitive styles (Meichenbaum & Gilmore, 1985).

Several strands of research have communicated the distinction between those behaviours operated in an

automatic or 'mindless' manner and those which are 'mindful' or under conscious supervision (see, for example, Langer, Blank & Chanowitz, 1978; Piper & Langer, 1986). Well learned behaviours and established habits constitute automatic behaviour. It has been demonstrated that such activities may be carried out in a 'mindless' way without recourse to process regulating cognitions (see below), and as such are labelled "automatic" or "unconscious" (Langer *et al.* 1978).

Mindfulness represents a dynamic state comprising the processes of differentiating, categorizing and generally conferring meaning. In contrast, mindlessness is a condition of reduced cognitive activity which relies on a 'rigid structure' arising both from a repeated experience (Langer & Imber, 1979), and from the unquestioning acceptance of new information contained in a single exposure (Chanowitz & Langer, 1980). Entire social situations as well as discrete behaviours may be mindlessly performed (e.g. Langer *et al.* 1978), and mindlessness may decrease survival especially in the elderly and institutionalized (Alexander *et al.* 1985; Langer *et al.* 1984). This latter point does, however, have implications for our learning history. A link is suggested between mindless processing and psychological problems in later life. Mindless behaviour may result in a person being susceptible to reductions in perceived control. That is, control may not be recognised because behaviours which engender percepts of control are performed automatically.

The mindfulness / mindlessness distinction is an important development in the theory of human control and its examination here is totally in-keeping with Rosenbaum's (1985) thoughts on controlled and automatic behaviour. It discards traditional outcome-driven views of ascribing control from the observer's perspective in favour of a phenomenological process-driven perspective. From the observer's standpoint a person may be perceived to have behavioural control. However, if someone is not aware of their interactions with the environment and behaves 'mindlessly' then they will not experience the control that the observer believes they possess. In Piper & Langer's (1986) words "...the "same" response enacted mindfully or mindlessly is not the same response" (p 75). The mindfulness/mindlessness model therefore considers control from the 'actors' point of view (2). Basically, this argument suggests that 'self-control' is not an automatic behaviour, and that if appropriate ongoing goal-directed behaviour proceeds uninterrupted then there is no need for self-regulation.

Piper & Langer (1986) asserted that it is important to note that "one need not be mindful of everything at the same time; rather one should always be mindful of something" (p 73). The research of Langer and her associates (Alexander et al. 1985; Langer & Rodin, 1976;

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(2) In this respect it was suggested that "all control would necessarily be perceived control", (Piper & Langer 1986, p72). If one engages in a certain amount of semantics it is apparent that "perceived" is somewhat of a 'misnomer', because from this model's emphasis on the actor's perspective - a perception is in fact an actuality, (e.g. Langer 1983; Piper & Langer 1986).

Rodin & Langer, 1977) suggests that increased mindfulness results in positive health benefits (premature death being one of the consequences of a mindless existence). They argue that it is inconsequential whether the focus of processing is so-called 'meaningful experience' or seemingly trivial aspects of daily life, both may have beneficial psychological and physiological effects. For example, the simple act of choosing to walk home from work over a different route every so often is a mindful behaviour. Piper & Langer (1986) asserted that unless a response is mindfully coordinated then, "psychologically speaking" the event becomes a nonevent; for example, blindly accepting that there is only one route to walk home from work each day (cf. Langer, 1983).

In concurrence with the suggestions of Rothbaum *et al.* (1982), the mindfulness perspective of control accepts the idea that giving up behavioural control may be perceived as exercising and possessing control. Covert behaviour which an observer might interpret as indicating depleted control may in fact be experienced by the actor as an active attempt to maintain control.

The mindfulness model suggests that a degree of unpredictability is needed if control is to be perceived. Langer (1983) noted that perceived control is "...the active belief that one has choice among responses that are differentially effective in achieving the desired outcome" (p 20). Implicit in this concept of differentially effective behaviours is the idea that some

uncertainty in the capability of these alternatives to succeed is a requirement. This in turn suggests that the mindful contemplation of behavioural options is a significant process, demanding more than a rudimentary level of processing. If an environment is totally predictable and goal attainment is certain then people are likely to act mindlessly and pay the price in terms of poorer health and longevity due to the adverse effects of reduced cognitive functioning (e.g. Langer & Imber, 1979).

Thus, theoretical, empirical and common sense perspectives suggest that self-control be regarded as a thoughtful or mindful process and automatic, non-self-controlled behaviours as unconscious or mindless processes.

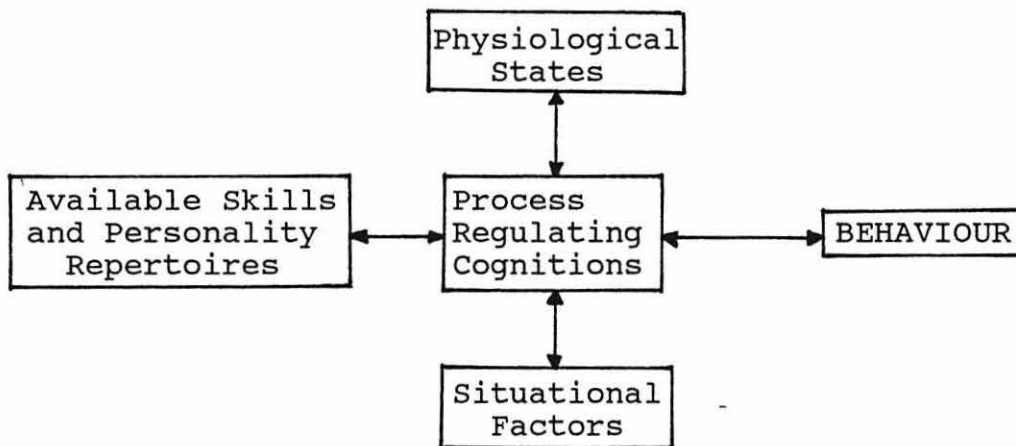
#### 4.4.2 Process Regulating Cognitions

Bandura (1978) referred to the 'self-system' as a functional set of "...cognitive structures that provide reference mechanisms and a set of subfunctions for the perception, evaluation and regulation of behaviour" (p 438). Similarly, Rosenbaum (1985) identified 'process regulating cognitions' as basic behavioural repertoires functioning to regulate the processes which determine behaviour. When the "smooth flow of habitual behaviour" is interrupted, process regulating cognitions are mobilized. These functions constantly interact with both



environmental and personal contingencies. Figure 4.6 illustrates this process.

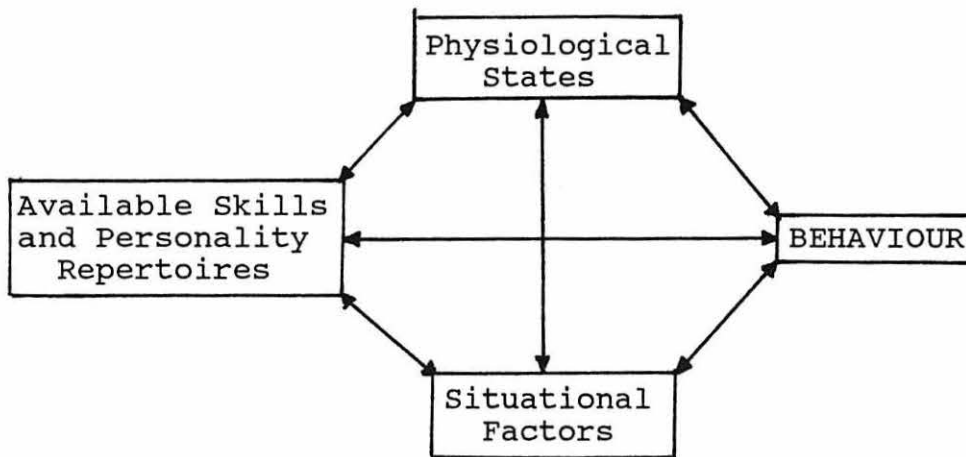
Process regulating cognitions include the following cognitive behaviours : problem identification and definition, causal attribution, assessment of personal ability to solve the problem, generation and discrimination of alternatives, decision making, the application of learned skills, appraisal of behavioural outcomes via comparison with some internal standard, and self-reinforcement (Rosenbaum, 1985; Rosenbaum & Ben-Ari Smira, 1986).



**Figure 4.6** : A Model of Conscious Control (After Rosenbaum, 1985).

Thus, the degree of behavioural interruption is a function of situational and personal factors. Disruption of smooth goal directed behaviour prompts self-regulation (Kanfer & Hagerman, 1981), which is guided by repertoires of mediating cognitions and is potentially influenced by personality repertoires for self-control (Rosenbaum, 1985).

Behaviour in the absence of any such mediating cognitions is considered to be automatic and "unconscious". The concept of process regulating cognitions neatly incorporates the consciousness - unconsciousness issue into this model of self-control. Figure 4.7 represents the automatic functioning of behaviour, without the mediation of process regulating cognitions.



**Figure 4.7** : A Model of Unconscious Control, i.e. without the mediating effects of process regulating cognitions, (After Rosenbaum, 1985).

Before overviewing Rosenbaum's work on the role of learned resourcefulness in the self-regulation process, his model of self-regulation based on cybernetic ideas will be examined (see Figure 4.8). As mentioned earlier this model predicts that self-control is directed at 'freeing' the system from the unwanted interruption of ongoing goal directed behaviour.

With reference to a number of stress theories (e.g. Lazarus & Folkman, 1984; Mandler, 1982; McGrath, 1976), and Kanfer's (1986) three stage model of self-regulation,

Rosenbaum proposed a self-control process which comprised three phases; the representational phase, the evaluation phase, and the action phase.

In agreement with Carver & Scheier (1982), he suggested that personal ability to detect internal and external changes is one of the most vital process regulating cognitive repertoires. The whole process of self-regulation cannot begin until the person is aware that a change has occurred. Assuming that an imaginary or real disruption to ongoing behaviour or planned action has been perceived, Rosenbaum (1988) argues that during the representational phase individuals respond "more or less automatically", i.e. cognitive-emotional reactions such as doubts about one's self-worth, competence and beliefs, or anxiety, panic and helplessness are 'triggered'. These reactions are not considered to be part of deliberate, conscious attempts to evaluate the situation. The self-regulatory mechanism is not activated unless such disruptions elicit such reactions on an automatic level.

The evaluation phase involves a cognitive appraisal of the meaning of the disruption to the individual. The prime concern is whether the problem is threatening, challenging and desirable, or benign (cf. primary appraisal, Lazarus & Folkman, 1984). If a benign appraisal is forthcoming, personal reactions to the disruption may be ignored and the self-control process disengaged.

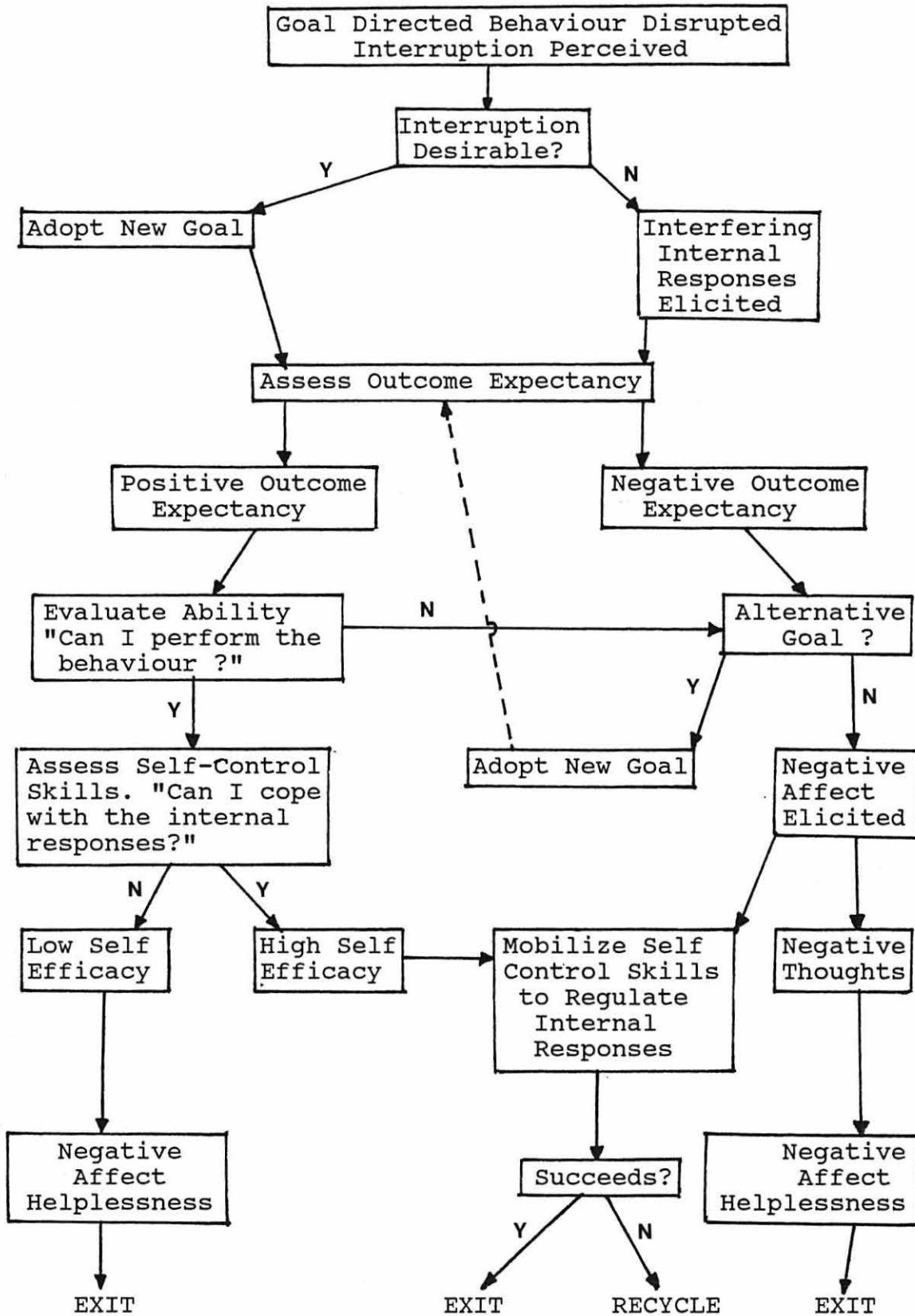


Figure 4.8 : A Self-Control Model Based On Cybernetic Principles (Adapted from Rosenbaum, 1985)

However, if threat or desirable challenge are perceived, an individual assesses his or her ability to reduce or negate any potential harm and/or capitalize on possible benefits, i.e. he/she asks "can I do something about this situation ?" (cf. secondary appraisal, Lazarus & Folkman, 1984).

If a person perceives that they can manage the threat or challenge (anticipated control), then the action phase is entered and coping strategies are mobilized - actual control is attempted. According to Figure 4.8, process regulating cognitions lead to expectancies regarding personal efficacy and behavioural outcomes (see Bandura, 1977; and Chapter 3 of this thesis). These expectancies occupy a significant position in the process. Disruptions are followed by judgements about one's self-control capability, and about whether or not the desired goal can still be realised. These pervasive evaluations are suggested to be the "major motivating force behind a person's self-regulation" (Rosenbaum, 1985, p 23). The following excerpt describes the significant involvement of efficacy and outcome expectancies in the self-regulation process :

"At each point in the sequence the individual judges whether or not the original goal is attainable. If it is judged to be attainable then the individual decides whether he or she is capable of removing the obstacles encountered. If individuals conclude that they have the inner resources to cope with the goal interfering factors, then they will continue to stick to the original goal. However if they conclude that they lack these resources, they may either despair and feel helpless or they may search for alternative goals. If the search for alternatives is also fruitless, the individuals may feel trapped and helpless. Yet if an alternate goal is judged to

be attainable, self-efficacy judgements are once again activated and the self-regulatory sequence continues" (Rosenbaum, 1985, p 23).

A person exits from the self-control process once behaviour becomes 'automatic' (i.e. is performed without thinking). This results when a desired goal can be attained without disruption (e.g. if the behaviour has been practised or overlearned), when no change is perceived and the behaviour is inappropriately run-off, or when the goal is perceived as unreachable via personal interventions. In the latter instance feelings of helplessness and negative affect may develop. Rosenbaum (1985) neglects to make an important point in relation to the potential termination of self-regulation. It is possible that the termination of such negative affect may form the basis for further self-regulatory activity and thus continue the cycle. It seems reasonable to suggest that in the rolling interplay between person and environment it is possible that coping with perceived impotence, and/or anxieties about one's personal abilities, are desirable goals to be achieved through self-regulation and that these alternative goals may replace those for which the original behaviour was intended.

#### 4.4.3 Learned Resourcefulness

Learned resourcefulness (Meichenbaum, 1977; Rosenbaum, 1983) or dispositional self-control, has been identified as a personality repertoire which is influential in the process of self-regulation. It was

operationally defined as a cognitive-behavioural repertoire of self-control skills mobilized for self-management and coping with internal responses that interfere with the performance of smooth ongoing behaviour. Figure 4.8 shows that learned resourcefulness influences self-regulation when it is decided to attempt to achieve the original goal despite disruptive internal responses, e.g. pain, anxiety, anger, frustration, fatigue.

Self-control is suggested to operate mainly on the action phase of the self-regulation process rather than at the representational or early evaluation phases. However, Rosenbaum (1988) suggested that, under certain conditions, the Self-control repertoire may influence process regulating cognitions, e.g. secondary appraisals and self-efficacy beliefs about one's ability to cope with a given stressor. For example, Rosenbaum & Ben-Ari Smira (1986) found that dispositional self-control was positively correlated with the self-efficacy beliefs of subjects (Haemodialysis patients) who had previous experience of the stressful task (complying with a strict fluid intake program). This relationship was not found when subjects had no experience of the stressful task (Weisenberg *et al.* 1986). Resourceful people who have acquired the necessary self-control skills and have succeeded in self-regulating disruptive internal reactions in the past may, therefore, harbour strong expectations that they will be able to do so again. Rosenbaum (1985) argues that the personality repertoire

of self-control may be an important source of information for the judgement of self-efficacy, in addition to past performance success, vicarious experience, (observing models and mental imagery), verbal persuasion and the physiological status of the organism (Bandura, 1977).

Those high in self-control perceive themselves to be more capable of managing the internal disruptions associated with task performance under stressful conditions. Conversely, low self-control individuals judge themselves to be deficient in the ability to cope with situational and personal demands, and are thus likely to "dwell more on their personal deficiencies and their self-worth than on the task at hand" (Rosenbaum & Ben-Ari, 1985). Consequently, the degree to which individuals perceive themselves to be resourceful may be an important determinant of motivation to continue self-regulation efforts.

Rosenbaum's (1988) model suggests that high self-control subjects use more self-regulation skills during a stressful event than do low self-control individuals. As suggested above, learned resourcefulness is hypothesised to have a major impact upon the actual mobilization of coping strategies (because it represents the acquired repertoire of these self-control skills). Consequently, the nature of a person's evaluation of a stressful event may well determine whether or not they make an effort to cope, but such attempts at coping will be futile unless an appropriate self-control repertoire is available (Rosenbaum 1983).



#### 4.4.4 Empirical Evidence

Since the beginning of this decade, Rosenbaum, his colleagues and others have embarked upon an extensive series of laboratory and field studies to investigate the role played by dispositional self-control in managing disruptive events. Self-control has been measured using the Self Control Schedule (SCS, Rosenbaum, 1980a). The development and psychometric characteristics of the SCS are covered in Chapter 7. To conclude this chapter the following sections will describe some of the extant empirical support for the theoretical importance of learned resourcefulness.

A number of studies have revealed that high and low Self-Control (SC) subjects do not differ in their perceptions of the severity or intensity of an experienced stressor but, do demonstrate differential efforts at coping with the aversiveness (Rosenbaum, 1980b; Rosenbaum & Palmon, 1984; Rosenbaum & Rolnick, 1980). Low Self-Control (LSC) subjects tend to reduce their efforts to persist with ongoing behaviour and feel helpless under duress, whereas high Self-Control (HSC) subjects feel challenged and persist in mobilizing coping skills. Rosenbaum (1985) stated that resourcefulness may not determine the initiation of self-regulation, but rather maintains the process once it has begun in the face of perceived disruption (see Figure 4.8).

An early study by Rosenbaum (1980b) showed that HSC was positively related to greater tolerance of a cold pressor, i.e. HSC subjects kept their hands in ice cold

water for significantly longer than LSC subjects. Furthermore, HSC subjects reported more frequent and effective mobilization of self-control skills than LSC subjects; although interestingly, there was no difference in the rated intensity of pain between the two groups. Gal-Or & Tennenbaum (1985) reported that HSC was related to better performance, and greater use of problem and emotion focused control strategies than LSC in novice parachutists. In another study, HSC subjects suffering with seasickness reported greater and more specific use of self-control strategies to cope with the situation than LSC subjects (Rosenbaum & Rolnick, 1983).

In natural childbirth, HSC women reported greater control over the delivery process, used breathing and relaxation techniques more often, and used more self-motivating and reassuring statements during delivery, than LSC women (Groves, 1986). In other health-related areas, and in the prediction of subject suitability for certain psychological interventions, learned resourcefulness has been found to play a significant role. High resourceful women who embarked upon a self-regulated weight-loss programme were found to benefit more in terms of weight loss and behaviour changes than low resourceful women. Further-more, more HSC women adhered to the programme better than LSC women (Smith, 1979). Similarly, Rosenbaum & Ben-Ari Smira (1986) reported that HSC and LSC haemodialysis patients, who had to adhere to a strict fluid intake schedule, did not differ in their understanding of the consequences of non

compliance with the medical advice, nor in their motivation to comply. However, HSC patients complied more closely to the prescribed regimen than did LSC patients. Amir (1985) obtained similar findings for diabetics who had to control their sugar intake, whilst Katz & Singh (1986) found that HSC smokers were more successful in giving up smoking on their own than those low in Self-Control.

Generally, HSC individuals have been found to comply more effectively than LSC individuals, with psychological treatments designed to enhance self-change (e.g. Achmon, 1988; Rusnak, 1983). Simons *et al.* (1985) demonstrated that clinically depressed HSC subjects derived greater benefit from cognitive-behaviour therapy, (based on self-control techniques), than did LSC subjects. However, the reverse was the case for drug based therapy. It was suggested that the skills, abilities and expectations of the HSC subjects were more congruent with the cognitive therapy and this facilitated its effectiveness. Conversely, the pharmacotherapy was more in line with the externally oriented expectations of the LSC group and was more effective with them. Many psychological interventions are said to be effective because they enhance perceived self-efficacy which encourages the mobilization of coping behaviours (Bandura, 1977). Rosenbaum (1985) highlights the point that many psychotherapeutic methods either mobilize existing self-control skills to cope, or educate and train people in

various new self-control techniques (e.g. Meichenbaum, 1977).

The learned helplessness paradigm has also been used to examine the self-control personality repertoire. Rosenbaum & Jaffe (1983) found that HSC subjects were generally more resistant to the induction of helplessness (exposure to inescapable loud noise), and did not exhibit helplessness induced performance deficits (e.g. Hiroto & Seligman, 1975), compared to those reporting low self-control. After exposure to uncontrollable noise both high and low self-control subjects believed the outcome was beyond their control, however high resourceful subjects had a greater belief that they could cope with the disruptive effects of the noise. In a related study, Rosenbaum & Ben-Ari (1985) revealed that HSC subjects coped with uncontrollable conditions by using more positive self-evaluations, more task oriented thoughts and fewer negative self-evaluations, than LSC subjects. It is true that for many life experiences we are cognizant of the fact that we cannot easily control the situation or outcome (e.g. certain socio-political and financial aspects); nevertheless, we may be aware that we can cope with our responses to these events.

There is evidence to suggest that HSC subjects are more prone to illusory control than LSC subjects. Rosenbaum & Palmon (1984) found that high resourceful epileptic patients believed more strongly that they could control the low to moderate seizures they experienced than low resourceful epileptic patients irrespective of

the degree of severity of their seizure disorder. These patients could not actually control their seizures any better than LSC subjects, but they could control the manner in which they coped with their psychological consequences. Rosenbaum & Hadari (1985) found that, compared to depressed and paranoid subjects, 'normal' subjects exhibited a robust relationship between outcome and personal efficacy expectations. Logically, one could argue that these expectancies should be independent because possession of the ability to produce a given behaviour is no guarantee whatsoever that this behaviour will result in the desired outcome. The 'illusion of control' phenomenon has already been cited as one way in which individuals ascribe meaning to a situation (e.g. Langer, 1975; Lefcourt, 1973; Rothbaum *et al.* 1982 and see Chapter 2), and this may be especially so for people with no psychiatric history, i.e. 'normally' functioning human beings (e.g. Alloy & Abramson, 1979; Fisher, 1986). This also supports the notion that we are motivated to perceive control (see Chapter 1).

All in all, there is a robust set of evidence to suggest that the personality repertoire of self-control is influential in both corrective and anticipatory self-regulation (Kanfer 1986). The former refers to efforts to regain smooth ongoing behaviour following an environmentally imposed disruption, whereas the latter reflects coping with self-generated disruptions which interrupt the enactment of intended behaviour (e.g. the recall of restrictive medical advice to adhere to a

particular health-related behavioural regime which requires abstinence from otherwise habitual behaviours).

Before concluding, it is important to note that whilst personality repertoires such as self-control are significant factors in coping with stress, other factors such as social resources should also be borne in mind. Referring to the three stage formulation of self-control, Rosenbaum (1988) suggests that perceived social support is most likely to affect the evaluation phase but not the action phase of self-regulation. Lieberman (1982) is cited as reporting that the belief that support is available mitigates stress effects regardless of whether or not it is sought or used. Fewer psychological symptoms ensue from perceived but unused support, whereas the high use of support is associated with poorer mental state (Monroe & Steiner, 1986). Rosenbaum (1988) goes so far as to hypothesise that those high in resourcefulness will gain the most from social support. In contrast, low resourceful individuals who are unable to help themselves and turn to others because they do not possess adequate self-control skills, are, through their socially dependent behaviour, very likely to exhaust their social resources. An important question is, 'at what point in the self-control process is social support sought by those differing in learned resourcefulness?'; another is 'when is social support most effective?'.

#### 4.5 Summary

The theme of this chapter progressed from a consideration of actual control functions to coverage of a model that combined both perceived and actual control in a cogent attempt to explain self-regulatory behaviour. Initially, Kuhl's (1986) conception of four actual control factors was presented. Of these four, Kuhl suggested that self-regulation was the most crucial. The discussion then took an information processing slant which covered Kuhl's (1986) action control model and Carver & Scheier's (1982) cybernetic model of self-regulation. Carver & Scheier (1982) noted that most attempts at self-control represent renewed efforts to cope with, or some form of withdrawal from, a stressful situation. They also emphasised the importance of self-focus or awareness in the self-regulation process (3). This point was built upon in the final presentation of Rosenbaum's (1985 and 1988) model of self control.

In agreement with Mandler (1982) and Carver & Scheier (1982), Rosenbaum's model is based on the premise that self-regulation is initiated to terminate potential or actual interruptions of smooth ongoing behaviour. The concepts of conscious, 'mindful' control and its obverse automatic, 'mindless' control (cf. Piper & Langer, 1986) were introduced as useful perspectives on the self-control process. Intimately related to the notion of mindful control was the proposition that the mediating cognitive activity which guides self-regulation is the

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(3) It should, however, be noted that such self-focus must be appropriate and constructive.

result of conscious operations. Process regulating cognitions constantly interact with environmental and internal states to regulate the processes which determine behaviour. Rosenbaum's (1985) model of self-control based on cybernetic principles was illustrated. This incorporated the relationships between perceived disruption of behaviour, interfering cognitive and emotional reactions, process regulating cognitions, dispositional self-control, and the mobilization of coping responses.

The concluding section described the theory and empirical evidence supporting the construct of dispositional self-control, or learned resourcefulness. This personality repertoire is suggested to have its greatest impact upon the mobilization of coping skills, i.e. the action phase of the self-regulation process. Empirical support for this premise is given in Chapter 9. Individuals, measured as high in self-control possess a rich repertoire of cognitive-behavioural skills that facilitate their coping with the cognitive-emotional response to interruption of planned or ongoing behaviour. In addition, high self-control enhances task orientation and performance.

The following chapter attempts to consolidate the information presented so far. The importance of meaning and subjective reality in human behaviour will be discussed. In addition, the concept of coping and its implications for health will be examined.



## CHAPTER 5

### COPING, CONTROL AND HEALTH

#### 5.1 Introduction

In a phenomenologically based treatise there is one factor which should pervade all argument, that is, *subjective reality*. The psychological meaning of an encounter and one's cognitive, emotional and behavioural responses to perceived, (or created), contingencies within the context of that encounter are perhaps the only true reality. Having said this, Lazarus & Folkman (1984) make the point that, generally, private reality corresponds quite closely to objective reality. This review chapter emphasises the personal interpretation of events and responses, the process of ascribing meaning and, subsequently the control strategies mobilized in accordance with perceived reality.

Running through the literature on stress and control is the notion of meaning abstracted from, or imposed upon, a stressful event by the individual (e.g. Fisher, 1984a and 1986; Lazarus & Folkman, 1984; Schonpflug, 1983; Thompson, 1981). It usually means a lot to us that we demonstrate self-determined competent behaviour. In Chapter 1 it was noted that we are probably highly motivated to perceive control in some form or other, and thus the abstraction of meaning is motivated by implication. There is evidence that people work hard to abstract meaning from stressful life-events, especially

catastrophic or uncontrollable ones (e.g. Janoff-Bulman & Brickman, 1980; Rothbaum *et al.* 1982).

Rothbaum *et al.* (1982) suggested that because great efforts are put into the interpretation of events and because the ability to accept and understand unpleasant events can engender a sense of mastery, establishing meaning is in fact a form of control, (secondary control in their theory). Conceivably, meaning determines whether a person engages a stressful situation 'head-on' in an attempt to resolve it or whether she/he resorts to more passive yet equally valid strategies. In the latter instance, initial meaning may be reappraised in order that psychological integrity be maintained. In Chapter 2 it was suggested that 'meaning' formed a unifying theme underlying the diverse classifications of control.

A number of studies have provided evidence that meaning not only guides responses, but also represents a means by which objectively uncontrollable situations are controlled. Recall the suggestion at the conclusion of Chapter 1 that human beings are never totally without control facility. Individuals lacking the ability or skills to actively solve problem encounters, (and who attribute failure to severely limited ability), tend to search for explanations and reasons for their lack of direct control. They often align themselves with unmodifiable factors like fate. Conversely, mastery oriented individuals attribute failure to motivational factors such as effort and are concerned with searching for, and using skills to achieve, solutions to a problem

rather than looking for causes or reasons for the problem (see, for example, Diener & Dweck, 1978). Coyne *et al.* (1980) noted that 'helpless' subjects "become preoccupied with the explanation of their inability" (p 352). Bulman & Wortman (1977) found that paralysed accident victims invested great effort in making sense of their predicaments by coming up with explanations which framed their situations in a positive light. Positive outcomes such as being able to take life at a more leisurely pace, meeting people they would not normally encounter, learning about others and life, and realizing how lucky they were to be alive, were common rationales. Langer, Janis & Wolfer (1975) reported that patients who were taught to interpret their hospitalization as an opportunity for positive outcomes such as 'time-out', diet and reflection, self-reported less stress and were rated by nursing staff as manifesting less stress than a control group. Research using both self-report and physiological indices of stress has supported the hypothesis that when people are given or formulate their own meaning for an event they may experience fewer stress symptoms (e.g. Holmes & Houston, 1974; Lazarus & Alfert, 1964).

In view of the above arguments, meaning associated with a stressful event has profound control implications - it determines both reactions and the ability to cope. The subjective meaning and context surrounding anticipated, actual and perceived control *must* be considered. For example, Epstein (1973) referred to the

"threat value" of a stimulus whereby there must be some cost-benefit weighting associated with the information processed about the event (e.g. Fisher, 1986; Schonpflug, 1988). Failure at a task in one situation, perhaps in a training environment, may not necessarily result in the perception of threat or harm. However, the same failure or thoughts of it could invoke intense anxiety under conditions where life is at stake or self-esteem is threatened. In this case, appraised loss of control and the likelihood of contingent punishment may be biasing factors which influence stress reactions (Fisher, 1986). Thompson (1981) argued that meaning is fundamental to any discourse on stress and control. She proposed three dimensions of meaning relevant to control. Firstly, the appraised durability of the perceived stress and one's reactions to it, i.e. the extent to which stress reactions constitute more potential harm than a person believes can be endured. Such events may provoke anticipatory anxiety and avoidance or escape. The provision of cognitive or behavioural control strategies could transform the meaning of the situation from one that is potentially intolerable to one that can be endured - thereby, less anxiety is evoked, the stressful conditions are more easily tolerated and there is less disruption to performance.

Secondly, there is a cost-benefit analysis of the situation and possible outcomes. The individual views the relationship between a potentially harmful event and the (perhaps highly) desired consequences of the situation,

as well as its undesirable consequences. For example, the benefit in terms of financial reward, power, safety, social prestige and/or self-esteem may outweigh the cost of potential pain, fear or humiliation contingent upon performance or failure during performance.

The third dimension of meaning relates to control ideology or generalized beliefs and attributions about one's agency in the world. Thompson (1981) stated that people tend to explain their experiences in terms of organised, meaningful and powerful external forces or in terms of personal plans, commitments and behaviour. Depending on experience and dispositional tendency, a stressful situation may be experienced as more or less emotionally and cognitively distressing if it is construed as being caused by either external factors (e.g. powerful others, luck, weather conditions, the will of god, etc), or as emanating from personal plans, goals and actions. The spheres of control model (Paulhus & Christie, 1980; Fisher, 1986) appears to have theoretically superceded the more traditional locus of control formulation, (see chapters 3 and 6), by accommodating the idea that people fluctuate in their degree of internality or externality within different contexts.

## 5.2 The Reality Question Revisited

One intriguing predicament which faces anyone attempting to unravel the intricacies of the personal control - stress relationship is that of the 'fit'

between a subjective appraisal of controllability and the degree to which a stressful encounter and its consequences are objectively controllable. Adaptive appraisal should mean a good match between perceived control and actual controllability. However, it is worth recalling the contentions of several researchers that a certain amount of distortion in appraisal of self-control may be beneficial and perhaps motivated (e.g. Fisher, 1984a; Langer, 1975; see also Chapter 2, Rothbaum *et al.* 1982).

The negative effects of a stressful event realistically perceived as uncontrollable, e.g. in learned helplessness studies, may be alleviated if the situation is altered through reappraisal, e.g. the illusion of control (Langer, 1975; Lefcourt, 1973; Rothbaum *et al.* 1982). Conversely, if a situation is wrongly appraised as uncontrollable when control is possible then the person is not likely to engage in problem oriented coping and there may be a greater prospect of ensuing harm. Furthermore, when an uncontrollable event is misappraised as being controllable, a person is likely to mobilize problem focused control efforts that get nowhere, eventually resulting in frustration and disappointment. In this analysis it is as pathological to believe that control is possible when it is not as it is to mistakenly perceive uncontrollability when control is possible. Folkman (1984) aptly stated that :

"A time honoured principle of effective coping is to know when to appraise a situation as uncontrollable and hence abandon efforts directed at altering that situation and turn to emotion-focused processes in order to tolerate or accept the situation" (p 894).

(See Chapter 8 with regard to the economic use of effort)  
In fact, many effective coping therapies are directed at strengthening an individual's sense of personal control, which includes the 'realistic' evaluation of controllability. Consequently, the contextual climate in which responses to stress are established is largely determined by appraisals of a discrepancy between intention and reality, and between demands and capabilities as well as strategic decisions about which sphere of control to operate in, (see Chapters 3 and 4). Decisions about which self-control strategies to mobilize and extrapolations about the cost and/or benefit of losing or gaining control will also figure prominently in this process.

### **5.3 The Ascription Of Meaning - Cognitive Appraisal**

The theoretical approach of Lazarus and his colleagues (Coyne & Lazarus, 1980; Folkman & Lazarus, 1984; Lazarus, 1966; Lazarus & Launier, 1978) posits two processes as mediators of stress and stress related control outcomes; namely, cognitive appraisal and coping. Both constructs are readily assimilated into the cognitive-behavioural perspective of control processes which has been discussed so far. According to Lazarus, one of the most important distinctions to be made is that between control as generalized belief, control appraisals (situational control beliefs), and control as actual

coping efforts (Folkman, 1984). This distinction broadly parallels Kuhl's (1986) expansive model which considered perceived control and actual control (see Chapters 3 and 4). Lazarus's position is clarified in the following sections.

Cognitive appraisal processes are considered central to the comprehension of stress because the nature and intensity of emotional responses are a result of at least four different appraisal elements (Smith, 1986). These are - the appraisal of demands; the appraisal of available resources to deal with them; the appraisal of the nature and likelihood of consequences if demands are not met; and the subjective meanings of possible consequences. In order to understand personal control effects on the perceived and actual stressfulness of a situation the meaning of the event to the person must somehow be established. Averill (1973) articulately argued that :

"About the only general statement which can be made with confidence is that the stress inducing or stress reducing properties of personal control depend upon the meaning of the control response to the individual and what lends a response meaning is the context in which it is embedded" (p 301).

The cognitive-phenomenological theory of control holds that the meaning of an event is determined by cognitive appraisal processes. Appraisal is an interpretive process which infuses the person-environment transaction with its meaning to the individual (Wrubel et al. 1983). Cognitive appraisal is a continuous evaluative process which has as a central precedent, the judgement of the functional



significance of particular circumstances for well-being. The way a person-environment transaction is construed depends largely upon two main types of appraisal, i.e. Primary and Secondary Appraisals.

### 5.3.1 Primary Appraisal

According to Lazarus, primary cognitive appraisals result in the categorization of three kinds of person-environment relationship, namely, those which are irrelevant, benign-positive or stressful. An appraisal of irrelevance ensues when an event is judged to have no implications for well-being - nothing is at stake for the individual. Benign-positive appraisals, on the other hand, reflect the interpretation that the qualities of the encounter and its potential outcome may enhance well-being or are potentially beneficial. Stress appraisals, which are the prime concern here, are derived from judgements that a situation is already harmful, threatening or challenging. Folkman (1984), clearly delineates these three forms of stress appraisal.

a) Harm/Loss : where actual damage or injury already exists, e.g. incapacitating illness, damage to friendship, loss of self or social esteem. The loss of central or strongly held commitments are considered most damaging.

b) Threat : the potential for harm or loss. Even when damage has been done, threat is always present because losses often have negative implications for future functioning.

c) Challenge : the opportunity for growth, mastery or gain. Challenge shares common features with threat in that it too requires the mobilization of coping efforts.

It is important to note that threat and challenge are not necessarily mutually exclusive appraisals. They are both suggested to be simultaneously derived in many stressful situations but their relative contribution to ongoing behaviour and coping fluctuates as the encounter unfolds (Folkman & Lazarus, 1985). Challenge also has a number of significant implications for functioning, not the least with respect to health. Lazarus & Folkman (1984) suggested that individuals who tend to feel appropriately challenged by their circumstances probably have advantages over those who are disposed toward perceiving threat, in terms of morale, the quality of functioning, confidence, ability to utilise available resources and somatic health.

Primary cognitive appraisals are shaped by numerous person-by-situation variables. Personal beliefs and commitments are considered to be amongst the most influential person factors (Folkman, 1984; Lazarus & Folkman, 1984; Wrubel *et al.* 1983). Beliefs in this sense are existing rational or irrational notions about reality that bias an individual's interpretation of the world. Negative beliefs about the world, that one is inadequate, beliefs about one's agency within different behavioural domains (spheres of control), or, commonly, about personal competence in specific situations (self-efficacy), may give rise to distressing emotional

responses such as anxiety or depression. These in turn, may be resistant to control by the individual because implicitly held beliefs engender negative expectations about what might be done. However, beliefs can also serve to dampen the impact of emotional responses, e.g. the belief that supportive others exist or that one always has some form of control at one's disposal could be viewed as a coping response. Mechanic (1962) labelled the supportive beliefs and reappraisals used by doctoral students facing their final examinations as "comforting cognitions" which lowered the threat value and helped regulate emotional distress. In addition, general self-efficacy beliefs about personal ability and capability (Bandura, 1977) are as important to primary appraisals as are generalized beliefs about the external world and one's agency within it.

Commitments refer to those things that a person construes to be important or valuable. Commitments are discernible at many levels of abstraction; for example, as values and ideals such as being a 'good person', or as specific goals such as running a marathon in under three hours. Commitments are often nonexplicit and represent a pattern of values expressed in long-term behaviour; that is to say, only through studying the process of thought and action over time can a person's 'network' of commitments be discerned. They provide an indication of what Klinger (1975) terms the 'current concerns' of the individual. A highly valued commitment, e.g. to one's continued existence, will influence the evaluation of an

event with respect to well-being if the potential outcome threatens that commitment. Generally, the greater the appraised threat, then the greater the meaning controllability engenders for the maintenance of a strong commitment. Wrubel *et al.* (1983) and Lazarus & Folkman (1984) suggest that commitments shape 'cue sensitivity' by motivating the direction of attention to what is meaningful and salient to the self in a person-situation transaction. Klinger (1975) maintained that depression may result through disengagement from commitments which have become overwhelming or untenable. Disengagement carries with it a loss of the sense of meaning that 'being committed' to something, or having a personal stake in proceedings, contributes to a situation. Depending upon the extent and severity of the disengagement, during the period before a new commitment is engaged, a person may experience "apathy, reduced instrumental striving, loss of concentration and increased preoccupation with momentary cues" (Klinger 1975, p 8), that is, depression.

Consequently, commitments and beliefs are person factors which form a basis for determining the meaning of transactions within given spheres of existence. At a macro level, they identify a person within a social or cultural frame, while at a micro level they are motivational influences on the personal meanings that operate within it (Wrubel *et al.* 1983).

Every person-situation interaction involves various environmental demands, constraints and resources that

must be managed. Situational factors affecting primary appraisals include the nature of the harm or threat (e.g. noise, shock, pain, death, humiliation, shame etc), and familiarity with the event or predictability (Gatchel, 1980; Lazarus & Folkman, 1984; Miller, 1979). Indeed, novelty itself may constitute a threat, since if there has been no previous experience of a situation then there is little evidence to suggest that the necessary resources are available to cope with it (Lazarus & Folkman, 1984). Falling prey to the demands inherent in one situation involving perceived, or actual harm, such as illness or being bereaved, lays one open to a host of other additional demands. Life experiences often involve people in "chains of stressful encounters" which may lead to the pervasive appraisal that every aspect of life is stressful and that no respite is forthcoming.

Temporal factors such as the duration (widely recognised as a major influence in disease and psychopathology; Lazarus & Folkman, 1984) and frequency of an event or stressor feature in the primary appraisal of stressfulness. People are often faced with situations in which they do not know precisely what is going to happen, the probability of it occurring, when it will happen, its duration or it's frequency; nor can they predict with certainty what other demands may be placed upon them in association with the impending event. Thus, ambiguity in the environment is a major situational variable impinging upon the primary appraisals one makes.

### 5.3.2 Secondary Appraisal

This cognitive appraisal process entails the evaluation of coping resources and control options (Folkman, 1984). Primary and secondary appraisals are conceptually distinct but operationally interdependent. The question "What can I do ?" becomes crucial when faced by harm/loss, threat and/or challenge. Folkman (1984) and Lazarus & Folkman (1984) consider psychological resources to include morale, beliefs, problem solving skills and self-esteem. This could be extended to include self-control skills and the efficiency and flexibility of underlying information processing. Other personal resources include health, energy and physical fitness. Social resources also provide important sources of information, as well as tangible and emotional support. Furthermore, Lazarus & Folkman cite material resources such as money, equipment, food etc, as influences on secondary appraisal. Schonpflug & Battmann (1988) agree with Lazarus & Folkman's (1984) cognitive theory and imply that primary appraisal of harm, threat or challenge relate to the acquisition, availability, allocation and depletion of various resources. According to them, structural resources such as coping skills, muscular potential or working memory are relatively enduring and are mobilized to produce or maintain goal-directed behaviour via energetic resources such as "biochemical excretions" which are more rapidly exhausted. Resources can serve a functional purpose (e.g. when cognitive/physical skills

or social support are used to cope with a situation), but can also represent the "origin of stress" (e.g. when loss or potential loss of resources are stress inducing, or when resource utility is appraised as inadequate).

Situation specific assessment of personal control forms part of the secondary appraisal process. It results from comparisons of situational demands with coping resources and options available, plus cognizance of one's ability to mobilize the desired strategies, that is to say, one's judgement about control opportunities in the specific situation. It is difficult to effectively evaluate situational appraisals of control because implicit, though not acknowledged, in empirical studies of control is the fact that there is often more than just one avenue for control; for example, in a learned helplessness paradigm, objectively determined instrumental responses are not the only option on which to base inferences about control.

According to Folkman (1984) and Karoly & Kanfer (1982) the question "Control over what?" assumes a central importance. In complex real-life situations this is liable to comprise a number of factors rather than the apparently simpler control of aversive events in the laboratory. Yet, even in these situations, the fact that a subject gives up instrumental control in the face of objective uncontrol-lability may be due to a number of mindful alternative controlling factors, e.g. control of energy expenditure, or control of disappointment. A desirable outcome may invoke the attainment of a number

of subgoals which in themselves vary in controllability and value. Health-related contexts offer a cogent example of the complex nature of control appraisals. Cohen & Lazarus (1979) identified various coping tasks during the recovery from illness. They noted the following subgoals associated with the overall desire for a complete return to good health: a) The reduction of harmful environmental conditions and the enhancement of prospects of recovery; b) Toleration of negative events or realities; c) Maintenance of a positive self-image; d) Maintenance of emotional stability; and e) The maintenance of satisfactory interpersonal relationships.

Behavioural outcomes may also fluctuate in the appraisal of controllability; that is to say, a subject may control one aspect of a situation but not another. For example, a person may believe that they can control themselves in a particular situation but that they do not have control over the occurrence or nature of the situation itself. This variability in the appraised potential for control of the "targets of control or outcomes" makes for increased complexity in secondary appraisal of coping strategies and the overall appraisal of the situation as threatening, challenging or both. Karoly & Kanfer (1982) reinforced this point by indicating that people may learn to develop control over their overt reactions to stressful events. Indeed, control may be directed at the environment in the first place, by, for example, stimulus modification. On the other hand, they may learn to control physiological



responses, emotional arousal, pain or worry. On top of this, appraisals of control may fluctuate as circumstances progress; for example, as a result of new information and/or coping efforts.

#### 5.4 Coping

Coping can be defined as behavioural or psychological responses intended to reduce the aversiveness, or meet the challenge of a situation, or as Lazarus & Folkman (1984) stated, coping can be regarded as :

"... changing cognitive and behavioural efforts to manage specific internal and/or external demands that are appraised as taxing or exceeding the resources of the person" (p 141).

Here, coping reflects all efforts to manage demands irrespective of the outcome of these efforts. This is distinct from the notion of coping representing success or managing, and not coping implying failure. Such a definition also accommodates the view of 'mindful' control and covert control efforts from the actor's perspective (Langer, 1983; Piper & Langer, 1986; Rosenbaum, 1985). A person's dispositional Self-Control repertoire is said to have its greatest impact upon the coping aspect of the stress-control process (Rosenbaum, 1985,1988). Growing evidence supports the view that people who learn and use a rich repertoire of self-control skills are able to cope more effectively with disturbing environmental stimuli (see Chapters 4 and 9).

Cohen & Lazarus (1983) classify coping into five modes. 1) Information Seeking, which involves attempts at learning more about the problem and the ways of coping with it. 2) Direct Action, involving changing the environment or oneself to manage or prevent harm and meet challenge. This includes any concrete act such as exercising, drinking, running away, arguing with someone or even attacking them, arranging the objects in a room, or cleaning a wound. 3) Inhibition of Action, in this case action is resisted because it is poorly grounded, potentially harmful or embarrassing, or morally deplorable. For example, suppressing impulsive action when one is very angry may be the best way of dealing with a situation. 4) Intrapsychic Processes (or cognitive coping) involves reappraising situations, deploying attention, or seeking different ways of obtaining gratification and includes processes such as intellectualization, denial and passive avoidance. Such self-generated cognitive coping can help make a person feel better about a situation and themselves, even though the objective features of the situation have not altered. 5) Turning to Others for support may enhance one's ability to cope with the stressfulness of a situation, or boost one's feelings of well-being.

Schonpflug & Battmann (1988) concluded that coping is a "resource management process". In coping with a stressor people make decisions regarding resource availability, allocation and depletion. Resource management will achieve its greatest significance for

well-being when extensive mobilization of both structural and energetical resources is necessary under conditions of high stressfulness.

#### 5.4.1 Coping Functions

Coping function refers to the purpose a strategy serves; for example, concentration on the task in hand, or the reduction of anxiety. Control skills may have a particular function but they are not defined in terms of outcomes. Therefore, a coping strategy function may be to instrumentally escape but its implementation may not result in escape.

A number of theorists have identified multiple coping functions. White (1974) suggested : the gathering of information about the environment, maintenance of appropriate internal conditions for information processing and action, and the maintenance of autonomy or freedom to flexibly operate one's behavioural repertoires. Similarly, Mechanic (1974) proffered the following coping functions : managing social and environmental demands, developing the motivation to meet perceived demands and maintaining psychological stability to aid efficient energy and skill allocation in response to demands. Finally, Pearlin & Schooler (1978) suggested coping functions to comprise : altering the stressful situation, controlling the meaning of potentially stressful stimuli before they become stressful, and controlling stress itself after it has emerged. These perspectives commonly embody the distinction between

copied aimed at managing the problem causing the distress, and coping that is directed at emotional regulation.

### 5.5 Problem Focused and Emotion Focused Control

As indicated above, coping can refer to the regulation of emotion or distress (emotion focused coping), or to regulation of the problem causing that distress (problem focused coping). Folkman & Lazarus (1980) demonstrated that both forms are used in most stressful encounters, and that their relative mobilization and influence varies with the ongoing appraisal of the situation; for example, whether it is potentially controllable or not amenable to control. Both emotion focused and problem focused coping include cognitive and behavioural strategies.

Emotion focused coping such as attempts to 'flow with the current', efforts to accommodate oneself to uncontrollable events, or more active efforts to regulate emotional reactions enhance both the perception of control, and actual control. In this light, illusory, vicarious and interpretive control (Rothbaum *et al.* 1982) alter the meaning of the situation and have been labelled - 'reappraisal' by Lazarus & Launier (1978) and Smith (1980). Emotion focused efforts also include cognitive efforts such as "looking on the bright side of things" and mental relaxation, or behavioural strategies like seeking emotional support, exercising or having an alcoholic drink. Folkman (1984) noted that certain

appraisals cannot be clearly distinguished from emotional coping especially in the case of a positive outcome evaluation. Thus, many coping strategies can have an appraisal function because they too influence the meaning of an event and similarly, appraisals can have a coping function because they help regulate distress.

Problem focused coping influences the conflict of the person-situation interaction through problem solving, planning, decision making and/or direct action. These strategies can be directed at oneself or the environment. The effect of problem oriented efforts depends greatly on the efficacy of emotion control because increased affective reactions may interfere with the cognitive activity needed for meeting problem demands (e.g. Easterbrook, 1959; Kahneman, 1973; Klinger, 1975; Wachtel, 1967; Wine, 1971). The negative emotions elicited by threat (for example, anxiety, fear, hopelessness) need regulation in order to maintain a tolerable internal state and prevent interference with problem focused control.

Importantly, no strategy should be considered inherently more or less valuable than another - ultimately it is about making the right coping decision at the right time. Coping competence can only be evaluated in terms of both short-term and long-term outcomes. The former includes the degree to which a control strategy helps to manage the situation or regulate emotional responses. Whilst the latter includes,

health, morale and social and psychological functioning, as outcomes by which to judge coping.

People vary greatly in the ways they go about enacting control behaviours (often with regard to their learning history). Thus, there may be different styles of coping as well as different foci (Goldstein, 1973). Fleming, Baum & Singer (1984) argued that coping styles may reflect higher order processes that are consistent; that is to say, there may be inconsistency in the approach taken to achieve a goal, but consistency in that the goal is always enhanced perceived, or actual, control. However, Lazarus and his associates throw considerable doubt upon the adequacy of a coping 'styles' or 'trait' approach to the evaluation of personal control (see Cohen & Lazarus, 1983; Lazarus & Folkman, 1984). Having said this, they do identify the much researched Type A behavioural repertoire as a possible coping 'style'. Friedman & Rosenman (1974) the originators of Type A research, defined the Type A pattern as a :

"chronic, incessant struggle to achieve more and more in less and less time, and if required to do so, against the opposing efforts of other things or persons" (p 67).

The extent to which the Type A pattern influences somatic health, social and work competence, and morale (Lazarus & Folkman, 1984) and precisely which psychophysiological mechanisms are implicated is still a matter for 'educated speculation' and further research. However, one influential theory about the nature and implications of Type A in relation to cardiovascular disease (Glass, 1977a and b) argues that Type A individuals have a strong

commitment to control situations. This commitment makes them especially vulnerable to loss of control or uncontrollability. In the face of uncontrollability, when control is threatened or frustrated, Type A individuals tend to react in a highly emotional fashion. They may alternate between excessive striving for control and distress or despair over their loss of control. Glass (1977a and b) suggests that this results in surges of catecholamine release and perhaps other psychophysiological responses that could affect cardiovascular functioning; for example, increased lipids and changes in blood clotting time (Lazarus & Folkman, 1984). The following section expands upon the health implications of coping and further explores the Type A phenomenon.

### 5.6 Coping, Control and Health

If one accepts that mental and physical well-being, as well as quality of life are affected by the manner in which a person appraises and copes with the 'normal' and abnormal stresses of life, then the major concern of appraisal and control is human adaptation (1). Lazarus & Folkman (1984) suggest that "the question should not be whether stress is good or bad, but rather how much, what kinds, at which times during the life course, and under what social and personal conditions it is harmful or

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(1) Recall that stress is not regarded here as inherently negative or injurious to mental and physical health. Rather, stress also has positive connotations, such as when people gain strength from the use of resources they did not know they had (Lazarus & Folkman, 1984), or when people actively seek stressful challenges (Zuckerman, 1979). See Chapter 1.

helpful" (p 182). In Chapters 3 and 4 it was implied that the degree of perceived or actual control experienced by a person appears to influence reactions to stress, by determining how stressful a situation is perceived in the first place and by moderating psychophysiological responses to stressful encounters. Adaptational outcomes reflect competent social functioning (including work and family life), life satisfaction or morale (including mental well-being), and somatic health (Lazarus & Folkman, 1984).

Rodin (1986) identified the work of Engel and Schmale as pioneering efforts to understand the relationships between loss of control, associated cognitive-affective responses and the onset of illness of all kinds (Engel, 1968 and 1971; Engel & Schmale, 1967; Schmale, 1972; Schmale & Engel, 1967). Fundamental to the actual, threatened or symbolic loss hypothesised by these authors to precipitate biological pathogenesis, is the concept of control (or rather the lack of it). Glass (1977) found that people exposed to a series of undesirable, uncontrollable life events tended to experience more illness. Support for this finding was provided more recently by Suls (1982) who reported that uncontrollable events were related to future physical and psychological ill-health only if they were undesirable. In Chapter 3, it was indicated that objectively uncontrollable events culminating in a positive outcome are often construed erroneously as emanating from personal intervention of some kind and that this may



represent a form of "helplessness-resistant" response (Fisher, 1986).

It has been suggested that *how* people control stressful episodes in their lives (from daily hassles to traumatic crises), is even more important to overall psychological, social and somatic health than stress *per se* (see, for example, Langer, 1983; Lazarus *et al.* 1980; Meichenbaum, 1977). More recently, Cox (1988) referred to the importance of control in : a) "the experience of stress and in coping" (p 622); and b) the pathogenesis of both physical ill-health (e.g. heart disease, certain cancers), and psychological disorders (e.g. depression, post traumatic stress disorder). The corollary of the above, stemming from a transactional, process view of stress and control, is that there are circumstances in which coping may be illness inducing and those in which it may be health enhancing (Lazarus *et al.* 1980). Schonpflug (1983) and Schonpflug & Battmann (1988) refer to the "operational costs of coping". They note that energetic resources such as 'arousal, attention, emotionality and effort' are depleted when an individual copes with a stressful situation. Glass *et al.* (1969) coined the phrase "psychic costs of adaptation" which referred to "any behavioural handicap which follows the confrontation with a stressor" (p 702). These psychic costs may manifest themselves as performance decrements, fatigue, lowered tolerance, depression etc.

Therefore, in spite of coping generally being regarded as a positive function, there are a number of

ways in which the inappropriate mobilization of control efforts can increase the risk of ill-health or even death (Langer, 1983; Roskies & Lazarus, 1980). An obvious example of ineffective coping is that which leads to direct physical damage, e.g. of the liver, lungs and cardiovascular system. Smoking, drinking alcohol, drug taking, and over- or under-eating in order to cope with stressful conditions (e.g. problem social relationships or job strains) may both exacerbate the source of the problem and increase the person's vulnerability to other disease. A more indirect negative effect of inappropriate coping relates to the possibility of damaging physiological consequences as a result of resource mobilization under stress. These may include elevated sympathetic arousal such as blood pressure and hormonal activity. This psychophysiological mobilization may contribute to initial coping with a specific stressful situation, but could result in the onset of disease if experienced chronically.

The third way in which ineffective coping may induce illness is when it interferes with adaptive health related behaviours that may enhance well-being or preserve life. For example, people who deny that they are at risk from coronary heart disease when their personality, lifestyle and daily habits clearly place them in the risk category, may experience an immediate reduction of emotional distress. However, in the long-term, denial processes may interfere with more appropriate life and health enhancing behaviours. Such

denial strategies may contribute to the poor use of health screening services (e.g. cervical cancer screening), as well as the uptake of, and adherence to preventive health-related behavioural regimes. Thus, palliative strategies in response to potentially very harmful outcomes may prevent realistic appraisal and coping with a problem for which objective solutions exist (Lazarus & Folkman, 1984).

### 5.7 Coping and Social Competence

Coping competence and social competence were implicated in relation to health outcomes in Chapter 1, with special reference to the experience of the physical and mental exhaustion associated with the 'burnout' syndrome. These constructs may also have particular significance in the pathogenesis of cancer. They relate strongly to a person's learning history, in particular their acquired behavioural repertoire of self-control skills (see Chapter 4). The hypothesis that a person's upbringing has strong influences upon how they cope with the stresses of later life, with its consequent potential for health or harm, is emphasized by Baltrusch & Waltz (1987). This view complements the Learned Resourcefulness (Self-Control) theory of Rosenbaum (1985, 1988). During the first two decades of life, the early social environment of the home modulates the development of psychological and social coping resources which can mediate the effects of stressful episodes across that

person's life-span(2). Thus, in childhood and youth, behaviour patterns related to future health or illness are acquired.

Learned coping competence is of particular importance from the perspective of stress-related disease. Coping competence is an important factor because the facility to cope with the emotional impact of chronic or significant loss events, and control interruptions to normal functioning without inappropriate denial/repression of strong emotion or prolonged periods of depression, may be essential for a non-pathological existence. The development of competency in the control of self and environment may be associated with positive self-concept, a sense of personal worth, and self-confidence. Further possible health enhancing factors involve what Antonovsky (1984) termed a 'sense of coherence'. That is, by early adulthood most people have developed generalized beliefs and attitudes toward the world. There may or may not be the feeling that one is socially competent and integrated into a secure, coherent social milieu. Antonovsky suggested three major components of a sense of coherence : a) comprehensibility or subjective meaning; b) manageability or appraisal of social resources; and c) meaningfulness or sense of emotional integration. These are contained within a sociological framework but their proximity to Lazarus's

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(2) This is not to say that people do not continue to learn, or are unable to be taught, new coping strategies throughout the rest of their lives, it merely points out the importance of the early part of one's life with respect to acquiring control skills.

cognitive theory of stress and control is readily apparent (Lazarus 1966, 1981; refer also to Chapter 5). In the above sense, having a 'healthy' personality would involve the possession of a general belief that the trials and tribulations of life are worthy of attention, commitment and investment of effort. Moreover, the 'hardy' personality would view life's stresses and strains as challenges, and would consider that control is always possible in some form or other, so that problems can always be eventually surmounted (cf. Kobasa, 1979; Kobasa *et al.* 1985).

Baltrusch & Waltz (1987) defined social competence as the social skill required to establish a social climate which affords minimal social stress and optimal social support in the middle and later years of life. Socially competent individuals 'create' the social coping resources (e.g. close friends or family) which are necessary to manage the distressing aspects of living, and thereby enhance the controllability of their daily lives. Aberrations in the development of social competencies, such as the early death of a parent, deprivation of certain emotional needs, marital disharmony, divorce etc, have been linked to the maladaptive repression of negative emotions as a dominant coping strategy in later life (see Baltrusch & Waltz, 1987). The extreme use of repression or denial could negate emotional warning signals, thus laying the organism open to chronic physiological arousal and its consequences for well-being. Another avenue for the

inadequate development of social competence concerns the emotional distance and over-protectiveness of some parents (see Chapter 1), which could obstruct the development of control and self-efficacy, as well as disrupt self-esteem (Parker, 1979). Related to the above parental characteristics are the concepts of 'pathological niceness' and lack of assertiveness. Pathological Niceness Syndrome has been identified in many cancer patients by Renneker (1981). Children are often socialized into suppressing both their anger and their assertiveness. Their social, emotional and physical needs are also often, perhaps overly, neglected for whatever reasons. Consequently, a child learns that to be valued and loved he or she must be 'pathologically nice', a pattern of behaviour which could have far reaching repercussions because it influences future choices and leads the person into a downward spiral of interpersonal detachment, loneliness, and the masking of anger and depression by a behavioural veneer of amiability. Once again, the possible consequences of such a lack of appropriate control strategies include both mental and physical debilitation.

Elsewhere, the control and coping value of social support together with its effects on mental and physical well-being has been extensively examined in occupational and health-related research and theorizing (Ajzen & Fishbein, 1980; Cassel, 1976; LaRocco, House & French, 1980; Lin *et al.* 1979; Payne & Fletcher, 1983; Payne & Jones, 1987). In general the findings suggest that

support may lessen the deleterious impact of psychosocial stress on an individual's health. Social competence which nurtures a good social support 'safety net' may therefore increase perceived control and coping in many stressful life situations. It is worth noting in this respect, that not only will support aid in the management of stress but also that a lack of it may be a source of stress in itself (Gore, 1978; Payne & Jones, 1987).

Analogous to the development of the Type A construct, one hypothesised coping style has been labelled the Type C behaviour pattern in an attempt by cancer researchers to conceptualize and operationalize a cancer-prone behavioural repertoire. The similarities with the notion of pathological niceness will be apparent. Manifestation of this behavioural repertoire is suggested to increase both the risk of developing tumors and to influence the way in which malignant disease runs its course (see, for example, Greer & Watson, 1985; Pettingale, 1985).

The suppression of negative emotions or inability to express strong emotion, particularly anger or fear, and a helpless/hopeless reaction to stress have been reported as cancer-prone characteristics (Cox & McKay, 1982; H J Eysenck, 1988). Other relevant psychological factors include aspects of self-concept; for example, poor body image, gender identity, low assertiveness and self-efficacy, and low self-esteem (Baltrusch & Waltz, 1987).

Earlier it was noted that learned helplessness has been linked to the development of depression (Abramson *et al.* 1978; Seligman, 1975). Significantly, non-psychiatric depression is one stress-related variable that has been associated with the initial development of human cancer (e.g. Bieliauskas & Garron, 1982; Shekelle *et al.* 1981).

Borysenko (1982) and later Baltrusch & Waltz (1987) proposed several levels of cognitive-behavioural influence upon pathogenesis. Of these, they implied that perceived and actual control, and their relationship to the experience of stress were considered to be "...the most promising area of current biobehavioural cancer research" (Baltrusch & Waltz, 1987, p 156). These authors reiterate the consistent reports of other researchers which suggest the etiological significance of coping style and the management of negative affect, as well as adverse reactions such as helplessness and depression, to uncontrollable stress.

The literature which has been reviewed in this section suggests that perceived event controllability and concomitant appraisals of personal agency (e.g. Cohen, 1979; Lazarus & Folkman, 1984) are possible determinants of immunocompetence and are possibly related to carcinogenesis (Baltrusch & Waltz, 1987; Cox, 1988; Lloyd, 1984). Rodin (1986, p 145), stated that :

"Regardless of the specific mechanisms involved it appears that at least the cellular arm of the immune system is responsive to the dimension of controllability, rather than stress per se."



Paralleling Lazarus & Folkman's (1984) theorizing on the stress-control relationship and its effects upon health, emphasis is placed not only upon how a stressful transaction is perceived to be, but also on the actual cognitive-behavioural control strategies mobilized to cope.

### 5.8 Summary

Early in this chapter the notion of subjective meaning raised in Chapter 2 was further examined with respect to personal control. Personal reality provides a means by which even objectively uncontrollable situations may be managed. A sense of coherence in terms of a healthy approach to life also embodies personal meaning as a central feature. Cognitive appraisal processes were then suggested as the prime movers in the ascription of meaning, especially when confronted by stressful circumstances. The influence of beliefs, commitments and various environmental factors upon primary control appraisals was highlighted. Secondary appraisal was discussed in terms of the evaluation of personal coping resources and available control options. A constellation of possible control resources was identified, including self-control skills, personal morale, health status, social support and material resources.

A distinct perspective was proposed for the examination of coping. Control outcomes were not considered to define or totally reflect coping efforts. Different types of coping process were delineated and

brief coverage was given to their suggested functions. The broad functional dichotomy of problem focused and emotion focused coping noted that both forms of control are invoked in most stressful situations, but that their relative degree of influence depends largely upon dynamic control appraisals of the extant circumstances. Consideration of coping styles led to the idea that coping could have detrimental as well as beneficial effects on health. This notion will be examined in the following chapter which explores the psychophysiological significance of control and its implications for well-being.

Chapter 1 examined the stress-control relationship and the control relevance of competence and motivation. In this review chapter, personal control in the form of coping and social competence, and the motivational deficits associated with helplessness and depression were suggested to be significant factors in the aetiology of health outcomes. Thus, the evidence presented here supports the contention that control and controllability are performance and health-relevant psychological factors which should command increased attention in future research.

The final chapter presents the research questions stemming from this review and overviews each of the intended studies. Methodological issues relating to the design of each study are discussed.

## CHAPTER 6

### RESEARCH QUESTIONS AND METHODOLOGICAL ISSUES

#### 6.1 Introduction

In this chapter the research questions stemming from the literature review will be presented together with a rationale for, and outline of, the research strategy guiding the studies which are presented in subsequent chapters. Methodological and statistical issues associated with the design and implementation of these studies will also be considered in general terms. More specific methodological commentary will be included in the relevant discussion sections of respective studies.

#### 6.2 Research Questions

The review section provided thorough coverage of how personal control has been conceptualized and, to some extent, operationalized in the relevant control literature. Emphasis was placed on the notion that personal control has significant implications for most aspects of human functioning, not least in terms of competent performance and health. The primary research problems identified as a result of the literature review were concerned with: a) the measurement of state self-control, b) the process of change in personal control across the time course of a demanding event, and c) the relationships between dispositional control, situational control and well-being. These problem areas were refined

into more tangible research questions with reference to the extant research. The following questions were derived:

1. In light of the lack of any existing state oriented self-control measure and the suggested process of change across the span of a stressful event, how can state self-control be measured?

2. Do the foci of control efforts fluctuate across a demanding/stressful event?

3. In what way does the focus of state control change? For example, does it change between functionally distinct forms such as emotion and problem focused control?

4. Do changes in the focus of control result in performance changes, or do performance changes result in switches in the focus of control? Are performance decrements or increments most likely to result in changes in the focus of control?

5. Under what kinds of task performance conditions will changes in the focus of control be observed? For example, do individuals demonstrate differential switching between problem focused and emotion focused control under different anxiety, and task difficulty manipulations?

6. Is a certain level of emotion focused control necessary to "quiet the system" before problem focused efforts can be implemented effectively?

7. Are high levels of dispositional self-control related to more extensive coping efforts under stressful circumstances? For example, does dispositional control have a causal influence upon coping?

8. Is mental well-being causally influenced by dispositional self-control?

These questions enabled the operationalization of the constructs involved (see subsequent studies). In this way it was possible to address the specific hypotheses to

be formulated for each study. The hypotheses are presented in the introductory sections of each study.

### **6.3 Research Strategy**

A multi-method approach with a broad perspective was adopted rather than a narrower focus on a specific control-relevant area. Comprising both explorative and explanatory strategies, this approach included questionnaire development and validation, an empirical study, and a non-experimental study involving path analytic techniques to test a control based model of mental well-being. Thus, the research designs necessitated a wide variety of statistical techniques. The data were examined through factor analysis, correlational analysis, analysis of variance, t-tests and path analysis involving multiple linear regression. The following sections run through each research design in turn to give an overview of the particular approach that was used for that study.

### **6.4 Development of a state self-control inventory.**

Scrutiny of the relevant literature revealed that there was no appropriate state self-control scale available for the purposes of the intended research, i.e. examination of changes in the focus of control across the span of a demanding event. Consequently, a decision was made to develop a scale theoretically based upon the distinction between problem and emotion focused control, and between control beliefs and control as coping efforts

(Lazarus and Folkman, 1984). Pre- and post-event scales were generated to enable the measurement of self-control prior to and in anticipation of a stressful event, as well as retrospectively indexing the participant's perceived control efforts during the same event. The development of pre- and post-event forms based on the same conceptual criteria but not necessarily containing exactly the same items was a novel aspect of this initial work. The following protocol was observed (more detailed information is available in the methodology section of Chapter 7):

#### 6.4.1 Study Protocol

- a) *Item generation*: The initial problem focused and emotion focused item pool was generated with reference to the extant literature on theoretically sound a priori grounds.
- b) *Item selection*: A panel of judges scrutinised the item pool and, retained, rejected and amended items according to specific criteria to form prototype scales. At this stage the content validity of the scales was qualitatively determined.
- c) *Subjects and events*: The initial scales were administered to a wide variety of subject groups in a range of differentially stressful situations, such as different competitive sports events. The objective here was to facilitate the external validity and generalizability of the scales for future use. One disadvantage, however, was that the sampling procedure

was not random. The naturalistic settings of the events at which the scales were administered militated against the random selection of participants. That is to say, it was necessary to target particular groups, so that some degree of self-selection was involved. This failure to randomly sample transgresses a major rule pertaining to control in research design and does, of course, mean that the internal and external validity of the findings are threatened (Christensen, 1988). More precisely, a lack of randomization means that unknown sources of variation or systematic bias in a study cannot be controlled.

d) *Factor analysis and further refinement*: Data from both scales was subjected to a principle components factor analysis in order to reduce the data set, make it more interpretable and enable validation of the hypothesised structure of the instruments. Items with factor loadings less than .3 were rejected. Further items were rejected according to a *priori* criteria set for the factor loading characteristics of each item. In addition, item-total correlations enabled the rejection of further items which showed a poor relationship ( $r < .3$ ) to the other items loading on the same factor.

e) *Reliability*: Internal consistency was determined by calculating Cronbach's alpha for each of the sub-scales.

f) *Validation of the scales*: The construct validity of the pre- and post-event scales was determined by examining the extent to which the self-control scales related to existing relevant questionnaires in a way consistent with the theoretical predictions derived from

the underlying concept of the new scales. The subjects were different to those used in the initial development phase of the questionnaire. A battery of conceptually related state and dispositional questionnaires were used to assess construct validity because it is a well established technique and there were not many clearly defined alternative methods available. This multiple questionnaires approach does have associated problems.

Firstly, it represents a single 'data capture' method. The design lacks the 'strength' of considering other aspects of criterion related validity. Secondly, there is a danger that the construct validity based upon correlations with other questionnaire scores is not due to common variance between underlying constructs but rather because of similarities between items. Overlap of item content is a methodological problem that is considered to be a form of method variance by many researchers (e.g. Aldag, Barr and Brief, 1981; Roberts and Glick, 1981). Thirdly, unless questionnaires are counterbalanced in their order of completion results may be prone to certain enforced order effects. For example, the completion of one questionnaire may influence the subsequent completion of a following scale. Fourthly, questionnaires such as the state oriented self-control inventory, are used to provide an observable empirical measurement of an unobservable concept that underlies the measured response. Thus, a major problem is one of



evaluating how well a questionnaire represents the underlying theoretical concept.

Method variance is a potential problem of concern to researchers heavily dependent on the use of questionnaires. It is considered to be an artifact of measurement that biases results when relations are explored among constructs measured in the same way (Spector, 1987). Campbell and Fiske (1959) described method variance as variance attributable to measurement method rather to the variables of interest and included "response sets" in self-report questionnaires as a prime example. Halo effects, acquiescence effects and social desirability effects have all been shown to bias the results of research studies (e.g. Cronbach, 1950; Nunnally, 1978)

Spector (1987) asserted that although many researchers assume that common method variance is a cause of spuriously high correlations between variables, the biases mentioned above may have other effects as well. For example, bias can disrupt score distributions, making them non normal in shape (James, Demaree and Wolf, 1984). A procedure for detecting method variance called 'multitrait-multimethod' analysis was developed by Campbell and Fiske (1959). However, this method tests for method error but does not identify the source or type of bias.

Overall, the above provides a strong argument for using multi-method assessments of the process rather than relying upon single method approaches.

### 6.5 Empirical Study

The second research method was based upon a "catastrophe paradigm" (after Fazey and Hardy, 1988; Hardy, Parfitt and Pates, 1990). A pilot study using the self-control inventory with university examinees was conducted, partly to further validate the Self Control Inventory but also to extract some information regarding the process of change in the focus of control. The catastrophe paradigm provided an effective and novel way to examine performance changes and hypothesised switches in the focus of control in relation to certain critical points across the time-span of a stressful event. Details of the specific hypotheses and methodology may be found in Chapter 8. The following protocol outlines the approach that was taken:

#### 6.5.1 Study Protocol

*Design:* A within-subjects factorial design was used; that is to say, the same subjects participated in all experimental conditions. The advantage of repeated measures designs is that subjects serve as their own control for individual differences. In this way, sensitivity to the effects of the independent variables should be increased because subjects in the various treatment conditions are perfectly matched. In addition,

within-subjects designs do not require as many subjects as do between-subjects designs since all subjects experience all experimental conditions. There are, however, disadvantages to repeated measures designs. Perhaps the most serious handicap is the confounding influence of a sequencing effect (Christensen, 1986). Counter-balancing was used in attempt to overcome sequencing effects in this experiment.

Another problem which was not (and could not) be controlled by this design was systematic complex interactions between subjects, the treatments, and the order of presentation of conditions.

a) *Subjects*: The intended 14 participants were members of a University basketball squad, and are to be selected on the basis of their moderate ability and experience. They were randomly assigned to one of two initial treatment groups. Although assignment to groups was random, the actual subject sampling procedure was not. To some extent a trade-off is necessary between the control that randomization gives and the practical considerations of obtaining participants for a study. Sometimes it is not possible to randomly select, for example, because the subject population is not large enough to furnish a suitable random sub-sample. The lack of randomization, the most important and basic of control methods, in this case inevitably leads to problems with the generalizability of the results. Small samples also do not allow any test of the normality assumption underlying

analysis of variance. The main reasons for adopting a small sample group for this experiment were time constraints and the availability of subjects, together with the fact that other researchers have successfully demonstrated catastrophe effects with similar designs (e.g. Hardy, Parfitt and Pates, 1990).

b) *Performance task*: The criterion task was an ecologically valid perceptual-motor task which requires subjects to accurately throw basketballs at a standard target basket from the "free throw" line on a normal basketball court.

c) *Goal difficulty/effort manipulations*: Goal difficulty was manipulated by setting subjectively referenced point goals to be attained. These goals were established for each subject following an ability pre-testing and familiarization session.

d) *Cognitive anxiety manipulations*: Neutral and ego-threatening instructional sets were used to influence cognitive anxiety without significantly elevating somatic anxiety (after Hardy, Parfitt and Pates, 1990)

e) *Measurements*: Scores for four variables were taken; namely, cognitive anxiety, criterion task performance, perceived effort and state self-control around perceived critical points in performance (details of these measures are given in Chapter 8)

f) *Procedure*: There were three experimental sessions: one pre-test followed by two experimental sessions. In the test sessions subjects were counterbalanced in both the treatment conditions (alternating high or low anxiety

group) and the goal difficulty point at which they commenced the criterion task.

g) *Analyses*: One tailed t-tests were used to check the effectiveness of the cognitive anxiety manipulations. The nature of the catastrophe paradigm to be employed in this study required a three factor analysis of variance (ANOVA) with repeated measures on all independent variables in order to test for the hypothesised complex interaction effects (see Chapter 8). For example, a three factor, Anxiety (high/low) by Performance sequence Direction (increasing/decreasing) by Goal Difficulty Level (20, 40, 60, 80 or 100% difficulty), ANOVA was used to analyse performance data.

Although the assumptions underlying analysis of variance are generally considered to be fairly resistant to violations, (Munro, Visintainer and Page, 1986; Winer, 1971; Box, 1954), the small subject sample intended for this study may be a disadvantage. For example, the dependent variable may not be normally distributed in each of the cells and the homogeneity of variance assumption may be violated because the groups do not demonstrate equivalent variances. Having said this, Winer (1971) stated that moderate departures from the homogeneity of variance assumption do not seriously affect the sampling distribution of the resulting F statistic. That is, when the variances in the cells are not equal the F statistic using pooled variance has approximately the same distribution as the F statistic

which takes the differences in the cell variances into account. However, unequal variances may result in slight biases with regard to achieving statistical significance and rejecting the null hypothesis, but this bias is not considered to be very detrimental (Box, 1954). Hartley's or Cochran's tests for homogeneity of variance are considered adequate to identify any violation of this assumption (Winer, 1971).

Box (1954) pointed out that the F test is insensitive to non-normality and thus, can be used under most conditions to indicate that means in a set differ significantly.

Nevertheless, perhaps the greatest weakness of this study was not so much that the assumptions underlying ANOVA might be violated, but rather that small samples do not really enable one to test the normality assumption.

#### **6.6 Non-experimental study**

The final study involved an exploration of the hypothesised relationships between dispositional self-control and self motivation, and subsequent health in two groups differing in the potential stressfulness of their daily lives (students and nursing staff). The most important aspect of this study was the test of a new self-control/self-motivation model of coping and health.

### 6.6.1 Study Protocol

#### Phase 1

*Design:* Between-subjects factorial designs was used for the first phase of this study. The initial phase was a form of non-equivalent control group design because it did not meet all the requirements necessary for controlling the influence of extraneous variables (Christensen, 1988). In this case a large degree of self-selection to participate was necessary in order to form subject groups, therefore the main control requirement not met was that of the random assignment of subjects to groups. Non-randomness of subject sampling again leads to problems of generalizability of the results. The voluntary return of questionnaires used in this study also leads to biased sampling because it means that the likelihood of individuals being included differs from one person to another (Guildford and Fruchter, 1986). Additionally, the fact that the control (low stress) and experimental (high stress) groups are not equivalent on all variables (e.g. the potential for stress, age, education, experience) may influence the dependent variables. Thus, the uncontrolled variables may operate as rival hypotheses to explain the results.

A questionnaire booklet containing three scales was used initially to gather data. This single method data capture again leaves the design open to common method error. As stated earlier, method variance may bias results when relations are explored among constructs measured by the

same method (Spector, 1987). To combat this error, confirmatory data could have been gathered using interviews and clinical, or behavioural assessments. Details of both phases of this study and more specific methodological comments may be found in Chapter 9. The protocol for the initial phase was as follows:

- a) *Subjects*: Two fairly large groups of subjects were used, one comprising nursing staff, the other comprising students. The practicality of obtaining participants outside of laboratory conditions militated against being able to randomly select individuals for each group.
- b) *Measures*: Three questionnaires were administered. These are the Self-Control Schedule (SCS, Rosenbaum, 1980), the Self-Motivation Inventory (SMI, Dishman and Gettman, 1980) and the General Health Questionnaire (GHQ, Goldberg, 1972). This single method of data gathering is again problematic because any shared variance explained may be due to the scales having similar items rather than because of variance due to their underlying constructs.
- c) *Procedure*: Questionnaire booklets were administered personally to students in their halls of residences, but were distributed to nurses mainly at work. Pre-paid, addressed envelopes will be provided to help ensure confidentiality. All subjects completed the questionnaires in the same order. Instructions asked subjects to complete the SCS and SMI first and then to leave a gap of at least an hour before completing the GHQ, in addition they were requested not to refer to



previously answered items. This was an attempt to limit order effects and response bias due to perceived desirability. Nevertheless, there are disadvantages to having subjects complete questionnaires in the same order. At the very least, fatigue or motivational effects could be confounding influences upon the results.

Sub-groups were formed by dividing the main groups into high and low self-control, and high and low self-motivation groups on the basis of a median split of these data. Subjects falling into each of the categories were asked to complete both the Ways of Coping Questionnaire (Lazarus and Folkman, 1988) and items tapping their perceived control, with respect to particular stressful situations. Structured interviews were used to help subjects focus down on a recent particularly stressful event.

d) *Analyses*: The interactive effects between occupation, self-control and self-motivation upon GHQ data were explored using a three factor ANOVA. Two factor ANOVA's were conducted on the coping and perceived control data obtained from the nursing sub-group.

#### Phase 2

In this part of the study path analysis was used to test the pathways of causal influence within a self-control/self-motivation model of coping and health. The data from the subgroups were used to test whether the model explained the correlations between the variables.

In path analysis the "fully recursive" or "just identified" model (in which all possible paths between variables are included), is compared to the "over-identified" model (in which some of the pathways have been deleted due to their low and/or non-significant path coefficients). This "theory trimming" exercise (Pedhazur, 1982) serves to establish the most parsimonious explanation for the causal phenomena occurring in the data. To test the relative goodness of fit of the model to the data the Q coefficient was calculated. The Q coefficient is more robust than the Chi-square goodness of fit statistic in that it is not affected by sample size (Pedhazur, 1982).

The intended model-testing procedure associated with the final study was a notable strength of this research not only because of the complex statistical procedures involved but also, more fundamentally, because a very specific conceptual model was proposed to explain health outcomes. The lack of such precise modelling associated with health psychology research has been criticised. Prentice-Dunn and Rogers (1986) for example, stated that the Health Belief Model (Rosenstock, 1974) provides a theoretically guided framework within which health behaviours may be investigated, but, the vacuous nature of the model necessitates the empirical verification of more fully specified models.

### 6.7 Conclusion

The evidence presented in the review chapters supports the view that personal control and controllability are performance and health-relevant psychological factors which should command increased attention in future research. This evidence formed the basis for the research questions addressed in this chapter. The methodological considerations related above note the general strengths and weaknesses of the research designs that were intended to answer these research questions. The studies which form the sequelae to these early chapters represent a contribution to a greater understanding of personal control.

## CHAPTER 7

### Questionnaire Development Study

#### THE MEASUREMENT OF STATE SELF-CONTROL

##### 7.1 Introduction

The preceding chapters illustrate the fact that examination of the stress - control relationship has been undertaken from a number of different conceptual perspectives (e.g. Averill, 1973; Fisher, 1986; Kuhl, 1982; Lefcourt, 1979; Miller, 1979; Seligman, 1975). However, the cognitively based theory of Lazarus and his colleagues represents one of the most influential approaches to this pervasive relationship between stress and personal control (Folkman, 1984; Folkman & Lazarus, 1980 and 1985; Lazarus, 1966; Lazarus & Launier, 1978; Schaefer, Coyne & Lazarus, 1981).

Lazarus's (1966) cognitive theory of stress and coping posits that the transaction between person and situation is a dynamic, ongoing process. This procession of events and responses not only operates in a reciprocal fashion, but also fluctuates with regard to the perception of control-lability, the appraisal of stress and the coping responses employed over a particular transaction. Thus, in a situation appraised as stressful, an individual might experience apparently contradictory emotions and mental states during different stages of the encounter (Folkman & Lazarus, 1980).

If one takes stress to connote a disturbance of the person - environment relationship (see Chapter 1), one can readily accept that personal control responses are targeted at altering that disturbance; but what is coping? As has already been indicated in Chapter 5, coping reflects all efforts at managing personal/ situational demands regardless of the objective success of these attempts. Folkman (1984) provided the following definition :

"Coping refers to cognitive and behavioural efforts to master, reduce or tolerate the internal and/or external demands that are created by a stressful situation" (p 142).

The complex process of coping with stressful circumstances is conceived as falling under two broad functional headings - namely, Problem Focused Coping and Emotion Focused Coping.

Problem focused coping is aimed at changing the problem situation appraised as stressful, for example, actively directing and increasing attention to important task cues, motor output, task relevant self-statements, consideration of alternative courses of action. Such coping also includes instrumental acts like avoidance, escape, attack or changes through other overt behaviour. Clearly problem oriented coping can be directed at both the environment and oneself.

Emotion focused coping refers to the self-regulation of distressing emotional responses, for example, competitive anxiety and unpleasant physical sensations. It is suggested that examples of both forms of coping are

operative in most stressful situations and that these manifest themselves to different degrees according to the features of the encounter (Folkman, 1984; Folkman & Lazarus, 1980). Other authors have also expounded this dichotomy of the focus of control processes (Pearlin & Schooler, 1978; Rothbaum, Weisz & Snyder, 1982), and the two broad functions of coping have long been implicated in the work of cognitively oriented behaviour therapists (e.g. Bandura, 1977; Deffenbacher & Suinn, 1980; Goldfried & Merbaum, 1973; Kanfer & Hagerman, 1981; Mahoney, 1974; Meichenbaum, 1977; Smith, 1980a).

It must be noted that stress appraisals here are assumed to have both positive and negative valence; that is to say, a situation can be perceived as challenging and as eliciting positive affect such as happiness and excitement. Conversely, it can be perceived as a threat with associated negative mood states like anxiety or hopelessness. A further contention here is that any consideration of different cognitive control processes must also note a major distinction between control beliefs, and control as coping efforts (Lazarus & Folkman, 1984). Firstly, generalised control beliefs (e.g. locus of control) and more specific state control beliefs are cognitive factors which influence stress appraisals, coping responses and subsequent performance. Alternatively, but not exclusively, control as coping refers to actual cognitive and behavioural attempts at managing a given situation.

The fact that most people cope in most stressful situations most of the time bears testimony to the psychological resilience of human beings and indeed to the existence of ways of coping acquired through life (cf. Rosenbaum's, 1980a notion of self-control as a repertoire of learned coping behaviours). Having said this, the past decade has been notable for an upsurge of concern regarding coping, mental well-being and health, in what appears to be an inherently stressful world (Lazarus, 1974). Moreover the *perception of control* has been cited as a fundamental ingredient in the complex relationship between stress effects and personal health (Fisher, 1985 and 1988). The notion of personal control has also guided much work in the fields of occupational psychology (Karasek, 1979; Payne & Fletcher, 1983; Spector, 1987), and health psychology (Prentice-Dunn & Rogers, 1986; Strickland, 1978), which inevitably overlap the area of more direct stress research (Cooper, 1983; Cox, 1988; Eysenck, 1983 and 1988; Fisher & Reason, 1988; Fleming, Baum & Singer, 1984).

The area of sport psychology has similarly promoted interest and research into sports performance and exercise related cognitive behavioural attributes, including self-control skills. In addition to the examination of psychological skills contributing to preparation for, maintenance of, and improvement of, performance (e.g. Gal-Or & Tenenbaum, 1986; Hardy & Nelson, 1988), there has been an adoption and adaptation, by sport psychologists, of the clinically derived self-

management principles developed by cognitive behavioural therapists (e.g. Bandura, 1977; Meichenbaum, 1977). It has also been acknowledged that educating individuals to engage in the self-initiation of existing or newly learned self-regulatory behaviours should be a primary aim of self-control training (Smith, 1980a). Many cognitive behavioural intervention procedures contain an educational phase and encourage the recipient to practice the self-control skills in their own time and in different situations with their attendant demands. The underlying principles of the personal control techniques used by, say, sport performers and those advanced by sport psychologists (Smith, 1980a and 1986; Straub, 1986), or provided through cognitive skills training programs (Hardy & Fazey, 1990; Gauron, 1982), can be broadly categorised into emotional and problem oriented self-control skills. For example, goal setting, planning, mental rehearsal of an upcoming movement or event, simulation training, task oriented self-talk, seeking advice from someone more experienced, and even 'psyching out' or physically hurting an opponent are all problem focused strategies. Emotion focused control might be reflected by attempts at reducing or tolerating negative affect, unpleasant thoughts and images, or distracting physiological activity evoked by a stressful situation through some form of relaxation technique, positive self-statements or mental imagery.



## 7.2 The Measurement of Personal Control

Generally, the self-report measurement of coping and control has been dominated by trait or dispositionally oriented scales (e.g. derivations of Rotter's, 1966 Locus of Control scale; Rosenbaum's, 1980a Self Control Schedule), or situation specific, but not 'state' referenced, instruments (e.g. Folkman & Lazarus', 1980 Ways of Coping Questionnaire). Following an extensive manual and computerised search of the appropriate literature it became apparent that no state oriented self-report instrument existed which was based on the conceptual distinctions between problem and emotion focused control, and between control beliefs and control as coping efforts. This prompted the development of a state self-control inventory founded precisely upon these principles. This self-report measure was devised to index self-control in relation to a variety of encounters perceived to be stressful. Initially, it was developed with respect to the cognitive skills employed by individuals in competitive or other stressful situations. The development and validation of the Self-control Inventory (SCI) will be covered in the following section

## 7.3 Initial Item Pool

The original items pertaining to the cognitive skills conceptualization of self-control discussed above were written with the intention of reflecting the state orientation of the respondent. Ninety-six pre-event and 94 post-event items were generated with reference to

existing pertinent self-report measures and relevant psychological skills literature (e.g. Cratty, 1983; Gal-Or & Tenenbaum, 1986; Mahoney & Avenier, 1977; Rosenbaum, 1980a; Straub, 1986). Pre-event and post-event forms were constructed in order to give a clearer indication of the foci of control in relation to a significant event. Additional items were formulated on the basis of their 'face value' as being representative of the two a priori criteria of problem and emotion focused control.

#### **7.4 Initial Item Selection**

The pool of items for both pre- and post-event forms were presented to a panel of three judges familiar with the notions of self-control espoused above. Items were retained, amended or rejected according to the following criteria :

a) Items should clearly reflect only one of the two a priori self-control factors. b) Items should be syntactically correct, unambiguous and readily understood. c) Items should be positively worded. d) Items should reflect a state orientation. Items independently considered by all three judges to satisfy the above criteria were retained. A small number of items were amended by slightly changing the wording. This selection process resulted in two forms, each comprising 53 items. Both forms were thus constructed with reference to control beliefs and state control as actual coping efforts over the course of a given encounter. These pre-event and post-event forms were administered to a variety

of subject groups experiencing a number of different situations. For all groups the pre-event form was completed between 1 hour and 5 minutes before a significant event. The post-event form was completed between  $\frac{1}{2}$  hour and 3 hours after the event.

### 7.5 Subjects and Events

A diverse range of subjects completed the initial forms in situations which differed widely in both the degree and nature of stressfulness. The intention was for the new measure to be generalizable across a range of situations and levels of perceived stressfulness or controllability. The breakdown of subject groups was as follows :

#### Pre-event Form

- a) Swimmers (N=30), before competing in a Masters' Championship.
- b) Graduands (N=20), prior to receiving their degree certificates before a crowded hall.
- c) Dental patients (N=13), prior to receiving dental treatment.
- d) Golfers (N=15), before playing in a two round championship match.
- e) Runners (N=32), including cross country and road runners prior to competing in important championships and league races.
- f) Athletes (N=12), including most disciplines before the 1986 Welsh National Athletics Championship. (1)
- g) Rowers (N=20), senior B and senior C crews prior to competing in an internationally attended competition.
- h) Bowls players (N=9), before competing in championship matches.

Total for pre-event form, N=151.

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(1) The athletes and runners groups included several international competitors.

Post-event Form.

- |                           |                          |
|---------------------------|--------------------------|
| a) Swimmers (N=16)        | All subjects completed   |
| b) New graduates (N=10)   | the post-event form in   |
| c) Dental patients (N=30) | relation to the events   |
| d) Golfers (N=16)         | as described above. They |
| e) Runners (N=31)         | were, however, not the   |
| f) Athletes (N=24)        | same subjects as above.  |
| g) Rowers (N=20)          |                          |
| h) Bowls players (N=9)    |                          |

Total for post-event form, N=156.

#### **7.6 Scoring of the Self-control Inventory**

Each form was scored on a 4-point 'Likert-type' scale in which 1=Strongly Disagree; 2=Slightly Disagree; 3=Slightly Agree and 4=Strongly Agree. Items were scored in a positive direction. High scores meant high state self-control, i.e. greater use of cognitive self-control skills. Those items predetermined to denote low state self control were reverse scored, e.g. "My mind wandered during the event" or "I felt frustrated during the event". The potential range of scores for each subscale was 12-48.

#### **7.7 Factor Analysis and Further Refinement**

The data from both forms were subjected to a principle components factor analysis and varimax rotated to achieve best fit. Two factors with eigenvalues greater than unity were extracted for both the initial forms. Items loading mainly on Factor 1 on the pre-event form

comprised mostly problem focused items, whereas Factor 2 comprised mainly emotion focused items. These factors were labelled problem focused and emotion focused control, respectively. For the post-event form, Factor 1 consisted predominantly of emotion oriented items (labelled emotion focused control), and Factor 2 of mainly problem oriented items (labelled problem focused control). See Table 7.1. A complete rotated factor structure matrix is given in Appendix I.

#### *Rejection of Items*

Further items were rejected on the grounds that :

- a) They had factor loadings of  $<.3$  on both factors (19 items);
- b) They loaded roughly equally on both factors (15 items);
- c) They loaded above  $.3$  on a factor incompatible with the a priori target of the items, irrespective of their loading on the 'correct' factor (5 items);

In this way the forms, now termed SCI-1 and SCI-2, were reduced to 32 and 35 items respectively. Item-total Pearson correlation coefficients were then computed for each subscale. This enabled further refinement whereby a total of 19 items with Pearson  $r$ 's  $\leq .3$  were rejected because of their poor relationship with the other items in the same factor subscale. More manageable 24-item pre- and post-event Self-control Inventories were thus derived.

### 7.8 Reliability

Internal consistency was tested by computing Cronbach's Alpha for each subscale. The following alpha's were obtained.

<b>SCI-1</b> (pre-event)	Problem Focused Control	alpha=.85
	Emotion Focused Control	alpha=.84
<b>SCI-2</b> (post-event)	Problem Focused Control	alpha=.81
	Emotion Focused Control	alpha=.89

The alpha's obtained demonstrate acceptable internal consistency for each of the subscales (normal rejection criterion, alpha=.80).

**Table 7.1** : Factor Loadings of Items on Final SCI Forms

1. SCI-1 Problem Focused Control Items : Factor 1

<u>Item</u>	<u>Loading:</u>	F1	F2
1. I have prepared well and believe that I am ready for this event.	.512	-	-
3. I have thought out strategies for this event	.525	-	-
5. I shall concentrate fully on my performance during this event	.535	-	-
7. I shall guide my performance to achieve the goals that I have set myself	.420	-	-
9. I believe that I am on-form for this event	.440	-	-
11. I have thought-through my performance for this event	.734	-	-
13. I have a precise plan of action ready for this event	.610	-	-
15. I have thought about how to overcome possible setbacks	.671	-	-
17. I shall stop my attention changing to irrelevant things during this event	.475	-	-
19. I have practiced this event in my mind	.736	-	-

21. I shall ignore things that distract me from the task in hand	.410	-
23. I shall control my actions to meet the challenge during this event	.626	-

2. SCI-1 Emotion Focused Control Items : Factor 2

<u>Item</u>	<u>Loading:</u>	F2	F1
2. I shall distract myself from any unpleasant feeling that arises during this event	.461	-	-
4. Negative thoughts about doing badly in this event keep bothering me	-.420	-	-
6. I shall remain calm if anything goes wrong during this event	.593	-	-
8. Unpleasant thoughts are interfering with my enjoyment/feeling good during this event	-.500	-	-
10. I shall reduce any tension I feel before or during this event by making myself relax	.456	-	-
12. I shall subdue any worrying images or concerns about this event	.587	-	-
14. I am finding it difficult to relax because of thoughts about this event	-.663	-	-
16. I shall overcome any unpleasant bodily sensations (butterflies, feeling shaky etc) brought on by this event	.562	-	-
18. I feel uncomfortable about the upcoming event	-.675	-	-
20. My concerns about this event prevent me thinking clearly about what I have to do	-.568	-	-
22. I shall overcome any feeling of anxiety that this event causes by calming myself down	.629	-	-
24. I shall subdue any feeling of panic or intense nervousness that might arise	.639	-	-

3. SCI-2 Emotion Focused Control Items : Factor 1

<u>Item</u>	<u>Loading:</u>	F1	F2
2. I felt unhappy during the event	-.620	-	-

4. I kept worries out of my mind during the event	.391	-
6. I was disappointed with my performance	-.666	-
8. I felt demoralised by the outcome	-.777	-
10. I remained concerned about how I was performing throughout the event	-.727	-
12. I felt frustrated during the event	-.827	-
14. Nervous feelings interfered with my performance	-.775	-
16. I am worried that my performance was poor	-.789	-
18. I controlled my feelings during the event	.722	-
20. I kept myself cheerful during the event	.494	-
22. I was irritated by discomfort throughout the event	-.493	-
24. I stopped myself feeling tense during the event	.445	-

4. SCI-2 Problem Focused Control Items : Factor 2

Item	Loading:	F2	F1
1. I planned my actions during the event	.637	-	
3. I attended fully to the task in hand	.587	-	
5. I ignored distractions during the event	.404	-	
7. I achieved my goals by guiding my performance to attain them	.625	-	
9. I concentrated on my performance	.809	-	
11. I used the information around me to my advantage during the event	.417	-	
13. I controlled my actions to overcome problems during the event	.624	-	
15. I focused on what I had to do, if distractions occurred during the event	.582	-	
17. My mind wandered during the event	.393	-	
19. I thought-through what I had to do during the event	.619	-	



21. Intruding thoughts interfered with my performance	-.463	-
23. In my mind I can go over my performance in the event	.513	-

### 7.9 Validation of the State Self Control Inventory

One reason for developing the SCI was that there were no other published scales that measured state self-control in the way conceived here. However, there are a number of scales conceptually related to the SCI. The concurrent validity of the SCI was examined by predicting the relationship between the SCI and other scales and then comparing scores obtained on its subscales with scores obtained from the existing self-report instruments. Because some of these conceptually related scales are not widely known they are each briefly described here.

#### 7.9.1 Competitive State Anxiety Inventory-2 (CSAI-2)

The CSAI-2 (Martens *et al.*, 1989), was based on the conceptual distinction between different components of state anxiety (e.g. Davidson & Schwartz, 1976; Liebert & Morris, 1967). The CSAI-2 has three subscales which assess cognitive anxiety (worry), somatic anxiety (emotionality), and self-confidence. Cognitive anxiety (CA) refers to negative performance expectations and negative self-evaluation. Somatic anxiety (SA) refers to the perception of the physiological and affective aspects of the anxiety experience developing directly from

autonomic arousal. Self-confidence (SC) represents positive expectations and feelings about the situation, and one's capability of performing competently.

Internal consistency of the CSAI-2 was computed for three samples, the product moment item subscale coefficients ranged from  $r=.79$  to  $r=.90$ . Each of the CSAI-2 subscales was also examined in relation to other state and trait anxiety inventories which produced the following correlational evidence for their concurrent validity. The Sport Competition Anxiety Test (Martens, 1977), a trait measure : CA .45, SA .62, SC  $-.55$ ; the STAI-Trait scale (Spielberger *et al.*, 1970), : CA .50, SA .37, SC  $-.46$ ; the Worry-Emotionality Inventory (Morris, Davis & Hutchings, 1981), a two-component state anxiety scale, WEI/Worry : CA .74, SA .57, SC  $-.62$ , WEI/Emotionality : CA .37, SA .82, SC  $-.40$ ; the STAI-State scale : CA .65, SA .78, SC  $-.66$  and the Affect Adjective Checklist (Zuckerman, 1960), a general state anxiety scale : CA  $-.63$ , SA  $-.66$ , SC .66; the Internal-External scale (Rotter, 1966), : CA .09, SA .11, SC  $-.17$ . Martens *et al.*'s (1989) paper should be consulted for a comprehensive account of the development and validation of the CSAI-2.

It was predicted that under competition stress:

a) Cognitive anxiety should show a more pronounced inverse relationship with problem focused control than with emotion focused control.

- b) Somatic anxiety should be more negatively related to emotion focused control than to problem focused control.
- c) Self confidence should be positively related to both SCI subscales.

#### 7.9.2 Cognitive Failures Questionnaire (CFQ)

The Cognitive Failures Questionnaire (Broadbent *et al.*, 1982) was developed to assess a number of cognitive 'lapses'. The CFQ is an index of perceptual, memory and action decrements. The authors suggest that people who exhibit high cognitive failure rates also tend to report a higher incidence of emotional symptoms. High CFQ scores were further suggested to indicate a 'vulnerability factor' which renders an individual more susceptible to stress effects.

Coefficient alpha for the 25-item questionnaire was .89 (N=98). Test-retest reliability for a number of subject groups were found to be as follows : over 21 weeks (N=57),  $r=.82$ ; over 65 weeks (N=32),  $r=.80$  and for a group of trainee nurses (N=73),  $r=.54$ , over a period of 16 months. For the latter group the CFQ was shown to be nearly as stable as more familiar scales generally regarded as trait measures (STAI-trait,  $r=.65$ ; Rotter's I-E scale,  $r=.69$ ; EPQ/N,  $r=.61$ ; EPQ/E,  $r=.72$  and EPQ/P,  $r=.55$ ).

Validation of the CFQ involved comparison with several other inventories related to indexing cognitive failure (Slips of Action, forms A & B,  $r=.57$  and  $r=.58$ , respectively; Absent Mindedness Questionnaire,  $r=.62$ ;

Forgetting scale of the Short Inventory of Memory Experiences,  $r=.59$ ). Additionally, product moment correlation coefficients were computed between the CFQ and a number of standard psychometric measures, including:- Rotter's I-E scale,  $r=.35$ ; STAI-trait,  $r=.31$ ; Adjective Checklist (Defenciveness),  $r=.24$ ; EPQ/N,  $r=-.27$ ; EPQ/E,  $r=-.11$ ; EPQ/P,  $r=.07$ ; EPQ/L,  $r=-.17$ . The closest relationship was that between the CFQ and the measure of externality of control (Rotter, 1966), which implied that the more influenced a person is by a belief in external controlling forces the less likely they are to employ appropriate cognitive strategies or use relevant information around them, thereby making them more susceptible to cognitive failure. The authors concluded that the CFQ was fairly uncontaminated by factors like defenciveness or social approval (EPQ Lie scale). See Broadbent *et al.* (1982) for relevant details.

Accepting that stress may have a greater effect on those who cannot cope as well cognitively as others, the following was predicted. The CFQ would demonstrate a negative relationship with the problem focused scale of the SCI and, in view of Broadbent *et al.*'s (1982) contention that high CFQ is associated with greater emotional symptomology, a negative relationship was also expected with the emotion focused control scale.

### 7.9.3 Locus of Control (LOC)

The Internal-External or Locus of Control scale developed by Rotter (1966) measures generalised expectancies with respect to internal versus external control of reinforcement. Those with an internal LOC believe reinforcements to be contingent upon their own behaviours or attributes. Externals tend to perceive outcomes as being contingent upon forces outside of themselves. An extensive literature has grown out of Rotter's theory of internality-externality and thorough reviews of the area and the development of the LOC scale can be found in Joe (1971), Lefcourt (1979) and Rotter (1966, 1976). From the LOC literature it appears theoretically reasonable to infer that those individuals with an internal control orientation should exhibit greater use of cognitive behavioural self-control methods (especially problem focused), than those with a more external orientation.

There have been many derivations of Rotter's original unidimensional scale (e.g. Levenson, 1973; Mirels, 1970; Reid & Ware, 1974; Wallston *et al.*, 1976). One such development was used in the present study. A modification of Coehlo's (1980) Multidimensional Health Locus of Control scale was employed. This scale was designed to measure three separate dimensions of locus of control related to health behaviour, namely, internality, powerful others externality, and chance externality. For present purposes the scale's wording was slightly altered to refer to sport performance locus of control beliefs

and thus make it more relevant to the subjects (who were mainly sport performers), in the validation phase. Examples of item changes for the internal (I), powerful others (PO), and chance (Ch), subscales respectively were as follows : from the original "If I take the right actions I stay healthy" to "If I take the right actions I maintain good performance" (I). From "Having regular contact with my physician is the best way for me to avoid illness" to " Having regular contact with more experienced performers and my coach is the best way for me to avoid poor performances" (PO) and finally, from "If it's meant to be I will stay healthy" to "If it's meant to be I will perform well" (Ch).

It was predicted that under stress subjects high on internal control would demonstrate greater state self control (especially problem focused control), than externals who were expected to show greater emotion focused control. The reasoning behind this prediction was that, because of their hypothesised tendency to percieve situations being beyond their personal influence, externals would rely more on emotional regulation as a means of coming to terms with any demanding circumstances encountered.

#### 7.9.4 Spheres of Control (SOC)

The spheres of control battery (Paulhus & Christie, 1980), entails the partitioning of a person's life-space into primary behavioural spheres. Three distinct domains

were proposed, each representing a particular confrontation with the world. The first domain concerns attempts at control in non-social situations involving personal achievement and is termed Personal Efficacy (PE). A second domain, termed Interpersonal Control (IP) refers to interactions with others. Perceived control in the third domain is called Socio-political Control (SP) reflecting transactions with the political or social system. The contention is that a person may have different expectancies of control within these three domains and that these expectancies fluctuate according to changing context. Thus, a person may fail to find the means for control in one sphere but find it in another, for example, a person might deduce that she has no personal control over a situation but she does have recourse to socio-political channels in order to create change. This is a considerable departure from the traditional stable and generalised beliefs about ones agency in the world embodied in Rotter's (1966) locus of control construct. More recently, Fisher (1986) provided strong arguments in support of the SOC idea and incorporated the spheres of control concept in a hierarchical model of processes involved in the perception of control.

Alpha reliabilities for the subscales range from .75 to .80 and test-retest correlations at 4-weeks were  $>.90$ , and at 6-months were  $>.70$ , for all three subscales. A number of individual difference measures were included in the validation process of the SOC scales. These were

Rotter's I-E scale; the Mach V scale of Christie & Geis (1970) and the Marlowe-Crowne Social Desirability scale. Furthermore, the SOC was used successfully to predict the unique control profiles of athletic and non-athletic groups, thereby supporting its construct validity. Comprehensive coverage of the SOC battery's development and validation can be found in Paulhus (1983) and Paulhus & Christie (1980). In the validation studies of the SCI the socio-political control scale of the SOC was omitted because it was deemed less relevant to the specific situations that subjects experienced. The following predictions were made for the SOC-SCI relationships.

- a) Subjects showing an internal orientation on either scale were anticipated to exhibit more problem focused control whereas externals would demonstrate less problem focused and more emotion focused control.
- b) Subjects with the highest PE scores were expected to be more aware of personal control skills and more likely to use them in stressful situations. Therefore, they should exhibit the greatest overall use of self-control skills.
- c) High scorers on the interpersonal control scale were also expected to report higher state self control on the SCI subscales than low IP subjects.

#### 7.9.5 Self Control Schedule (SCS)

This self report instrument (Rosenbaum, 1980a),



assesses dispositional tendencies to employ cognitive self-control strategies in the solution of behavioural problems. Self-controlling responses are considered to be elicited by internal events such as anxiety, pain or negative thoughts which might disrupt effective performance. The self-control behaviours assessed by the SCS were derived from the literature on stress management methods (e.g. Lazarus, 1976), and the various coping skills therapies devised by cognitive behaviour modifiers (e.g. Goldfried & Goldfried, 1975; Mahoney, 1974; Meichenbaum, 1977); that is to say, much the same literature as the state Self-control Inventory.

The test-retest reliability of Rosenbaum's' SCS was  $r=.86$ , ( $p<.01$ ), over a 4-week period ( $N=82$ ) and alpha coefficients (Kuder-Richardson Formula 20), obtained for five samples (total  $N=657$ ), were .81, .80, .84, .78 and .80, thus demonstrating satisfactory internal consistency. The SCS was validated through comparison with a number of conceptually related scales (Locus of Control scale, Irrational Beliefs Test, MMPI, and Cattell's 16PF), and behavioural measures of self-control: see Rosenbaum (1980a, 1980b) for greater detail. The utility of the SCS has been further demonstrated in a number of studies examining self-control in relation to cold pressor toleration (Rosenbaum 1980a), chronic headache, (Courey et al., 1982), objectively uncontrollable situations (Rosenbaum & Ben-Ari, 1985), coping with sea-sickness (Rosenbaum & Rolnick, 1983), trait anxiety effects upon parachute training performance

(Gal-Or *et al.*, 1985), the prediction of response to cognitive therapy for depression (Simons *et al.*, 1985), health related behaviour (Katz & Singh, 1986; Rosenbaum & Ben-Ari Smira, 1986), and coping with epilepsy (Rosenbaum & Palmon, 1984). The results of the above studies suggest that those measured as high in self-control on the SCS possess a rich behavioural repertoire of cognitive skills that facilitates their coping with emotional and physiological responses as well as enhancing task orientation and performance.

It was predicted that high self-control subjects (measured on the SCS), would score higher than low self-control subjects on both scales of the state self-control inventory, that is to say, they would demonstrate a greater tendency to employ both problem focused and emotion focused self-control strategies under stressful conditions.

#### **7.10 Validation : Subjects and Events**

The SCI forms and related self-report measures were administered to a total of 85 sports performers. They were engaged in a variety of sports and experienced a number of different stressful events. The breakdown of the groups was as follows :

- a) Basketball players competing in national university and important North Wales competitions (N=23).
- b) Women soccer players competing in the 1988 Universities Athletic Union national 5 a-side championships (N=12).

- c) Archers competing in the North Wales Archery Championships (N=9).
  - d) Hockey players competing in the 1988 Universities Athletic Union hockey championships (N=7).
  - e) Judoka competing in the 1988 University of Wales' Judo championships (N=8).
  - f) Rowers racing in the 1988 internationally attended 'Head of the Rivers Race', Tidesway, the largest of its kind in Europe (N=16).
  - g) Physical Education students participating in a compulsory gymnastics assessment before a small audience (N=10).
- Total N=85. Female N=38, Male N=47.

State scales (SCI and CSAI-2), were group-administered between 1 hour and 10 minutes prior to each event, and between 10 minutes and 1 hour after the event. Subjects also rated their degree of satisfaction with both their performances and the performance outcome post-event. Trait measures were taken at least 2 weeks prior to, or 2 weeks following, an event. In completing the trait-like measures, no reference was made to any event in particular - emphasis was placed on subjects completing the scales in terms of how they generally felt or acted.

Initially, Pearson's correlation coefficients were calculated for the data (see Table 7.2). The data were then further analysed by performing median split analyses on each of the validating scales. Scores above the median were designated the 'high' group and those below it were assigned to the 'low' group for each measure. One-tailed t-tests were then performed for each of the SCI subscales. Support was given for a number of the

hypothesised relationships between both state and trait measures and the SCI. However, some unexpected and interesting results also emerged.

#### 7.10.1 Pre-event SCI-1/CSAI-2

- a) *Cognitive anxiety* : The prediction that cognitive anxiety (CA) would show a pronounced inverse relationship with problem focused control was not upheld. However, CA was significantly negatively related to emotion focused control ( $r=-.439$ ,  $p<.001$ ). The median split analysis of these data also indicated that the low CA subjects reported significantly greater emotion focused control than those high in CA ( $t=3.83$ ,  $df=84$ ,  $p<.0005$ ).
- b) *Somatic anxiety* : The predicted relationship was well supported, with SA negatively related to emotion focused control ( $r=-.472$ ,  $p<.001$ ). No relationship with problem focused control emerged. Subjects in the high SA group also showed significantly less emotion focused control than those in the low SA group ( $t=3.87$ ,  $df=84$ ,  $p<.0005$ ).
- c) *Self-Confidence* : The anticipated relationship was observed for both problem and emotion focused control ( $r=.215$ ,  $p<.05$  and  $r=.730$ ,  $p<.001$  respectively). The high SC group also demonstrated significantly greater emotion focused control than the low group ( $t=6.40$ ,  $df=84$ ,  $p<.0001$ ), and significantly more problem oriented control than low SC subjects ( $t=2.30$ ,  $df=84$ ,  $p<.03$ ).

**Table 7.2 : Intercorrelations Between the SCI and Validation Scales**

	<b>Pre-event Problem Focused Control</b>	<b>SCI-1 Emotion Focused Control</b>	<b>Post-event Problem Focused Control</b>	<b>SCI-2 Emotion Focused Control</b>
<i>Pre-event CSAI-2</i>				
<b>CA</b>	-.024	-.439***	.004	-.245**
<b>SA</b>	.097	-.472***	.092	-.170
<b>SC</b>	.215*	.730***	.161	.222**
<i>Post-event CSAI-2</i>				
<b>CA</b>	.051	-.184*	-.247**	-.659***
<b>SA</b>	.171	-.222*	-.088	-.459***
<b>SC</b>	.043	.311**	.297**	.619***
<b>Performance Satisfaction</b>	.140	.172	.456**	.710***
<b>Outcome Satisfaction</b>	.010	-.100	.194*	.569**
<b>CFQ</b>	-.115	-.399***	-.336***	-.246**
<b>SOC Personal Efficacy</b>	.234**	.441***	.472***	.342***
<b>Inter- personal Control</b>	.220*	.115	.217*	.206*
<b>LOC Internal</b>	.192*	.389***	.433***	.333***
<b>Powerful Others</b>	.018	.063	-.068	-.060
<b>Chance</b>	-.162	-.274**	-.109	-.082
<b>Self-Control Schedule</b>	.180	.277**	.187	.188

(\*= $p < .05$ ; \*\*= $p < .01$ ; \*\*\*= $p < .001$ ).

## 7.10.2. Post-event SCI-2/CSAI-2

a) *Cognitive anxiety* : As predicted, problem focused control demonstrated a significant negative correlation with CA ( $r=-.247, p<.01$ ). However, once again, emotion focused control was seen to be strongly inversely related to CA ( $r=-.659, p<.001$ ). The low CA group reported significantly greater use of problem focused control than did the high CA group ( $t=3.10, df=84, p<.003$ ). The low CA group also showed significantly higher emotion focused control than the high CA subjects ( $t=6.80, df=84, p<.0001$ ).

b) *Somatic anxiety* : The expected negative correlation between SA and emotion focused control was obtained ( $r=-.459, p<.001$ ). No relationship with problem focused control emerged. High SA following an event was reflected by lower emotion focused control ( $t=3.60, df=84, p<.0007$ ). Thus, those low in SA reported using greater emotion focused control during the event and less emotional disturbance following it.

c) *Self-confidence* : Self-reports of problem and emotion focused control correlated in the hypothesised way with self-confidence ( $r=.297, p<.01$  and  $r=.619, p<.001$ , respectively). The high SC group were significantly more emotionally controlled during and after their events than the low SC group ( $t=5.74, df=84, p<.0001$ ). Similarly, those highest in SC also reported greater use of problem focused control than low SC subjects ( $t=2.80, df=84, p<.007$ ).

### 7.10.3 SCI-2/Performance Satisfaction

Both problem focused and emotion focused control were strongly related to performance satisfaction reported post-event ( $r=.456$ ,  $p<.01$  and  $r=.710$ ,  $p<.001$ , respectively). High performance satisfaction subjects were higher in problem focused control than those not satisfied with their performances ( $t=3.25$ ,  $df=84$ ,  $p<.002$ ). In the same way, those satisfied with their performance reported significantly higher emotion focused control than low performance satisfaction subjects ( $t=7.53$ ,  $df=84$ ,  $p<.0001$ ).

### 7.10.4 SCI-2/Outcome Satisfaction

Outcome satisfaction also demonstrated significant positive relationships with both problem and emotion oriented control ( $r=.194$ ,  $p<.05$  and  $r=.569$ ,  $p<.001$  respectively). However, only emotion focused control was significantly higher for those highly satisfied with the outcome of their performance ( $t=5.54$ ,  $df=84$ ,  $p<.0001$ ).

Note: No relationship between the pre-event SCI-1 subscales and either of the satisfaction measures emerged.

### 7.10.5 SCI/Cognitive Failures Questionnaire

*SCI-1/CFQ* : A low negative Pearson's  $r$  was observed for the problem focused subscale ( $r=-.115$ ). This was non-significant but in the predicted direction. Emotion focused control was found to be significantly negatively related to CFQ ( $r=-.399$ ,  $p<.001$ ). This relationship was

reflected by high scorers on the CFQ (i.e. those tending to exhibit a greater number of cognitive lapses) reporting significantly less emotion focused control prior to an event than the low CFQ group ( $t=3.53$ ,  $df=84$ ,  $p<.0008$ ).

*SCI-2/CFQ* : Problem focused control showed the predicted negative relationship with CFQ ( $r=-.336$ ,  $p<.001$ ). A negative correlation was also found for emotion focused control

( $r=-.246$ ,  $p<.01$ ). The high CFQ subjects reported significantly less use of both problem focused control ( $t=2.10$ ,  $df=84$ ,  $p<.04$ ), and emotion focused control ( $t=2.28$ ,  $df=84$ ,  $p<.03$ ), than those scoring low on the CFQ.

#### 7.10.6. SCI/Locus of Control

*SCI-1/Internalness* : Both problem and emotion focused subscales were positively related to internalness ( $r=.192$ ,  $p<.05$  and  $r=.389$ ,  $p<.001$  respectively). However, the high internal group showed significantly greater use of self-control skills than low internals only for emotion focused control ( $t=2.95$ ,  $df=84$ ,  $p<.005$ ).

*SCI-2/Internalness* : Emotion and problem focused control were both found to be positively related to internalness ( $r=.333$ ,  $p<.001$  and  $r=.433$ ,  $p<.001$  respectively).

However, only high internals reported the use of significantly greater problem focused control during the event than low internals ( $t=2.43$ ,  $df=84$ ,  $p<.02$ ).



The notion that externals (low internals), should exhibit greater emotion focused control under stress was not upheld. In fact a trend for the converse was found, that is to say, there was a tendency for a positive relationship between internality and the reported use of self-control skills, be they problem oriented or emotion oriented. Consequently, the prediction that individuals with an internal control orientation should exhibit greater use of personal control strategies than those with an external orientation was, at least, partially supported.

*SCI-1 & 2/Chance* : Although there was a tendency towards a negative relationship between chance external locus of control and state self-control under competitive pressure, only the correlation between pre-event emotion focused control and the chance subscale reached significance ( $r=-.274$ ,  $p<.01$ ). This suggested, that for these subjects, a higher reliance on external forces such as luck or fate was accompanied by a lesser tendency to operate problem and emotion focused control. This was also significantly demonstrated by the high chance group compared to the low chance group ( $t=2.00$ ,  $df=84$ ,  $p<.05$ ).

*SCI-1 & 2/Powerful Others* : No significant relationships emerged. It appears that reliance on the influence of powerful others such as coaches or more experienced performers bears little relationship, in this instance, to the utilization of self-control skills. It is worth noting that the active seeking of advice from others

about, say, an upcoming event could be a positive problem focused strategy. This aspect was not, however, measured by the SCI.

#### 7.10.7 SCI/Spheres of Control

*SCI-1/Personal Efficacy* : The hypothesised relationships were obtained for both problem and emotion focused control ( $r=.234$ ,  $p<.01$  and  $r=.441$ ,  $p<.001$  respectively). There was strong support for the prediction that subjects with the highest personal efficacy scores should exhibit greater use of self control skills; problem focused ( $t=3.46$ ,  $df=84$ ,  $p<.0009$ ), and emotion focused ( $t=5.50$ ,  $df=84$ ,  $p<.0001$ ).

*SCI-2/Personal Efficacy* : Once more the prediction that problem and emotion focused control should be positively related to PE was confirmed ( $r=.472$ ,  $p<.001$  and  $r=.342$ ,  $p<.001$ , respectively). The high PE group reported significantly greater problem focused ( $t=4.04$ ,  $df=84$ ,  $p<.0002$ ), and emotion focused control ( $t=2.31$ ,  $df=84$ ,  $p<.03$ ).

*SCI-1 & 2/Interpersonal Control* : Correlations were in the predicted direction and, with the exception of pre-event emotion focused control, significant but weak. Pre-event problem focused control gave  $r=.220$  ( $p<.05$ ), emotion focused control  $r=.115$  (ns), post-event problem focused control  $r=.217$  ( $p<.05$ ), and emotion focused control  $r=.206$  ( $p<.05$ ). Only post-event emotion focused control demonstrated any significant difference between groups high and low in interpersonal control. High IC

subjects reported significantly greater emotion focused control during their events than low IC subjects ( $t=2.28$ ,  $df=84$ ,  $p<.03$ ).

#### 7.10.8 SCI/Self Control Schedule

*SCI-1 & 2/SCS* : The results in this case were perhaps the most disappointing. The anticipated relationships were observed between the SCI and SCS but on the whole they were weak. Both the post-event subscales narrowly missed significance at the 5% level: problem focused control,  $r=.187$ ,  $p=.059$ , and emotion focused control,  $r=.188$ ,  $p=.058$ . Neither demonstrated differences between high and low SCS groups. Consequently, the anticipated strong correlations were not realised and only emotion focused control reported pre-event reached significance ( $r=.277$ ,  $p<.01$ ). Here, subjects in the high SCS group also demonstrated significantly greater use of emotion focused control than those scoring low ( $t=2.62$ ,  $df=84$ ,  $p<.02$ ).

These results, while not supportive of the predictive validity of Rosenbaum's (1980a) Self Control Schedule were not altogether untoward since it has been suggested that highly salient situational cues may 'override' general dispositional tendencies to respond (e.g. Folkman, 1984; Rotter, 1966 and 1975). In this instance, it is suggested that dispositional self-control as measured by the SCS had less significance for these subjects under competitive and evaluative stress than did state self-control beliefs and coping efforts.

### 7.11 Discussion

The predicted relationships between the conceptually related self-report measures and the SCI were broadly realised. Having said this however, a number of unpredicted, perhaps anomalous findings emerged which run a little contrary to reports in the literature. Pre-event cognitive anxiety (concerns with failure on the task), was hypothesised to interfere with cognitions or state self-control beliefs directed at facilitating effective task performance, i.e. problem focused control. This position was not supported. However, post-event cognitive anxiety demonstrated the hypothesised inverse relationship with problem focused control. Conceivably, the control responses (or lack of them), directed at the situation's demands elicited differential cognitive preoccupation with whether these task-relevant demands were effectively met or not. Thus, it appears that low post-event cognitive anxiety was associated with the perception that appropriate task directed self-control strategies were used during the event (which in itself reflects upon one's coping competence). Additionally, if problem focused control was low and performance suffered then this and the subsequent percepts of low control over what was an important situation may have contributed to the evocation of worry following the event.

The analysis of median-split data for the SCI-2 subscales on both satisfaction scores tends to support the above. The median-split of the performance satisfaction data also revealed that, compared to the low

performance satisfaction group, high performance satisfaction subjects used significantly greater problem focused control. Greater satisfaction with one's performance suggests positive appraisals of how one coped with the task and the emotional demands of the event, and implies less worry about one's competence in the face of these demands.

The strong inverse correlation between both pre- and post-event cognitive anxiety, and emotion focused control was somewhat unexpected, though not the anomaly it might seem. It was observed that those high in cognitive anxiety reported low emotion focused control during the course of the event. This is particularly significant when one considers that high somatic anxiety before and after the event was also associated with lower emotion focused control. It is suggested that, in this instance, elevated somatic anxiety resulting from an inability to manage or reduce physiological arousal served as a conditional stimulus for the elevation of cognitive anxiety. A number of researchers have suggested that a 'reason to worry' may be conditioned to the perception of somatic reactions (e.g. Borkovec, 1976; Smith, 1986). An alternative explanation might be that subjects' general pre-event strategy was to focus on emotional control, and that both cognitive and somatic anxiety interfered with this.

Martens *et al.*'s (1989) self-confidence subscale, both pre- and post-event, upheld the hypothesised relationships. Those high in self-confidence reported

significantly greater mobilization of self-control skills than those low in self-confidence. In terms of the validity of this study, these results offer good support for the concurrent validity of the SCI because confidence prior to competition was paralleled by self-control beliefs indexed by the SCI-1. In a similar respect, self-confidence following the event was positively related to the amount of self-control reported to have been used during them. Therefore, the high self-control group were more confident both before and after their events than the low self-control group. Emotion focused control demonstrated the strongest relationship which adds weight to the suggestion that a belief in, and the use of, appropriate personal control behaviours targeted at emotional responses may be an important factor in developing situational self-confidence. This has implications for mobilizing cognitive skills directed at the demands of a particular task. That is, in the present study, emotion focused control was by far the most significant aspect of the subjects' encounters with stressful competitive environments and most strongly associated with both performance and outcome satisfaction. It was found that subjects reporting high emotional control during and after their events were more satisfied with the outcome of the event than the low emotion focused group irrespective of whether they won or lost. This relationship was not obtained for problem focused control. Whether or not emotion focused control was used in a 'defensive' capacity, when negative

outcomes were experienced, was not explored in this investigation; however, it remains a plausible explanation worthy of further attention.

It is tentatively suggested that emotion focused control occupies this important position because a certain level of emotional regulation is necessary under competitive anxiety before problem focused behaviours can be operated effectively. Thus, high physiological arousal may have 'direct hit' effects upon performance (Easterbrook, 1959; Fisher, 1986; Humphreys & Revelle, 1984) via, for example, on short-term memory or the distracting effects of negative affect (Mandler, 1975; Wine, 1971). Furthermore, these 'direct-hit' effects could disrupt the recall, organization and execution of appropriate performance-task related cognitive efforts, so that performance deteriorates. Emotion focused control could go some way to alleviating these consequences.

The various other conceptually related dispositional measures also offered support for the construct validity of the SCI. The Cognitive Failures Questionnaire (CFQ), developed by Broadbent *et al.* (1982) was predicted to be most strongly related to problem focused control since the CFQ is an index of perceptual, memory and action lapses, i.e. the tendency to suffer decrements in the performance of given tasks. The group assigned by high CFQ scores (demonstrating significantly more cognitive lapses) reported using significantly less problem focused control during and after events. One explanation of the

lack of significant differences in problem focused control between high and low CFQ groups before the event is that prior to a stressful event a person may feel that, despite previous cognitive failures, they are no less able to cope with the problems of the task ahead than anyone else. However, after the event when they have appraised what they have done, these high CFQ subjects may perceive themselves to have been unable to focus on the problem of the task as well as the more proficient low CFQ group. This suggests that people with a high rate of cognitive failure may well not appraise a situation in accordance with this tendency. They may still believe that they will be able to apply themselves to the demands of a specific task. It is worth recalling that CFQ scores refer to general failures in the past rather than to failures in a task which is specifically targetted in advance. Alternatively, CFQ scores may simply reflect subjects' perceptions of their previous performances; that is to say, high CFQ scorers may not actually have any more cognitive failures than low CFQ scorers. They may simply be more self-conscious about them.

The essential nature of emotion focused control is again emphasised, high CFQ subjects may have believed that they had problem focused control before a demanding event but they could not attend to the problem sufficiently well because they did not have effective emotion focused control.

Prior to the event, only emotion focused control was significantly related to CFQ score with lower emotional



control exhibited by the high CFQ group. Recall that lower emotional control was associated with higher somatic anxiety or emotionality. This is in line with Broadbent *et al.*'s (1982), contention that those reporting high cognitive failure rates also tend to report higher incidence of emotional symptoms. These results are taken as supportive of the SCI's construct validity. The notion that high CFQ scores indicate a 'vulnerability' factor whereby an individual is more susceptible to stress effects is borne out by this study. It is reasonable to assume that a poorly stocked or operated repertoire of cognitive behavioural self-control skills could be instrumental in rendering a person more prone to the negative effects of stressful circumstances. It is also worth noting the fact that emotion focused control once more plays an important part in the observed relationships. Again, this may be indicative of the need for a certain minimal level of emotional control to 'quiet' the physiological/somatic systems, and percepts thereof, before effective problem focused efforts can be used.

Further strong supportive evidence was found with the personal efficacy subscale of the Spheres of Control battery (Paulhus & Christie, 1980). High personal efficacy was predictive of significantly higher state self-control than low personal efficacy on both the SCI-1 and the SCI-2. High personal efficacy denotes a high internal locus of control, the generalised expectancy

that outcomes are contingent upon one's own behaviours. It was predicted that this group would be more aware of their own control capability under competitive stress and would show the greatest use of self-control skills in order to influence the outcome of their performance. Low personal efficacy scores reflect greater externality (Paulhus & Christie, 1980). The locus of control literature suggests that under stressful circumstances externals will tend to be less inclined to problem focused efforts, since they hold the belief that what happens is generally "in the lap of the gods" or depends on luck, fate etc, (2) and should tend toward more emotion oriented coping (Davis & Phares, 1967; Gore & Rotter, 1963; Houston, 1972; Strickland, 1978). This was not observed in the present study. Externals (Low PE group), tended to report significantly less use of cognitive self-control strategies (both emotion and problem focused) than internals. This is intuitively appealing since an external orientation might lead a person to 'accept' non-contingency between his or her actions and their consequences, and thus not actively mobilize self-control to any great extent (at least not in the modes measured by the SCI scales). It is also possible that an external orientation to the world, acquired through life experiences might mean that adequate self-control skills have not been developed, or

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(2) The proviso must be added, that the situationally specific perception of control will play a major part in determining whether or not there is congruence between locus of control tendency and the reaction to the situation as suggested in the literature.

that the knowledge of how to apply them is incomplete. This proposed 'acceptance' of or 'acquiescence' to powerful external forces (which may require some form of emotional control) is not tapped by the items of the SCI, which tend to be more concerned with active efforts at self-control in relation to a specific task.

Interpersonal control expectancies, as measured by the SOC battery, were also positively related to state self-control but in general these predicted relationships were low. Only post-event reports of emotion focused control demonstrated a significant effect for group. The low correlations can be partially explained in terms of the orientation of the interpersonal control and the SCI items. The former are directed at general beliefs about one's effectiveness in influencing others whereas the SCI is primarily concerned with self- or task-targeted behaviours. Presumably, to influence others one must possess a modicum of self-control, hence the low correlations.

Locus of control was measured using a modification of Coelho's (1980) Multidimensional Health Locus of Control scale so that the items related to generalised beliefs about a person's agency in his or her sport performance. As expected internality was significantly positively related to state self-control on both SCI forms. A significant group difference was observed between low and high internals for pre-event emotion focused control (i.e. state beliefs about preparation and anticipated control over one's emotional responding), and

retrospective reports of problem focused control. The high internals perceived themselves to have done something to influence the problem situation. One possible explanation for the lack of significant difference between high and low groups in emotion focused control reported after their event is as follows. The suggestion is that an internal locus of control influences one to believe that one has control over oneself emotionally (pre-event SCI-1), but that this does not necessarily translate into greater emotional control during the event. Nevertheless, internality may lead one to believe that one did have more control over the outcome experienced, the circumstances that occurred during the stressful situation, and the way in which those circumstances arose, i.e. in terms of the problem.

These results therefore suggest that not only do internally oriented individuals tend to use personally referenced cognitive skills more, but also that emotion focused control beliefs and efforts prior to a significant event are possibly important precursors for more effective allocation of coping resources to task demands during the event. Chance external orientations tended to be accompanied by fewer personal control efforts under competitive stress. This was also in line with the findings for low personal efficacy reported above. In spite of the finding that high scores on the chance scale corresponded to significantly less pre-event emotion focused control than low scores, it is difficult

to infer that externally oriented individuals do not use self-control skills in stressful circumstances. It may well be that they resort to more passive, accepting forms of control (see, for example, Piper & Langer, 1986; Rothbaum *et al.*, 1982).

The powerful others subscale of the LOC inventory was unrelated to SCI scores. One could take this to indicate that acquiescing to the control of others may be less relevant to the use of state self-control in this domain of human endeavours than other pre-dispositions. However, it is more probable that a person could believe in the existence of powerful others without acquiescing to them, which is what the lack of relationship between the SCI and the powerful others subscale more realistically suggests. Furthermore, if people who align themselves with powerful others do not mobilize self-control skills, but people who do not believe in powerful others do mobilize self-control skills, then a relationship between the SCI and powerful others should have emerged. Of course, in some circumstances, acquiescing to powerful others may be quite an effective self-control strategy, depending upon one's reason for doing it, e.g. "she has knowledge I can use" or "she is powerful, I must obey".

The predictive validity of Rosenbaum's (1980a) Self Control Schedule based on the conceptualization of self-control as a learned predisposition to possess and employ a rich repertoire of self-control skills was only weakly supported. Thereby the concurrent validity of the SCI was

also somewhat damaged. The correlations obtained were in the predicted direction but were much weaker than anticipated. High and low SCS subjects differed significantly only in the use of emotion focused control reported pre-event. The SCS predicted how subjects may have felt about the situation but failed to predict problem oriented expectancies. To be fair, positive relationships between the SCS and the SCI-2's subscales did border on the 5% level of significance which suggested that it did go some way towards predicting what subjects did about the performance situation and their emotional control during and after competition. However, on the whole these results were disappointing.

It could be argued that the relatively weak relationship between the SCS and the SCI subscales was due to the situationally specific nature of the state measure; i.e. competitive and evaluative sports situations compared to the SCS's focus on generalised self-control. This said, the data obtained from the other validation scales tends to demonstrate the hypothesised relationships between these and the SCI subscales. In this study, the SCS does not seem to have provided all the information about self-control that was required. The events seem to have been heavily concerned with emotion focused control and the SCS was not quite sensitive or representative enough to predict such emotion focused control behaviour.

### 7.11.1 Methodological Issues

Having completed the research described above a number of associated methodological problems became apparent over and above the considerations, such as non-random sampling, detailed in Chapter 6. Firstly, it could be argued that the item to subject ratio (1:3) for the factor analyses of the prototype Self Control Inventory (SCI) scales was not sufficient to give statistical integrity to the results. A ratio of at least one item to five subjects is considered adequate. This is because, with smaller ratio's, the influence of relationships based on random patterns within the data is more pronounced (Munro, Visintainer and Page, 1986). Secondly, no confirmatory factor analysis was carried out on the final pre- and post-event SCI scales to establish whether or not the original factor structure had been maintained. Thirdly, during the validation process, only convergent validity was assessed through comparison of the SCI with conceptually related scales. No attempt was made to determine discriminant validity nor social desirability effects.

### 7.12 Conclusion

To conclude, the evidence from this study generally supports the construct validity of the SCI. There is the suggestion that people with a high incidence of cognitive failure are not good at emotion focused control under stressful conditions, and emotional factors may well influence the occurrence of such lapses. Overall, it

appears that on the day of these competitive situations the overriding stress response was an emotional one. This suggests that there is a need for a certain amount of emotion focused control before the problem situation's demands can be addressed. The potential for teasing out, temporally, the intricacies of cognitive behaviour under competitive or other stress is alluring and more possible today (e.g. Martens *et al.*, 1989; Parfitt & Hardy, 1987). Obviously, more empirical investigation using the SCI is necessary to evaluate its reliability and worth in this respect.

If situation specific beliefs about state controllability are important factors in influencing the operation of appropriate control responses, then flexible switching of the focus of control is conceivably essential for the congruence of intention, action and outcome. The process of changing the focus of control across the timescale of specific events is considered briefly in the following section and more extensively in the next chapter.

### 7.13 Further Validation of the Self Control Inventory

The SCI was used in a further study as a test of its concurrent validity. Very brief coverage will be given here.



### 7.13.1 Examination Stress Pilot Study:

Fifty two undergraduate students engaged in their end of year examinations completed the SCI-1 and the Worry-Emotionality Inventory (WEI; Morris, Davis & Hutchings 1981), 5 to 10 minutes prior to entering the examination hall. The WEI comprises two subscales indexing Worry (cognitive anxiety) and Emotionality (somatic anxiety), and as such has been used to measure state test anxiety. Following the examination each student completed items of the SCI-2 in relation to identified "critical points" during the examination. This was a pilot study based on suggestions which evolved from the development of the SCI regarding the 'switching' of the focus of control in response to particularly significant points during performance. Subjects retrospectively reported two points that occurred during their examination at which they perceived their performance to have changed for the better and for the worse, respectively. SCI-2 items were completed with reference to the subject's behaviour immediately before and after these perceived points of change.

A correlational analysis revealed similar results to those obtained for the SCI/CSAI-2 comparison reported in Chapter 5. The SCI subscales showed significant moderate to strong negative relationships with the WEI subscales. Emotion focused control was strongly negatively related to emotionality as predicted ( $r=-.744$ ,  $p<.001$ ). Problem focused control and worry were also robustly related, ( $r=-.589$ ,  $p<.001$ ). Emotion focused control was also

negatively correlated with worry ( $r=-.543$ ,  $p<.001$ ), a relationship which was not anticipated to be so strong but was not altogether surprising in view of the suggested importance of emotion focused control in performance environments (See Chapter 5; Table 2; pages 25 and 31-35). A low to moderate significant correlation emerged between problem focused control and emotionality ( $r=-.269$ ,  $p<.03$ ). These results provided further support for the concurrent validity of the SCI.

Although there were a number of reservations regarding this pilot work which attempted to examine the hypothesised fluctuation about subjective critical points, some interesting results did emerge from the data. The emotion focused and problem focused control data were analysed using separate single factor ANOVA's with repeated measures over time. Significant 'time' effects were revealed for both problem focused control,  $F(4,153)=15.03$ ,  $p<.001$ , and emotion focused control,  $F(4,153)=4.61$ ,  $p<.005$  (See Figures 7.1 and 7.2). Statistical details are given in Appendix Ic.

7.13.2 Problem Focused Control : At time 3, just prior to the point at which a change for the better was perceived, Tukeys post-hoc test revealed that problem focused control was significantly lower than at any other time.

7.13.3 Emotion Focused Control : Post-hoc tests showed that emotion focused control at time 2, the point which followed a perceived drop in performance, was

significantly higher than at any other time. No significant differences were observed between any of the other measurement times.

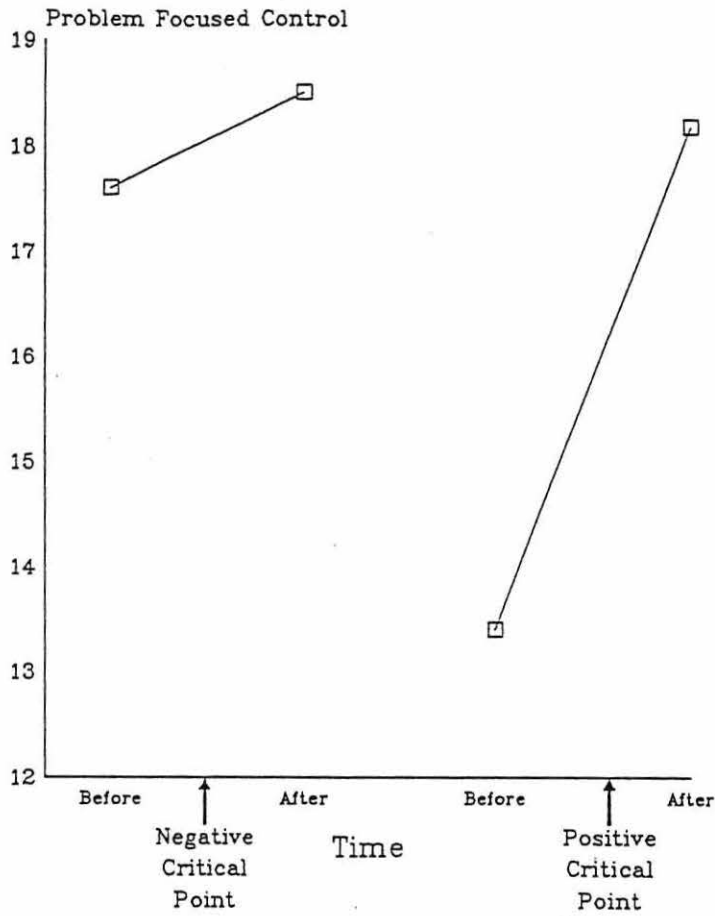
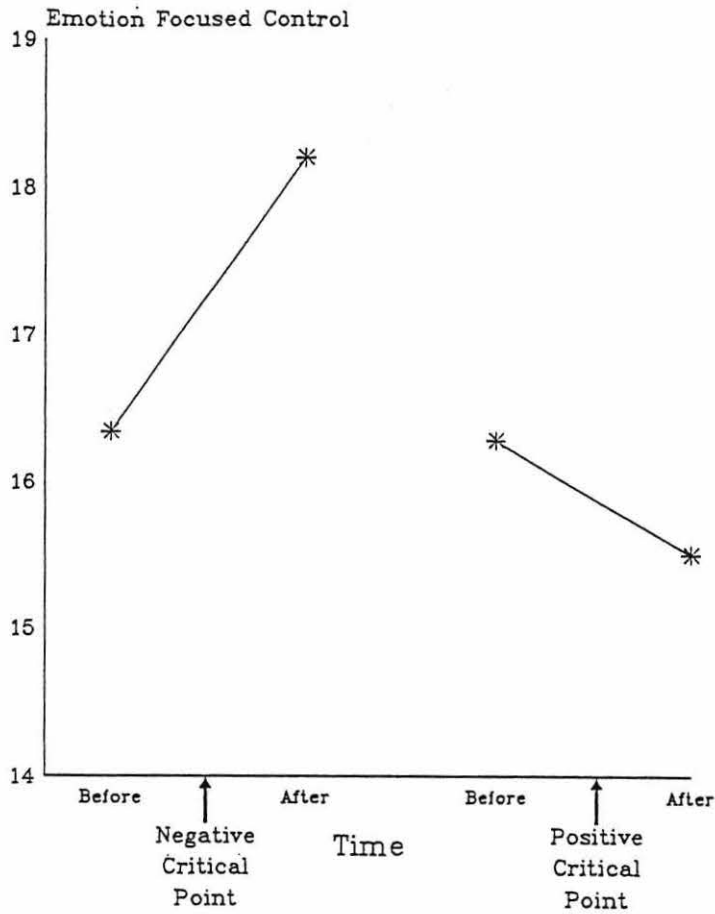


Figure 7.1 : Problem focused control in relation to perceived critical points during examination performance



**Figure 7.2 :** Emotion focused control in relation to perceived critical points in examination performance

These results suggest that following a detrimental critical point, emotion focused control rose significantly accompanied by a significant drop in problem oriented efforts. At face-value it could reasonably be inferred that there was a strategic shift in the focus of control in response to changed subjective demands. Indeed, it is tempting to propose that a switch in the focus of control did occur between the critical points, whereby problem focused control was decreased in favour of emotion focused control following the point at

which a downturn in performance was perceived. Emotion focused control may have been necessary to regain composure after a period of 'panic' following the performance drop. When the affective and physiological reactions to the crisis had abated, performance improved, emotion focused control was no longer needed to such a great extent, and the task of getting on with answering the examination questions was reflected by an increase in problem focused control.

Whilst the above results are encouraging there are a number of points of caution that should be highlighted. Firstly, there was no attempt made to ascertain whether or not actual performance did demonstrate noticeable points of change which in any way reflected the perceived critical points. In fact, this would have been methodologically extremely difficult in view of the nature of the performance variable used in the study. Secondly, only two critical points were identified on the form; presumably there could have been any number of 'ups and downs' over the course of three hours. Finally, with respect to Figures 7.1 and 7.2 above, it is necessary to highlight the fact that the actual time between identified critical points varied enormously, i.e. from less than a minute to over 2 hours. This was reflected by great disparity in the actual times at which the first of these critical points was indicated, for some subjects it was as the exam started, for others it was before the examination, and for still others it was well into the exam. In a similar fashion, the second critical point

could come at any time later. Because of this, it was impossible to discern how long problem focused control had been decreased when it was recorded at time 3, or whether it had fluctuated during this time. Similarly, it was not possible to tell whether emotion focused control stayed high and relatively stable after time 2 until falling at time 3. These problems notwithstanding, there does seem to be some credence in the idea that control strategies change in response to performance catastrophes and that further research into this area is warranted. Work on the examination of performance catastrophes and their associated psychological concomitants has recently been carried out by Hardy and associates with some success (Fazey & Hardy, 1988; Hardy, Parfitt & Pates, 1990). To this end, the experiment reported in Chapter 8 employs a catastrophe paradigm to examine further the relationship between anxiety, perceptual-motor performance and self-control.

## CHAPTER 8

### Catastrophe Experiment

#### SELF-CONTROL AND PERFORMANCE

##### 8.1 Introduction

Ideas about the relationship between self-control and performance under stressful conditions emerged following the development and administration of the state oriented Self Control Inventory and the pilot study reported at the end of Chapter 7. In that series of studies it was found that emotion focused control held great significance for subjects under conditions of competitive or evaluative stress. It was suggested that flexible switching of the focus of control during a stressful encounter was conceivably essential if there was to be congruence between intention, action and outcome. This implies the need to examine changes in such variables across the time-span of an event. Furthermore, the adoption of such a perspective is wholly consistent with a process approach based upon the theoretical dynamism of the person - environment interaction (Lazarus & Folkman, 1984). 'Snapshots' are fine for illuminating the psychological significance of a particular moment in time. However, the examination of transitions between different points in time over an event is of crucial importance to a better understanding of stress related behaviour. Such an approach implies a certain 'realism'

in recognising that physical and psychological demands are dynamic rather than static factors, and that much depends on subjective impressions of these demands as well as their objective qualities (Cox, 1988). The straightforward contention here is that it is what an individual *actually does* in relation to her/his cognitive appraisals across a complete encounter that has the most profound impact upon performance and its consequences. Thus self-control processes, their appropriate mobilization and their focus are significant elements in the stress-performance equation.

#### 8.1.1 Aim

This study adopted a process approach to the examination of hypothesised changes in the focus of control behaviours under different conditions of cognitive anxiety and criterion task difficulty. The aim was to investigate whether subjects switched between problem focused and emotion focused control in relation to their anxiety status and task difficulty level, and also how any such switches might influence perceptual-motor performance. The intention was to examine whether it was the perception of a critical change in performance combined with high anxiety that caused a shift in the focus of control; or whether it was an effortful shift in the focus of control in response to perceived performance difficulty that resulted in performance changes under conditions of high cognitive anxiety.



## 8.2 Catastrophe Theory

The notions of critical points of change, performance fluctuations and differential foci of control responses were considered in relation to Thom's (1975) catastrophe theory. Anecdotal evidence suggests that as stress is increased or decreased passed some optimum level, performance often fails catastrophically rather than in an almost orderly fashion. Perhaps more importantly, there is growing debate amongst many researchers as to the adequacy of the ubiquitous inverted-U Hypothesis (Eysenck, 1983; Hockey & Hamilton, 1983; Hardy & Whitehead, 1984; Lacey, 1967; Morris *et al.*, 1981). The unidimensional nature of arousal expounded by the inverted-U Hypothesis has been found wanting on a number of counts as a model for explaining human performance under stress. Fazey & Hardy (1988) presented both a cogent explanation of why traditional arousal theory is lacking, and an alternative 'catastrophe' model of anxiety and performance. Their Catastrophe model (Figure 8.1) predicts dramatic rather than gradual switches from one functional level to another under conditions of high cognitive anxiety. Catastrophe theory (Flay, 1978; Fazey & Hardy, 1988; Thom, 1975; Zeeman, 1976), and its methodological operational-ization (Guastello, 1981 and 1987; Hardy, Parfitt & Pates, 1990), provides an opportunity for exploring what happens at critical points during a stressful situation and how this might tip the balance in favour of an abrupt shift in the focus of control.

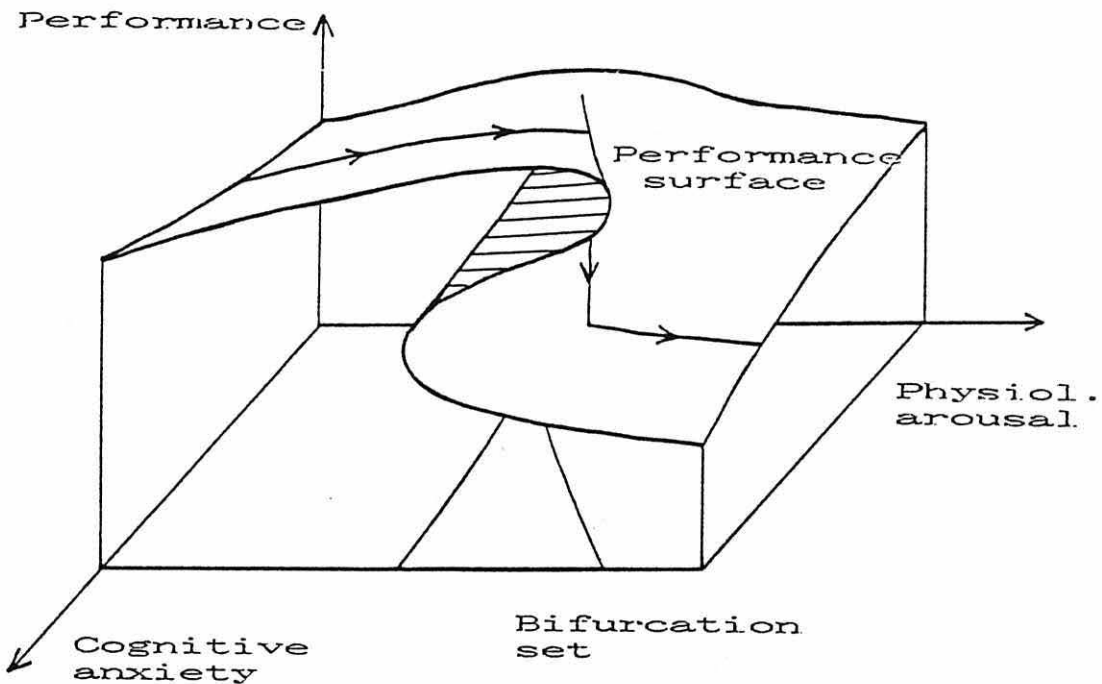


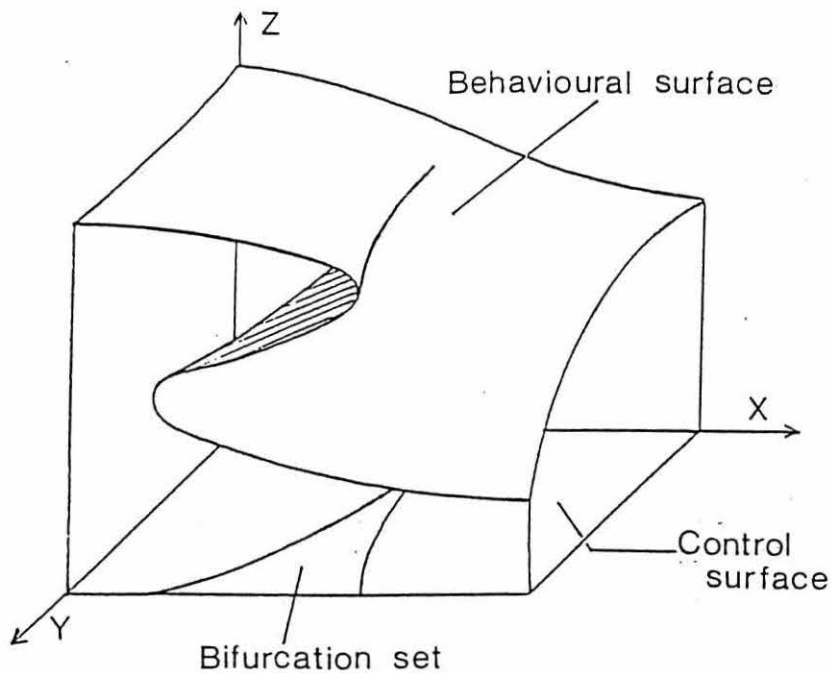
Figure 8.1 : Catastrophe Model (Fazey & Hardy, 1988)

That is, in this case, switching from focusing on resolving the problem situation to control of one's emotional responses or vice versa. In two different experiments Hardy et al. (1990) demonstrated that task performance under stressful circumstances was catastrophically influenced by high physiological arousal (or its associated high somatic anxiety), when cognitive anxiety was high.

Catastrophe theory developed as a model of functional discontinuities in variables which are continuous under normal circumstances (Thom, 1975). Zeeman (1976) later highlighted the implications that

catastrophe theory had for the behavioural and natural sciences. Thom (1975) proposed seven elementary catastrophes which in topological terms described all naturally occurring discontinuities. The simplest and most commonly applied of these catastrophes is the **cuspl catastrophe** (Figure 8.2). The cusp catastrophe is a three-dimensional model which assumes that a given behaviour is governed by two factors - a '**normal**' factor (X), and a '**splitting**' factor (Y). These two factors are represented by physiological arousal and cognitive anxiety, respectively, in Fazez & Hardy's (1988) model (see Fig 8.1). The X-Y plane is termed the **control surface** and the upper folded plane represents the **behavioural surface** (Z). The latter is portrayed as the performance surface in Figure 8.1. The set of (X,Y) values which lie beneath the folded portion of the behaviour surface is known as the **bifurcation set**. This is the set of points on the control surface for which there are two possible values of Z on the behavioural surface.

Citing Cobb (1978), Hardy *et al.* (1990) reiterate the statistical, as opposed to deterministic, nature of behavioural models and state that the upper and lower behaviour sheets depict the set of points of maximum likelihood. In addition, the folded or middle (inaccessible) sheet represents the set of points of minimum probability.



**Figure 8.2** : A Cusp Catastrophe model

A probability density function operates about these points so that within the bifurcation set "leakages" occur whereby abrupt changes in  $Z$  are not restricted to the extreme edges of the fold, but rather occur with greater frequency as the edges are approached.

Fazey & Hardy's (1988) model predicts that toward the back of the control surface where  $Y$  is small, gradual changes in  $X$  lead to gradual changes in  $Z$ . Thus, in Figure 8.2, when cognitive anxiety is low an essentially inverted-U shaped relationship is predicted. However, towards the anterior of the the control surface it is predicted that gradual changes in  $X$  can result in sudden (catastrophic) changes in  $Z$ . This 'jump' on the behavioural surface may occur at one of two points depending on whether  $X$  is increasing or decreasing for a

given value of  $Y$ . Such behaviour is termed **bimodal** and is also characterised by the hypothesis that when  $Y$  values are high,  $Z$  (in the present case, performance) will follow a different path when  $X$  is increasing to that taken when  $X$  is decreasing. This phenomenon is known as **hysteresis**. Hardy & Fazey's model provides a clear illustration of the preceding theory.

Here, cognitive anxiety acts as a splitting function which determines whether the effects of physiological arousal are small and smooth, large and catastrophic, or somewhere in between. When physiological arousal is increasing, performance follows the upper curve for corresponding values of  $(X,Y)$  in the bifurcation set until a critical point is reached, at which performance shifts to the lower curve. Alternatively, when physiological arousal is decreasing, those same  $(X,Y)$  values are reflected by performance following the lower curve until it attains the critical level at which it jumps to the upper curve. This suggests that when a performance catastrophe occurs under conditions of high stress it would be necessary to reduce the level of physiological arousal by a substantial degree in order to re-attain the 'upper performance curve'. Thus, according to Fazey & Hardy (1988), the notion that small reductions in arousal leads to improved performance (as proposed by traditional Arousal theory), is not tenable and is to some extent unrealistic when one considers coping with critical situations.

The SCI development studies revealed a fairly strong inverse relationship between somatic anxiety and emotion focused control for subjects operating under conditions of competition stress. This led to the suggestion that an investigation into the possibly effortful switching of higher order cognitive processes at critical times during a stressful situation was warranted. Not only did the affective response and its control appear to have great valence for subjects in the aforementioned studies, but also it was shown that those subjects high in emotional control were more self confident and more satisfied with their performance than those reporting low emotion focused control. The possibility exists that these subjects were able to switch effectively between emotion and problem focused control in order to achieve better performance. Whether the control consequences of such switching was the *result* of performance changes/demands, or the *cause* of them was one hypothetical consideration which it was proposed to investigate in the present study.

### 8.3 Effort and Goal Difficulty

Whilst Catastrophe theory appears to provide a 'good' model of stress and performance it must be stated that for greater understanding and explanatory power, an examination of what influences the occurrence of 'critical points' and what psychological processes operate around these points of change is necessary. This requirement represented a further aim of the present

study. To this end, manipulations of subjective goal difficulty and the rating of effort expenditure were considered in addition to the process of self-control relative to critical points in performance. Because of the assumption that these variables were important factors in the stress-performance relationship being investigated here, brief coverage of each is given below.

The concept of effort was considered as a significant influence upon an individual's ability to perform effectively when highly anxious. Thomas (1983) noted that the concept of effort has been of central importance in many analyses of achievement oriented behaviour; for example, in Atkinson's (1957) theory of achievement motivation, effort is often equated with motivation and measured by a performance index such as persistence on a task. Norman & Bobrow (1975) emphasised the notion of processing capacity limitations and suggested that complex cognitive task performance relied on the effortful application of resources to that task. Kahneman (1973) equated effort with the cognitive capacity available for deployment on a task. He further suggested that increases in effort (motivation) might create additional resources. This position was supported by the contentions of Navon & Gopher (1979) who, citing evidence from dual task paradigms, argued that processing capacity is actually 'elastic' and can expand with effort to accommodate increases in processing load. This may, of course, represent the mobilization of previously unallocated or unavailable resources. Therefore, one way

in which effort is thought to affect performance is through its influence upon the allocation of cognitive processing resources. More precisely, it has been implied that there may be spare capacity or resources that remain unallocated until the motive for doing well at a task (e.g. achieving a cherished goal, or preventing humiliation, or the loss of self-esteem, following failure), dictates their effortful on-task allocation (Navon & Gopher, 1979).

Performance may also be influenced by effort mediating the effects of anxiety. Anxiety has been argued to affect performance in a number of ways. One suggestion is that it creates extra processing demands that are not conducive to competent task performance; that is to say, it causes the misdirection of attention (Wine, 1971). Another theory is that either the range of cues relevant to the task are not attended to, so that task-relevant information is not processed; or that task irrelevant cues are processed thereby 'diluting' essential task information (Easterbrook, 1959). Wachtel (1966) stated that when an individual is anxious, attention is diverted to the perception of his anxiety and therefore less attention is available for external stimuli. Davidson & Schwartz (1976) proposed that the different components of anxiety 'clog up' the limited capacity processing channels (Navon & Gopher, 1979), with unwanted and distracting activity. Thus, there is much support for the idea that anxious subjects misdirect attention and devote cognitive capacities to worrying



about their ability to perform competently on the task in hand rather than actually getting on with it (Hamilton, 1975; Mandler & Watson, 1960; Sarason, 1960; Wine, 1971).

In his comprehensive review of the concept of effort, Mulder (1986) concluded that there are two forms of effort. One form is engaged whenever a task requires attention-demanding information processing, the other causes changes in the 'energetical resource state' when it is suboptimal for competent performance of the task. Other researchers have also presented models of stress and human performance that recognise the central importance of effort. Humphreys & Revelle (1984) view it as a motivational state commonly taken to mean trying hard or being more involved in a task. However, they also elaborate on this definition by defining on-task effort as the allocation of processing resources to the task at hand. Sanders (1983) proposed a model that included the effects of three energetical systems upon information processing. In this case, effort was understood to operate in a coordinative role via its influence on decision making processes or the other energetical systems of arousal (affecting perceptual processes), and activation (influencing motor-response preparation). According to Sanders, stress occurs if effort fails to correct aberrant arousal and/or activation levels, or if insufficient effort is allocated to decision making.

Hardy *et al.* (1990) also suggested that effort may play an important role in explaining the occurrence of performance catastrophes. They cited several

possibilities, including the notion that physiological arousal may indeed be simply a reflection of effort expenditure (Eysenck, 1982). In this instance, it was predicted that a catastrophic drop in performance could only be rectified if physiological arousal was dramatically reduced; that is to say, if the on-task effort required by the situation was significantly reduced. Only then should the person perceive the task demands to be within their ability to cope, and thus revert to investing the effort needed to tackle the problem task once more.

An alternative explanation was that performers might not actually "give up trying to cope when they are cognitively anxious". In spite of this, however, their level of physiological arousal might indeed interfere with performance in one of several ways, e.g. either through distraction (Deffenbacher, 1980); a reduction in processing capacity (Humphreys & Revelle, 1984); or by leading performers to selectively attend to the maintenance of effort, rather than their performance on the task (Naatanen, 1973). "To put this latter point crudely, performers may waste valuable resources telling themselves to 'try hard', instead of getting on with the task" (Hardy et al., 1990)

#### **8.4 Compensatory Effort**

Malmo (1965) hypothesised that task involvement and level of difficulty were determinants of effort. He proposed a compensatory effort mechanism which maintained

the quality of performance at the level of some pre-set goal. Obrist (1981) and Light (1985) have used the related concept of 'effortful active coping' in psychophysiological research on the way effort serves to mobilize coping skills under stressful circumstances. Kahneman (1973) also suggested that effort plays a compensatory role in that an anxious person experiencing performance decrements will invest extra effort to allocate additional processing resources to a task. He further asserted that appraisal of task demands (and by implication the ability to cope with them), is one of the most potent influences upon the investment of effort. At this point, caution is recommended with respect to the relationship between effort and task difficulty. Note that the effort response to a task appraised as very difficult may be similar to that for a very easy task; that is to say, little effort may be invested in either because it would be wasted in the former and unnecessary in the latter (Obrist *et al.*, 1978). One implication of this line of reasoning for the present study was that if task demands become too great and cognitive anxiety engaged processing capacity, then a realistic appraisal of the situation should result in a reduction of effort directed towards problem focused control. Instead, in the face of possible perceived incompetence, performers should show an increase in effort directed towards self-regulatory activities until such a time that task oriented efforts are perceived as being feasible once more.

### 8.5 Goal Difficulty

Because of the above arguments regarding the central role occupied by effort, the present study utilised the same catastrophe paradigm employed by Hardy *et al.* (1990) but with goal difficulty substituted for physiological arousal. Svebak (1986) argued that increased mental or physical effort involves the mobilization of energy resources and that this investment is not "free" (cf. Schonpflug's, 1988, notion of the costs and benefits of effortful coping). Svebak further cited goal setting research as evidence for how this expenditure takes place; that is to say, the mediating role played by effort in compensating for suboptimal processing (Eysenck, 1983; Locke, 1968).

One implication of this is that incentives such as instructions, social approval, or the demonstration of competence may result in re-evaluations of task difficulty and personal efficacy which influence subsequent goal-setting. Revelle & Michaels (1976) noted that motivation is affected by the subjective probability of success and suggested that moderately difficult goals should motivate effort expenditure on a task, whereas very difficult goals would be de-motivating. This notion has also received experimental support from Erez & Zidon (1983). The perception of a critical point in performance (e.g. a high goal difficulty level) beyond which the investment of effort is appraised as unproductive could thus result in a suspension of that effort, or even a reallocation of resources to strategies more compatible

with subjective requirements. Eysenck (1979) suggested that highly anxious individuals would be more susceptible to the de-motivating effects of very high goal difficulty, and thus decreased task oriented effort, which further suggests that the present examination of performance catastrophe's and self-control merited the inclusion of goal difficulty. In this analysis, anxious individuals would be expected to be more vulnerable to goal difficulty manipulations and hit critical points more often and sooner than non-anxious individuals. Further evidence of the detrimental effects of anxiety in relation to goal acceptance and goal difficulty has been provided by Hardy, Maiden & Sherry (1986). They found that high anxiety had a negative effect on both goal acceptance and optimal goal difficulty. Highly anxious subjects rejected goals at levels that they had accepted under no-threat conditions. It seems reasonable to infer that these effects are due to a reduced investment of effort because, under high anxiety, subjective appraisals of what is a 'manageable' level of goal difficulty and one's ability to perform competently at that level (the situation's perceived 'controllability') are reduced.

### 8.6 Hypotheses

The following hypotheses were postulated with regard to performance under different levels of cognitive anxiety.

1). Cognitive anxiety was predicted to act as a splitting factor which would mediate the effects of goal difficulty upon performance. Thus, under high cognitive anxiety conditions hysteresis was expected to occur, with performance taking a different path when goal difficulty increased compared to that taken when goal difficulty decreased.

2). Increasing goal difficulty was predicted to result in a catastrophic decline in performance when cognitive anxiety was high. A similar decline was not expected to occur for low anxiety conditions when goal difficulty was increased. Furthermore, any decline in performance which did occur was hypothesised to occur at a higher goal difficulty level.

3). Differential patterning of the focus of self-control attempts was predicted in relation to the hypothesised critical points of performance change when cognitive anxiety was high. Firstly, following a catastrophic performance drop (-ve critical point), it was hypothesised that there would be a shift to greater emotion focused control. Problem focused control would either be reduced as more effort was made to regulate emotional responses to the inability to demonstrate task competence under evaluative threat, or would remain at a similar level to its pre-catastrophe status. The mobilization of emotion focused control would serve to 'quiet the system', and regain composure until problem

focused efforts were appropriate once more. Effectively, problem focused control would be either put on 'hold', or strategically not allocated resources that would be wasted.

Secondly, it was predicted that after a +ve critical point, following which performance increased dramatically, emotion focused control would decrease significantly whereas problem focused control would increase as greater effort was put into competently performing the task once the interfering or distracting effects of physiological and/or affective responses had been quelled. Between perceived negative and positive critical points emotion focused control was hypothesised to remain relatively high or to increase. Under low-anxiety conditions this switching of emphasis between the foci of control was not expected to occur.

4). It was anticipated that self-reported effort expenditure would parallel the pattern obtained for problem focused control because any reference to effort was related to on-task endeavours rather than to efforts made to self-regulate emotional responses. Consequently, effort would also demonstrate hysteresis in line with performance.

## 8.7 Methodology

### 8.7.1 Subjects:

The subjects were all members of University College of North Wales basketball squads (7 female and 7 male). They were selected on the basis of their moderate ability and experience. Subjects were randomly assigned to one of two groups both of which were to experience all the experimental manipulations in a balanced design.

### 8.7.2 Performance Task and Goal Difficulty Manipulations:

Goal difficulty was manipulated by setting each subject five different point goals, ranging from very easy (20% of maximum), through 40, 60, 80, to 100% of maximum (see below). These goals were subjectively referenced rather than objectively imposed by the experimenter. This was achieved by subjects performing an ability pre-test which involved shooting 20 sets of 5 throws from the free throw line with the aim of scoring as many points as possible on each set. The highest points total achieved for any set was taken as the subjects maximum and her/his goals for the criterion task were set with reference to this. At each test session, subjects were required to take 10 sets of 5 shots at the basket from the free throw line. Subjects were informed of the specific task requirements as follows : "This test involves you shooting ten sets of five shots from the foul line. Your performance will be scored using the following points system :



5 pts = clean basket  
 4 pts = hits ring first and goes in  
 3 pts = hits backboard first and goes in  
 2 pts = hits ring first but rolls out  
 1 pt = hits backboard first but misses  
 0 pts = complete miss

For each set you will be given a particular target score to achieve. This will be based on the highest score you achieved on the pre-test which was.....points. This has been increased by 3 points so that your new maximum is.....points." (1)

Instructions Given Prior to Each Set of Shots :

**Set A** : "For this set of 5 shots you are required to score at least 20% of your maximum i.e. at least.....points. Your cumulative score after each shot will be called to you."

**Set B** : (Similar to above but goal = 40% of maximum)

**Set C** : (Similar to above but goal = 60% of maximum)

**Set D** : (Similar to above but goal = 80% of maximum)

**Set E** : "For this set you are required to, at least, equal or exceed your maximum score of .....points. Your cumulative score after each attempt will be called to you" (2)

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(1)Note : The maximum score was increased above that achieved on the pre-test in an attempt to ensure that subjects perceived the 100% goal to be extremely difficult, if not impossible. Since no subject scored higher than 22 points on their pre-test, it was considered appropriate to increase each subjects maximum by 3 points.

(2)By instructing subjects to score "at least x points" it was intended to reduce the likelihood that the subject would not bother with the remainder of a particular set (thereby confounding the performance scores) once she/he had achieved the target score.

### 8.7.3 Cognitive Anxiety Manipulations :

The experimental design required cognitive anxiety to be manipulated without significantly affecting the somatic component. The following ego-threatening and neutral instructional sets were used to elevate and suppress cognitive anxiety, respectively (after Hardy *et al.*, 1990).

#### *Ego-threat Instructions :*

"A characteristic of a good basketball player is an ability to shoot accurately and consistently. Research has shown that the best NBA players score highest on a set-shot test similar to the one you are about to perform. Your scores will be compared with both those published for the NBA players and also scores published for club players in this country. Whilst you are not expected to compare very favourably with the NBA players, many of you should score very well and certainly achieve a high ranking when compared with other club players."

#### *Neutral Instructions :*

"Today you are being used as an experimental control group. Your scores will simply be used for standardization purposes and will not be used to assess your personal ability as a basketball player."

### 8.7.4 Measurements :

Measurements were taken on four variables; namely, performance, cognitive anxiety, perceived effort and state self-control (see Appendix II).

Performance was measured by simply recording the total points score for each subject and each goal set.

*Cognitive Anxiety* was measured using the Competitive State

Anxiety Inventory - 2 (CSAI-2, Martens et al., 1990). The CSAI-2 is a 27 item inventory comprising three subscales which index cognitive anxiety, somatic anxiety and self-confidence. (See section on validation of the SCI for more information).

*Pre-performance self-control* was indexed using the Self Control Inventory-1 (SCI-1), described in detail in the previous chapter.

*Critical Points.* A Critical Points Form (Appendix IIa), was used to measure subjective critical points in performance. These were reported retrospectively on an analogue scale which represented the five levels of goal difficulty. Two points were recorded, one for ascending goal difficulty, the other for descending goal difficulty. Self control before and after the reported critical points was also measured using the Critical Points Form. This contained problem and emotion focused control items from the SCI-2. Thus, in relation to each of these points subjects answered a set of self-control items that referred to their perceptions of what they felt, thought or did immediately prior to and immediately after each point. In this way, it was possible to obtain

information regarding self-control mobilization for both the increasing and decreasing goal difficulty series.

*Perceived effort* was indicated using a self-report ratio-category scale. The Borg scale (Borg, 1970 and 1975), has become a frequently used measure of degree of exertion in ergonomics, work physiology and sport. Borg developed his ratio scale to index the ability to perceive and rate effort expenditure along a range of physical work intensities. The scale has an absolute zero point and includes maximal exertion as a reference intensity; values in between are spaced equidistantly. Similarly, Gopher & Braune (1984) developed a subjective effort scale for assessing the processing resources invested to meet task demands. Finally, Dornic (1977) advocated the utility of measuring effort by self-report number scales or graphical scales verbally anchored at the extremes. For the present study, a ratio scale ranging from 0 - 20 was used. Anchor-points denoted a range of effort from maximal effort, through moderate effort to a point at which no effort was perceived to have been invested in the task.

### **8.8 Procedure**

Subjects attended three experimental sessions, each conducted at the same time of day because of established evidence regarding diurnal fluctuations in performance (Blake, 1967; Folkard, 1975 and 1983).

*Session 1* : The first session was used for familiarisation with the task, the experimental procedures and the data collection instruments. This session was also used to pre-test subjects on the criterion task in order to establish personal maximum scores on which to base subjective goal difficulty levels. Finally, this preliminary session served to offset any short-term learning effects on the primary task. The second and third sessions were used for data collection. Subjects were presented with the different experimental conditions individually in a balanced order.

*Session 2* : Group 1 subjects read the 'ego-threatening' instructional set which was verbally reinforced by the experimenter. Group 2 subjects read the 'neutral' instructions. Subjects then completed the CSAI-2 and the SCI-1 with reference to the task and testing situation. Following this, they were presented with instructions for the first goal difficulty set of the criterion task which included their personally referenced goal points for that level. Before actually performing the task each subject rated the amount of effort they *intended* investing in the task using the effort scale. The task was then completed, after which perceived *actual* effort expended was recorded. The before and after index of effort was an attempt to discern whether or not performance outcome influenced the rating. This procedure was repeated ten times in all for each subject - five sets of five shots were made with goal difficulty progressively increasing

and five sets completed with goal difficulty decreasing. Subjects were balanced in that successive subjects commenced the task series in the opposite direction to that taken by the preceding subject. After completing the first five sets, the instructional set was readministered and reinforced. Performance was recorded by the experimenter. On completion of the task the Critical Points Form was completed - subjects reported perceived critical points for each goal difficulty series and indicated their focus of control about these points.

*Session 3* : The above procedure was repeated for the second testing session except that the instructional sets were reversed for each group. Subjects who started the task on the ascending order of goal difficulty in session two started on the descending order in this session and vice versa. Following this final testing session each subject was 'interviewed' by a different experimenter who was 'blind' as to the group and treatment each subject had been allocated to. The interview was intended to help clarify whether or not subjects accepted the goals set, and how they had allocated effort to the task.

### **8.9 Analyses and Results**

Owing to subject mortality complete data were collected for 12 subjects. A preliminary inspection of this data and re-examination of the pre-test performance data resulted in the 'culling' of four subjects from the analyses. This was considered appropriate on the grounds that these subjects' ability on the task was in no way comparable to that of the remaining subjects and this

lack of skill was likely to confound the reliability of the performance task. A further subject was omitted from the analyses because he was a far better player than any of the other subjects, and in fact showed no real changes in anxiety or performance throughout the experiment. Since the primary objective was to examine the occurrence and causes of performance catastrophes and associated mental activity, this subject's data were considered irrelevant. Indeed, one could argue that a player of this standard should not be at all affected by such a moderate stressor as the instructional set used. The analyses were carried out on the remaining 7 subjects' data (4 male, 3 female).

#### 8.9.1 Analysis of the Anxiety Components

One-tailed t-tests were used on the CSAI-2 and SCI-1 subscale data to establish whether or not the instructional sets had achieved the desired result. For the CSAI-2, only cognitive anxiety (CA) demonstrated significant effects which revealed that the ego-threatening instructions had resulted in higher cognitive anxiety than the neutral instructions,  $df=6$ ,  $t=2.63$ ,  $p<.02$ . Analysis of the SCI-1 revealed that under the high cognitive anxiety condition subjects scored significantly higher in both problem focused control,  $df=6$ ,  $t=6.68$ ,  $p<.001$ , and emotion focused control,  $df=6$ ,  $t=2.79$ ,  $p<.02$ , than in the low-anxiety conditions. CSAI-2 and SCI-1 means are shown in Table 8.1.

**Table 8.1** : CSAI-2 and SCI-1 Subscale Means

	Neutral	Ego-threatening
<b>CSAI-2</b>		
Cognitive Anxiety	13.14 (2.54)	16.43 (3.87)
Somatic Anxiety	12.00 (1.83)	12.43 (3.20)
Self Confidence	26.00 (7.11)	24.14 (6.33)
<b>SCI-1</b>		
Problem Focused Control	31.86 (4.84)	38.85 (4.26)
Emotion Focused Control	38.00 (6.58)	42.71 (2.70)

Note that although statistically significant, the difference is not great and the 'high' CA condition is relatively modest when one considers that a total score of 28 could have been obtained, and that values of 19.87 to 24.00 have been typically reported by Hardy, Parfitt & Pates (1990) prior to competitions.

#### 8.9.2 Analysis of the Dependent Variables

A three-way ANOVA (Anxiety by Direction by Goal Difficulty), with repeated measures on each factor was performed for each of the dependent variables (performance, intended effort and actual effort). A three-way ANOVA (Anxiety by Direction by Time), with repeated measures on all factors was also used to examine the focus of control about perceived critical points.

*Performance* : No statistically significant main or interaction effects were observed. Having said this a



number of effects did exhibit weak or marginal significance around the 10% level. These were the main effect for Direction,  $F(1,6)=3.64$ ,  $p=.105$ ; the Anxiety by Direction interaction,  $F(1,6)=3.74$ ,  $p=.101$  and the Direction by Goal Difficulty interaction,  $F(2,12)=2.22$ ,  $p=.097$ . The three-way interaction did not approach significance.

*Intended Effort and Perceived Actual Effort* : No significant effects emerged for these data and no effects even approached significance. This was a disappointing outcome since effort had been hypothesised to be an important influence in the occurrence of performance catastrophes. However, it was perhaps an accurate reflection of the general absence of significant performance effects.

*Critical Points Form* : Without exception subjects identified a critical point for both goal difficulty sequences. They also indicated that performance worsened following the perceived critical point on the Goal difficulty increasing series, whereas performance improved after the critical point occurred on the goal difficulty decreasing sequence. (3)

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(3) Subjects in the low anxiety condition generally reported a perceived critical point much later (e.g. 80% or 100% in the goal difficulty increasing sequence) and much earlier (e.g 100% or 80% in the decreasing sequence) compared to the high anxiety conditions. Two subjects in the low anxiety condition stated that they did not perceive a critical point. They were therefore instructed to complete the problem and emotion focused items in relation to their perceptions of their control

*Self-Control* : A 3-way ANOVA of the SCI-2 subscales with repeated measures on all factors revealed a number of significant effects in relation to the perceived critical points in performance which subjects reported. The ANOVA factors were Anxiety (High/Low), Direction (Difficulty Increasing/Decreasing) and Time (Before/After).

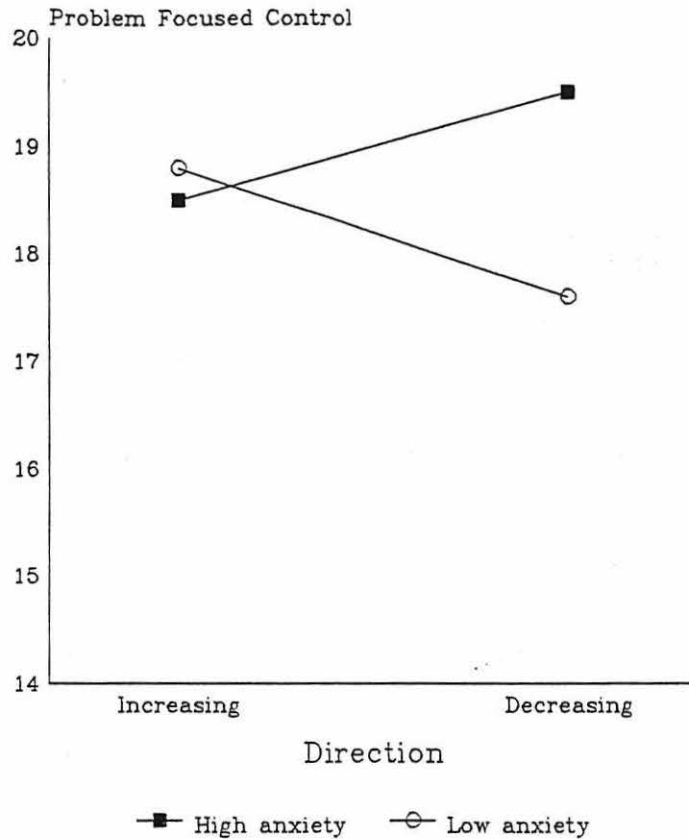
*Problem Focused Control* : The only significant effect to emerge was an anxiety by direction interaction,  $F(1,6)=6.37, p<.05$ . Tukey's post-hoc test failed to identify where the significant differences lay. However, the results suggested that when goal difficulty increased problem focused control was similar across the perceived negative critical point for both anxiety conditions. When goal difficulty decreased high cognitive anxiety subjects mobilized greater problem focused control than they did in the low anxiety condition (see Figure 8.3). Thus, as the goals became progressively easier to achieve high cognitive anxiety subjects put more energy into the task around their critical points than did low anxiety subjects.

*Emotion Focused Control* : The analysis for emotion focused control was far more productive. It revealed an anxiety main effect,  $F(1,6)=7.23, p<.04$ , whereby subjects used significantly greater emotion focused control under

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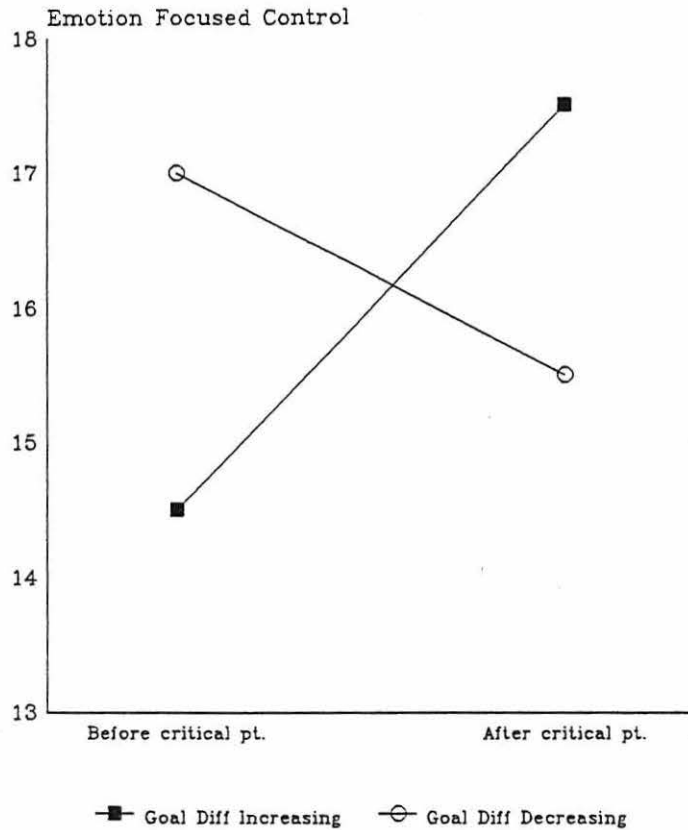
efforts around the 100% goal difficulty level for both directions.

high cognitive anxiety conditions than under low anxiety conditions.



**Figure 8.3** : The Anxiety by Direction Interaction for Problem Focused Control

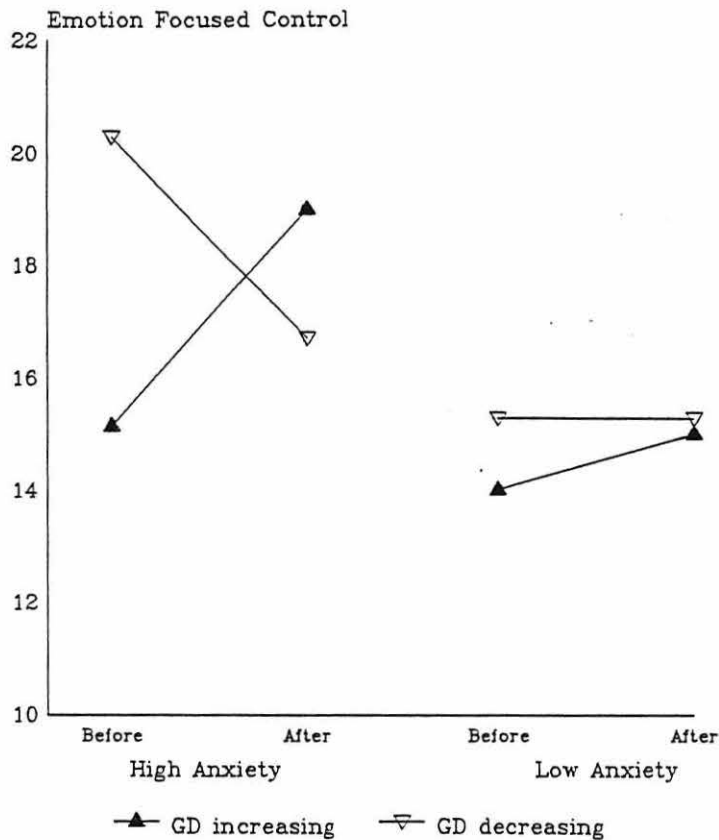
A significant Direction by Time interaction was also obtained,  $F(1,6)=24.51$ ,  $p<.004$  (Figure 8.4). Tukey's follow up test indicated that when goal difficulty increased emotion focused control was significantly higher **after** a perceived critical point compared to before it. When goal difficulty was decreasing emotion focused control was highest **before** the perceived critical point.



**Figure 8.4** : The Direction by Time Interaction for Emotion Focused Control

By far the most interesting result was the significant 3-way interaction that emerged (Anxiety by Direction by Time),  $F(1,6)=26.41$ ,  $p<.003$ . Post-hoc Tukey's tests revealed that for the increasing goal difficulty sequence, high anxiety subjects reported significantly higher emotion focused control after a perceived critical point than before one, and significantly greater emotion focused control at this time than after their critical point in the goal difficulty decreasing sequence. Furthermore, subjects also reported significantly more emotion focused control before a critical point in the goal difficulty decreasing

sequence than after it, and also significantly more emotion focused control at that time than before their critical point in the goal difficulty increasing sequence (Figure 8.5).



**Figure 8.5 :** The Patterning of Emotion Focused Control in relation to Perceived Critical Points in Performance

In the low anxiety condition, Tukey's tests revealed no significant differences between any of the conditions (Figure 8.5).

#### 8.10 Further Consideration of the Performance Data

The above results indicated that whilst the subjective critical points analyses looked promising, the objective catastrophe (performance) analysis was disappointing. Since the subjective critical points

analysis was based upon a catastrophe model of performance, it was considered worthwhile attempting to examine the objective data a little further.

One possible explanation of the lack of significant performance effects was that the goal difficulty levels at which objective critical changes occurred were different for each subject in the high anxiety condition. This is not unreasonable with respect to the strong phenomenological stance taken in this thesis. Thus, it seems reasonable to infer that each highly anxious person would react idiosyncratically to the goal difficulty pressure and would conceivably show performance decrements or improvements at different places compared to others under the same conditions. Scrutiny of the data did in fact indicate that most of those in the high anxiety condition experienced decrements in performance as goal difficulty increased but that the (critical) point of maximum decrement varied between the 40% and 80% goal difficulty (see Table 8.2). Similarly, improvements in performance occurred as goal difficulty decreased through the range 80% to 40% goal difficulty. Another piece of significant evidence emerged from the comparison between these objective critical points in performance and the perceived critical points reported by subjects. Table 8.2 shows the results of this comparison. While most subjects' reported critical point matched the objective one for the goal difficulty increasing sequence, (6/7); only one subject's identified critical

point matched the performance data when difficulty decreased.

**Table 8.2** : Comparison of Objective and Subjective Critical Points in Performance Under Conditions of High Cognitive Anxiety

Subject	Critical Point			
	Objective	Subjective	Objective	Subjective
	Goal Difficulty Increasing	Goal Difficulty Increasing	Goal Difficulty Decreasing	Goal Difficulty Decreasing
1	80%	80%	40%	60%
2	40%	40%	80%	60%
3	60%	60%	40%	60%
4	80%	80%	60%	80%
5	60%	80%	80%	40%
6	60%	60%	60%	40%
7	80%	80%	60%	60%

There was encouraging though not conclusive evidence to support the contention that under high cognitive anxiety conditions functional discontinuities did occur for the goal difficulty increasing sequence and that these were significant to the subjects. For the goal difficulty decreasing sequence, the objective and subjective critical points were at least generally very close. Since it is these points of discontinuity in the performance curve which are of crucial importance to a catastrophe analysis it was decided to perform a post-hoc analysis using a modified data set.

The modified data set comprised those performance data points which occurred at the following goal difficulty levels:

- a) The goal difficulty level before (i.e. lower than) the one at which an objective critical point occurred in the high anxiety, goal difficulty increasing sequence;
- b) The goal difficulty level at which an objective critical point occurred in the high anxiety, the goal difficulty increasing sequence; that is to say, after which a maximum decrement (catastrophe) occurred; and
- c) The goal difficulty level following the objective critical point.

The primary aim of this study was to examine performance catastrophes; that is to say the points of greatest performance change under high cognitive anxiety conditions. Although observation of the performance data for the low anxiety treatment revealed no objective critical points it was meaningful to include data from the three goal difficulty levels which defined each subjects objective critical point in the high cognitive anxiety, goal difficulty increasing sequence in a post-hoc analysis for comparison purposes. Note that these points corresponded to the objective points associated with the greatest performance decrement for the high anxiety condition when goal difficulty was increasing. It was hypothesised that this alignment of the points of greatest change should produce the originally hypothesised anxiety by direction by goal difficulty interaction if its absence from the original analysis was due to individual differences.

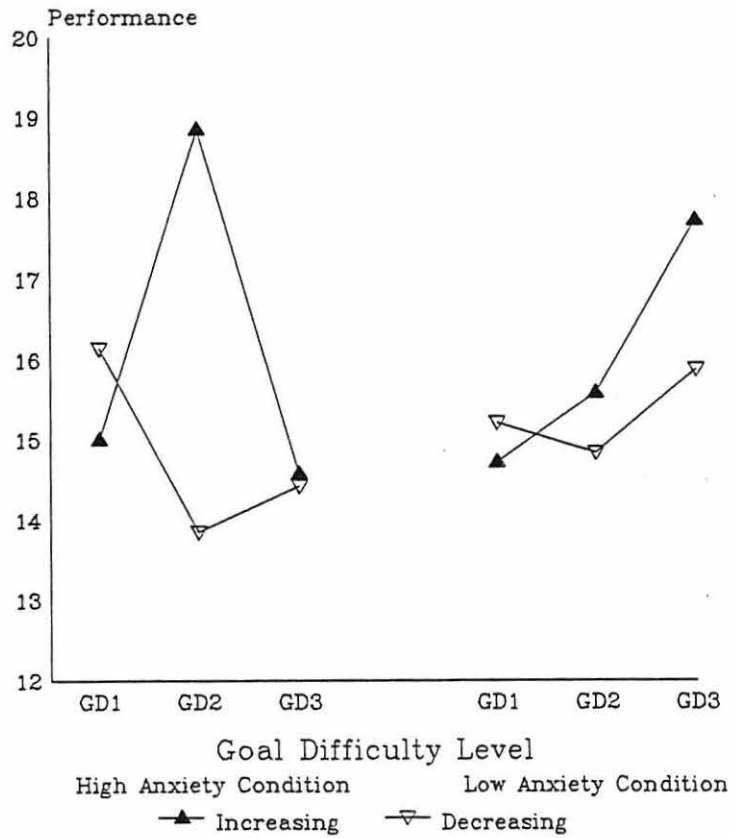
*PERFORMANCE* : The performance data were re-examined using a 3-factor ANOVA (Anxiety by Direction by Goal Difficulty), with repeated measures on all factors. A



number of interaction effects were observed, including a significant 3-way interaction,  $F(2,12)=8.09$ ,  $p<.007$ . See Figure 8.6.

*High Anxiety Condition* : Post-hoc Tukey's tests showed that as goal difficulty increased in the high anxiety condition there was a significant performance increase up to the critical point (Goal difficulty level 2) after which there was a significant drop (Figure 8.6). As goal difficulty decreased high anxiety subjects demonstrated a significant improvement in performance after the critical point, i.e. performance followed a different path when goal difficulty decreased compared to that followed when it increased.

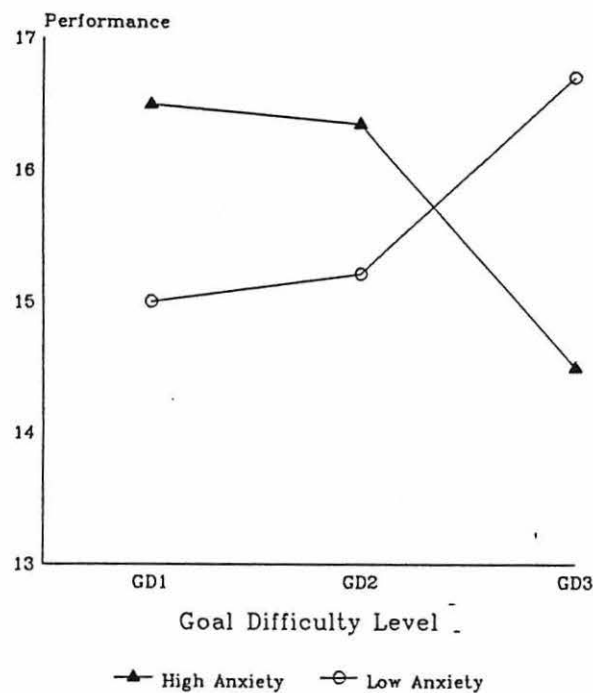
*Low Anxiety Condition* : Tukey's follow up test revealed that in the low anxiety condition subjects demonstrated an almost linear performance curve as goal difficulty increased, i.e. no significant critical points (Figure 8.6). Performance at goal difficulty level 3 (GD3) was significantly higher than GD1. As goal difficulty decreased, significant critical points were again absent. Furthermore, there were no significant differences in performance as goal difficulty changed in this direction.



**Figure 8.6 : The 3-Way Interaction for Performance**

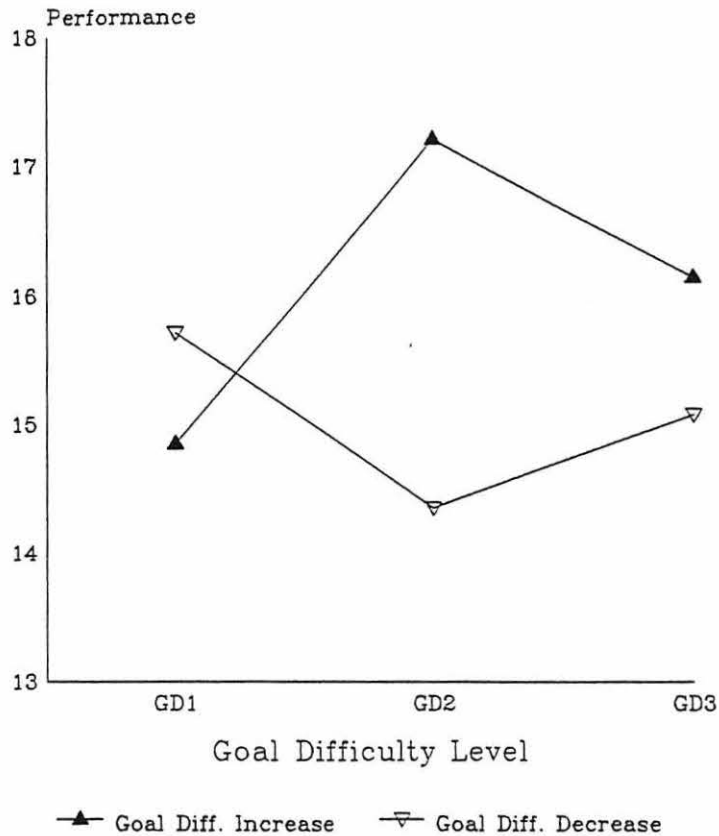
*Differences between the cognitive anxiety conditions :*  
 In the high cognitive anxiety/goal difficulty increasing condition performance at GD2 was significantly higher than performance at GD1 and GD2 in the low cognitive anxiety/goal difficulty increasing condition, and at all goal difficulty levels for the low cognitive anxiety/goal difficulty decreasing condition. Performance at GD3 in the low cognitive anxiety/goal difficulty increasing condition was significantly higher than GD3 for goal difficulty increasing, and GD2 and GD3 for the goal difficulty decreasing sequences under high cognitive anxiety.

A significant Anxiety by Goal Difficulty interaction was also obtained,  $F(2,12)=6.80$ ,  $p<.02$  (Figure 8.7). Tukey's post hoc test revealed that subjects' performance in the high anxiety condition was significantly lower than their low anxiety performance at Goal Difficulty level 3 (i.e. after the critical point). No other differences were significant.



**Figure 8.7** : The Anxiety By Goal Difficulty Interaction For Performance

Finally, a significant Direction by Goal Difficulty interaction was also obtained  $F(2,12)=3.90$ ,  $p=.05$  (Figure 8.8). Tukey's post-hoc test revealed that performance at GD2 was significantly higher in the goal difficulty increasing condition compared to the goal difficulty decreasing condition. No other significant differences were obtained.



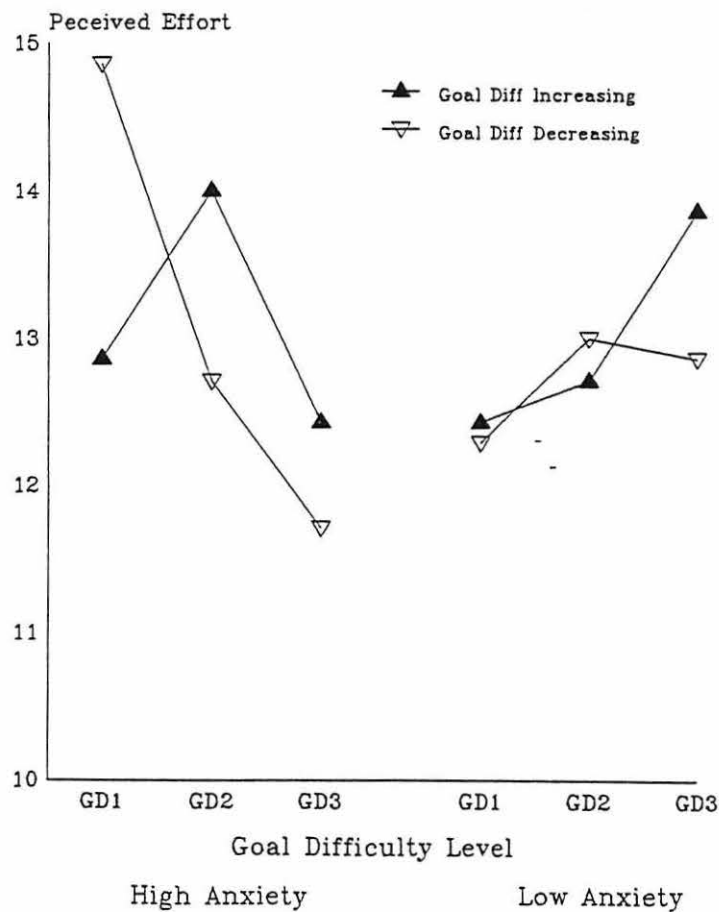
**Figure 8.8** : The Direction by Goal Difficulty Interaction For Performance

*EFFORT* : The effort data were also examined in relation to the objective critical points observed in the performance data. Three-way ANOVA's with repeated measures were again used.

*Intended Effort* : No significant effects were observed for these data.

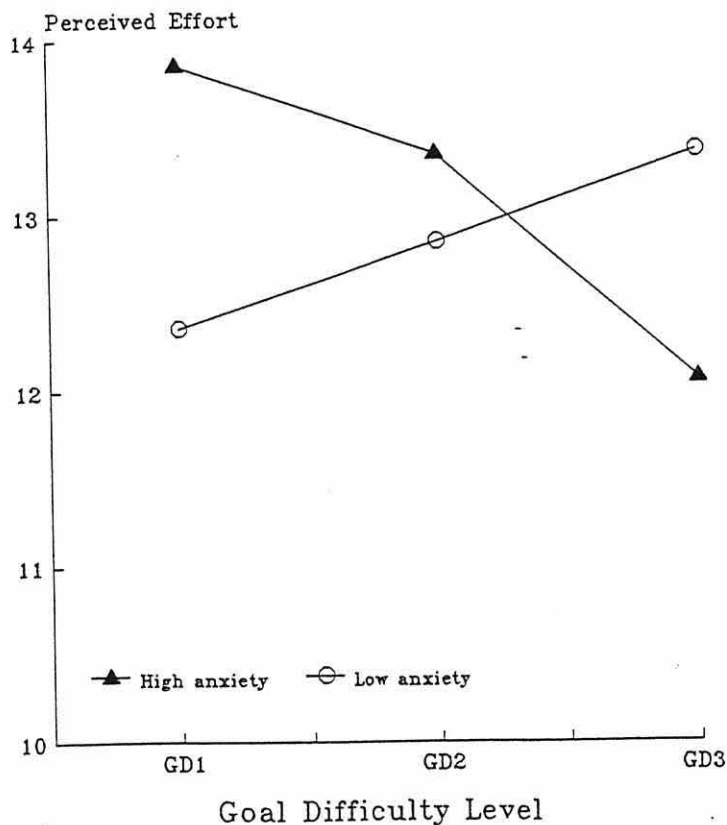
*Perceived Actual Effort* : A 3-way interaction was obtained,  $F(2,12)=4.00$ ,  $p<.05$ . Figure 8.9 illustrates the interesting pattern resulting from the analysis.

*High Anxiety Condition* : Under high cognitive anxiety conditions Figure 8.9 shows that as goal difficulty increased there was a tendency for effort to also increase up to the point of change in performance, after which there was a marked drop in effort expenditure. When goal difficulty decreased, subjects in the high anxiety condition tended to show a greater increase in effort after the objective critical point (as the goals became easier).



**Figure 8.9** : Patterning of Perceived Actual Effort in relation to Objective Critical Points in Performance

In fact, there appeared to be a 'surge' of effort for the high anxiety group once goals were perceived as achievable. Unfortunately, Tukey's tests did not appear to be sensitive enough to pick up these changes in effort rating, and showed only that perceived effort at GD1 was significantly higher than at GD3 in the high cognitive anxiety/goal difficulty decreasing condition. The reader might like to recall that the 3-way interaction for performance demonstrated that there was also a significant increase in performance at this time (see Figure 8.6 above).



**Figure 8.10** : The Anxiety by Goal Difficulty Interaction for Perceived Effort

*Low Anxiety Condition* : The low anxiety treatment (Figure 8.9) showed more gradual linear effort curves in relation to goal difficulty; somewhat similar to those for performance. No significant differences emerged.

*Differences between the cognitive anxiety conditions* :

The only significant difference that emerged was that of effort at GD1 in the high cognitive anxiety/goal difficulty decreasing condition being significantly higher than effort at GD1 in the low cognitive anxiety condition for both the goal difficulty increasing and decreasing sequences.

A significant Anxiety by Goal Difficulty interaction was obtained,  $F(2,12)=5.91$ ,  $p<.02$  (See Figure 8.10). Tukey's post-hoc test suggested that for the high cognitive anxiety condition perceived effort dropped following the critical point at GD2 (i.e. the critical point after which an objective performance decrement occurred or was lower prior to a positive critical point at which an increment occurred). However, only the difference between GD1 and GD3 was significant. In the low cognitive anxiety condition, perceived effort gradually increased from GD1 to GD3. However, no significant differences emerged.

### 8.11 Discussion

Considerable support was obtained for the hypotheses stated earlier and some support was obtained for Hardy et al.'s (1990) suggestions regarding the role of effort in

Fazey & Hardy's (1989) Catastrophe Model of performance under stress. Acceptance and interpretation of the positive results must however be tempered with caution because of the relatively small number of subjects involved and the need to modify the performance data set to align idiosyncratic objective performance decrements in the high anxiety condition (as explained on pages 246-250). Further evidence for the dissociation of anxiety components (Martens *et al.*, 1983; Morris & Liebert, 1967), was obtained as demonstrated by the successful independent manipulation of cognitive anxiety (even if not to the extent that was desired). Whilst not absolutely necessary in a phenomenologically based approach which emphasises the importance of subjective appraisals and self-generated meaning in stressful situations, the modification of the performance data was vindicated by the resulting findings. These not only showed that there was generally quite a good 'fit' between the objectively scored data and the subjectively reported data in terms of "critical points" in performance, but also the importance of being theoretically guided by the notion that personal perceptions are vital elements in a given encounter (Cox, 1988; Lazarus & Folkman, 1984). The matching of objective and subjective data suggested that under high cognitive anxiety points of change in the goal difficulty increasing sequence were more realistically appraised than when goal difficulty decreased. Perhaps, as pressure mounts it becomes more adaptive to form realistic



judgements regarding personal agency in that situation whereas when pressure drops, and a subject could be more assured of performance improvements (goal difficulty decreasing), then not so much attention is paid to exactly when this improvement occurs. It is worth pointing out that, catastrophically speaking, the decrements during the goal difficulty increasing sequence are hypothesised to be greater than the increments in the goal difficulty decreasing sequence (see Hardy *et al.*, 1990 and Figure 8.1). Consequently one might expect a better subjective - objective match for the goal difficulty increasing critical points.

The hypothesis that cognitive anxiety acts as a splitting function which mediates the effects of goal difficulty upon performance was supported (cf. Hardy *et al.*, 1990; Parfitt, 1989). Under low cognitive anxiety performance followed a generally smooth curve whereas when cognitive anxiety was high the phenomenon known as hysteresis was observed. This was demonstrated by the three way interaction which showed that performance followed a different path when goal difficulty increased compared to that taken when goal difficulty decreased.

There was an indication that in terms of a catastrophe paradigm the role of effort in the anxiety - performance relationship is worthy of closer scrutiny. There would seem to be support for the proposed strategic use of effort (Eysenck, 1981; Fisher, 1986; Wilkinson, 1965). Zipf (1945), proposed the "least effort principle"

which suggested that a strategy is selected to ensure that reaching a desired goal involves minimum effort overall. He argued that the use of 'cognitive economies' could ensure a reduction in mental effort. Fisher (1986) enlarged upon this premise, firstly, by suggesting that broader strategies might be at play when considering cognitive economies, e.g. the so-called speed/accuracy trade-off. Secondly, she noted that a further question of interest is the motivating dimension in the least-effort principle. One possible motivating factor is that of 'least expenditure of any resource', another possible principle is resource expenditure as required to achieve a desired goal and thus reduce the effort needed in the long term.

The present data revealed that under high anxiety perceived on-task effort increased up to an apparent critical point as goal difficulty increased. After this point however, effort was reduced dramatically; possibly in an attempt not to waste resources on achieving very difficult goals that were appraised as being beyond the present capability of the subjects. Thus, it is suggested that in the face of perceived task uncontrollability (high goal difficulty) subjects opted to focus on retaining their composure until such a time that the problem task could be engaged once more. In the low cognitive anxiety condition no significant differences in performance emerged, although it was observed that subjects tended to report increased effort as goals

became more difficult to achieve, whereas in the goal difficulty decreasing performance sequence there was a tendency for effort to decrease, perhaps also in an attempt not to waste resources. This would concur with the 'least effort principle', as well as the contentions of Obrist *et al.* (1978) and Svebak (1986).

It has been suggested that greater effort may be associated with heightened emotionality (Eysenck, 1979). Kahneman (1973) also introduced the notion that greater effort could cause raised arousal levels. The results of the high cognitive anxiety/goal difficulty increasing condition would appear to be compatible with this hypothesis. When effort was high prior to a critical drop in performance, the ensuing emotional responses may have contributed both to the appraisal of the situation as uncontrollable, and to a shift to focusing on the control of these responses after the critical point had been perceived.

Psychobiological evidence provided by Frankenhauser & Johansson (1982) gives rise to further speculation that this may indeed be the case. Frankenhauser & Johansson argued that control is a fundamental factor in determining whether a stressful situation is appraised as challenging or distressing. High control tasks were said to induce effort but not distress whereas low control tasks should involve both effort and distress which, chronically, could have detrimental effects upon health. In this study the results suggest that the task could

became more difficult to achieve, whereas in the goal difficulty decreasing performance sequence there was a tendency for effort to decrease, perhaps also in an attempt not to waste resources. This would concur with the 'least effort principle', as well as the contentions of Obrist et al. (1978) and Svebak (1986).

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reasonably be construed as low-control in the high anxiety condition when goal difficulty increased from the mid to the high region, and in the high to mid range when goal difficulty decreased. In light of this, an appraisal of uncontrollability may conceivably have elevated emotional reactions. The data support the evidence that people experiencing high anxiety reject goals at difficulty levels they would accept under no-threat conditions (Hardy, Maiden & Sherry, 1986).

The pattern of problem focused control in relation to reported critical points paralleled that of perceived actual effort, especially for the high cognitive anxiety treatment. This was expected because problem focused control refers to the effortful allocation of resources to a particular problem, task performance in this case, and here effort was operationalized primarily with reference to on-task endeavours. In addition, emotion focused control was observed to be greater following a perceived negative critical point, possibly to cope with elevated emotionality (4). In the same analysis, when goal difficulty decreased, emotion focused control was high before the point after which performance improved. This suggests that when difficulty is increasing and a problem is perceived to be unmanageable with problem focused resources, emotion oriented control is used to cope. Furthermore, as goal difficulty decreases the need

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(4) Note that this does not imply causality, i.e. that emotionality occurs because of increased effort. It could occur for other reasons such as the onset of panic or the realization that failure is imminent.

for emotion focused control to 'calm' the system continues up to the point of perceived problem controllability. In catastrophe terms high emotional control was necessary as an interim measure in order that, under the right conditions, problem focused control could be reinstated effectively, thereby enabling performance to 'regain' the upper performance curve.

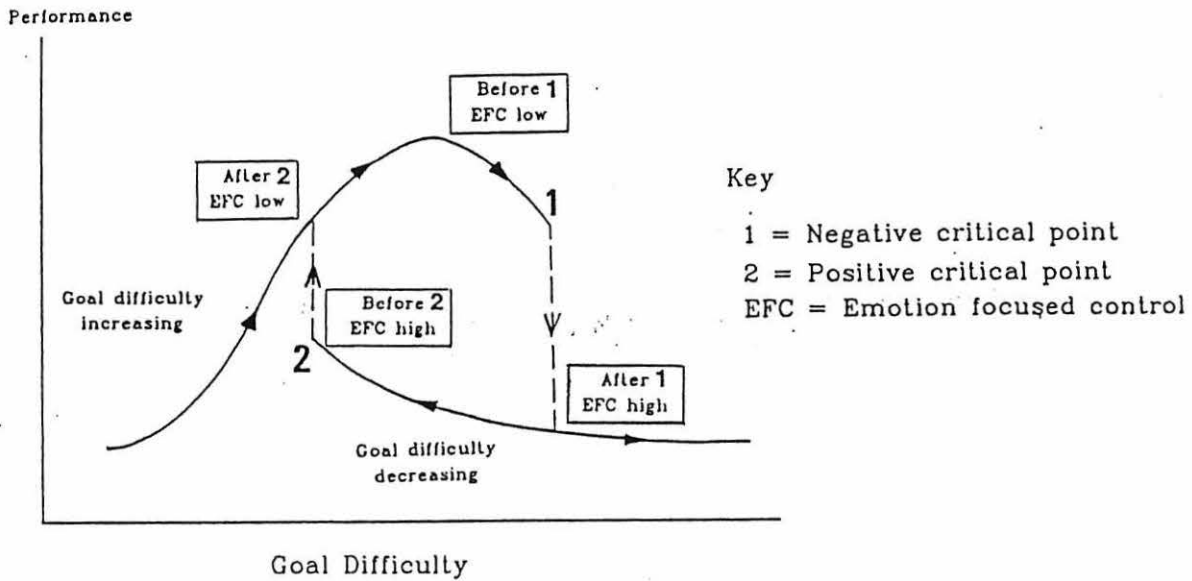
The shift of emphasis in control from the task problem to emotion oriented control is viewed in strategic terms and is not construed as the relinquishing of control or 'giving up'. Rothbaum, Weisz & Snyder (1983) proposed two major categories of control - Primary and Secondary control (see Chapter 2). Secondary control basically involves aligning oneself with environmental forces when a situation is perceived as uncontrollable, it embodies more palliative strategies. They argued that withdrawal type behaviours and the reduction of on-task endeavours should not be negatively biased by such terms as 'giving up' or learned helplessness, but rather that self-control is maintained until such a time that task problems can be effectively approached. Therefore, there are no grounds to assume that coping has not occurred simply because a task has not been successfully and competently completed when under duress. However, there are strong grounds to suggest that coping (manifested in any cognitive or behavioural efforts to manage a situation regardless of objective success), has taken place in such a way as to be most adaptive and 'energy efficient' for the organism. Figure 8.11 gives a

schematic representation of how the present results have been interpreted in relation to a catastrophe model. There was tentative support for the hypothesis that it is a perceived critical point in performance which elicits a shift to greater emotional control strategies. These strategies are used to cope when there is a withdrawal of effort from direct confrontation with the problem task 'head-on' or the maintenance of problem focused efforts at a stable level. However, emotion focused control is relinquished in favour of greater problem oriented control once the pressure has eased.

It must be conceded, however, that the direction of causality suggested above could be the other way round, that is to say, worry and high effort are associated with distress which elicits greater emotion focused control which in turn is followed by a performance catastrophe because task relevant resources are interfered with (see Kuhl, 1986, and Chapter 4). One issue that has emerged from this study is that any evaluation of stress and performance should embrace the notion of perceived controllability in its theory and design.

As such, it is not only a retrospective subjective appraisal of action outcomes, but is also very much a prospective factor which influences the control decisions a person takes. A corollary of this is the idea that, although individuals may be dispositionally inclined to demonstrate self-control and possess a rich behavioural repertoire of coping resources and/or support, another important factor is that they *perceive themselves to have*

a choice in the way that they mobilize their energies in the face of demanding circumstances.



**Figure 8.11** : Schematic of the Hypothesised Pattern of Emotion Focused Control Before and After Perceived Critical Points

In the sphere of occupational psychology the notions of 'jurisdiction', 'autonomy' and 'discretion' have been used to refer to perceived control in a person's work domain (e.g. Hackman & Lawler, 1978; Jackson, 1983; Wall & Clegg, 1981; Karasek, 1979). All imply that having decisional control over the actions one takes is crucial if negative stress effects are to be avoided especially in jobs that entail high workload (or underload). The following Chapter describes an investigation into the relationships between dispositional self-control, the mobilization and focus of control strategies and mental



health; with regard to specific 'crisis' situations under chronically stressful work conditions.

#### 8.11.1 Methodological Issues

The main methodological issues in connection with this study were discussed in Chapter 6. The problem of having a small subject sample, with its attendant implications for the normality and homogeneity of variance assumptions underlying analysis of variance, was brought to the fore because the initial subject sample of 14 was reduced by half for the data analyses. In repeated measures analysis of variance an additional assumption is that the variance-covariance matrix has compound symmetry (Winer, 1971). This assumption was not tested. The other major weakness, of course, was the lack of randomization in the sampling of subjects. This aspect of control and the small sample number suggests treating the findings and interpretations with caution. Having said this, one of the main reasons for conducting this study with a small sample was that other similar studies based on a catastrophe paradigm have achieved considerable success (notably, Hardy, Parfitt and Pates, 1990). In addition, it should be emphasized that the use of a catastrophe paradigm for this research was a particularly effective and novel approach to addressing the hypothetical problems posed to answer the research questions.

**CHAPTER 9****A non-experimental study****SELF-CONTROL, COPING AND HEALTH****9.1 Introduction**

In addition to the goals of understanding and explaining mental life, one of the consuming passions of mainstream Psychology could be said to be a desire to be able to accurately predict human behaviour given certain conditions. This is no less evident in the field of Health Psychology which employs psychological theory and methodology for the promotion and maintenance of health (1). The assertion that the major causes of morbidity and mortality currently faced by people are preventable (Prentice-Dunn & Rogers, 1986), adds to the urgent need for the development of health behaviour models which predict, for example, compliance with medically prescribed exercise, weight-loss or other health enhancing programs such as stress-management. A number of theoretically based models have been developed in an attempt to predict health behaviours and consequent health status. The most comprehensive of these social-

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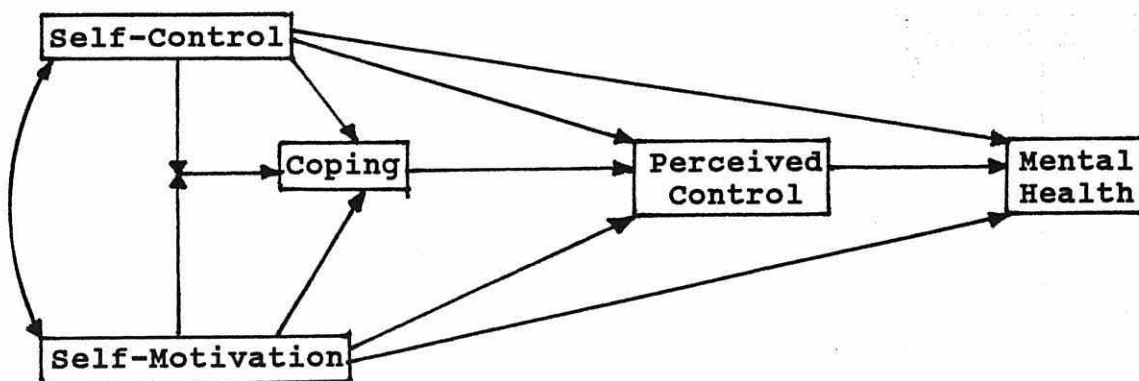
(1) "Health" may be taken to reflect one aspect of a global quality of life concept. Here, however, it is more specifically and simply regarded as physical and mental well-being. A state of well-being is achieved through health enhancing, curative, rehabilitative and maintenance behaviours (actions or responses which impact upon the state of well-being, Girdano & Dusek, 1988).

psychological frameworks include the Health Belief Model (HBM, Rosenstock, 1974; Becker & Maiman, 1975); the Psychobiologic Model (Dishman & Gettman, 1980); the Theory of Reasoned Action (Fishbein & Ajzen, 1975); Locus of Control Theory (Rotter, 1966; Wallston *et al.*, 1978; Coelho, 1985); and Protection Motivation Theory (Rogers, 1983; Prentice-Dunn & Rogers, 1986). Needless to say these models have met with varying degrees of success in their predictive capability. Indeed, the most extensive research, based on the Health Belief Model, has been highly equivocal in its findings because of the apparently 'all-encompassing' nature of the model, and a lack of reliable, valid measures specifically designed to test the model. Prentice-Dunn & Rogers (1986) stated that the HBM has provided an 'intuitive framework' for explaining preventive health behaviours. However, they also noted that the rather vacuous structure of the model necessitates the empirical verification of more fully specified models.

It is worth noting that the theories of Lazarus & Folkman (1984) and Rosenbaum (1985) have not been widely tested as models for predicting health behaviours and well-being. Their perspectives do however, form a significant part of the more specified, experimentally testable, model proposed and investigated in the following sections.

## 9.1.1. Aim

The aims of this study were twofold. Firstly, to investigate the intuitively appealing premise that Self-Control as a dispositional tendency will be strongly related to coping and subsequent health. Secondly, to examine the efficacy of applying a Self-Control Model to one aspect of health, namely mental well-being. This approach ascribes causal pathways of influence from the personality variables of Self-Control and Self-Motivation directly upon mental health (Rosenbaum, 1989). It also maps a path of influence, through situational coping strategies and the success or failure of these strategies in controlling stressful situations, on to non-pathological mental health status (see Figure 9.1). This model is necessarily eclectic in nature and draws upon the established cognitively based theories of Rosenbaum (1985), Lazarus (1966), and to a certain extent the work of Dishman (1987) in the field of Exercise Psychology and Health. Both Rosenbaum's and Lazarus's theories have been extensively covered in Chapters 4 and 5 respectively.



**FIGURE 9.1** : A Self-Control/Self-Motivation Model of Health

### 9.1.2. Self Control / Learned Resourcefulness

The reader might recall that Rosenbaum (1980 and 1988) posited the concept of Self-Control (or Learned Resourcefulness) in terms of a personality repertoire. Personality repertoires are not personality traits but rather "basic behavioural repertoires" (Staats, 1975), comprising a set of behaviours, cognitions and emotions that constantly interact with the individual's internal and external environment. This notion sits well with the contention that the person and environment co-exist in a dynamic, constantly changing relationship.

Learned Resourcefulness is suggested not to influence initial cognitive and emotional reactions to a stressor, nor the primary evaluation of that stressor, but it may influence control expectancies. However, by far the greatest impact of Self-Control as a personality repertoire is its influence upon *coping* (Rosenbaum, 1988). This was previously defined as all behavioural and cognitive efforts to manage the demands of a person-environment interaction that is perceived to tax or exceed the resources available to the person (Folkman et al., 1986). Coping is said to occur irrespective of whether a given stressful situation is objectively controlled; that is to say, any self-regulatory process initiated in response to a stress appraisal is regarded as 'coping' even though a particular strategy may not

successfully alleviate the unwanted disruptions to smooth ongoing behaviour.

Rosenbaum's (1988) theory of Self-Control implies that high resourceful subjects should employ more self-control strategies than low resourceful subjects during an event that is appraised as being stressful. Research findings have generally indicated that individual differences in Self-Control and the number of coping methods used under stress are not associated with significant differences in subject perceptions of the severity or intensity of an experienced stressor (Rosenbaum, 1980b; Rosenbaum & Rolnick, 1983; Rosenbaum & Ben-Ari Smira, 1986). Thus, Self-Control is regarded as playing a major role in what might be termed the 'action phase' of the self regulation process - that is, the mobilization of self control skills under stress.

### 9.1.3 Self-Motivation

Dishman and his colleagues (Dishman & Gettman, 1980; Dishman, Ickes & Morgan, 1980; Dishman, 1988), proposed a Psychobiologic 'screening' Model in relation to medically prescribed, sport preparation and health oriented exercise adherence. Self-motivation features as a major predictor variable in this model and is conceptualised as a generalised non-specific tendency to persist in the absence of extrinsic reinforcement. This tendency is conceptualised as being largely independent of situational influence (Dishman & Gettman, 1980). As

such, it has implications far beyond the realm of exercise adherence. Self-motivation is operationalised by Dishman and Gettman (1980) as a relatively stable personality 'trait'. In this context, self-motivation is considered to be socially learned and dependent upon one's ability at self-reinforcement. The existence of a disposition to persevere at goal-directed behaviour in relation to a given task once the behaviour has been initiated, would presumably, in Dishman's (1988) and Sonstroem's (1988) analysis, transfer relatively well to situations in which a person experiences chronic stress. In this type of scenario one might expect those individuals with high self-motivation to persevere in the pursuance of whatever activity they are engaged in. Conversely, those low in self-motivation might be expected to discontinue particular goal-directed behaviour and possibly pay the cost in terms of poorer mental and physical health as a result of not managing the demands of the tasks that face them, nor their cognitive and emotional reactions to those situations.

Self-Motivation has been successfully used as a predictor of exercise program and athletic adherence (Dishman & Ickes, 1981; Olson & Zanna, 1982; Knapp *et al.*, 1984; Stone, 1983; Thompson *et al.*, 1984; Dishman 1983). Having said this, other studies have produced insignificant or equivocal results (e.g. Gale *et al.*, 1984; Weinberg *et al.*, 1984; Wankel & Yardley, 1982). The development of the Self-Motivation Inventory (SMI, Dishman & Gettman, 1980) has been well received by health

and exercise psychology researchers concerned with the knotty problems of predicting health related compliance behaviours. Sonstroem (1988) went further when he stated that :

"Its items reflect high face validity for adherence not only to exercise but for perseverance and the exhibition of willpower in meeting many life challenges" (p 132).

The construct of Self-Motivation is apparently independent of concepts like achievement and approval motivation, locus of control or causal attributions (Sonstroem, 1988). It is further conjectured to possibly incorporate the ability to delay gratification and involve the use of cognitive skills such as imagery and self-statements regarding goal attainment (Dishman & Gettman, 1980). Note that these skills are also major components of Rosenbaum's (1980) Self-Control Schedule. This suggests that both Self-Control and Self-Motivation are appropriate potential predictor variables in the model proposed for the present study.

#### 9.1.4 Coping, Control and Health

Lazarus and his colleagues (Folkman *et al.*, 1979; Lazarus, 1966; Lazarus & Folkman, 1984; Lazarus *et al.*, 1974) have emphasised the part played by cognitive appraisal as a mediator in the coping process. This appraisal embodies personal perceptions and judgements about the specific nature of stressful situations, their significance in terms of what is at stake, and an evaluation of the resources available to manage the person-environment transaction.



One aspect of particular salience in relation to Self-control is the extent to which a given situation is perceived as controllable or amenable to change, perceived control is included in the proposed model. In the present study the extent of coping efforts with respect to a specified stressful incident also represents one of the mediating variables of the model proposed in Figure 9.1. Knight (1987) stated that most stress theory is phenomenological. Consequently, it may be deduced that actual objective control is less important in determining activation and effortful coping than the perceived controllability of a situation and individuals' responses to it. Many studies have, however, manipulated the facility for objective control as a means of studying the relationship between control and stress outcomes (Jackson, 1983; Langer & Rodin, 1975; Schulz, 1972; Houston, 1972). An alternative to this approach is to adopt a more quasi-experimental stance and examine differences in the stress-coping-control relationship between subject groups which experience differential levels of stress in their daily lives; for example, a group that is chronically stressed by the nature and demands of their occupation, and one that does not normally experience prolonged periods of stressfulness. This investigation adopted the latter approach and looked at Nursing staff and Student populations.

Coping was operationalised as the extent to which cognitive and behavioural coping strategies were used in

relation to a specific event or circumstances identified by subjects to be the most stressful situation recently experienced. In addition to this somewhat gross categorization of coping (i.e. total number of strategies used.), an investigation was also conducted into the *kinds* of coping methods employed in the given situations using the Ways of Coping Questionnaire (Lazarus & Folkman, 1980).

In a similar way, Mental Health was measured as a 'global' construct using the General Health Questionnaire (Goldberg, 1972), and the subscales of this instrument were used to examine the finer details of how different aspects of mental well-being were related to the predictor variables in the model.

## 9.2 Hypotheses

A number of hypotheses were proposed in relation to the constructs comprising the model.

1. In view of the origins of the Self-Control Schedule (Rosenbaum, 1980b), it was hypothesised that subjects high in self-control would report significantly greater use of coping strategies than low self-control subjects when faced by a specifically stressful situation.
2. Subjects with a well developed repertoire of self-control skills were expected to perceive themselves to

have been more in control of their specifically stressful event than low self-control subjects.

3. A synergistic interaction between Self-Control and Self-motivation was hypothesised whereby subjects with greater self-control and better motivation would be more able to cope with stressful life events, and therefore develop healthier profiles. Self-control and Self-Motivation were also expected to correlate positively.

4. It was predicted that the effects of self-control would interact with the degree of stressfulness in a person's life experience such that : (i) Individuals exposed to chronically stressing conditions and reporting low self-control would show poorer mental health when compared to subjects in the same group who had high self-control.

(ii) Compared to the chronic stress group, the 'low-stress' group would show better mental health profiles. However, within this group, those reporting high self-control were predicted to reveal better mental well-being than those low in self-control. (iii) The magnitude of the effects of self-control would be significantly greater, and more important in health terms, for the high-stress subjects compared to the low-stress subjects. To summarise, the scope of this study was restricted to:

(a). The development and application of a Self-Control/Self-Motivation model to coping and mental health, thereby testing the theoretical contentions of

several researchers (Dishman, 1988; Lazarus, 1966; Rosenbaum, 1985).

(b). An examination of differences in the relationship between the personality, coping and health variables in two groups of subjects with differing stress experiences.

(c). A Path Analysis to explore the amount of causal influence predictor variables had upon subsequent variables and ultimately upon mental health - a test of the parsimony and predictive validity of the proposed model.

### 9.3 Methodology

#### 9.3.1 Subjects

Two relatively large subject groups were used. One group (n=109, Female=98, Male=11, Mean Age=27.45), comprised established/qualified nursing staff from the Gwynedd area, the majority of whom worked at a large district hospital. The second group (n=170, Female=146, Male=24, Mean Age=20.67), comprised students enrolled at the University College of Wales, Bangor. It was necessary to use fairly large groups in order that reasonable numbers of subjects could be extracted for further involvement in the study following preliminary analyses. The initial analysis was performed to separate subjects into sub-groups by median splits on the Self-Control and Self-Motivation data. In this way four sub-groups were attained : 1). High self-control/High self-motivation, 2). High self-control/Low self-motivation, 3). Low self-

control/High self-motivation and 4). Low self-control/Low self-motivation.

### 9.3.2 Measures

A number of reliable and validated self-report measures were employed to examine the self-control/self-motivation model proposed earlier (See Appendix IIIa for examples of each measures).

#### (a) *Self Control Schedule* (SCS, Rosenbaum, 1980a)

This scale assesses dispositional tendencies to mobilise self-control strategies when faced by behavioural problems (see Chapters 5 and 7 for details). Briefly, the SCS covers the content areas of : the use of cognitions and self-instructions to cope with emotional and physiological responses; the application of problem-solving strategies; the ability to delay immediate gratification and general belief in one's ability to self-regulate internal events.

#### (b) *Self-Motivation Inventory* (SMI, Dishman & Gettman, 1980)

Because this scale is relatively unknown in this country, it was felt that detailed coverage was warranted. This is a 40-item self-report inventory based on the premise that self motivation derives from social learning, depends upon a person's ability at self-reinforcement and may include the ability to delay gratification (a prominent self-control skill; see, for example, Mischel, 1984; Rosenbaum, 1980a).

As Soenstrom (1988) noted, this psychological construct has been formulated and interpreted as a disposition to persevere at a task after the task has been started. This behavioural perseverance can be applied to many challenging or otherwise stressful life events. These include health related behaviours motivated by preventive, curative or simply health enhancing expectations.

"Self-motivation is conceptualised as a generalised non-specific tendency to persist in the absence of extrinsic reinforcement and is thus largely independent of situational influence" (p 297, Dishman & Gettman, 1980).

Dishman & Gettman (1980) highlighted the remarkable correspondence between dropout patterns in health related exercise programs (e.g. Morgan, 1977a) and non-compliance patterns in psychotherapeutic programs, including addictive behaviour treatment and hypertension control (e.g. Baekeland & Lundwall 1975). They suggested that similarities in the influences impinging upon healthy behaviours are in operation across a variety of health-care situations. The personal characteristics and perceptions implicated by Dishman (1988) as health behaviour compliance predictors are: a) Expectations, b) Self-Motivation, c) Self- Perceptions and d) Health Status. While Dishman and his colleagues have incorporated the Self-Motivation construct into a Psychobiologic Model of exercise adherence, the utility of the SMI is considered to have far wider ramifications - as Dishman & Gettman (1980, p 307), stated :

"...the predictive efficacy of the self-motivation measure is apparently not restricted to a single

exercise setting; rather, it seems to be effective in a wide range of settings including competitive athletics, adult fitness and preventive medicine"

Thus, Dishman, Ickes & Morgan (1980) suggested that the notion of a single, unitary 'trait' which reflects a general disposition to persevere might offer both conceptual parsimony in helping to explain the role of motivation in health-related behaviours, and a possible simplification of the operationalization of motivation in such a context.

Primarily, Dishman's aim was to develop a measure of dispositional self-motivation in relation to adherence to physical activity programs. Items were generated to reflect individuals' tendencies to persevere across a wide variety of situations. The 40-item scale demonstrated high internal consistency with a Cronbach's Alpha reliability coefficients of .91 and .86 for two different groups. Test-retest reliability of the SMI over a one month time interval was .92. The possible response range is between 40 and 200, with high scores indicating high self-motivation.

Convergent and discriminative analyses generally supported the construct validity of the SMI. Self-Motivation's relationships with other conceptually relevant psychometric variables were on the whole supportive. Self-Motivation was found to correlate significantly with the Thomas-Zander (1973) Ego Strength Scale ( $r=.63$ ,  $p<.005$ ). This was expected and viewed as reinforcing the conceived meaning of the self-motivation

construct. However, a moderate correlation ( $r=.36$ ,  $p<.01$ ), between the SMI and the Marlowe-Crowne Social Desirability Scale (Crowne & Marlowe, 1964), suggested the need to obtain behavioural evidence of its discriminant validity.

An initial discriminant validation study using the above scales as predictors of the adherence of a women's rowing crew to a training program demonstrated that self-motivation was a significant predictor of adherence to training. A stepwise regression analysis revealed that self-motivation entered the equation first with a resultant multiple R of .33 ( $p<.05$ ). Inclusion of Ego-Strength and Social Desirability did not significantly increase  $R^2$ . A median split of self-motivation scores for subjects who stayed in the program for up to 32 weeks revealed that the percentage of adherence for low self-motivation subjects was 40.6%, whilst the percentage of adherence for high self-motivation subjects was 78.1%. This difference was shown to be highly significant by a chi-square test (chi squared =9.32,  $df=1$ ,  $p<.005$ ).

A second validation study was carried out to provide more evidence on the Self-Motivation Inventory's reliability and validity in relation to exercise regimes of a therapeutic nature. Health related exercise has profound implications for preventive medicine as well as rehabilitation after illness. Recidivism rates are high for both adult exercise programs and medically or psychiatrically prescribed treatment. The second investigation was a 20 week prospective study of adult



males participating in organised health-related physical activity programs (some of which were medically supervised). Soenstrom's (1974) Physical Estimation and Attraction Scales; a Health Locus of Control scale (Wallston *et al.*, 1976), and the Attitude Towards Physical Activity scale (Kenyon, 1968), were administered along with the SMI. Physiologic measurements included percent body fat, body weight and metabolic capacity. A stepwise multiple discriminant analysis revealed that only percent body fat, self-motivation and body weight contributed significantly to the discriminant function predicting adherers and dropouts ( $p < .05$ ). A multiple regression analysis also showed these three variables to be the only ones that predicted the extent of adherence ( $R = .67$ ,  $p < .01$ ). Thus, the three variables accounted for a substantial proportion of the variance in adherence.

In this way, it was established that of the psychological constructs employed, self-motivation was the only one that contributed to the prediction of exercise program adherence. Self-motivation and adherence demonstrated a quite substantial relationship ( $r = .44$ ,  $p < .05$ ). Additionally, Pearson product moment coefficients indicated that self-motivation was only weakly correlated with social desirability ( $r = .26$ ,  $p > .05$ ), achievement motivation ( $r = .24$ ,  $p > .05$ ) and Health Locus of Control ( $r = -.23$ ,  $p > .05$ ). These results suggest that the self-motivation construct does reflect a relatively distinct factor. A test-retest correlation over the 20 week period also yielded a reliability

coefficient of  $r=.86$  ( $p<.01$ ), providing further evidence for the dispositional nature of self-motivation as operationalised by Dishman and his colleagues. The rationale for including self-motivation within the framework of the model being applied in the present study was given earlier.

(c) *The Ways of Coping Questionnaire* (WOCQ, Lazarus & Folkman 1988)

The latest version of the Ways of Coping Questionnaire (WOCQ), was used in this study. The WOCQ assesses the cognitive and behavioural actions individuals use to cope with stressful events. The scale is a theoretically derived measure used to explore the mediating influence of the coping process upon the relationship between stress and adaptational outcomes (Lazarus & Folkman, 1988). The questionnaire identifies coping strategies used in relation to a *specific* stressful encounter and as such it measures the process of coping, not coping styles. For details of the theoretical foundations upon which the WOCQ is built, the reader is referred to Chapter 5. For the sake of completeness in this section, however, Lazarus's definition of coping will be reiterated. Coping is defined as - *All cognitive and behavioural efforts to manage specific external and/or internal demands appraised as taxing or exceeding the resources of the individual*. Note that this definition was amended in the introductory section of this thesis to take clearer account of the emphasis placed upon 'positive stress

appraisals' by Lazarus and colleagues. The appraisal of challenge and potential for overcoming the demands of a situation in association with the positive affect this invokes is the common example given. Lazarus & Folkman's (1988) definition of coping is important because they stipulate four main features; a) A process orientation, b) An association with management rather than mastery, c) No *a priori* judgement regarding the quality of the coping process and d) The acceptance of a stress-based distinction between coping and automatic adaptive behaviours (cf. Rosenbaum, 1985, and the section on his theory in Chapter 4).

The 66 items comprising the WOCQ provide an opportunity not only to assess the total number of coping strategies used in a specific stressful transaction but can also be divided into the two broad categories of coping identified by Lazarus & Folkman (1984), namely; Problem Focused Coping (26 items) and Emotion Focused Coping (40 items). Factor analysis during the development phase of the WOCQ revealed 8 factors corresponding to the subscales described in Table 9.1. The WOCQ can therefore be used to examine in greater detail the *types* of strategies mobilised under conditions of threat or challenge.

The WOCQ and its precursor the Ways of Coping Checklist have been used successfully in a number of studies which investigated coping in relation to particular person-environment transactions and personality factors. Folkman *et al.* (1986) investigated

how residential married couples coped with the demands of daily life. Folkman & Lazarus (1985) studied students coping with an examination. Parkes (1984) examined student nurses coping with stressful episodes and also related coping to locus of control orientation. Coping, as measured by the WOCQ, has also been related to other personality variables, e.g. Type A and Type B behaviour patterns in police officers (Kirmeyer & Diamond, 1985); Neuroticism and Extraversion (McCrae & Costa, 1986); and Dispositional Optimism in students (Scheier, Weintraub & Carver, 1986).

**Table 9.1. :** WOCQ Subscales (after Lazarus & Folkman, 1988)

Confrontive Coping	Aggressive efforts to alter the situation, suggesting some degree of hostility and risk-taking.
Distancing	Cognitive efforts to detach one-self and to minimize the significance of the situation.
Self-Controlling	Efforts to regulate one's feelings and actions.
Seeking Social Support	Efforts to seek informational, tangible and emotional support.
Accepting Responsibility	Acknowledgment of one's own role in the problem with a concomitant theme of trying to put things right.
Escape-Avoidance	Wishful thinking and behavioural efforts to escape or avoid the problem.
Planful Problem Solving	Deliberate problem focused efforts to alter the situation, coupled with an analytic approach to solving the problem.
Positive Reappraisal	Efforts to create positive meaning by focusing on personal growth. It also has a religious dimension.

Frankenhauser & Lundberg (1982) recognised that activation for coping (the autonomic and cognitive channelling of energy and resources in readiness to act) shares an intimate relationship with the individual's perception of situational controllability. That is - "Can it be controlled ?" and "Do I have the resources available to control it ?". Knight (1987) stated that a demand may be considered stressful not because it requires change per se but because the person perceives the situation to be uncontrollable, or that available resources are inadequate to meet the demand. Following Knight's (1987) lead, two additional items were included on the WOCQ to measure perceived control over a specific situation. These were :

1). Was the situation you have in mind one that you COULD resolve or do something about if you had the right resources, (e.g. personal abilities or external resources such as support, finances, equipment etc) ?

YES/NO

2). Were all the needed resources available to you ?

YES/NO

Thus, the classification of perceived control was based upon mutually exclusive responses to these items. A situation was defined as controllable when subjects perceived that it could be solved with adequate resources and that these resources were available. Uncontrollable incidents were defined as those reported as (i) unsolvable even with the necessary resources at hand, (ii) unsolvable because the necessary resources were

unavailable or (iii) both. Of course, these items indicate *retrospective* perceived control and should not be construed as part of the cognitive appraisal processes that occurred *before* or *during* the stressful episode. Note also that the contention here is that coping may have occurred even though individuals may not have perceived themselves to have managed their stressful situation satisfactorily (i.e. did not get the result they wanted). Perceived uncontrollability does not imply a lack of coping within a situation and vice versa, perceived control does not necessarily mean that coping has occurred. However, in the latter case, it is possible that the perception of control constitutes a form of coping strategy (see Chapter 3).

(d) *The General Health Questionnaire* (GHQ, Goldberg, 1972)

This is a self-report questionnaire designed to detect non-psychotic psychiatric disorder (Goldberg, 1972; Goldberg & Hillier, 1979). The 28-item version of the GHQ was used. This gave scores for five aspects of psychological health in the subject populations. An overall score also provided a measure of general psychological distress. The four-point response scale was scored in a bimodal manner, so that only pathological deviations from the mean signalled possession of the item. Consideration of the questionnaire's four subscales provided information regarding somatic symptoms, anxiety and insomnia, social dysfunction and severe depression.

In the present study, overall score together with the four subscale scores were used as dependent variables. One of the reasons for using the GHQ to measure mental health was because it has been used to good effect with Nursing staff populations in previous studies; for example, Jones *et al.* (1987) found that a sample of psychiatric nursing staff scored significantly higher on reported symptoms of psychological distress compared to other employed samples.

#### 9.4 Procedure

Phase 1 : Questionnaire booklets were distributed to nursing staff at a large district General Hospital and a smaller Maternity Hospital. Each booklet contained a copy of the SCS, SMI and GHQ, and was accompanied by a covering letter which explained the nature of the study and why participation would be of value. Addressed envelopes and stamps were also provided to help ensure confidentiality and encourage further participation. The questionnaires were completed by staff in various sections of the hospitals, including : the Psychiatric Unit, the Theatre, Accident and Emergency, Intensive Care, General Medical, Paediatric, Gynaecological and Labour wards. There was a 43.6% response rate for the nursing staff (109 out of 250), which in survey terms was quite a respectable return.

Booklets, covering letters and envelopes were distributed personally to the student sample in halls of residence. Because the completed questionnaires were

collected the day following distribution there was a very high return of 94.4% (170 out of 180). All subjects were able to indicate on the booklet whether they would be willing to participate further. 71.6% of the nursing staff (78 out of 109), and 83.5% of students (141 out of 170), consented to further contact. However, time constraints and the fact that most students had begun studying for examinations and were unwilling to participate when actually approached, prevented the follow-up of this group. Thus, only the self-selected nursing group proceeded to phase 2. The nursing sample was divided into high and low self-control (SC) and self-motivation (SM) groups on the basis of median splits of these data.

Phase 2 : Nursing staff subjects falling into the above categories were contacted to arrange meeting times and places convenient to them. It was possible to obtain 13 subjects per cell for the nursing staff sample (n=52, Female=47, Male=5, Mean age=28.34). Each subject was given a brief standardised interview designed to funnel their attention onto a particular stressful encounter experienced in the past week including the day of the interview. This event was identified and described by each subject who then completed the Ways of Coping Questionnaire with reference to that event. Few subjects encountered any difficulty in vividly recalling a recent stressful episode, nor did they have difficulty in identifying whether or not they perceived it to be



controllable. Thus, a measure of perceived control relative to a specific event was obtained for the subgroups. More importantly, data from the WOCQ represented the coping variables specified in the self-control/self-motivation model and so provided the final data to enable the model to be tested.

### 9.5 Analyses

The data were analysed in two phases. Phase 1 examined the influence of different levels of SC and SM on the mental health factors. A completely 3-way ANOVA (Occupation by SC by SM) was conducted on the GHQ data (N=279). Differences were further explored using Tukey's follow-up tests. The nursing subgroup data were then analysed using 2-way ANOVA's (SC by SM) with the WOCQ coping scores as dependent variables. The above analyses provided information regarding differences in effects between and within subject groups with respect to self-control, self-motivation and the assumed stressfulness of their respective existences.

Phase 2 explored the fit of these data to the self-control/self-motivation model previously described. A major aim of this study was to apply this model to the prediction of mental health. A Path Analysis was conducted to test the viability of the model; that is to say, to test the *a priori* assumptions of causal influence associated with the model and whether or not the model was a good fit of the data. Details of these analyses may be found in Appendix III.

## 9.6 Results

### 9.6.1. Phase 1

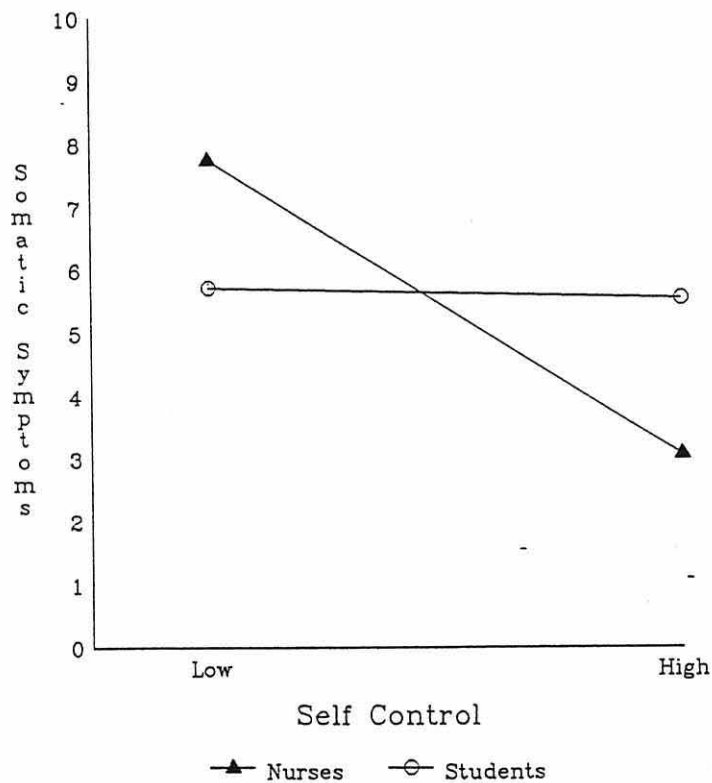
The three factor (Occupation by SC by SM) ANOVAs performed on the mental health data for the total subject sample (N=279) revealed no Occupation or SM main effects. Self-Control demonstrated strong main effects for all mental health factors (all  $p < .0001$ ) - See Table 9.2. and Appendix IIIb.

**Table 9.2** : Comparison of High and Low Self-Control Means across Mental Health Variables

	Self-Control		Prob.
	Low	High	
<b>Somatic Symptoms</b>	7.74	4.31	$p < .0001$
<b>Anxiety &amp; Insomnia</b>	7.92	3.52	$p < .0001$
<b>Social Dysfunction</b>	7.88	6.15	$p < .0001$
<b>Depression</b>	2.32	0.615	$p < .0001$
<b>General Mental Health</b>	6.27	2.45	$p < .0001$

Occupation by SC interactions were found for a number of mental health factors (see Figure 9.2). Firstly, somatic symptoms,  $F(1,271)=20.31$ ,  $p < .0001$ . Post hoc Tukey's test identified that high SC corresponded to significantly lower somatic symptoms than low SC for the nursing staff. No significant differences existed between high and low SC subjects in the student sample. Secondly, the Occupation by SC interaction for anxiety and insomnia was also significant,  $F(1,271)=7.56$ ,  $p < .006$ . Tukey's follow-up tests revealed that for both groups high SC was associated with significantly less reported anxiety and insomnia than low SC. However, high SC nursing staff reported significantly less anxiety and insomnia than

high SC students whereas low SC nurses indicated significantly greater anxiety and insomnia than low SC students. Finally, there was a significant Occupation by SC interaction for general mental health,  $F(1,271)=9.44$ ,  $p<.002$ . Tukey's tests indicated that nursing staff were in significantly better general mental health when in possession of high SC compared to low SC. The students did not differ significantly in general mental health between levels of SC.



0 = Better Health 10 = Poorer Health

**Figure 9.2 :** (a) Occupation by Self-Control Interaction Effects on Somatic Symptoms for the Total Subject Population

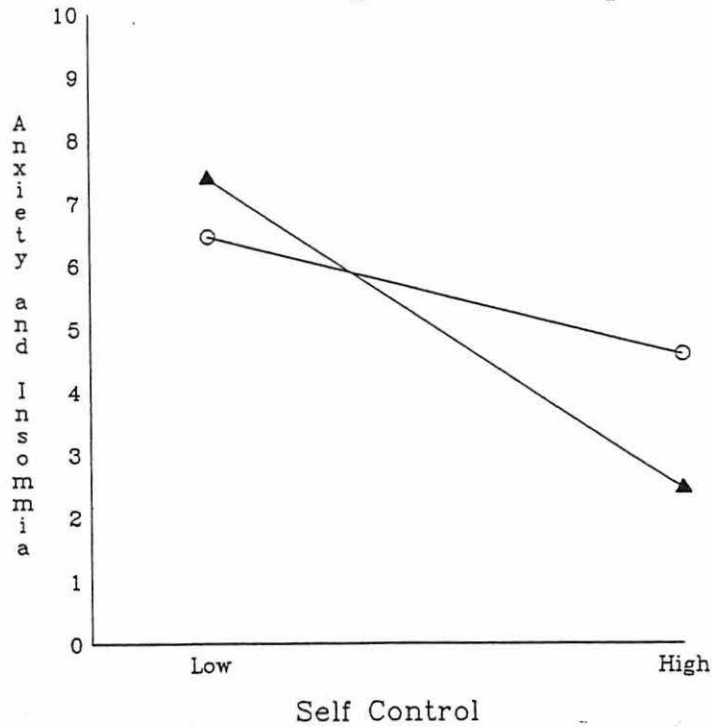
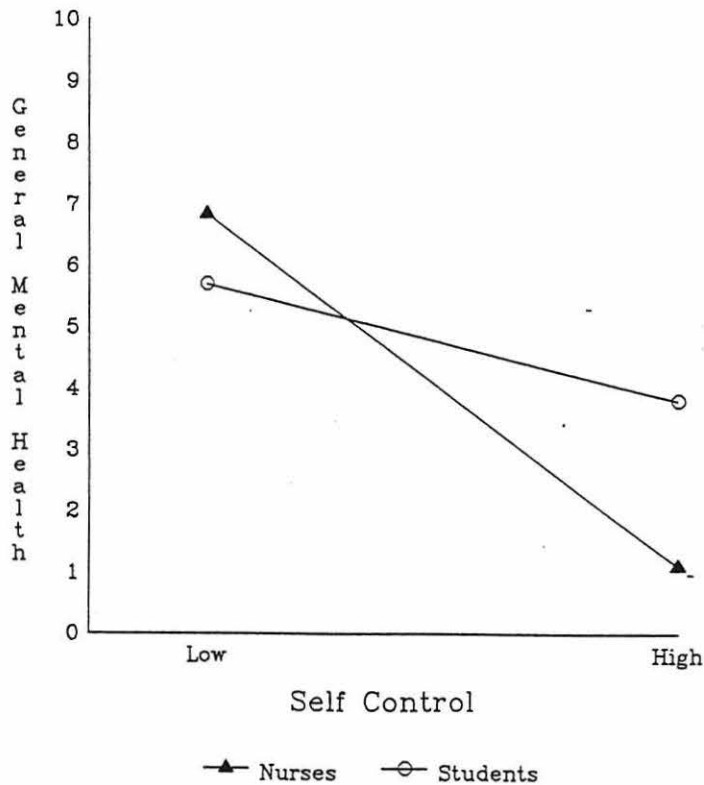


Figure 9.2 : (b) Occupation by Self-Control Interaction Effects on Anxiety and Insomnia for the Total Subject Population

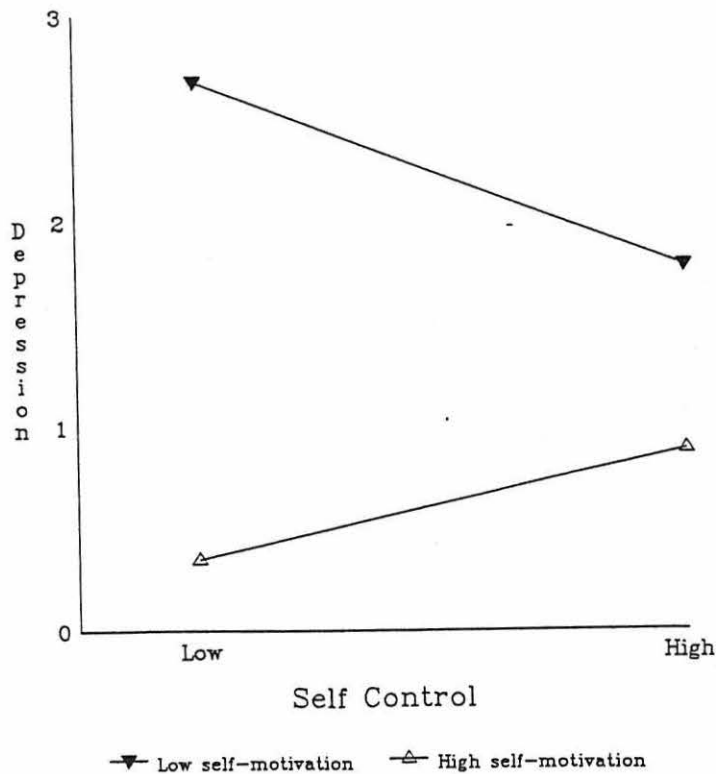


0 = Better Health 10 = Poorer Health

Figure 9.2 : (c) Occupation by Self-Control Interaction Effects on General Mental Health for the Total Subject Population

Furthermore, high SC nurses reported significantly fewer symptoms than high SC students, whilst Low SC nursing staff reported poorer (although not significantly poorer) general mental health than low SC students.

The analysis also revealed a significant SC by SM interaction effect for depression,  $F(1,271)=4.22$ ,  $p<.041$ , - see Figure 9.3. Tukey's post hoc tests demonstrated that subjects in the low SC/low SM group were more depressed than those in the low SC/high SM and high SC/high SM groups, whilst low SC/high SM subjects reported less depression than high SC/low SM subjects. No three-way interactions were obtained.



**Figure 9.3** : Self-Control by Self-Motivation Interaction Effects on Mental Health for the Total Subject Population

To check the hypothesis that high Self-Control would be associated with better mental health within the subject cohorts, separate two-Way ANOVA's on the total nursing staff (N=109) and student data were conducted. In the nursing staff sample, these revealed significant main effects for SC (Table 9.3), across all of the mental health factors; that is to say, somatic symptoms, anxiety and insomnia, social dysfunction, severe depression and the measure of general mental health (all  $p < .002$ ). High self-control was associated with lower scores (and better mental well-being) on each of the mental health factors. No effects were observed for SM and no interaction effects emerged. Details of the analysis may be found in Appendices IIIc and IIIId.

**Table 9.3** : Comparison of High and Low Self-Control Means across Mental Health Variables for the Nursing Staff Group

	Self-Control		Prob.
	Low	High	
<b>Somatic Symptoms</b>	7.25	2.90	$p < .0001$
<b>Anxiety &amp; Insomnia</b>	6.88	2.37	$p < .0001$
<b>Social Dysfunction</b>	7.72	5.83	$p < .0001$
<b>Depression</b>	2.26	0.40	$p < .002$
<b>General Mental Health</b>	6.16	1.21	$p < .0001$

Similarly, two-Way ANOVA's on the student sample (N=170), revealed a main effect of SC for anxiety and insomnia ( $p < .02$ ), social dysfunction ( $p < .02$ ), severe depression ( $p < .02$ ), and general mental health ( $p < .03$ ). See Table 9.4. Again, high self-control subjects reported significantly better health on these factors than low self-control subjects. No main effects were obtained for

SM, although a marginally significant SC by SM interaction was observed for severe depression ( $p < .064$ ).

**Table 9.4** : Comparison of High and Low Self-Control Means across Mental Health Variables for the Student Group

	Self-Control		Prob.
	Low	High	
<b>Anxiety &amp; Insomnia</b>	6.79	4.46	$p < .02$
<b>Social Dysfunction</b>	8.19	6.79	$p < .02$
<b>Depression</b>	2.67	1.07	$p < .02$
<b>General Mental Health</b>	6.34	3.67	$p < .03$

Two-Way ANOVA's were also carried out on the coping and perceived control data obtained from the nursing staff sub-sample ( $N=52$ ). As reported previously, sub-groups were obtained by median-splitting the SC and SM data. Self-control had highly significant main effects on the WOCQ measures of problem focused and emotion focused coping,  $F(1,51)=53.815$ ,  $p < .0001$  and  $F(1,51)=39.695$ ,  $p < .0001$  respectively. High self-control subjects demonstrated greater problem and emotion focused coping during their idiosyncratic stressful events than low self-control subjects. No self-motivation main effects or interaction effects emerged. Unsurprisingly, strong main effects were also found for self-control with the 'general' measure of coping (obtained by summation of the problem focused and emotion focused coping scales),  $F(1,51)=52.41$ ,  $p < .0001$ . This indicated that high self-control subjects employed a more extensive variety of coping strategies than did those low in self-control. No SM main effects or interaction effects were obtained. See Appendix IIIc for ANOVA tables.

Non-significant effects were found for perceived control upon the general coping measure,  $F(1,51)=1.901$ ,  $p<.17$ . The effects obtained for problem focused control did not even approach significance. The emotion focused coping results were also non-significant,  $F(1,51)=2.486$ ,  $P<.09$ , but they weakly suggested that nursing staff who perceived their situation to have been resolvable tended to report more emotion focused coping than those who appraised their situation as uncontrollable (see Appendix IIIe). This finding appeared contradictory to previous research findings which have found that more emotion focused coping is mobilised under uncontrollable conditions (Knight, 1987; Lazarus & Folkman, 1980).

**Table 9.5** : Comparison of Perceived Control Means across Coping Variables for the Nursing Staff Sub-Group (N=52)

	Perceived Control		Prob.
	Control Possible	No Control Possible	
<b>General Coping</b>	83.50	62.99	$p<.17$
<b>Problem Focused Coping</b>	36.83	29.08	$p<.42$
<b>Emotion Focused Coping</b>	46.67	33.91	$p<.09$

Having said this, the issue may have been somewhat clouded by the operationalization of perceived control as a retrospective report in this study compared with its prospective report in other studies (see the discussion section for further consideration of this point).

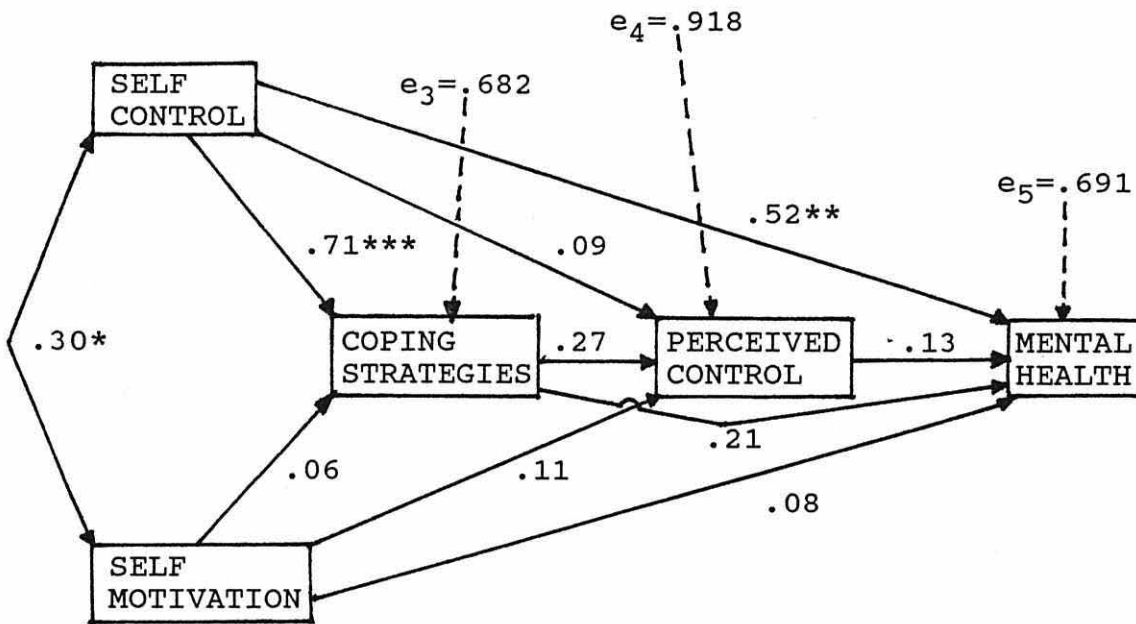


### 9.6.2 Phase 2 : Path Analysis

Data obtained from the nursing staff sub-group (N=52), were subjected to a path analysis. This was to determine whether or not the proposed model (Figure 9.1) explained the correlations between the variables. The path analysis also served to test the prescribed pattern of causal influence in the model and thus its predictive viability and parsimony. The correlation matrix analysed is shown in Table 9.5.

In conducting the path analysis, the 'fully recursive' or 'just-identified' model (i.e. one in which all possible paths among the variables are included; see Figure 9.4) was compared to an 'over-identified model' (i.e. one in which some of the pathways have been deleted due to their low and/or non-significant path coefficients; see Figure 9.5). Pedhazur (1982) refers to the deletion of non-significant paths in causal models as "theory trimming". This process serves the purpose of establishing the most parsimonious explanation possible for the causal phenomena occurring in one's data. Appendix IIIf provides further details of these analyses.

To help achieve 'best fit' between the model and data Pedhazur (1982) suggests setting an *a priori* critical level for path coefficients, below which they are omitted from the model. In accordance with this premise a path rejection level of .10 was set (see Pedhazur, 1982; pp 616-617). Path coefficients below this level did not achieve significance.

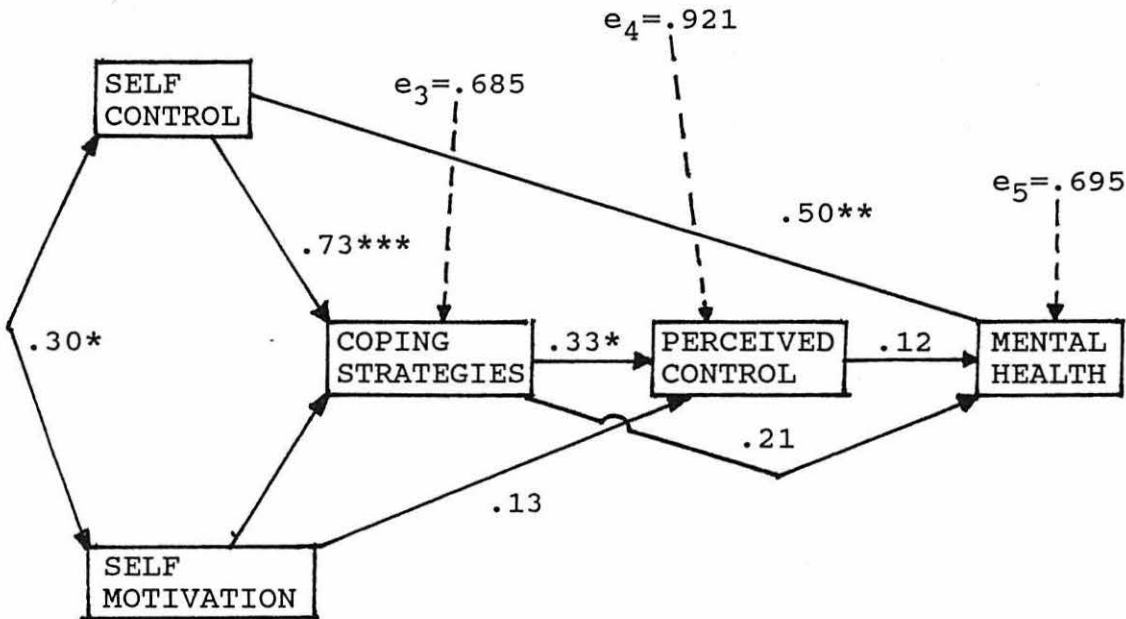


**Figure 9.4 :** Path Coefficients of the Fully Recursive Self-Control/Self-Motivation Model of Mental Health. (\*= $p < .02$ ; \*\*= $p < .001$ ; \*\*\*= $p < .0001$ )

There is some debate as to whether or not other non-significant paths should be deleted in accordance with Duncan's (1975) and Heise's (1969) suggestion that path coefficients not meeting the criteria of statistical significance and/or meaningfulness should be deleted from the model. However, it was felt that a relatively high cut-off of .10 would be sufficient to maintain meaningfulness, whilst at the same time paring off path coefficients which did not contribute greatly to the flow of causal influence in the model (Pedhazur, 1982, indicates that a cut-off point of .05 is generally acceptable).

To examine whether or not the data were consistent with the 'new' (over-identified), model the path coefficients of the new model were recalculated and used in an attempt to reproduce the original correlation

matrix (see lower half of Table 9.5 for the reproduced correlations). Because the discrepancies between the original and reproduced correlations are small, it was concluded that the data are consistent with the more parsimonious model (Pedhazur, 1982).



**Figure 9.5** : Path Coefficients of the Over-Identified Self-Control/Self-Motivation Model of Mental Health. (\*= $p < .02$ ; \*\*= $p < .001$ ; \*\*\*= $p < .0001$ )

Note that three pathways have been deleted in the over-identified model.

To test the relative goodness of fit of path models, Pedhazur (1982) recommends examining the Q coefficient since it is not affected by sample size (in the way the chi-square goodness-of-fit statistic is).

**Table 9.5** : Original Correlations Between Model Variables with Reproduced Correlations in the lower half of the Matrix (significance levels are shown in parentheses)

	<b>Self Control</b>	<b>Self Motivation</b>	<b>Coping Strategies</b>	<b>Perceived Control</b>	<b>Mental Health</b>
<b>Self Control</b> (.001)	----	.304 (.014)	.729 (.001)	.327 (.009)	.691
<b>Self Motiv<sup>n</sup></b> (.129)	.304	----	.273 (.025)	.218 (.060)	.160
<b>Coping Strats</b> (.001)	.730	.220	----	.370 (.004)	.617
<b>Perc'd Control</b> (.005)	.280	.202	.359	----	.357
<b>Mental Health</b>	.728	.322	.689	.400	----

This coefficient represents the ratio of the variance explained by the over-identified model to that explained by the fully recursive model. See Appendix IIIg for details of how this statistic is calculated. Q can take a value from 0 to 1, with values close to 1 indicating that the over-identified model can account for nearly all of the "explainable" variance in the dependent or endogenous variables. The Q coefficient for the self-control/self-motivation model was calculated to be .97.

This clearly indicates that the reduced model possesses very strong explanatory power relative to the fully recursive model for the data obtained in this study. However, it must be borne in mind that the actual proportion of variance predicted by the reduced model was  $R^2=.516$ .

It was predicted that high self-control would result in better mental health. More precisely, the model predicted that self-control would have direct effects upon coping and mental health; these pathways were both statistically significant ( $p < .0001$  and  $p < .001$ , respectively). The model also predicted an indirect effect of self-control on mental health through the pathways between coping strategies, perceived control and mental health. Only the path between coping strategies and perceived control achieved significance ( $p < .02$ ); however, the route of causal influence was nevertheless confirmed. In relation to the causal model, self-control would appear to be the prime influence upon mental health either directly or indirectly. Self-motivation was shown to directly influence perceived control of the stressful encounter; however, the path was non-significant. Situation specific coping strategies relied heavily upon the direct influence of self-control. The extent to which coping strategies were utilised significantly affected the perception of control over the stressful events considered. Coping also affected mental health directly but the path failed to reach significance.

The picture became somewhat confused around the perceived control variable which demonstrated a weak non-significant causal effect upon mental health. The weak influence of self-motivation only added to the significant lack of explanatory power at this juncture in the model. It strongly implied that at this point other

mediating variables had greater salience in terms of mental health and should be included in the model. This implication is supported by the high path coefficient of .921 for the residual ( $e_4$ ), indicating a strong influence of variables *outside* the system upon perceived control. There are of course a variety of other factors which impinge upon the management of a situation, and which were not included in this model; for example, personality variables such as attributional style, social support, job type, job satisfaction, the precise nature of the stressful situation encountered etc. There is further scope for examining the role played by 'Process Regulating Cognitions' (Rosenbaum, 1988), by operationalizing and incorporating them in the model. It is reasonable to assume that mediating variables such as self-efficacy expectations, cost-benefit appraisals, perceived controllability and the value of managing the situation to the person, will all contribute to the process of dealing with a particular stressful episode, the subjective success of this endeavour and, in terms of the model, a better mental health profile.

### 9.7 Discussion

The present study was designed to examine differences in coping and mental health in relation to self-control, self-motivation and life stress. The initial data analyses revealed that self-control was of almost singular importance for mental well-being in groups differing in their stress experiences. A second

major aim of this investigation was to empirically evaluate a self-control/self-motivation model of mental health. However, once again, dispositional self-control emerged as by far the most influential component in the model, thereby confirming the results of the preliminary analyses. Many of the predictions regarding self-control and its relationship with coping and mental health were well supported. Hypothesis 1, and Rosenbaum's (1985 and 1988) assertion that high Learned Resourcefulness (self-control) relates to the possession of a rich cognitive-behavioural repertoire of self-control skills which are mobilised when conditions demand self-regulation (see Chapter 4), were strongly supported by this investigation.

More detailed examination of the combined data not only highlighted the strong self-control main effects for all mental health factors, but also revealed a number of occupation by self-control interactions which further emphasised the important role played by self-control in determining mental health status. This finding helped to confirm hypothesis 4(iii) which stated that self-control would have greater salience for subjects operating under chronically more stressful environmental conditions (nursing staff), than for those operating in 'low-stress' conditions (students). The occupation by self-control interactions were marked for somatic symptoms, anxiety and insomnia, and the index of general mental health. Nursing staff showed a far more pronounced and strongly

significant disparity between the two levels of self-control than the students. Thus, the possession of self-regulatory skills appears to assume a greater significance in relation to occupational characteristics which expose an individual to persistent stress. For example, nursing staff indicated that constant staff shortages, shiftwork, tiredness, keeping terminally ill, unconscious patients alive with technology when there was absolutely no hope of that person experiencing any quality of life again, and lack of managerial support constituted daily pressures; whilst dealing with accident victims, ward emergencies, the death of patients, especially children, and consoling bereaved families were occasional but extremely severe sources of stress.

It is recognised that the above association between stress and occupation is perhaps too crude and over-generalised an approach in view of earlier statements regarding the phenomenological nature of stress reactions. There is no assumption made here that all nursing staff are more stressed, but rather that their working environment is *potentially* more stressful on a daily basis than that of the student cohort. This is a justifiable stance. For example, Bailey (1985) labelled nurses as a group of health professionals who are 'casualties of caring' because of the mounting evidence which suggests that the nursing profession is a stressful one (e.g. Gillespie & Gillespie, 1986; Bailey, 1981; Marshall, 1980; Parkes, 1982). However, it seems prudent to heed the point made by Jones (1987) in respect of



stress among nurses; namely, that whilst nursing in general may be considered as a potentially stressful profession, it is vital to emphasise the non-homogeneity of this occupational grouping. Indeed, as was very apparent in the study reported here, stressors may be different for different types of nursing staff, different wards and different kinds of hospital (Marshall, 1980). However, having said all this, the results of the present study do appear to confirm the face validity of regarding nursing staff as experiencing more stress more of the time than students.

Depression featured in a significant self-control by self-motivation interaction obtained from the total sample data. High self-motivation in combination with high or low self-control was reflected by a lower score on depression. This was especially significant for the low self-control subjects which suggested that high SM appeared to be able to compensate for the negative effects of low SC upon depression. Thus, even though self-control and self-motivation correlated positively, hypothesis 3 received only partial support. Self-motivation did not perform as expected and was generally observed to have no significant main effects upon the dependent variables. No other interaction effects were observed.

These results, with respect to the efficacy of including the self-motivation construct in the model, are

disappointing to say the least. After suggesting that dispositional self-motivation showed promise in the prediction of health status, where mental well-being was concerned, self-motivation appeared to have little significance. It may be that Dishman & Gettman's (1980) original conception of the construct as a predictor of health behaviour *adherence* is the most suitable area in which to apply it following its relative success in this respect. Clearly, predicting compliance with a particular health-related program is very different from predicting actual health consequences.

High self-control was also associated with better mental health than low self-control when groups' data were analysed separately, thereby confirming hypotheses 4(i) and 4(ii). The general pattern of results just discussed was reproduced in the analyses of the nursing staff sub-group data which included measures of how they coped with situations that placed them under considerable strain. Mental health was again significantly poorer for those low in learned resourcefulness compared to those high in learned resourcefulness (hypothesis 1). The ANOVA results revealed robust self-control main effects and indicated that cognitive-behavioural skills were mobilised more extensively when prospectively measured self-control was high in comparison to when it was low. In addition, the path analysis suggested that those high in self-control used their coping skills to greater effect in terms of perceiving control of their identified stressful situation. Furthermore, there was a tendency

(non-significant) for subjects who perceived themselves to have been in control to also report better mental well-being compared to those reporting no control.

#### 9.7.1 Predictive Viability of the Proposed Causal Model

The results of the path analysis supported the hypothesised 'flow' of causal influence in the model, its representation of the data obtained, and thus its ability to predict mental health status for this sample. In relation to the causal model, as might be expected from its theoretical background, self-control emerged as a major influence upon mental health both directly and indirectly. Moreover, the very strong causal relationship between self-control and coping strategies used offers significant support for Rosenbaum's (1980 and 1988) theory. Situation specific coping strategies relied heavily upon the direct influence of self-control. It would appear that possession of a rich cognitive-behavioural repertoire does lead to a more extensive mobilisation of self-control skills under duress, and that the extent to which coping strategies are utilised significantly affects the perception of control over a stressful event.

Self-control and self-motivation were moderately positively related. However, the hypothesised interaction between the two variables in relation to occupational stress and subsequent mental health did not materialise. Self-motivation contributed little to the structure or substance of the proposed model, in its present form at

least. It is worth emphasising that self-motivation was moderately related to self-control in the model (see also, Rosenbaum 1980a and 1985) which in turn was strongly related to the other variables. It is possible that the variance accounted for by self-motivation was contained in the self-control variable. Hence the poor results for self-motivation. However, the ANOVA results with their independent manipulation of self-control and self-motivation argue very strongly against such an interpretation. Self-motivation did link in to perceptions of control with a weak causal relationship which seemed to suggest that those high in the tendency to persevere at a task when under stress were more likely to perceive their stressful situation as controllable.

Indeed, as has already been noted, several researchers have argued that human beings are motivated to perceive control even in the most objectively uncontrollable situations (Langer, 1975; Wortman, 1975). It has also been argued that this motivation has a pervasive influence upon attributions of causality (Kelley, 1971), especially when a person is confronted by a threatening outcome (Lerner, 1975). Furthermore, a self-serving bias in causal attribution for good and bad outcomes has been proposed (Cates-Zientek & Breakwell, 1988; Kelley, 1976; Roberts, 1975; Spink, 1978; Zuckerman, 1979) whereby performers tend to attribute positive events internally and negative events externally.

It may be recalled that in the present study the rating of perceived control was obtained by requesting subjects to indicate whether or not a stressful situation was amenable to being resolved given the appropriate resources, and secondly whether or not these resources were available to them in the context of that encounter. An attribution of control was considered to be one in which both items were answered affirmatively, all other combinations denoted no-control of the situation. There are a number of points which must be made here with respect to the perception of control in this study.

Firstly, the majority of respondents (77%), indicated no-control over the situation. This appears to be realistic on the whole because most of the events reported were objectively in the control of forces external to the subjects, e.g. funding; staff shortages; having to implement the orders of higher ranked medical staff even though the outcome was blatantly futile; the death of terminally ill patients. Secondly, the *actual* outcomes of these transactions were not recorded. It is only possible to infer that a positive outcome ensued for subjects reporting control of the situation.

Thirdly, the important distinction between control of the situation one finds oneself in and control of oneself must be reiterated. Clearly they are distinct, though interrelated, concepts. The contention of this thesis is that self-control is a necessary precondition for situational control under stress, but that controlling the environment is not an absolute

prerequisite for self-regulation. Furthermore, controlling oneself is argued to have a far greater impact upon health status than situational control. The results of this study tend to bear out this assertion (see Figure 9.5). Indeed, many of the subjects who intimated that the situation identified was uncontrollable still reported considerable coping efforts which were earlier identified as a particular aspect of the control process (see Chapters 4, 5 and 7).

Fourthly, perceived control was operationalised as a retrospective statement and was not necessarily a reflection of perceptions 'going into' the demanding episode. However, in an attempt to clarify this point the majority of subjects (71%) were contacted again. Each was carefully reminded of the recent situation they identified as stressful and the perceptions of control they reported. They were then asked whether or not these perceptions were the same as when they initially approached the situation (i.e. were they aware of the same conditions existing prior to the event). With the exception of two (from 37), each subject reported that they were cognizant of the controllability of the situation throughout its course - their retrospective percepts of control matched their recall of their prospective control appraisals. In this sense therefore, these perceptions of control appear to have remained relatively stable across the stressful episode. High self-control subjects reported the greatest perceived

control but a sizable proportion of this group also indicated no-control of the situation.

Subjectively appraised controllability appears to represent part of what Lazarus would call the "Secondary Appraisal process" or Rosenbaum would term "Process Regulating Cognitions"; that is to say, antecedents to subsequent behaviour such as the mobilisation of coping strategies. Within the model presented here such mediating cognitions would intercede between, say, the self-control and coping variables. If such process regulating cognitive activity does have a significant influence upon decisions about whether or not the situation is controllable and which cognitive or behavioural self-regulation methods should be utilised, then including retrospective perceived control may not be the most propitious operationalization of this construct. This explanation could account for the perceived control variable's lack of significant influence in the model, i.e. it is 'in the wrong place' for its potential contribution to coping and eventual mental health to be clearly delineated.

Perceived control is of central importance for the actions taken in response to stress appraisals. In many ways it is a reflection of the recognition that one has the opportunity to make choices in forging one's destiny as well as in demonstrating competent behaviour. Such decisional control has been found to contribute to better health outcomes (e.g. Schulz, 1977). In this study a perception of control was associated with better mental

well-being than one of no-control (but the relationship was not significant). The process of control appraisals and their effects across a stress inducing event certainly merit further empirical consideration.

The self-motivation construct proved less than satisfactory in predictive terms. It was evident that a great deal of external influence was associated with the perceived control variable and that this confused the issue somewhat. This suggests that although self-motivation may have a role to play, it is in connection with variables external to the model that it will demonstrate its predictive potential. Furthermore, in the case of retrospectively reported perceived control of the identified stressful encounter, it is possible that Attributional Style (Peterson, Semmel *et al.*, 1982), and situational outcome-specific attributions (Heider, 1958; Weiner, 1975) could form part of the causal equation in relation to the consequences of control and, ultimately, health. Attributional style stems from Abramson *et al.*'s (1978) reformulated model of learned helplessness and refers to the extent to which individuals demonstrate characteristic attributional tendencies. Abramson *et al.*'s (1978) model of learned helplessness holds that when uncontrollable bad events are attributed to internal, stable and global factors then depression results. Klinger (1975) went so far as to suggest that early mastery training may be one way of reducing the frequency of depression caused by chronic exposure to uncontrollable life outcomes. An alternative would be



training in the ability to realistically appraise the controllability of demanding situations. Thus, if an event is truly uncontrollable then the most adaptive self-control response may be one of acceptance and working 'within' the recognised constraints of the situation. Attribution theory has been applied in other mental health contexts; for example, in relation to anxiety reduction and pain tolerance (Nisbett & Schacter, 1966), loneliness (Peplau & Perlman, 1982) and the amelioration of insomnia (Storms & Nisbett, 1970).

Attribution theorists are concerned with the antecedents and consequences of perceived causality. As far as the synthetic nature of a two dimensional model of health will allow it is conceivable that the perceived outcome of subjects' coping efforts might influence mental health status via causal attributions. One antecedent of situational attributions would be a person's attributional style another might be the extent to which that person has mobilised coping skills or managed a given event. Causal attributions are postulated to impact upon the affective reactions to experienced outcomes (Weiner, 1980). Empirical support for this contention has been presented by Biddle & Hill (1989). Presumably, in relation to events perceived as uncontrollable, if these emotional and associated cognitive responses are bad enough and occur often enough, then negative consequences will accrue in terms of mental well-being and health in general.

### 9.7.1 Methodological Issues

The main difficulties associated with the design and methodology of this study have been expressed in Chapter 6. Primarily, these revolve around the issues of the possibility of common method error due to single method data capture and, more importantly, the non-random assignment of subjects to groups. In addition, the idea that different questionnaires with similar items could explain the variance observed, was highlighted to some degree by the lack of explanatory power of the Self-Motivation Inventory in both phases of the study. It would appear that the construct of self-motivation was to some extent subsumed under the Learned Resourcefulness repertoire.

The design and operationalization of the model could be strengthened by the inclusion of variables which tap concurrent perceived control, or the process of control across a stressful event rather than retrospectively reported percepts of control. Other constructs such as causal attributions or self-efficacy expectations might also add to the model's explanatory power. Finally, different stressful situations and subject groups, and other aspects of health (physical symptoms, health records) could be included to test the generalizability of the model.

### 9.8 Conclusion

In the light of this study a self-control approach to health and health-related behaviour is endorsed. The model described has a number of weaknesses, but also some notable strengths (not least of which is the very fact that it has been proposed) which could be followed up and built upon. Furthermore, strong supporting evidence for the model's explanatory power was obtained from its ability to fit the data quite closely. Overall, the behavioural repertoire of self-control, or learned resourcefulness, emerged as an influential factor in both predicting and contributing to health status. The construct shows great potential for use in the field of Health Psychology. This potential should be capitalised upon.

Finally, the finding that a poor repertoire of cognitive and behavioural skills (low self-control), is strongly related to poorer mental health status in the nursing staff sample suggests the need for training to be provided in this area. Self-regulation skills evaluation and acquisition during the training of staff would contribute significantly to the effectiveness and life quality of recipients, by providing them with some of the psychological tools and wherewithal to cope effectively under conditions of chronic and acute stress should they arise.

## CHAPTER 10

### GENERAL DISCUSSION

#### 10.1 Summary of the Literature Review

The theoretical and empirical considerations of the preceding chapters were generally supportive of the contention that control has important implications for most aspects of human functioning. It is, however, recognised that an understanding of the complex processes involved in the effects of perceived or actual control is far from complete. The empirical section of this thesis attempts to contribute to this understanding. Control can be broadly defined as an ability to exert some influence over one's internal (intrapsychic and psychophysiological), and external environments either through perceiving control or achieving control behaviourally. Cognitive control through, for example, perceptions, beliefs, attributions, appraisals etc. is suggested here to represent the 'prime-mover' in the control process. This is especially pertinent with respect to the maintenance of optimal functioning and health.

The following major points were derived from the literature. Personal control should be viewed from the "controller's" perspective (as an aspect of subjective reality) rather than from the perspective of the observer. Cognitive appraisal and reappraisal are the

major processes through which meaning is established. A constellation of learned control options may significantly impact upon the action phase of gaining control. The gaining of personal control need not be associated with observable behaviours or objective outcomes. There does, however, need to be a degree of 'mindfulness' for control to be established. The idea that cognitive self-control underlies the mastery, toleration, or escape from those situations which are perceived as stressfully threatening or challenging led to the suggestion that humans may never be truly bereft of control in some form or another. Moreover, control appears to have a significant impact upon health status.

## 10.2 The Studies

The above points influenced the form of the questions to be addressed in the three distinct, but related, stages of the experimental phase of this thesis (see Chapter 6). The primary research problems of concern involved :

- 1) The development of a state oriented self-control questionnaire.
- 2) An examination of the relationship between self-control and competent performance under stressful conditions.
- 3) An investigation of how the personality repertoire of self-control related to coping and health, and a test of a hypothesised model of self-control and mental well-being.

### 10.2.1 Study 1: Questionnaire Development

This study attempted to develop a state oriented Self- Control Inventory (SCI). This self-report scale was based upon theoretical distinctions between problem and emotion focused control, and between control beliefs and control as coping efforts. The SCI was developed to index the self-control skills employed by individuals under specific stressful situations. Methodological issues were discussed in Chapter 6. An innovative aspect of the SCI is that it was designed as a pre- and post-event measure whose focus is the process of change in control efforts across a particular event.

#### *Summary of Findings*

The concurrent validity of the pre- and post-event forms of the Self Control Inventory received robust support. The predicted relationships between the SCI subscales and measures of state anxiety, cognitive failure rates, spheres of control, satisfaction, locus of control and dispositional self-control were generally obtained.

Cognitive anxiety and somatic anxiety were inversely related to both problem focused control (PFC) and (more strongly), emotion focused control (EFC). Furthermore, situational self-confidence positively correlated with PFC, and again to a greater extent with EFC. It was suggested that a belief in, and the use of, appropriate personal control behaviours targeted at emotional responses was an important factor in developing situational self-confidence. Both performance and outcome

satisfaction were significantly related to high EFC irrespective of objective outcome, but a similar relationship was not obtained for PFC.

A self-reported tendency toward high cognitive failure rates was associated with low PFC during a stressful event. It was suggested that individuals with a high rate of cognitive failure may well not have appraised the situation in accordance with this tendency, i.e. they may have believed that they would be able to apply themselves to the demands of the tasks facing them. Low cognitive failure rates were associated with high EFC. It was suggested that people with a high incidence of cognitive failure are not good at emotion focused control under stressful conditions, and that emotional factors may well influence the occurrence of such lapses. Such a contention supports the hypothesis that high incidence of cognitive failure may predicate a person's 'vulnerability' to stress effects (Broadbent *et al.*, 1980).

The main finding regarding the Spheres of Control battery and the Locus of Control scale showed that internally oriented subjects tended to use significantly more cognitive control skills (both PFC and EFC), than externals. Taken together these results seem to suggest that emotion focused control efforts prior to a significant event are possibly important precursors for more effective allocation of coping resources to task demands during the event. Although the relationships were

in the predicted direction, the weak correlations between the SCI scales and dispositional self-control, measured on Rosenbaum's (1980) Self Control Schedule (SCS), were disappointing when one considers the close conceptual background of each.

To conclude, the evidence obtained by this study generally supported the concurrent validity of the Self Control Inventory. Overall, emotion focused control emerged as, by far, the most significant strategic control response to the competitive and evaluative circumstances to which subjects were exposed. It was suggested that certain minimal levels of emotion focused control were needed before the problem situation's demands could be addressed effectively.

#### 10.2.2 Study 2: The Catastrophe Experiment

The results of a pilot study using examinees (Appendix Ib) supported the view that emotion focused control was the most significant variable for subjects under competitive or evaluative stress. It was suggested that flexible strategic switching of the focus of control during a stressful encounter was essential if there was to be congruence between intention, action and outcome. In accordance with a process oriented approach, based upon the theoretical dynamism of the person-environment interaction, Study 2 attempted to examine changes in the focus of control across the time-span of a demanding event.



A catastrophe paradigm was adopted in order to examine performance changes and hypothesised switches in the focus of control in relation to certain 'critical points' during the encounter. This paradigm has been shown to be successful in previous research (Hardy, Parfitt and Pates, 1990) and as such the design formed a novel and effective method for addressing the research questions relating to changes in the focus of control under demanding circumstances. Methodological issues relating to a lack of randomization in sampling, small subject numbers and the implications this has for analysis of variance were discussed in Chapter 6.

State anxiety was manipulated successfully using ego-threatening and neutral instructional sets, and task demand was manipulated through changing goal difficulty levels on a perceptual motor task. Cognitive anxiety was predicted to mediate the effects of goal difficulty upon performance resulting in catastrophic changes in performance when cognitive anxiety was high.

One implication of the present study was that if task demands became too great and cognitive anxiety was engaging processing capacity then a realistic appraisal of the situation should result in a reduction of effort in problem focused control and instead, in the face of possible perceived incompetence, an increase in self-regulatory activities until such a time that task oriented efforts were perceived as being feasible once

more. That is, it was hypothesised that there would be shifts in the focus of control in association with performance catastrophes.

#### *Summary of Findings*

The results of Study 2 highlighted the importance of subjective meaning in stressful situations, and gave credence to the fact that the methodology was theoretically guided by the notion that personal perceptions are vital elements in a given encounter. Under conditions of high cognitive anxiety, perceived effort and the focus of control were found to fluctuate in the proximity of both perceived and objective critical points in performance. When cognitive anxiety was high and goal difficulty was increasing, there was a reported tendency for effort to increase up to the negative critical point, after which there was a marked drop in perceived effort expenditure. After the positive critical point, as goal difficulty decreased, high cognitive anxiety subjects tended to report a 'surge' of effort as goals became more achievable. The patterning of perceived effort and objectively scored performance corresponded quite closely.

It was suggested that such stress-related critical points elicited the 'strategic' changes in the primary focus of control, rather than being the result of changes in control orientation. Emotional control strategies were used, following a negative critical point, to cope when there was a withdrawal of effort from direct

confrontation of the problem task 'head-on' because this was judged to be inappropriate. However, EFC was relinquished in favour of problem oriented control once the pressure was perceived to have eased (following a positive critical point).

The catastrophe paradigm proved to be a useful method with which to test the hypotheses in Chapter 8 and as such is a positive feature of the research undertaken.

### 10.2.3 Study 3: The Non-experimental Study

The third phase of the empirical section involved an examination of the relationships between dispositional self-control and self-motivation, and subsequent health in groups differing in the potential stressfulness of their daily lives (students and nursing staff).

Importantly, Study 3 also proposed and applied a self-control/self-motivation model in relation to coping, perceived control and mental health. Path analysis was used to explore the causal influence of predictor variables upon subsequent variables and ultimately upon the dependent variable, mental health.

### *Summary of Findings*

Although interpretation of the results must be tempered by the methodological considerations highlighted in Chapter 6, it was clear that many of the predictions regarding self-control and its relationship to coping efforts and mental well-being were well supported. The

initial analyses revealed that the personality repertoire of self-control, or learned resourcefulness, was significantly associated with mental well-being. Occupation by self-control interactions revealed that self-control was especially salient for the nursing staff whose daily lives potentially exposed them to more chronic and acute stress than that to which the students were exposed. Generally, high self-control was associated with better mental health as measured by the GHQ-28. Self-motivation failed to demonstrate any significant effects apart from an interaction with self-control for depression. High self-motivation combined with low self-control was associated with significantly fewer reported depressive symptoms than the combinations of low self-motivation/low self-control and low self-motivation/high self-control, whilst high self-motivation combined with high self-control was associated with significantly less reported depression than low self-motivation/low self-control.

Analyses of the data obtained from the nursing staff subsample revealed that dispositional self-control was found to have highly significant main effects upon the extent to which situational coping skills were mobilised. In addition, subjects who perceived control tended to employ a variety of coping strategies more extensively than those who perceived no-control over the stressful situation, the differences were, however, non-significant.

The hypothesised 'flow' of causal influence proposed in the new model was broadly achieved. However, self-motivation contributed little to the explanatory power of the model in its present form at least. Having said this, the model was shown to represent the data obtained fairly well and thereby to predict mental health status for this sample. Learned resourcefulness (self-control), emerged as the major influence upon mental health both directly and indirectly. Situation specific coping relied heavily upon the direct influence of self-control. It would appear that the possession of a rich cognitive-behavioural repertoire of self-control led to more extensive mobilisation of coping skills under duress, and that the extent to which coping strategies were utilised significantly influenced the perception of control over the stressful event. Overall, the model suggested that high self-control coupled with extensive coping efforts is associated with better mental well-being. Although it is acknowledged that the model is far from complete, it represents a positive step forward in the attempt to predict health outcomes by providing a specific and testable framework.

### 10.3 Theoretical Implications

Underlying the empirical section are two fundamental metatheoretical principles; namely, the concepts of transaction and process (Lazarus, 1988). Embodied in the approaches taken, is the tacit recognition that both personal agendas and environmental realities interact

reciprocally in an ongoing process of flux. One important implication is that when personal control is viewed as a process rather than an artefact of the degree of success attached to some objective outcome, control is always possible for an individual. Transaction and process were inherent considerations in the design and procedure of Studies 1, 2 and 3. The concepts were manifest in terms of personal meaning, enduring personality repertoires and the nature of the stressful environment, and in the attempt to 'map' the control process across the duration of given events. This was especially evident in the catastrophe paradigm which quantified subjective impressions of effort, performance and control, as well as objective performance, across the whole period of the experiment. In Study 3, process was implied through the path analytic investigation of the proposed self-control/self-motivation model of mental health.

A further major implication is that any evaluation of stress and performance should consider including the notion of perceived controllability in both its theory and design. Personal interpretation of action contingencies is a basic theme which transcends both the review and empirical sections of this thesis. Perceived controllability derives from percepts, including cost-benefit analyses, of existing demands, coping resources (including behavioural repertoires), and appraisals of the constraints under which control responses are to occur.

The operationalisation of Catastrophe Theory offers to be a promising methodological tool for examining functional changes which may occur in the proximity of objective and, perhaps more significantly, subjective critical points. Furthermore, Catastrophe Theory facilitates a more 'complete' picture of the interactional processes involved when competent performance is interrupted. It offers a more complete perspective because it goes beyond the unsatisfactory explanatory power of the traditional inverted-U hypothesis (Fazey & Hardy, 1988). As a general systems theory for describing and predicting discontinuous changes in the course of events Catastrophe Theory has been applied to a range of problems in psychology (Guastello, 1987; Stewart & Peregoy, 1983). For example, it has been used to model the occurrence of accidents in industry (Guastello, 1989); to predict fatigue and performance in physically demanding jobs (Guastello & McGee, 1987); and to explain performance catastrophes under conditions of high cognitive anxiety and physiological arousal (Hardy, Parfitt & Pates, 1990). Guastello (Note 1) has further intimated that one area in which Catastrophe paradigms could be profitably used is that of examining the performance and health problems associated with shiftwork. The replication of Study 2 with a far greater number of subjects would enhance the statistical integrity of the results. It would also be beneficial to at least attempt to iron out the methodological weaknesses highlighted in Chapters 6 and

8. In addition, the findings would be strengthened by obtaining objective measures of physiological arousal and effort, for example, heart rate and heart rate variability respectively.

In spite of the poor relationships which emerged between the SCI and the Self Control Schedule (Rosenbaum, 1980) in Study 1, the extant Learned Resourcefulness literature (see Chapter 4) suggests there to be merit in attempting to educe a greater understanding of the link between the personality repertoire of self-control and situationally specific state self-control efforts, i.e. the impact phase of the control process. Indeed, the strong direct relationship between dispositional self-control and the extent of coping efforts obtained in Experiment 3 would seem to strengthen the case for further research in this important health-related area. Rosenbaum (Note 2) has, for example, suggested that high learned resourcefulness might be a significant individual difference factor enabling shiftworkers to tolerate the stressfulness of disruptions caused to their circadian rhythms by unusual periods of activity and sleep. The ability to predict tolerance to shiftwork would have far reaching consequences for both individuals and the organisations employing them. This important avenue of enquiry has already been started by the author.

The relative lack of self-motivation effects in Study 3 was somewhat disappointing. However, the



tentatively proposed model was essentially posited in the context of "redressing the balance". Self-motivation (Dishman & Gettman, 1980), in this instance, may not have emerged as a significant variable because the stressful situations that nursing staff identified required what could be termed "redressive self control" (Rosenbaum, 1989). Generally, these situations were externally imposed disruptions to normal functioning (e.g. resource shortages, accidents). Redressive self control is hypothesised to be aimed at ameliorating such disruptions. Self-motivation has been most fruitfully employed in research of adherence behaviours which require people to persist at, or adhere to a prescribed, often health related, behavioural regimen (see Chapter 9). Such a scheme would involve the 'self-disruption' of normal functions, or habits, and the implementation of new behaviours. "Reformative self control" behaviour (Rosenbaum, 1989), is self-generated and minimally influenced by external feedback. In light of this, self-motivation in the proposed model may have far greater predictive impact in situations involving reformative self-control than in situations involving redressive self-control.

The theoretical implication, and to some extent the empirical finding, that a learned repertoire of control skills has a direct impact upon personal control, and ultimately health, under demanding conditions may also hold for other 'personality repertoire' based approaches

to the moderation of stress effects. Hardiness research is one such approach (Kobasa, 1982 and 1988). Hardiness is a constellation of personality characteristics which apparently function to counter the deleterious effects of chronic stressful life experiences, possibly through influencing how a person copes under duress. Having said this, Cohen & Edwards (1988) reviewed the hardiness literature and did not find any evidence that coping behaviours were actually measured.

The 'hardy' personality is suggested to comprise three primary components : a) *Commitment*, which is a belief in the value of oneself and what one does in all aspects of daily life, b) *Control*, which is the tendency to believe and behave as if one can influence and master the demands of the situations one is involved in, and c) *Challenge*, which reflects an orientation towards seeking and expecting change rather than stability. Change is viewed as an exciting, rather than threatening aspect of life.

As a composite, the hardy repertoire is hypothesised to enable individuals to resist the sub-optimal mental health, physical health, and performance consequences of chronic stress. Further studies are needed to clarify the theoretical and practical utility of integrating personality factors such as hardiness and learned resourcefulness into a global interactional approach to control research.

Fisher (1986) contended that perceived control and subjective demand must also be considered as partly a

function of the more global interaction between person and situation (cf. Lazarus, 1988). This supports the view expressed above relating to the consideration of personality and dispositional repertoires, and also presents an opening for the consideration of other conceptually relevant personality factors such as the Spheres of Control derivative of Locus of Control theory (Paulhus & Christie, 1980), which was adopted by Fisher (1986) as an element in her theorising on the relationship between stress, control, coping and health. The concept of spheres of control could offer a great deal in terms of examining more generalised control beliefs within, for example, occupational-stress settings (e.g. Hardy *et al.*, 1990). The reader is referred back to Chapter 7, on the development of the Self Control Inventory, for a description of the Spheres of Control concept.

The findings regarding the extent of coping efforts and mental health (Study 3) lead on to questions about the types of coping operated in response to stress appraisals. Many researchers have found that there are different emphases in the kinds of strategies employed depending upon perceptions of situational controllability. More precisely, appraisal of control over the source of stress affects coping choices and efforts (Knight, 1987; Folkman & Lazarus, 1980). For example, Folkman & Lazarus (1980) found that emotion focused coping was used more in situations appraised as not

amenable to change; problem focused coping was used more in situations appraised as changeable. Similarly, Folkman *et al.* (1986) reported that controllable situations were associated with using more confrontive coping, planful problem solving, positive reappraisal and acceptance of responsibility. Conversely, in encounters appraised as having to be accepted (uncontrollable), more distancing, self-control and escape-avoidance was used.

Interestingly, the results of Study 2 (Catastrophe experiment, Chapter 8), concur with the above findings. It was found that in conditions that could be construed as low perceived control, i.e. high goal difficulty, greater emotion focused control was reported.

Control and coping have been conceptualized in terms of specific strategies (such as distancing, intellectualization, seeking support, withdrawal etc.) as well as in terms of foci of control, such as, emotion focused and problem focused (Edwards, 1988). However, although this distinction has been made, there are, as Edwards (1988) suggests, difficulties in distinguishing between coping methods and the foci of control. Gaining control in a particular situation may involve a variety of strategies with multiple foci. At a theoretical level it may be desirable to precisely define categories of control. At the level of the individual under stress, however, it is reasonable to assume that no such distinction is being made. Perhaps one of the weaknesses in Studies 1 and 2 of this thesis is the lack of clear definition regarding the

focus of control efforts and coping (see Chapter 6 for discussion of methodological issues). However, the results of Study 2 did suggest that certain forms of control efforts (e.g. concentrating on the task in hand) may be put on 'hold' at a particular level, or reduced, while other control resources (e.g. trying to relax) are mobilized to a greater extent following a critical negative event.

Another important area of interest has been touched upon already; namely, the investigation of *process regulating cognitions* within the health related context of the causal model proposed in Chapter 9 (see Chapter 4 for coverage of Rosenbaum's presentation of this concept). Some of these hypothesised mental processes have been widely researched and have an extensive literature, for example, efficacy expectations (Bandura, 1982). Other mediating cognitions that may be brought to bear upon coping include perceived constraints; perceived vulnerability; appraisals of illness consequences; perceived benefits of preventive measures (e.g. Health Belief Model, Becker & Maiman, 1977); the value a particular behaviour or outcome has for an individual (Lazarus & Folkman, 1984); state self-control beliefs; perceived controllability and the appraisal of a situation's degree of stressfulness. The products of cognitive appraisal and coping, such as response outcome, causal attributions, and self-efficacy expectations, also require more systematic empirical investigation in

relation to coping and health, and could be included under the mantle of mediating cognitive processes.

#### 10.4 Practical Implications

The concept of control is establishing itself as a primary theoretical and practical consideration in both occupational and health psychology. Furthermore, the control-health relationship has achieved much greater significance in the light of reports which suggest that several of the risk factors leading to the major "killer" diseases prevalent today, are very much under the potential control of the individual (e.g. Breslow & Enstrom, 1980; Ivancevich & Matteson, 1988). Indeed, the need to develop resourceful, hardy people capable of taking up, and adhering to relatively straightforward personal health practices (albeit flying in the face of illness-promoting cultural mores), assumes an almost unprecedented urgency when one considers that 71% of world mortality in 1988 was reported to be associated with heart disease and cancer (Kakkar, 1989). Because many of the contributory risk factors to both heart disease and cancer are suggested to be personally controllable, this is certainly a chilling statistic. There is a serious need for the concepts of personal control and situational controllability to be integrated into a 'wellness', or proactive, model of health which promotes the optimisation of good health as opposed to an 'illness', or reactive, model (probably predominant today), which seeks to minimize the impact of disease.

Within occupational settings such as hospitals many different areas of speciality exist; furthermore, a variety of tasks and duties constitute any one area. Job characteristics differ, for example, in terms of the constraints placed upon one's opportunity to execute control in one's working environment (e.g. decision latitude, or skill at soliciting support), and in the demands (internal or external) one experiences in the course of working. Karasek (1980) reported that job strain in the form of raised effort and distress is a likely consequence of combinations of high demand with low discretion or control. Furthermore, high demand and high control potential are considered by Karasek to evoke effort and positive affect rather than distress.

Karasek's (1979) Demand-Discretion model has been found to predict a range of job-related strains indexed by perceived exhaustion, drug consumption, absenteeism, job-satisfaction (Karasek, 1979), endocrine and metabolic processes (Karasek, Russell & Theorell, 1982) and coronary heart disease (Alfredson, Karasek & Theorell, 1982). The Demand-Discretion model has, however, been criticised by Ganster (1988), who questioned Karasek's operationalization of the control construct by confounding it with job-complexity, and doubted whether Karasek's findings really tell us very much about the effects of control in occupational settings. The more recent Demands-Supports-Constraints model of Payne & Fletcher (1983) predicts that jobs which are high in demand may carry excessive risk of strain, but not if

they are 'active jobs' characterised by high levels of support, control and decision latitude. Conversely, the higher the demand, the lower the support and the greater the constraints, then the greater the risk to health.

Frankenhauser's work (Frankenhauser, 1971; Frankenhauser & Johansson, 1982; and see Chapter 6), provided evidence that the psychobiological consequences of experienced demand and low perceived control are potentially damaging to health. As Fisher (1986) maintained, hormone levels and eventually health and efficiency may reflect control and demand characteristics. For their part, Frankenhauser & Johansson (1982) argued that control is the critical factor, suggesting that high control tasks elicit effort but not distress, whereas low control tasks involve both.

Following an extensive nationwide research project into night nursing services for the National Health Service (NHS Management Consultancy Services, 1987) it was reported that nursing staff work in a reactive, demand-led industry in which they attempt to achieve acceptable standards of care within an increasing workload over which they have little control, and under the constraints of scarce resources. Because their jobs are, in many respects, relatively bereft of personal control and support (for one reason or another organisational support is absent, or material and human resources are scarce) they may, consequently, suffer chronic strain within their working environment.



A somewhat gloomy picture is often painted of the stressful nature of many jobs. However, it is important to note that occupational factors are not entirely responsible for suboptimal health. Being in work may have positive health benefits, for example, psychological dysfunction has been reported to be associated with unemployment (Jackson & Warr, 1984; Kasl, 1980). Moreover, specific occupational characteristics may promote health; for example, workers in jobs requiring high energy output have been found to have a lower incidence of cardiac infarction than those requiring either intermediate or low energy expenditure (Fletcher, 1988). Fletcher (1988) also noted that the job-redesign literature highlighted the fact that changes which increased worker autonomy (control), task identity, significance, variety and feedback, all served to increase mental health (cf. Broadbent, 1985).

The hypothesised importance of personal control in the work-place was reflected in the results of Study 3 in which learned resourcefulness and perceived controllability were associated with better mental well-being. An obvious practical implication of this is that control-enhancing policies should be developed to empower workers individually. In this way, developing a person's metacognitive skills (flexible control responses being some of them), could be a significant contributor to greater functional competence. Rather than teaching *what* decisions to make, *decision making* could be taught.

Similarly, training in the reinterpretation (e.g. through cognitive restructuring) of stressful stimuli *in general*, could be provided. This would be of far greater practical and functional worth than the experimental presentation of a single stressor (e.g. electric shock, white noise, etc.) for reappraisal in a non-stressful light. A 'proficiency' model could be adopted (rather than a 'deficiency' model), which was founded on the the premise that most people develop their own levels of resourcefulness through life. This view is in opposition to an approach which assumes that the skills to cope effectively are not possessed and therefore coping skills need to be acquired. A proficiency model implies that people may not be deficient in the skills required to manage a stressful episode; but rather, they may just be unable to access them or recognise that the strategies they possess are valid. One form of resourcefulness training might simply attempt to expose and ratify the mobilization of hitherto unused but viable cognitive-behavioural skills.

To conclude, the final section briefly proposes a number of control-related areas worthy of future study. The suggestions are by no means exhaustive and to a great extent complement those made above.

### 10.5 Future Research

On the basis of the results and discussion of Studies 1 and 2 the need for further examination of a number of control-related issues is implied. These issues include the question of when emotional versus problem focused control is most appropriate. This leads on to ideas about realistic appraisals of controllability and the strategic switching of control in response to changing conditions during a stressful encounter. These changing conditions might include "critical points" of change at which dramatic decrements or improvements in performance may occur (Fazey & Hardy, 1989; Hardy *et al.*, 1990).

One corollary of the above is the possibility of developing (teaching) the capability for realistic appraisal of control demands, together with the skill of flexible and appropriate switching of the focus of control. The findings suggesting the significance of emotion focused control efforts may be indicative of the requirement for a certain minimal level of emotional control to 'quiet' the physiological/somatic systems and percepts thereof, before effective problem focused efforts can be employed.

The decision-making processes underlying the strategic allocation of control resources and factors that affect these processes have been largely overlooked in the control literature (a notable exception being

Fisher, 1986). Further examination of the decisional process through which perceived and/or actual control is achieved is warranted. Such research into the process of control decisions would aid the understanding of not only *how* individuals control themselves and their stressful encounters, but also *why* particular control resources are accessed. In addition, some of the empirical work of this thesis would suggest further examination of *when* particular control strategies are implemented in relation to catastrophic (or other) changes in ongoing behaviour. This would contribute to explanations of the complex processes by which personal control influences stress experiences, performance and well-being.

Reliable psychometric measures of personal control, which tap each level of the control process, would help us gain this knowledge in a number of areas; for example, the importance of control in different life domains which influence control decisions and perceptions, and the way in which control resources are mobilised under stressful conditions. The SCI (Chapter 7) would have to go through further validity research before it could be considered a viable tool for use in attempts at unravelling the intricacies of the control-stress relationship. Nevertheless, it is a step in the right direction of scientifically developed control measures. Experimental interventions which, for example, increase coping awareness and skills, facilitate goal-setting, or realistic appraisals of controllability as part of a process of empowerment could be tested using such

measures. The experimental manipulation of control relative to theoretically derived models in, say, occupational or institutional settings, would enable an examination of the direct and indirect effects of control before and after the implementation of control interventions. Control may be hypothesised to affect occupational stress and its consequences in three ways:

- a) A direct effect of control on the stress response, Personal control enhances perceived competence and self-esteem through moderating a person's psychological and physiological reactions to chronic stress.
- b) A direct effect on job characteristics and work demands, If there is perceived control and the mechanisms for actual control are in place then undesirable job-characteristics, e.g. underload or overload, may be moderated. In this way control is also suggested to indirectly affect job strain.
- c) Control interacts with job characteristics to moderate job stresses. Recall Karasek's (1979) 'healthy' high demand - high control hypothesis.

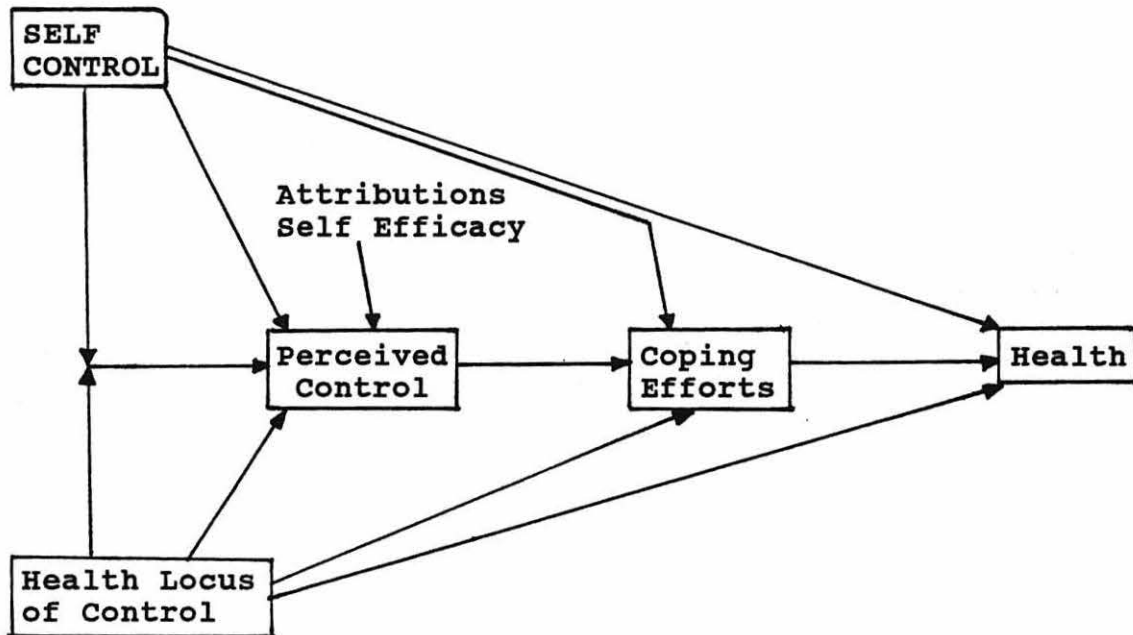
As is often the case with exploratory studies Study 3 raised more questions than it answered and highlighted a number of important areas for future study. The most significant predictor variable of the self-control/self-motivation model of mental health presented was the personality repertoire of self-control. The strong main and interactive effects obtained support self-control as

a principal factor for inclusion in other health-related studies, especially in relation to adherence behaviours (e.g. Rosenbaum & Ben-Ari Smira, 1986), which cover a multitude of health enhancing, recuperative, curative and preventive cognitive and behavioural actions. Self-motivation as operationalised by Dishman & Gettman (1980) was also suggested to be more appropriate in an exercise adherence based context.

The model presented and tested in Study 3 of this thesis could provide the theoretical basis for future research. Figure 10.2 presents a modified self-control model which has taken account of the likely role of process regulating cognitions (attributions, self-efficacy beliefs etc) in the perception of control. In addition, it is hypothesised that control ideology (health-specific locus of control) may be an influential predictor variable. However, by far the most crucial element of the model is the dispositional self-control variable which was observed to have the most significant predictive power in Study 3.

With learned resourcefulness becoming established as an important factor in the achievement and maintenance of better well-being, further questions such as how is resourcefulness acquired? and what life experiences foster the development of resourcefulness?, need to be addressed. Another area to be explored is the influence of physiological factors on process regulating cognitions. Notably, Bandura (1977) suggested that physiological responses may provide another source of

information which influences self-efficacy expectations (process regulating cognitions) regarding one's ability to cope under duress.



**Figure 10.2** : A modified predictive self-control model of perceived control, coping and health (see Chapter 8).

According to Rosenbaum (1989) the role of physiological factors in the self-control process has received relatively little research attention.

Further longitudinal studies designed to gather data about the effects of both the loss or lessening of control, as well as gains in control, may help overcome the problems inherent in cross-sectional designs which could underestimate the significance of control status for individuals. This is because cross-sectional designs

are unable to discriminate between those who have lost control and those who have gained control, nor do they distinguish between those subjects who have lost or achieved control and those who have experienced relatively stable control across the period of the event. Having said this, the experiments reported earlier were a step in the right direction because they did attempt to delineate the procession of changes associated with control across the span of a stressful episode.

Control *is* an important, if incompletely understood facet of human existence. Social scientists will be increasingly required to strive for this understanding and to promote resourcefulness. Thus, one of the greatest challenges to psychology and medicine today is to understand the processes through which individuals take charge of their own behaviours. This thesis has been aimed at making a contribution to this cause.



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APPENDIX I

## QUESTIONNAIRES AND STATISTICAL TABLES FOR EXPERIMENT 1

Appendix Ia

Examples of the Self-Report measures used in the validation of the SCI scales.

**Self Control Inventory-1**

Directions : Each statement below concerns what you believe about yourself now in relation to the upcoming event. Circle the number that indicates best, the extent to which you agree or disagree with each statement in order to reflect most closely what you believe about yourself at this moment.

	Strongly Disagree	Slightly Disagree	Slightly Agree	Strongly Agree
1. I have prepared well and believe that I am ready for this event.	1	2	3	4
2. I shall distract myself from any unpleasant feeling that arises during this event.	1	2	3	4
3. I have thought out strategies for this event.	1	2	3	4
4. Negative thoughts about doing badly in this event keep bothering me.	1	2	3	4
5. I shall concentrate fully on my performance during this event.	1	2	3	4
6. I shall remain calm if anything goes wrong during this event.	1	2	3	4
7. I shall guide my performance to achieve the goals that I have set myself.	1	2	3	4
8. Unpleasant thoughts are interfering with my enjoyment/feeling good during this event.	1	2	3	4

- |  |   |   |   |   |
|--|---|---|---|---|
| 9. I believe that I am on-form for this event.   | 1 | 2 | 3 | 4 |
| 10. I shall reduce any tension I feel before or during the event by making myself relax.                           | 1 | 2 | 3 | 4 |
| 11. I have thought through my performance for this event.  | 1 | 2 | 3 | 4 |
| 12. I shall subdue any worrying images or concerns about this event.   | 1 | 2 | 3 | 4 |
| 13. I have a precise plan of action ready for this event   | 1 | 2 | 3 | 4 |
| 14. I am finding it difficult to relax because of thoughts about this event.                                       | 1 | 2 | 3 | 4 |
| 15. I have thought about how to overcome possible setbacks.  | 1 | 2 | 3 | 4 |
| 16. I shall overcome any unpleasant bodily sensations, (butterflies, feeling shaky etc), brought on by this event. | 1 | 2 | 3 | 4 |
| 17. I shall stop my attention changing to irrelevant things during this event.                                     | 1 | 2 | 3 | 4 |
| 18. I feel uncomfortable about the upcoming event.   | 1 | 2 | 3 | 4 |
| 19. I have practiced this event in my mind.  | 1 | 2 | 3 | 4 |
| 20. My concerns about this event prevent me thinking clearly about what I have to do.                              | 1 | 2 | 3 | 4 |
| 21. I shall ignore things that distract me from the task in hand.  | 1 | 2 | 3 | 4 |
| 22. I shall overcome any feeling of anxiety that this event causes by calming myself down.                         | 1 | 2 | 3 | 4 |
| 23. I shall control my actions to meet the challenge during this event.  | 1 | 2 | 3 | 4 |

24. I shall subdue any feeling  
of panic or intense nerves  
that might arise.                    1                    2                    3                    4

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### Self Control Inventory-2

Directions : Each statement below concerns what you believe about yourself in relation to the just completed event. Circle the number that indicates best, the extent to which you agree or disagree with each statement in order to reflect most closely what you believe about yourself at this moment, and about what you did during the event.

- |   | Strongly<br>Disagree | Slightly<br>Disagree | Slightly<br>Agree | Strongly<br>Agree |
|---|----------------------|----------------------|-------------------|-------------------|
| 1. I planned my actions during the event.                                 | 1                    | 2                    | 3                 | 4                 |
| 2. I felt unhappy during the event.                                       | 1                    | 2                    | 3                 | 4                 |
| 3. I attended fully to the task in hand.                                  | 1                    | 2                    | 3                 | 4                 |
| 4. I kept worries out of my mind during the event.                        | 1                    | 2                    | 3                 | 4                 |
| 5. I ignored distractions during the event.                               | 1                    | 2                    | 3                 | 4                 |
| 6. I was disappointed with my performance.                                | 1                    | 2                    | 3                 | 4                 |
| 7. I achieved my goals by guiding my performance to achieve them.         | 1                    | 2                    | 3                 | 4                 |
| 8. I felt demoralised by the outcome.                                     | 1                    | 2                    | 3                 | 4                 |
| 9. I concentrated on my performance.                                      | 1                    | 2                    | 3                 | 4                 |
| 10. I remained concerned about how I was performing throughout the event. | 1                    | 2                    | 3                 | 4                 |
| 11. I used the information around me to my advantage during the event.    | 1                    | 2                    | 3                 | 4                 |

12. I felt frustrated during the event.	1	2	3	4
13. I controlled my actions to overcome problems during the event.	1	2	3	4
14. Nervous feelings interfered with my performance.	1	2	3	4
15. I focused on what I had to do if distractions occurred during the event.	1	2	3	4
16. I am worried that my performance was poor.	1	2	3	4
17. My mind wandered during the event.	1	2	3	4
18. I controlled my feelings during the event.	1	2	3	4
19. I thought through what I had to do during the event.	1	2	3	4
20. I kept myself cheerful during the event.	1	2	3	4
21. Intruding thoughts interfered with my performance.	1	2	3	4
22. I was irritated by discomfort throughout the event.	1	2	3	4
23. I can go over my performance in the event, in my mind.	1	2	3	4
24. I stopped myself feeling tense during the event.	1	2	3	4

### Competitive State Anxiety Inventory-2

Directions : Below are a number of statements which people have used to describe their feelings before performing in an event like this. Circle the appropriate number to the right of each statement to indicate how you feel right now, at this moment. There are no right or wrong answers. Choose the number which describes your feelings right now.

	Not At All	Some- what	Moderately So	Very Much So
1. I am concerned about this event.	1	2	3	4
2. I feel nervous.	1	2	3	4
3. I feel at ease.	1	2	3	4
4. I have self doubts.	1	2	3	4
5. I feel jittery.	1	2	3	4
6. I feel comfortable.	1	2	3	4
7. I am concerned that I may not do as well in this event as I could.	1	2	3	4
8. My body feels tense.	1	2	3	4
9. I feel self-confident.	1	2	3	4
10. I am concerned about being the worst.	1	2	3	4
11. I feel tense in my stomach.	1	2	3	4
12. I feel secure.	1	2	3	4
13. I am concerned about choking under pressure.	1	2	3	4
14. My body feels relaxed.	1	2	3	4
15. I'm confident I can meet the challenge.	1	2	3	4
16. I'm concerned about performing poorly.	1	2	3	4
17. My heart is racing.	1	2	3	4
18. I'm confident about performing well.	1	2	3	4



19. I'm worried about reaching my goal.	1	2	3	4
20. I feel my stomach sinking.	1	2	3	4
21. I feel mentally relaxed.	1	2	3	4
22. I'm concerned that others will be disappointed in my performance.	1	2	3	4
23. My hands are clammy.	1	2	3	4
24. I'm confident because I mentally picture myself reaching my goal.	1	2	3	4
25. I'm concerned I won't be able to concentrate.	1	2	3	4
26. My body feels tight.	1	2	3	4
27. I'm confident of coming through under pressure.	1	2	3	4

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### Cognitive Failures Questionnaire

Directions : The following questions are about minor mistakes which everyone makes from time to time, but some of which happen more often than others. We want to know how often these things have happened to you in the last six months. Please circle the appropriate number.

	Very Often	Quite Often	Occasionally	Very Rarely	Never
1. Do you read something and find you haven't been thinking about it and must read it again ?	4	3	2	1	0
2. Do you find you forget why you went from one part of the house to the other ?	4	3	2	1	0
3. Do you fail to notice signposts on the road ?	4	3	2	1	0

4. Do you find you confuse right and left when giving directions ?	4	3	2	1	0
5. Do you bump into people ?	4	3	2	1	0
6. Do you find you forget whether you've turned off a light or a fire or locked a door ?	4	3	2	1	0
7. Do you fail to listen to people's names when you are meeting them ?	4	3	2	1	0
8. Do you say something and realize afterwards that it might be taken as insulting ?	4	3	2	1	0
9. Do you fail to hear people talking to you when you are doing something else ?	4	3	2	1	0
10. Do you lose your temper and regret it ?	4	3	2	1	0
11. Do you leave important letters unanswered for days ?	4	3	2	1	0
12. Do you find you forget which way to turn on a road you know well but rarely use ?	4	3	2	1	0
13. Do you fail to see what you want in a supermarket (even though its there) ?	4	3	2	1	0
14. Do you find yourself suddenly wondering whether you've used a word correctly ?	4	3	2	1	0
15. Do you have trouble making up your mind ?	4	3	2	1	0
16. Do you find you forget appointments ?	4	3	2	1	0
17. Do you forget where you put something like a newspaper or a book ?	4	3	2	1	0

18. Do you find you accidentally throw away the thing you want to keep and keep what you meant to throw away ?	4	3	2	1	0
19. Do you daydream when you ought to be listening to something ?	4	3	2	1	0
20. Do you find you forget people's names ?	4	3	2	1	0
21. Do you start doing one thing at home and get distracted into doing something else (unintentionally) ?	4	3	2	1	0
22. Do you find you can't quite remember something although it's on the tip of your tongue ?	4	3	2	1	0
23. Do you find you forget what you came to the shops to buy ?	4	3	2	1	0
24. Do you drop things ?	4	3	2	1	0
25. Do you find you can't think of anything to say ?	4	3	2	1	0

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### Sport Locus of Control

Directions : The statements below represent what performers believe about themselves generally in relation to their activities. Indicate the extent to which each statement is descriptive or characteristic of you by circling the appropriate number. (1=Strongly Disagree to 6= Strongly Agree)

	Strongly Disagree					Strongly Agree	
1. If I perform poorly it is my own behaviour which determines how soon I perform well again	1	2	3	4	5	6	7
2. Most things that affect my performance happen to me by accident	1	2	3	4	5	6	7

- |  |    |   |   |   |   |   |   |
|--|----|---|---|---|---|---|---|
| 3. When I regain good performance after a bad patch it's usually because of the help and advice of others    | 1  | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. If I take the right actions I maintain good performance   | 1  | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. Luck plays a big part in how soon I recover from a bad performance  | 1  | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. Whenever I perform poorly I should consult someone more experienced e.g. coach                            | 1  | 2 | 3 | 4 | 5 | 6 | 7 |
| 7. The main thing that affects my performance is what I myself do  | 1  | 2 | 3 | 4 | 5 | 6 | 7 |
| 8. If it is meant to be I will perform well  | 1  | 2 | 3 | 4 | 5 | 6 | 7 |
| 9. Having regular contact with more experienced performers is the best way for me to avoid poor performances | 1  | 2 | 3 | 4 | 5 | 6 | 7 |
| 10. I am in control of how I perform   | 1  | 2 | 3 | 4 | 5 | 6 | 7 |
| 11. No matter what I do I am likely to make mistakes when I perform  | 1  | 2 | 3 | 4 | 5 | 6 | 7 |
| 12. Regarding my performance, I can only do what my coach or other experienced person tells me to do         | -1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 13. If I train hard I can avoid poor performance   | 1  | 2 | 3 | 4 | 5 | 6 | 7 |
| 14. My good performance is largely a matter of good fortune  | 1  | 2 | 3 | 4 | 5 | 6 | 7 |
| 15. Better and more experienced people control my performance  | 1  | 2 | 3 | 4 | 5 | 6 | 7 |
| 16. When I perform poorly I am to blame  | 1  | 2 | 3 | 4 | 5 | 6 | 7 |
| 17. No matter what I do, if I am going to perform poorly, then it will happen                                | 1  | 2 | 3 | 4 | 5 | 6 | 7 |
| 18. Other performers have a lot to do with my making mistakes or whether I perform well                      | 1  | 2 | 3 | 4 | 5 | 6 | 7 |

### Spheres of Control

Directions : The statements below represent what people generally believe about themselves in relation to different situations. Indicate how descriptive or characteristic each statement is of you by circling the appropriate number i.e. the extent to which you agree or disagree with it as a description of you. (1=Strongly Disagree, 7= Strongly Agree)

	Strongly Disagree				Strongly Agree		
1. When I get what I want it's usually because I worked hard for it	1	2	3	4	5	6	7
2. Even when I'm feeling self-confident about most things, I still seem to lack the ability to control social situations.	1	2	3	4	5	6	7
3. When I make plans I'm almost certain to make them work	1	2	3	4	5	6	7
4. I have no trouble making and keeping friends	1	2	3	4	5	6	7
5. I prefer games involving some luck over games requiring pure skill.	1	2	3	4	5	6	7
6. I'm not good at guiding the course of a conversation with several others.	1	2	3	4	5	6	7
7. I can learn almost anything if I set my mind to it	1	2	3	4	5	6	7
8. I can usually establish a close personal relationship with someone I find attractive	1	2	3	4	5	6	7
9. My major accomplishments are mainly due to my hard work and ability	1	2	3	4	5	6	7
10. When being interviewed I can usually steer the interviewer toward the topics I want to talk about and away from those I wish to avoid	1	2	3	4	5	6	7
11. I usually don't set goals because I have a hard time following through on them.	1	2	3	4	5	6	7

12. If I need help in carrying off a plan of mine, it's usually difficult to get others to help. 1 2 3 4 5 6 7
13. Competition discourages excellence. 1 2 3 4 5 6 7
14. If there's someone I want to meet I can usually arrange it 1 2 3 4 5 6 7
15. Often I get ahead just by being lucky. 1 2 3 4 5 6 7
16. I often find it difficult to get my point of view across to others. 1 2 3 4 5 6 7
17. On any sort of exam or competition I like to know how well I do relative to everyone else 1 2 3 4 5 6 7
18. In attempting to smooth over a disagreement I usually make it worse. 1 2 3 4 5 6 7
19. It's pointless to keep working on anything that's too difficult for me. 1 2 3 4 5 6 7
20. I find it easy to play an important part in most group situations 1 2 3 4 5 6 7

=====

### Self Control Schedule

Directions : Please circle the most appropriate number for each item to indicate how characteristic or descriptive each of the following statements is of you, by using the code below.

#### Scoring Code

- +3 = very characteristic of me/extremely descriptive  
 +2 = rather characteristic of me/quite descriptive  
 +1 = somewhat characteristic of me/slightly descriptive  
 -1 = somewhat uncharacteristic of me/slightly undescriptive  
 -2 = rather uncharacteristic of me/quite undescriptive  
 -3 = very uncharacteristic of me/extremely undescriptive

1. When I do a boring job, I think about the less boring parts of the job and the reward I will receive once I am finished -3 -2 -1 1 2 3

- |  |    |    |    |   |   |   |
|--|----|----|----|---|---|---|
| 2. When I have to do something that is anxiety arousing for me I try to visualize how I will overcome my anxieties while doing it    | -3 | -2 | -1 | 1 | 2 | 3 |
| 3. Often, by changing my way of thinking I am able to change my feelings about almost everything                                     | -3 | -2 | -1 | 1 | 2 | 3 |
| 4. I often find it difficult to overcome my feelings of nervousness and tension without another's help.                              | -3 | -2 | -1 | 1 | 2 | 3 |
| 5. When I am feeling depressed I try to think about pleasant events  | -3 | -2 | -1 | 1 | 2 | 3 |
| 6. I cannot avoid thinking about mistakes I have made in the past.   | -3 | -2 | -1 | 1 | 2 | 3 |
| 7. When I am faced by a difficult problem I try to approach its solution in a systematic way   | -3 | -2 | -1 | 1 | 2 | 3 |
| 8. I usually do my duties quicker when somebody is pressuring me.  | -3 | -2 | -1 | 1 | 2 | 3 |
| 9. When I am faced by having to make a difficult decision I prefer to postpone making it even when all the facts are at my disposal. | -3 | -2 | -1 | 1 | 2 | 3 |
| 10. When I find that I have difficulties in concentrating on my reading I look for ways to increase my concentration                 | -3 | -2 | -1 | 1 | 2 | 3 |
| 11. When I plan to work I remove all the things that are not relevant to my work   | -3 | -2 | -1 | 1 | 2 | 3 |
| 12. When I try to get rid of a bad habit I first try to find out all the factors that maintain this habit                            | -3 | -2 | -1 | 1 | 2 | 3 |
| 13. When an unpleasant thought is bothering me I try to think about something pleasant   | -3 | -2 | -1 | 1 | 2 | 3 |
| 14. If I smoked two packs of cigarettes a day I would probably need someone else's help to stop smoking.                             | -3 | -2 | -1 | 1 | 2 | 3 |
| 15. When I am in a low mood I try to act cheerful so my mood will change   | -3 | -2 | -1 | 1 | 2 | 3 |
| 16. If I had the pills with me I would take a mild tranquilizer whenever I felt tense and nervous.                                   | -3 | -2 | -1 | 1 | 2 | 3 |

- |  |    |    |    |   |   |   |
|--|----|----|----|---|---|---|
| 17. When I am depressed I try to keep myself busy with things that I like  | -3 | -2 | -1 | 1 | 2 | 3 |
| 18. I tend to postpone unpleasant duties even if I could perform them immediately.   | -3 | -2 | -1 | 1 | 2 | 3 |
| 19. I need outside help to get rid of some of my bad habits.   | -3 | -2 | -1 | 1 | 2 | 3 |
| 20. When I find it difficult to settle down to do a certain job I look for ways to help me settle down   | -3 | -2 | -1 | 1 | 2 | 3 |
| 21. Although it makes me feel bad I cannot help thinking about all kinds of possible catastrophes in the future.                                     | -3 | -2 | -1 | 1 | 2 | 3 |
| 22. First of all I prefer to finish a job that I have to do and then start doing the things that I like  | -3 | -2 | -1 | 1 | 2 | 3 |
| 23. When I feel pain in a certain part of my body I try not to think about it  | -3 | -2 | -1 | 1 | 2 | 3 |
| 24. My self-esteem increases once I am able to overcome a bad habit  | -3 | -2 | -1 | 1 | 2 | 3 |
| 25. In order to overcome bad feelings that accompany failure I often tell myself that it is not such a disaster and that I can do something about it | -3 | -2 | -1 | 1 | 2 | 3 |
| 26. When I feel that I am too impulsive I tell myself "stop and think before you do anything"  | -3 | -2 | -1 | 1 | 2 | 3 |
| 27. Even when I am terribly angry with someone I consider my actions very carefully  | -3 | -2 | -1 | 1 | 2 | 3 |
| 28. Facing the need to make a decision I usually find out all the possible alternatives instead of deciding quickly and spontaneously                | -3 | -2 | -1 | 1 | 2 | 3 |
| 29. Usually I do the things I like doing even if there are more urgent things to do.   | -3 | -2 | -1 | 1 | 2 | 3 |
| 30. When I realize that I cannot help being late for a meeting I tell myself to keep calm  | -3 | -2 | -1 | 1 | 2 | 3 |
| 31. When I feel pain in my body I try to divert my thoughts from it  | -3 | -2 | -1 | 1 | 2 | 3 |



32. I usually plan my work when faced with a number of things to do	-3	-2	-1	1	2	3
33. When I am short of money I decide to record all my expenses in order to plan more carefully for the future	-3	-2	-1	1	2	3
34. If I find it difficult to concentrate on a certain job I divide the job into smaller segments	-3	-2	-1	1	2	3
35. Quite often I cannot overcome unpleasant thoughts that bother me.	-3	-2	-1	1	2	3
36. Once I am hungry and unable to eat I try to divert my thoughts away from my stomach or try to imagine that I am satisfied	-3	-2	-1	1	2	3

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Appendix Ib

Complete Rotated Factor Structure Matrix for the Self-Control Inventory (letters in parentheses indicate items loading incongruously on the Factor for which they were not intended)

SCI-1

Item	Item number on final version	FACTOR LOADINGS	
		Factor 1 Problem Foc'd	Factor 2 Emotion Foc'd
1	-	---	.301
2	-	---	.317
3	1	.512	---
4	-	---	---
5	-	---	---
6	2	---	.461
7	3	.525	---
8	7	.420	---
9	-	---	.310
10	-	---	.368(p)
11	-	---	---
12	6	---	.593
13	-	.362	---
14	-	.351	.337
15	-	---	.593
16	5	.535	---
17	8	---	-.500
18	10	---	.456
19	12	---	.587
20	-	---	---
21	-	---	---
22	-	-.405	.364
23	4	---	-.420

FACTOR LOADINGS			
Item	Item number on final version	Factor 1 Problem Foc'd	Factor 2 Emotion Foc'd
24	-	---	.305
25	14	---	-.663
26	-	.308	.364
27	16	---	.562
28	18	---	-.675
29	20	---	-.568
30	-	.452	---
31	-	---	---
32	-	---	-.394
33	9	.440	---
34	-	.380	---
35	11	.734	---
36	-	---	---
37	13	.610	---
38	22	---	.629
39	15	.671	---
40	24	---	.639
41	17	.475	---
42	19	.736	---
43	-	---	---
44	21	.410	---
45	-	.375	.462
46	23	.626	---
47	-	.493	.415
48	-	---	.417
49	-	---	-.302
50	-	---	---
51	-	.303	---
52	-	-.459	-.401
53	-	.303	.382

## SCI-2

FACTOR LOADINGS			
Item	Item number on final version	Factor 1 Emotion Foc'd	Factor 2 Problem Foc'd
1	-	---	.321
2	1	---	.637
3	3	---	.587
4	5	---	.404
5	2	-.620	---
6	-	.453 (p)	---
7	4	.391	---
8	7	---	.625
9	-	.383	.305
10	9	---	.809
11	-	-.435	-.361
12	-	.323	.317
13	13	---	.624
14	-	.381	.323
15	-	-.301	---
16	6	-.666	---

FACTOR LOADINGS			
Item	Item number on final version	Factor 1 Emotion Foc'd	Factor 2 Problem Foc'd
17	-	---	.528 (e)
18	8	-.777	---
19	-	---	.309
20	10	-.727	---
21	-	---	---
22	21	---	.463
23	15	---	.582
24	12	-.827	---
25	-	---	---
26	11	---	.417
27	-	---	---
28	-	---	.418
29	14	-.775	---
30	-	.451	.401
31	-	---	---
32	-	---	---
33	-	.401	---
34	16	-.789	---
35	17	---	.393
36	-	---	---
37	-	-.381	-.391
38	-	.423 (p)	---
39	-	---	.516
40	-	-.401	-.370
41	-	---	.602 (e)
42	-	.468	.410
43	-	---	---
44	-	.302	---
45	18	.722	---
46	20	.494	---
47	23	---	.513
48	19	---	.619
49	-	---	---
50	22	-.493	---
51	-	---	---
52	-	---	---
53	24	.445	---

Appendix IcSTATISTICAL TABLES FOR FURTHER VALIDATION STUDY ON THE  
SCI

Oneway ANOVA Table for problem focused control with repeated measures across time.

Source of Variation	Sum of Squares	DF	Mean Square	F	Prob.
Within Cells	3119.21	153	20.39		
Time	919.29	3	306.43	15.03	.0001

Tukeys Follow-Up Test.

	TIME			
CD = 2.25	T1	T2	T3	T4
p<.05	17.56	18.75	13.40	18.17
17.56	-----	1.19	<b>4.16</b>	0.61
18.75		-----	<b>5.35</b>	0.58
13.40			-----	<b>4.77</b>
18.17				-----

Oneway ANOVA Table for emotion focused control with repeated measures across time.

Source of Variation	Sum of Squares	DF	Mean Square	F	Prob.
Within Cells	2313.16	153	15.12		
Time	209.09	3	69.70	4.61	.004

Tukeys Follow-Up Test.

	TIME			
CD = 1.96	T1	T2	T3	T4
p<.05	16.34	18.30	16.38	15.59
16.34	-----	<b>1.96</b>	0.04	0.75
18.30		-----	1.92	<b>2.71</b>
16.38			-----	0.79
15.59				-----

APPENDIX II

## QUESTIONNAIRES AND STATISTICAL TABLES FOR EXPERIMENT 2

Appendix IIa**Perceived Effort Scale.**

Subjects were given the following instructions depending upon whether they were completing the scale before or after performing the criterion task.

Instructions : Using the following scale, please rate the amount of effort you *intend* to put into your performance of this task by circling the appropriate number.

or

Instructions : Using the following scale, please rate the amount of effort you *actually* put into your performance of this task by circling the appropriate number. Do not let the outcome of your performance influence your answer, since some people may put a lot of effort into a task but not perform particularly well, or vice versa.

Effort Scale (after performance of the task)

- 0 I didn't bother at all with the task
- 1
- 2 I hardly bothered with the task
- 3
- 4 I made a very slight attempt to do well at the task
- 5
- 6 I made some attempt to do well at the task
- 7
- 8 I made a moderate attempt to do well at the task
- 9
- 10 I tried quite hard to do well at the task
- 11
- 12 I tried hard to do well at the task
- 13
- 14 I tried very hard to do well at the task
- 15
- 16 I tried extremely hard to do well at the task
- 17
- 18 I put virtually everything into my performance of
- 19 the task
- 20 I put everything I possibly could into my performance of the task

### Critical Point Self-Report Scales Used In Experiment 2.

Directions : The following items relate to the whole of your task performance.

CRITICAL POINT refers to any goal difficulty level at which your performance changed noticeably for the better or for worse. This change being due to something internal or external, (e.g. thoughts, feelings, other people, the difficulty of the task etc).

PLEASE BE SURE TO COMPLETE THE WHOLE FORM. If you are uncertain about anything please ask the researcher to explain.

When goal difficulty was increasing did there appear to be a critical point at which your performance changed ? Indicate on the scale below, the goal difficulty level at which any initial critical point occurred.

Goal Difficulty            20%            40%            60%            80%            100%  
 Level Increasing +---+---+---+---+---+---+---+---+---+---+

At this point did your performance improve or get worse ? \_\_\_\_\_

In relation to the point you have just indicated - answer the following items according to what you thought or felt JUST BEFORE it occurred, by circling the appropriate number.

	Strongly Disagree-	Slightly Disagree	Slightly Agree	Strongly Agree
1. I planned my actions	1	2	3	4
2. I felt unhappy	1	2	3	4
3. I attended fully to the task	1	2	3	4
4. I kept worries out of my mind	1	2	3	4
5. I concentrated on my performance	1	2	3	4
6. I felt frustrated	1	2	3	4
7. I controlled my actions	1	2	3	4
8. Nervous feelings interfered with my performance	1	2	3	4

9. My mind wandered	1	2	3	4
10. I felt concern about how I was performing	1	2	3	4
11. I ignored distractions	1	2	3	4
12. I stopped myself feeling tense	1	2	3	4

Now, in relation to this same point of change, indicate what you thought or felt IMMEDIATELY FOLLOWING that moment.

	Strongly Disagree	Slightly Disagree	Slightly Agree	Strongly Agree
1. I planned my actions	1	2	3	4
2. I felt unhappy	1	2	3	4
3. I attended fully to the task	1	2	3	4
4. I kept worries out of my mind	1	2	3	4
5. I concentrated on my performance	1	2	3	4
6. I felt frustrated	1	2	3	4
7. I controlled my actions	1	2	3	4
8. Nervous feelings interfered with my performance	1	2	3	4
9. My mind wandered	1	2	3	4
10. I felt concern about how I was performing	1	2	3	4
11. I ignored distractions	1	2	3	4
12. I stopped myself feeling tense	1	2	3	4

When goal difficulty was decreasing did there appear to be a second critical point at which your performance changed? Remember, we are asking about the point of *greatest* change that you perceive. Indicate on the scale below, the goal difficulty level at which this point of change occurred.

Goal Difficulty      100%      80%      60%      40%      20%  
 Level Decreasing +-----+-----+-----+-----+-----+-----+

At this point did your performance  
 improve or get worse ? \_\_\_\_\_

In relation to the point you have just indicated - answer  
 the following items according to what you thought or felt  
 JUST BEFORE it occurred, by circling the appropriate number.

	Strongly Disagree	Slightly Disagree	Slightly Agree	Strongly Agree
1. I planned my actions	1	2	3	4
2. I felt unhappy	1	2	3	4
3. I attended fully to the task	1	2	3	4
4. I kept worries out of my mind	1	2	3	4
5. I concentrated on my performance	1	2	3	4
6. I felt frustrated	1	2	3	4
7. I controlled my actions	1	2	3	4
8. Nervous feelings inter- fered with my performance	1	2	3	4
9. My mind wandered	1	2	3	4
10. I felt concern about how I was performing	1	2	3	4
11. I ignored distractions	1	2	3	4
12. I stopped myself feeling tense	1	2	3	4

Once more, in relation to this same point of change,  
 indicate what you thought or felt IMMEDIATELY FOLLOWING that  
 moment.

	Strongly Disagree	Slightly Disagree	Slightly Agree	Strongly Agree
1. I planned my actions	1	2	3	4



2. I felt unhappy	1	2	3	4
3. I attended fully to the task	1	2	3	4
4. I kept worries out of my mind	1	2	3	4
5. I concentrated on my performance	1	2	3	4
6. I felt frustrated	1	2	3	4
7. I controlled my actions	1	2	3	4
8. Nervous feelings interfered with my performance	1	2	3	4
9. My mind wandered	1	2	3	4
10. I felt concern about how I was performing	1	2	3	4
11. I ignored distractions	1	2	3	4
12. I stopped myself feeling tense	1	2	3	4

=====

See Appendix Ia for examples of the SCI scales and the CSAI-2

#### Appendix IIb

Three-Way ANOVA (Anxiety By Direction By Time) With Repeated Measures, For Problem And Emotion Focused Control In Relation To Perceived Critical Points:

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
--------	------	----------------	--------------	---------	---------

#### Problem Focused Control

Within Cells	6	17.21	2.87		
Anx by Dir'n	1	18.29	18.29	6.37	.045

#### Emotion Focused Control

Within Cells	6	97.21	16.20		
Anxiety	1	117.16	117.16	7.23	.036

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Within Cells	6	15.21	2.54		
Dir'n by Goal Difficulty	1	62.16	62.16	24.51	.003
Within Cells	6	8.21	1.37		
Anx by Dir'n by Goal Difficulty	1	36.16	36.16	26.41	.002

Tukey's Post-Hoc Test For The Direction By Time Interaction:

	Goal Difficulty Increasing		Goal Difficulty Decreasing	
	Before	After	Before	After
CD=2.43 p<.05	14.50	17.00	17.78	16.00
14.50	-----	<b>2.50</b>	<b>3.28</b>	1.50
17.00		-----	0.78	1.00
17.78			-----	1.78
16.00				-----

Tukey's Post-Hoc Test For The 3-Way Interaction:

	High Anxiety				Low Anxiety			
	Goal Difficulty Increasing		Goal Difficulty Decreasing		Goal Difficulty Increasing		Goal Difficulty Decreasing	
	Bef	Aft	Bef	Aft	Bef	Aft	Bef	Aft
CD=2.70 p<.05	15.14	19.00	20.28	16.71	14.00	15.00	15.28	15.28
15.14	-----	<b>3.86</b>	<b>5.14</b>	1.57	1.14	0.14	0.14	0.14
19.00		-----	1.28	2.29	<b>5.00</b>	<b>4.00</b>	<b>3.72</b>	<b>3.72</b>
20.28			-----	<b>3.57</b>	<b>6.28</b>	<b>5.28</b>	<b>5.00</b>	<b>5.00</b>
16.71				-----	<b>2.71</b>	1.71	1.43	1.43

Appendix IIc

Three-Way ANOVA (Anxiety By Direction By Goal Difficulty)  
With Repeated Measures, For Performance In Relation To  
Objective Critical Points:

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Within Cells	12	39.83	3.32		
Anx by Goal Difficulty	2	45.17	22.58	6.80	.011
Within Cells	12	74.36	6.20		
Dir'n by Goal Difficulty	2	48.31	24.15	3.90	.050
Within Cells	12	27.26	2.27		
Anx by Dir'n by Goal Difficulty	2	36.74	18.37	8.09	.006

Tukey's Post-Hoc Test For The Anxiety By Goal Difficulty Interaction:

High Anxiety				Low Anxiety		
CD=1.90 p<.05	GD1	GD2	GD3	GD1	GD2	GD3
	16.50	16.35	14.50	15.00	15.21	16.71
16.50	-----	0.15	<b>2.00</b>	1.50	1.29	0.21
16.35		-----	<b>1.85</b>	1.35	1.14	0.36
14.50			-----	0.50	0.71	<b>2.21</b>
15.00				-----	0.21	1.71
15.21					-----	1.50
16.71						-----

Tukey's Post-Hoc Test For The Direction By Goal Difficulty Interaction:

Goal Difficulty Increasing				Goal Difficulty Decreasing		
CD=2.85 p<.05	GD1	GD2	GD3	GD1	GD2	GD3
	14.85	17.21	16.14	15.71	14.35	15.07
14.85	-----	2.36	1.29	0.86	0.50	0.22
17.21		-----	1.07	1.50	<b>2.86</b>	2.14
16.14			-----	0.43	1.79	1.07
15.71				-----	1.36	0.64
14.35					-----	0.72
15.07						-----



Appendix IID

Three-Way ANOVA With Repeated Measures For Perceived Effort  
In Relation To Perceived Critical Points:

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Within Cells	12	28.29	2.36		
Anx by Goal Difficulty	2	27.88	13.94	5.91	.016
Within Cells	12	18.10	1.51		
Anx by Dir'n by Goal Difficulty	2	12.07	6.04	4.00	.047

Tukey's Post-Hoc Test For The Anxiety By Goal Difficulty Interaction:

	High Anxiety			Low Anxiety		
CD=1.54 p<.05	GD1	GD2	GD3	GD1	GD2	GD3
	13.86	13.35	12.07	12.36	12.85	13.36
13.86	-----	0.51	<b>1.79</b>	1.50	1.01	0.50
13.35		-----	1.28	0.99	0.50	0.01
12.07			-----	0.29	0.78	1.29
12.36				-----	0.49	1.00
12.85					-----	0.51
13.36						-----

Tukey's Post-Hoc Test For The Three-Way Interaction.

	HIGH ANXIETY					
	Goal Difficulty Increasing			Goal Difficulty Decreasing		
CD=2.35 p<.05	GD1	GD2	GD3	GD1	GD2	GD3
	12.86	14.00	12.43	14.86	12.71	11.71
12.86	-----	1.14	0.43	2.00	0.15	1.15
14.00		-----	1.57	0.86	1.29	2.29
12.43			-----	<b>2.44</b>	0.29	0.71
14.86				-----	1.15	<b>3.15</b>
12.71					-----	1.00
11.71						-----



APPENDIX III

## STATISTICAL TABLES FOR EXPERIMENT 3

Appendix IIIaSelf Report Measures Used In Experiment 3:

Self Control Schedule (See Appendix Ia)

**Self-Motivation Inventory** (Dishman & Gettman, 1980)

Directions : Please read each of the following statements and write in the box, to the right of each item, the letter of the alternative which best describes how characteristic the statement is when applied to you. The alternatives are :

A : Extremely uncharacteristic of me

B : Somewhat uncharacteristic of me

C : Neither characteristic nor uncharacteristic of me

D : Somewhat characteristic of me

E : Extremely characteristic of me

Please be sure to answer every item. Try to be as honest and as accurate as possible in your responses.

1. I'm not very good at committing myself to do things.
2. Whenever I get bored with projects I start I drop them to do something else.
3. I can persevere at stressful tasks even when they are physically tiring or painful
4. If something gets too much of an effort to do I'm likely to just forget it.
5. I'm really concerned about developing and maintaining self discipline
6. I'm good at keeping promises, especially the ones I make to myself
7. I dont work any harder than I have to.
8. I seldom work to my full capacity.

9. I'm just not the goal setting type.
10. When I take on a difficult job, I make a point of sticking with it until it's finished
11. I'm willing to work for things I want as long as it's not a big hassle for me.
12. I have a lot of self-motivation
13. I'm good at making decisions and standing by them
14. I generally take the path of least resistance.
15. I get discouraged easily.
16. If I tell somebody I'll do something you can depend upon it being done
17. I don't like to over-extend myself.
18. I'm basically lazy.
19. I have a very hard driving, aggressive personality
20. I work harder than most of my friends
21. I can persist in spite of pain or discomfort
22. I like to set goals and work toward them
23. Sometimes I push myself harder than I should
24. I tend to be overly apathetic.
25. I seldom if ever let myself down
26. I'm not very reliable.
27. I like to take on jobs that challenge me
28. I change my mind about things quite easily.
29. I have a lot of will power
30. I'm not likely to put myself out if I don't have to.
31. Things just don't matter much to me.
32. I avoid stressful situations.
33. I often work to the point of exhaustion
34. I don't impose much structure on my activities.
35. I never force myself to do things I don't feel like doing.



36. It takes a lot to get me going.
37. Whenever I reach a goal I set a higher one
38. I can persist inspite of failure
39. I have a strong desire to achieve
40. I don't have much self-discipline.

**General Health Questionnaire (Goldberg, 1972)**

Directions : Please read this carefully. We should like to know if you have had any medical complaints and how your health has been in general over the past few weeks. Please answer **all** the questions on the following pages simply by underlining or circling the answer which you think most nearly applies to you. Remember that we want to know about present and recent complaints, not those you had in the past.

It is important that you try to answer **all** the questions. Thankyou very much for your co-operation.

-----

HAVE YOU RECENTLY :

been feeling perfectly well and in good health ?	Better than usual	Same as usual	Worse than usual	Much worse than usual
been feeling in need of a good tonic ?	Not at all	No more than usual	Rather more than usual	Much more than usual
been feeling run down and out of sorts ?	Not at all	No more than usual	Rather more than usual	Much more than usual
felt that you are ill ?	Not at all	No more than usual	Rather more than usual	Much more than usual
been getting any pains in your head ?	Not at all	No more than usual	Rather more than usual	Much more than usual
been getting a feeling of tightness or pressure in your head ?	Not at all	No more than usual	Rather more than usual	Much more than usual

been having hot or cold spells ?	Not at all	No more than usual	Rather more than usual	Much more than usual
-----				
lost much sleep over worry ?	Not at all	No more than usual	Rather more than usual	Much more than usual
had difficulty staying asleep once you were off ?	Not at all	No more than usual	Rather more than usual	Much more than usual
felt constantly under strain ?	Not at all	No more than usual	Rather more than usual	Much more than usual
been getting edgy and bad tempered ?	Not at all	No more than usual	Rather more than usual	Much more than usual
been getting scared or panicky for no good reason ?	Not at all	No more than usual	Rather more than usual	Much more than usual
found everything getting on top of you ?	Not at all	No more than usual	Rather more than usual	Much more than usual
been feeling nervous and strung-up all the time ?	Not at all	No more than usual	Rather more than usual	Much more than usual
-----				
been managing to keep yourself busy and occupied ?	More so than usual	Same as usual	Rather less than usual	Much less than usual
been taking longer over things you do ?	Quicker than usual	Same as usual	Longer than usual	Much longer than usual
felt on the whole you were doing things well ?	Better than usual	About the same	Less well than usual	Much less well

been satisfied with the way you have carried out your tasks ?	More satisfied	About same as usual	Less satisfied than usual	Much less satisfied
felt that you are playing a useful part in things ?	More so than usual	Same as usual	Less useful than usual	Much less useful
felt capable of making decisions about things ?	More so than usual	Same as usual	Less so than usual	Much less capable
been able to enjoy your normal day-to-day activities ?	More so than usual	Same as usual	Less so than usual	Much less than usual
-----				
been thinking of yourself as a worthless person ?	Not at all	No more than usual	Rather more than usual	Much more than usual
felt that life is entirely hopeless ?	Not at all	No more than usual	Rather more than usual	Much more than usual
felt that life isn't worth living ?	Not at all	No more than usual	Rather more than usual	Much more than usual
thought of the possibility that you might make away with yourself ?	Definitely not	I dont think so	Has crossed my mind	Definitely have
found at times you couldn't do anything because your nerves were bad ?	Not at all	No more than usual	Rather more than usual	Much more than usual
found yourself wishing you were dead and away from it all ?	Not at all	No more than usual	Rather more than usual	Much more than usual
found that the idea of taking your own life kept coming into your mind ?	Definitely not	I dont think so	Has crossed my mind	Definitely have

**Ways Of Coping Questionnaire** (Lazarus & Folkman, 1988).

Instructions:

To respond to the statements in this questionnaire, you must have a specific stressful situation in mind. Take a few moments and think about the most stressful situation that you have experienced in the past week.

By "stressful" we mean a situation that was difficult or troubling for you, either because you felt distressed, or because you had to use considerable effort to deal with the situation. The situation may have involved your family - your job - your friends or something else important to you. Before responding to the statements below, think about the *details* of this stressful situation, such as where it happened, who was involved in the situation, how you acted and why it was important to you. While you may still be involved in the situation, or it could have already happened, it should be the most stressful situation that you experienced during the week.

NOW IN THE SPACE BELOW PLEASE WRITE IN YOUR OWN WORDS, A SHORT DESCRIPTION OF THE MOST SIGNIFICANT STRESSFUL SITUATION YOU EXPERIENCED IN THE PAST WEEK.

As you respond to each of the statements on the following pages, please keep this stressful situation in mind. Read each statement carefully and indicate, by circling the appropriate number, to what extent you used it in the situation.

First, please answer the following items:

1. Was the situation you have in mind one that you COULD resolve or do something about if you had the right resources (e.g. personal abilities, or external resources such as support, finances equipment etc.) ? YES / NO
  2. Were all the needed resources available to you ? YES / NO
- =====

Please respond to each of the following items by using the following key:

0 = Does not apply or not used. 1 = Used somewhat.  
2 = Used quite a bit. 3 = Used a great deal.

=====

- |  |   |   |   |   |
|--|---|---|---|---|
| 1. I just concentrated on what I had to do next.                                       | 0 | 1 | 2 | 3 |
| 2. I tried to analyse the situation in order to understand it better.                  | 0 | 1 | 2 | 3 |
| 3. I turned to work or another activity to take my mind off things.                    | 0 | 1 | 2 | 3 |
| 4. I felt that time would make a difference - the only thing was to wait.              | 0 | 1 | 2 | 3 |
| 5. I bargained or compromised to get something positive from the situation.            | 0 | 1 | 2 | 3 |
| 6. I did something that I didn't think would work, but at least I was doing something. | 0 | 1 | 2 | 3 |
| 7. I tried to get the person responsible to change his or her mind.                    | 0 | 1 | 2 | 3 |
| 8. I talked to someone to find out more about the situation.                           | 0 | 1 | 2 | 3 |
| 9. I criticized or lectured myself.  | 0 | 1 | 2 | 3 |
| 10. I tried not to burn my bridges but leave things open somewhat.                     | 0 | 1 | 2 | 3 |
| 11. I hoped for a miracle.   | 0 | 1 | 2 | 3 |
| 12. I went along with fate, sometimes I just have bad luck.                            | 0 | 1 | 2 | 3 |
| 13. I went on as if nothing had happened.  | 0 | 1 | 2 | 3 |
| 14. I tried to keep my feelings to myself.   | 0 | 1 | 2 | 3 |
| 15. I looked for the silver lining so to speak I tried to look on the bright side.     | 0 | 1 | 2 | 3 |
| 16. I slept more than usual.   | 0 | 1 | 2 | 3 |
| 17. I expressed anger to the person(s) who caused the problem.                         | 0 | 1 | 2 | 3 |
| 18. I accepted sympathy and understanding from someone.                                | 0 | 1 | 2 | 3 |
| 19. I told myself things that made me feel better.                                     | 0 | 1 | 2 | 3 |
| 20. I was inspired to do something creative about the problem.                         | 0 | 1 | 2 | 3 |
| 21. I tried to forget the whole thing.   | 0 | 1 | 2 | 3 |
| 22. I got professional help.   | 0 | 1 | 2 | 3 |

- |   |   |   |   |   |
|---|---|---|---|---|
| 23.I changed or grew as a person.   | 0 | 1 | 2 | 3 |
| 24.I waited to see what would happen before doing anything.                               | 0 | 1 | 2 | 3 |
| 25.I apologised or did something to make up.  | 0 | 1 | 2 | 3 |
| 26.I made a plan of action and followed it.   | 0 | 1 | 2 | 3 |
| 27.I accepted the next best thing to what I wanted.                                       | 0 | 1 | 2 | 3 |
| 28.I let my feelings out somehow.   | 0 | 1 | 2 | 3 |
| 29.I realised that I had brought the problem on myself.                                   | 0 | 1 | 2 | 3 |
| 30.I came out of the experience better than when I went in.                               | 0 | 1 | 2 | 3 |
| 31.I talked to someone who could do something concrete about the problem.                 | 0 | 1 | 2 | 3 |
| 32.I tried to get away from it for a while by resting or taking a holiday.                | 0 | 1 | 2 | 3 |
| 33.I tried to make myself feel better by eating drinking, smoking, using medications etc. | 0 | 1 | 2 | 3 |
| 34.I took a big chance or did something very risky to solve the problem.                  | 0 | 1 | 2 | 3 |
| 35.I tried not to act too hastily or follow my first hunch.                               | 0 | 1 | 2 | 3 |
| 36.I found new faith.   | 0 | 1 | 2 | 3 |
| 37.I maintained my pride and kept a stiff upper lip.                                      | 0 | 1 | 2 | 3 |
| 38.I rediscovered what is important in life.  | 0 | 1 | 2 | 3 |
| 39.I changed something so that things would turn out all right.                           | 0 | 1 | 2 | 3 |
| 40.I generally avoided being with people.   | 0 | 1 | 2 | 3 |
| 41.I didn't let it get to me; I refused to think too much about it.                       | 0 | 1 | 2 | 3 |
| 42.I asked advice from a relative or friend I respected.                                  | 0 | 1 | 2 | 3 |
| 43.I kept others from knowing how bad things were.  | 0 | 1 | 2 | 3 |
| 44.I made light of the situation - I refused to get too serious about it.                 | 0 | 1 | 2 | 3 |

45.I talked to someone about how I was feeling.	0	1	2	3
46.I stood my ground and fought for what I wanted.	0	1	2	3
47.I took it out on other people.	0	1	2	3
48.I drew on my past experiences; I was in a similar situation before.	0	1	2	3
49.I knew what had to be done, so I doubled my efforts to make things work.	0	1	2	3
50.I refused to believe that it had happened.	0	1	2	3
51.I promised myself that things would be different next time.	0	1	2	3
52.I came up with a couple of different solutions to the problem.	0	1	2	3
53.I accepted the situation since nothing could be done.	0	1	2	3
54.I tried to keep my feelings about the problem from interfering with other things.	0	1	2	3
55.I wished that I could change what had happened or how I felt.	0	1	2	3
56.I changed something about myself.	0	1	2	3
57.I daydreamed or imagined a better time or place than the one I was in.	0	1	2	3
58.I wished that the situation would go away or somehow be over with.	0	1	2	3
59.I had fantasies or wishes about how things might turn out.	0	1	2	3
60.I prayed.	0	1	2	3
61.I prepared myself for the worst.	0	1	2	3
62.I went over in my mind what I would say or do.	0	1	2	3
63.I thought about how a person I admire would handle the situation and used that as a model.	0	1	2	3
64.I tried to see things from the other person's point of view.	0	1	2	3
65.I reminded myself how much worse things could be.	0	1	2	3
66.I jogged or exercised.	0	1	2	3

Appendix IIIb

ANOVA Tables of the Mental Health Variables For Total Sample, (N=279).

Somatic Symptoms

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Within					
Cells	271	3745.23	13.28		
Self-Motiv'n	1	12.16	12.16	.88	.349
Occupation	1	2.57	2.57	.19	.666
Self-Control	1	326.66	326.66	23.64	.000
Occupation by					
Self-Control	1	280.63	280.63	20.31	.000
Occ by SM	1	31.14	31.14	2.25	.134
SC by SM	1	4.95	4.95	.36	.550
Occ by SC					
By SM	1	15.56	15.56	1.13	.290

Tukey's Post Hoc Test : The Occupation By Self-Control Interaction For Somatic Symptoms.

CD=1.65 p<.05	NURSES		STUDENTS	
	HSC	LSC	HSC	LSC
3.07	3.07	7.76	5.55	5.72
7.76	-----	4.69	2.48	2.65
5.55		-----	2.21	2.04
5.72			-----	0.17
				-----

Anxiety and Insomnia

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Within					
Cells	271	4581.90	16.91		
Self-Motiv'n	1	14.67	14.67	.87	.353
Occupation	1	19.29	19.29	1.14	.286
Self-Control	1	645.33	645.33	38.17	.000
Occupation by					
Self-Control	1	127.75	127.75	7.56	.006
Occ by SM	1	6.39	6.39	.38	.539
SC by SM	1	.23	.23	.01	.907
Occ by SC					
By SM	1	1.08	1.08	.06	.801



Tukey's Post Hoc Test : The Occupation By Self-Control  
Interaction For Anxiety And Insomnia.

CD=1.83 p<.05	NURSES		STUDENTS	
	LSC	HSC	LSC	HSC
	2.46	7.39	4.58	6.46
2.46	----	4.93	2.12	4.00
7.39		----	2.81	0.93
4.58			----	1.88
6.46				----

Social Dysfunction

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Within Cells	271	1600.14	5.90		
Occupation	1	9.59	9.59	1.62	.204
Self-Motiv'n	1	3.21	3.21	.54	.462
Self-Control	1	129.09	129.09	21.86	.000
Occ by SC	1	8.12	8.12	1.38	.242
Occ by SM	1	5.53	5.53	.94	.334
SC by SM	1	.20	.20	.03	.852
Occ by SC By SM	1	6.44	6.44	1.09	.297

Depression

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Within Cells	271	2300.30	8.49		
Occupation	1	1.81	1.81	.21	.645
Self-Motiv'n	1	4.16	4.16	.49	.485
Self-Control	1	160.92	160.92	18.96	.000
Occ by SC	1	9.80	9.80	1.15	.284
Occ by SM	1	.80	.80	.09	.759
Self-Control by Self-Motivation	1	35.81	35.81	4.22	.041
Occ by SC By SM	1	3.64	3.64	.43	.513

Tukey's Post Hoc Test : The Self-Control By Self-Motivation  
Interaction For Depression.

CD=1.30 p<.05	LOW MOTIVATION		HIGH MOTIVATION	
	LSC	HSC	LSC	HSC
	0.88	0.35	1.78	2.86
0.88	----	0.53	0.90	1.98
0.35		----	1.43	2.51
1.78			----	1.08
2.86				----

General Mental Health

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Within Cells	271	5846.48	21.57		
Occupation	1	32.70	32.70	1.52	.219
Self-Motiv'n	1	16.79	16.79	.78	.379
Self-Control	1	804.87	804.87	37.31	.000
Occupation by Self-Control	1	203.57	203.57	9.44	.002
Occ by SM	1	50.22	50.22	2.33	.128
SC by SM	1	1.54	1.54	.07	.790
Occ by SC By SM	1	6.74	6.74	.31	.577

Tukey's Post Hoc Test : The Occupation By Self-Control Interaction For General Mental Health.

CD=2.06 p<.05	NURSES		STUDENTS	
	HSC	LSC	HSC	LSC
1.11	1.11	6.84	3.80	5.70
6.84	-----	5.73	2.69	4.59
3.80		-----	3.04	1.14
5.70			-----	1.90
				-----

Appendix IIIc

ANOVA Tables for Self-Control Across Mental Health, Coping and Perceived Control Variables For The Nursing Staff Sub-Sample (N=52).

Somatic Symptoms

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Main Effects	2	348.654	174.327	15.558	.000
Self-Control	1	340.173	340.173	30.359	.000
Self-Motiv'n	1	8.481	8.481	.757	.389
SC by SM	1	3.250	3.250	.290	.593
Explained	3	351.904	117.301	10.469	.000
Residual	48	537.846	11.205		
Total	51	889.750	17.446		

Anxiety and Insomnia

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Main Effects	2	555.885	277.942	15.235	.000
Self-Control	1	523.558	523.558	28.698	.000
Self-Motiv'n	1	32.327	32.327	1.772	.189
SC by SM	1	10.173	10.173	.558	.459
Explained	3	566.058	188.686	10.343	.000
Residual	48	875.692	18.244		
Total	51	1441.750	28.270		

Social Dysfunction

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Main Effects	2	92.038	46.019	8.896	.001
Self-Control	1	91.558	91.558	17.699	.000
Self-Motiv'n	1	.481	.481	.093	.762
SC by SM	1	.481	.481	.093	.762
Explained	3	92.519	30.840	5.962	.002
Residual	48	248.308	5.173		
Total	51	340.827	6.683		

Depression

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Main Effects	2	87.538	43.769	4.136	.022
Self-Control	1	83.769	83.769	7.915	.007
Self-Motiv'n	1	3.769	3.769	.356	.553
SC by SM	1	.692	.692	.065	.799
Explained	3	88.231	29.410	2.779	.051
Residual	48	508.000	10.583		
Total	51	596.231	11.691		

General Mental Health

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Main Effects	2	610.538	305.269	16.195	.000
Self-Control	1	609.308	609.308	32.325	.000
Self-Motiv'n	1	1.231	1.231	.065	.799
SC by SM	1	1.923	1.923	.102	.751
Explained	3	612.462	204.154	10.831	.000
Residual	48	904.769	18.849		
Total	51	1517.231	29.750		

Problem Focused Coping

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Main Effects	2	2922.038	1461.019	27.583	.000
Self-Control	1	2850.481	2850.481	53.815	.000
Self-Motiv'n	1	71.558	71.558	1.351	.251
SC by SM	1	5.558	5.558	.105	.747
Explained	3	2927.596	975.865	18.424	.000
Residual	48	2542.462	52.968		
Total	51	5470.058	107.256		

Emotion Focused Coping

Source	D.F.	Sum of Squares	Mean Square	F Ratio	F Prob.
Main Effects	2	4156.077	2078.038	20.810	.000
Self-Control	1	3963.769	3963.769	39.695	.000
Self-Motiv'n	1	192.308	192.308	1.926	.172
SC by SM	1	4.923	4.923	.049	.825
Explained	3	4161.000	1387.000	13.890	.000
Residual	48	4793.077	99.856		
Total	51	8954.077	175.570		

Appendix IIIId

ANOVA Tables for Self-Control Across Mental Health Variables For The Student Group (N=170).

Anxiety

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Main Effects	2	249.522	124.761	6.873	.001
Self-Control	1	117.648	117.648	6.481	.012
Self-Motiv'n	1	19.536	19.536	1.076	.301
SC by SM	1	.161	.161	.009	.925
Explained	3	249.683	83.228	4.548	.004
Residual	166	3013.429	18.153		
Total	169	3263.112	19.308		

Social Dysfunction

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Main Effects	2	94.043	47.021	7.661	.001
Self-Control	1	38.674	38.674	6.301	.013
Self-Motiv'n	1	10.715	10.715	1.746	.188
SC by SM	1	5.624	5.624	.916	.340
Explained	3	99.667	33.222	5.413	.001
Residual	166	1018.827	6.138		
Total	169	1118.494	6.618		

Depression

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Main Effects	2	122.694	61.347	6.756	.002
Self-Control	1	51.202	51.202	5.639	.019
Self-Motiv'n	1	13.502	13.502	1.487	.224
SC by SM	1	31.544	31.544	3.474	.064
Explained	3	154.238	51.413	5.662	.001
Residual	166	1507.409	9.081		
Total	169	1661.647	9.832		

General Mental Health

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Main Effects	2	359.060	179.530	7.354	.001
Self-Control	1	126.163	126.163	5.168	.024
Self-Motiv'n	1	56.000	56.000	2.294	.132
SC by SM	1	21.245	21.245	.870	.352
Explained	3	380.304	126.768	5.193	.002
Residual	166	4052.643	24.414		
Total	169	4432.947	26.230		

ANOVA Tables for Self-Control Across Mental Health Variables For The Nursing Group (N=109).

Somatic Symptoms

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Main Effects	2	512.873	256.437	21.871	.000
Self-Control	1	452.516	452.416	38.586	.000
Self-Motiv'n	1	.266	.266	.023	.881
SC by SM	1	11.716	11.716	.999	.320
Explained	3	524.589	174.863	14.914	.000
Residual	105	1231.099	11.725		
Total	108	1755.688	16.256		

Anxiety and Insomnia

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Main Effects	2	554.000	277.000	17.224	.000
Self-Control	1	486.574	486.574	30.256	.000
Self-Motiv'n	1	.455	.455	.028	.867
SC by SM	1	11.130	11.130	.692	.867
Explained	3	565.129	188.376	11.713	.000
Residual	105	1688.614	16.082		
Total	108	2253.743	20.868		

Social Dysfunction

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Main Effects	2	100.458	50.229	9.096	.000
Self-Control	1	98.163	98.163	17.777	.000
Self-Motiv'n	1	3.079	3.079	.558	.457
SC by SM	1	8.068	8.068	1.461	.229
Explained	3	108.526	36.175	6.551	.000
Residual	105	579.805	5.522		
Total	108	688.330	6.373		

Depression

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Main Effects	2	94.873	47.437	6.117	.003
Self-Control	1	89.860	89.860	11.588	.001
Self-Motiv'n	1	.867	.867	.112	.739
SC by SM	1	.480	.480	.062	.804
Explained	3	95.354	31.785	4.099	.009
Residual	105	814.224	7.755		
Total	108	909.578	8.422		

General Mental Health

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Main Effects	2	676.371	338.185	17.949	.000
Self-Control	1	649.816	649.816	34.488	.000
Self-Motiv'n	1	11.063	11.063	.587	.445
SC by SM	1	10.800	10.800	.573	.451
Explained	3	687.171	229.057	12.157	.000
Residual	105	1978.389	18.842		
Total	108	2665.560	24.681		

Appendix IIIe

ANOVA Tables for Perceived Control Across Mental Health and Coping Variables For The Nursing Group (N=52)

Problem Focused Coping

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Main Effects	3	2947.083	982.361	18.495	.000
Self-Control	1	2240.380	2240.380	42.180	.000
Perceived Ctrl	2	96.602	48.301	.909	.410
SC by Per Con	2	79.721	39.860	.750	.478
Explained	5	3026.804	605.361	11.397	.000
Residual	46	2443.254	53.114		
Total	51	5470.058	107.256		

Emotion Focused Coping

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Main Effects	3	4436.210	1478.737	15.561	.000
Self-Control	1	2707.017	2707.017	28.487	.000
Perceived Ctrl	2	472.440	236.220	2.486	.089
SC by Per Con	2	146.598	73.299	.771	.468
Explained	5	4582.807	916.561	9.645	.000
Residual	46	4371.270	95.028		
Total	51	8954.077	175.570		

General Coping

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Main Effects	3	14455.367	4818.456	19.266	.000
Self-Control	1	9857.188	9857.188	39.413	.000
Perceived Ctrl	2	950.675	475.338	1.901	.161
SC by Per Con	2	405.249	202.625	.810	.451
Explained	5	14860.617	2972.123	11.884	.000
Residual	46	11504.460	250.097		
Total	51	25365.077	516.962		

Appendix IIIf

Path Analysis Regression Tables For The Fully Recursive Model.

SM = Self Motivation                      Dep. = Dependent Variable  
 SC = Self Control                        Pred. = Predictor Variable(s)  
 CP = Coping                                entered into the  
 PC = Perceived Control                    equation.  
 MH = Mental Health

Dep.	Pred.	Beta	SigT	MultR	R <sup>2</sup>	AdjR <sup>2</sup>	SE
SM	SC	.30	.028	.304	.092	.074	25.28

ANOVA	DF	Sum of Squares	Mean Square	F	SigF
Regression	1	3259.53	3259.53	5.09	.028
Residual	50	31977.44	639.54		

Dep.	Pred.	Beta	SigT	MultR	R <sup>2</sup>	AdjR <sup>2</sup>	SE
CP	SC	.71	.000	.731	.534	.515	15.82
	SM	.06	.584				

ANOVA	DF	Sum of Squares	Mean Square	F	SigF
Regression	2	14098.10	7049.05	28.15	.000
Residual	48	12266.96	250.34		

Dep.	Pred.	Beta	SigT	MultR	R <sup>2</sup>	AdjR <sup>2</sup>	SE
PC	SC	.09	.627	.394	.156	.102	.403
	SM	.11	.411				
	CP	.27	.171				

ANOVA	DF	Sum of Squares	Mean Square	F	SigF
Regression	3	1.43	.478	2.94	.042
Residual	47	7.79	.162		



Dep.	Pred.	Beta	SigT	MultR	R <sup>2</sup>	AdjR <sup>2</sup>	SE
MH	SC	.52	.001				
	SM	.08	.434				
	CP	.21	.160				
	PC	.13	.254	.723	.523	.482	3.92

ANOVA	DF	Sum of Squares	Mean Square	F	SigF
Regression	4	793.54	198.38	12.88	.000
Residual	47	723.69	15.39		

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 Path Analysis Regression Tables For The Over-Identified Model, (see page).

SM = Self Motivation                      Dep. = Dependent Variable  
 SC = Self Control                        Pred. = Predictor Variable(s)  
 CP = Coping                                entered into the  
 PC = Perceived Control                    equation.  
 MH = Mental Health

Dep.	Pred.	Beta	SigT	MultR	R <sup>2</sup>	AdjR <sup>2</sup>	SE
SM	SC	.30	.028	.304	.092	.074	25.28

ANOVA	DF	Sum of Squares	Mean Square	F	SigF
Regression	1	3259.53	3259.53	5.09	.028
Residual	50	31977.44	639.54		

Dep.	Pred.	Beta	SigT	MultR	R <sup>2</sup>	AdjR <sup>2</sup>	SE
CP	SC	.73	.000	.731	.531	.522	15.71

ANOVA	DF	Sum of Squares	Mean Square	F	SigF
Regression	1	14022.13	14022.13	56.80	.000
Residual	50	12342.94	246.85		

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Dep.	Pred.	Beta	SigT	MultR	R <sup>2</sup>	AdjR <sup>2</sup>	SE
PC	SM	.13	.359	.389	.151	.116	.399
	CP	.33	.018				

ANOVA	DF	Sum of Squares	Mean Square	F	SigF
Regression	2	1.39	.698	4.371	.018
Residual	49	7.83	.159		

Dep.	Pred.	Beta	SigT	MultR	R <sup>2</sup>	AdjR <sup>2</sup>	SE
MH	SC	.50	.001	.718	.516	.486	3.90
	CP	.21	.170				
	PC	.12	.289				

ANOVA	DF	Sum of Squares	Mean Square	F	SigF
Regression	3	783.98	261.32	17.10	.000
Residual	48	733.24	15.27		

### Appendix IIIg

Calculation Of The Q Coefficient (Pedhazur, 1982)

SM = Self Motivation  
 SC = Self Control  
 CP = Coping  
 PC = Perceived Control  
 MH = Mental Health

Fully Recursive Model	Over-Identified Model
1. MH on SC, SM, CP, PC R <sup>2</sup> = .523	MH on SC, CP, PC R <sup>2</sup> = .516
2. PC on SC, SM, CP R <sup>2</sup> = .156	PC on SM, CP R <sup>2</sup> = .151
3. CP on SC, SM R <sup>2</sup> = .534	CP on SC R <sup>2</sup> = .531

Residual Path Coefficients (using  $e = \sqrt{1 - R_i^2}$ )

$$\begin{aligned} e_5 &= \sqrt{1 - .523} = .691 & e_5 &= \sqrt{1 - .516} = .695 \\ e_4 &= \sqrt{1 - .156} = .918 & e_4 &= \sqrt{1 - .151} = .921 \\ e_3 &= \sqrt{1 - .534} = .682 & e_3 &= \sqrt{1 - .531} = .685 \end{aligned}$$

For a fully recursive multistage path model  $R_m^2$  is then calculated. This represents the ratio of the generalized variance explained by the causal model to the generalized variance which was to be explained by the model (Specht 1975, p121)

$$\begin{aligned} R_m^2 &= 1 - (.691)^2 (.918)^2 (.682)^2 \\ &= .813 \end{aligned}$$

Similarly, for the overidentified model M is calculated. This statistic is analogous to  $R_m^2$ . In this instance the  $R^2$ 's are based on a model in which some of the paths have been deleted. Thus, M can take values between zero and  $R_m^2$ . The smaller M is in relation to  $R_m^2$  the poorer the fit of the overidentified model.

$$\begin{aligned} M &= 1 - (.695)^2 (.921)^2 (.685)^2 \\ &= .808 \end{aligned}$$

The Q coefficient is then calculated as a measure of the goodness of fit between the fully recursive and overidentified models. Where :

$$Q = \frac{1 - R_m^2}{1 - M}$$

Thus, for this model:

$$\begin{aligned} Q &= \frac{1 - .813}{1 - .808} \\ &= .97 \end{aligned}$$

Q therefore reflects an extremely robust goodness of fit for these data.