CONCEPTUAL AND METHODOLOGICAL ISSUES IN SELF-EFFICACY THEORY

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Corrigenda

Page 15: "Bandura and Walters (1973)" should be read as "Bandura and Walters (1963)".

Page 21: "Physiological arousal was initially listed as a source of efficacy expectations (Bandura, 1977a) but later descriptions of the theory (e.g., Bandura, 1982b) have argued that...." should be read as "Physiological arousal was originally listed as a source of efficacy expectations (Bandura, 1977a) but in later descriptions of the theory, Bandura (1982b) has argued that..."

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SUMMARY

Self-efficacy theory, proposed within the framework of social learning theory by Bandura (1977a), argues that individuals have specific "efficacy expectations" concerning their ability to perform particular activities, and that these expectations are major proximal determinants of behaviour. Efficacy expectations arise from information obtained from previous performance, from observation, from linguistic information, and from interpretations of physiological arousal. The efficacy expectation is a complex synthesis of this information, and is modified by the input of new information. Bandura argues that all behaviour change results from the modification of efficacy expectations.

The theory has empirical support across a wide range of behavioural domains, but there are some points of contention. This thesis reviews the current literature within the self-efficacy framework, and that which is directly critical of it. Several contentious issues, both theoretical and methodological, are identified and addressed, and a series of experiments which reflect on these issues is presented. A number of substantive areas are used in these experiments, but assertiveness training is the major area. Therefore, after the presentation of the theory and review of the self-efficacy literature, but before the experimental evidence concerning self-efficacy is presented, there is a review of the assertiveness-training literature and a description of an assertiveness training programme from which much of the self-efficacy data were collected. (For each issue related to efficacy theory, data from this assertiveness training programme are presented, as well as data from other experimental situations.) After this description, the thesis returns to contentious issues for self-efficacy theory, and presents nine experiments. Six of the experiments are concerned with the theoretical

issue of the accuracy with which efficacy expectations predict later performance. Bandura's theory argues that efficacy expectations, as proximal determinants of behaviour, are more accurate predictors than are previous behavioural measures or other cognitive measures. The first two studies examine the accuracy with which self-efficacy predicts maintenance of behaviour change. The first, dealing with the assertiveness training programme, finds efficacy expectations to be highly accurate predictors; the second, which deals with maintenance of physical activity following fitness training, does not find a strong relationship between efficacy and maintenance of activity. It is argued that the participants in the second study did not have sufficient knowledge of or control over the constraints on exercising which would arise in this natural setting, and that unexpected changes in situation may have had a strong mitigating influence on the relationship between efficacy and maintenance of activity.

Having established that efficacy expectations do predict behaviour, at least in highly structured and predictable situations, the thesis turns to a consideration of an important methodological problem, that of the reactive effects of measuring self-efficacy. Three experiments examine the extent to which the measuring of efficacy expectations affects performance. One involves a snake handling task, one the assertiveness training programme, and the third an assertiveness testing session, all with first-year psychology students. The conclusion reached is that there are reactive effects of measurement, and that these effects appear to change in a regular manner as familiarity with the situation increases, but seem unrelated to an individual's level of skill.

The thesis then returns to theoretical questions, and four further studies dealing with the accuracy with which efficacy predicts behaviour

are presented. Two studies examine the relative accuracy of efficacy expectations and behavioural measures as predictors of later behaviour. Data from the assertiveness training study indicate that, contrary to the theory's prediction, behavioural measures are much more accurate predictors than are efficacy measures. The second study, involving a group of girl gymnasts preparing for a competition, however, does support the theory. Efficacy expectations are found to be better predictors of competition performance than are behavioural measures from previous competitions. It is suggested on the basis of these conflicting findings that the relationship between efficacy and behaviour is more complex than the theory might suggest, and that a number of other variables might influence these relationships. The precision and valence of obtained feedback, and the individual's levels of skill and motivation, are suggested as variables which may influence the relationship between efficacy expectations and behaviour.

The final two studies examine the relative predictive accuracy of efficacy expectations and outcome expectations. It has been suggested that outcome expectations may be more important predictors than efficacy expectations, or that the two types of expectation may interact in some way in producing behaviour. The two studies, one involving an assertiveness-assessment session and the other a snake-handling task, were similar in design. Undergraduate students served as subjects, and each completed measures of efficacy and outcome expectations before performing a behavioural test. In both cases, efficacy and outcome expectations were correlated, but efficacy expectations alone were better predictors of outcome than were outcome expectations alone or an additive or multiplicative combination of the two. Thus, there was no support for the idea that outcome expectations might predict behaviour either better than or independently from efficacy expectations.

The nine studies examine several aspects of self-efficacy theory, and the final chapter attempts to bring these aspects together into an overall assessment. It is concluded that self-efficacy theory has in general been supported by these findings, but that there appear to be other variables which influence the precise relationship between efficacy and behaviour. It is suggested that further research might focus on the effects of feedback clarity and valence, of skill level, of modelling, and of variations in goal setting on the relationship between efficacy and behaviour. If the effects of these variables could be clarified and integrated into the model, the accuracy and applicability of self-efficacy theory would be likely to be increased.

This thesis contains no material which has been accepted for the award of any other degree or diploma in any other university and, to the best of my knowledge and belief, contains no material previously published or written by another person, except when due reference is made in the text.

Christina Lee

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CHAPTER I

OVERVIEW

I. 1. INTRODUCTION

This thesis is concerned with self-efficacy theory, a social-learning approach to the relationships between cognitions and behaviour, which was proposed by Bandura (1977a). In particular, it is concerned with a number of problematic issues which emerge from a consideration of the current literature pertaining to this theory. The overall aim is to examine a number of these problematic issues, to reach a conclusion concerning the extent to which the theory deals adequately with the issues it confronts, and to suggest possible further areas for development which could enhance the general applicability of the theory.

Such an aim necessitates a varied approach, with studies in a range of substantive areas examining a number of separate issues. The purpose of this initial chapter is to provide an overview of the chapters to follow and an explanation of the overall structure of the thesis (see Figure I. 1).

I. 2. OVERVIEW

The main body of this thesis begins with Chapter II, which first sets self-efficacy theory in perspective within the development of social learning theories, and then goes on to a detailed description of the theory itself. Chapter III follows this description of the theory with an outline of experimental work supporting it. The original paper describing the theory (Bandura, 1977a) was supported by three experiments by Bandura and his colleagues; because of the importance of these studies in the development of the theory, they are described in some detail. Following this section is a description of other published studies within the self-efficacy framework, covering a wide range of

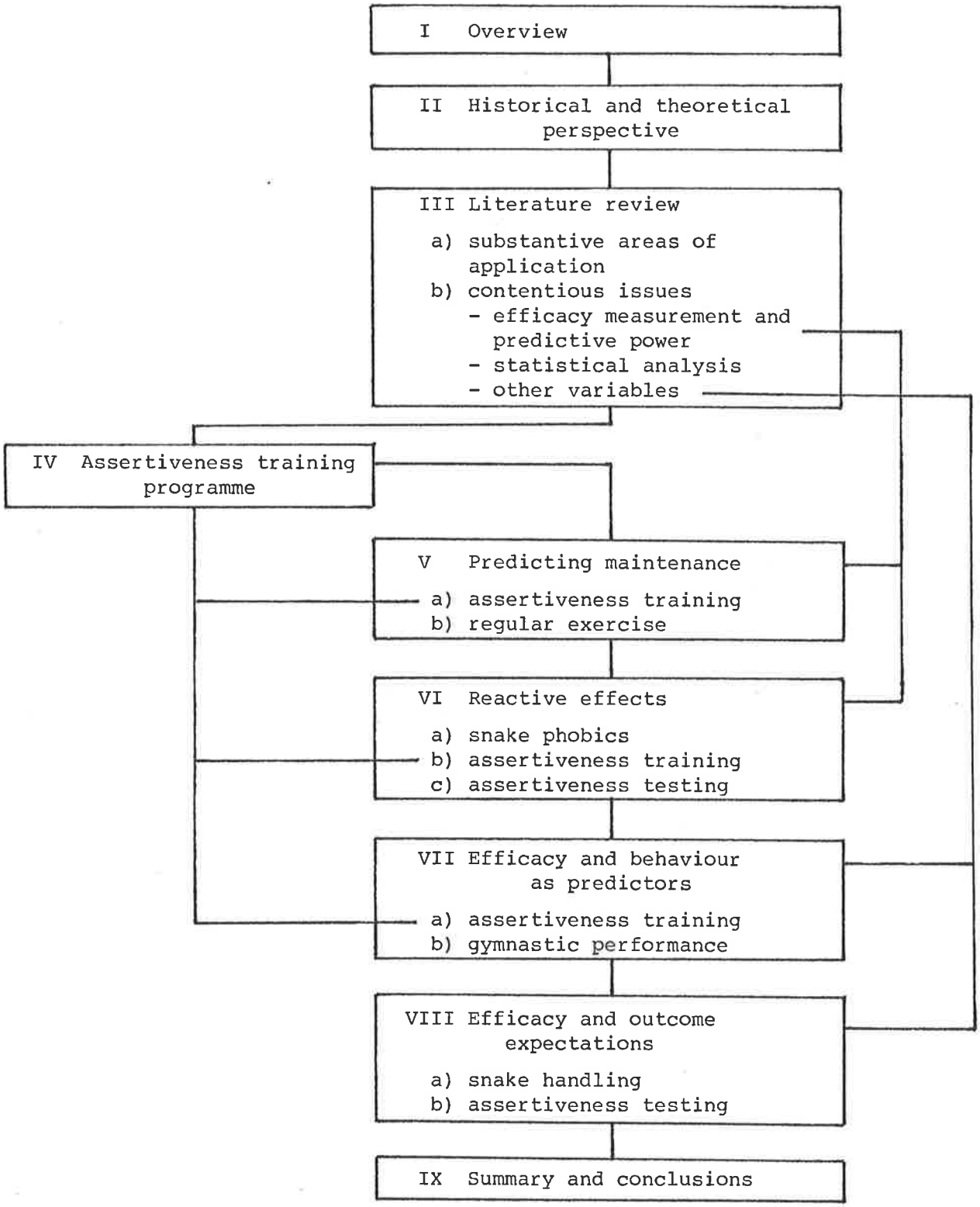

FIGURE I.1. Flow diagram indicating the main conceptual and substantive links between chapters of this thesis.

behavioural domains and in general producing results which are supportive of the theory. The final section of Chapter III looks at reviews which view self-efficacy theory in a critical light, and at arguments for and against a number of points of contention concerned with the theory. This chapter concludes the introductory section of the thesis by listing the problematic issues which will be considered in the remaining chapters.

In order to examine theoretical questions in the light of empirical research, it is necessary to select an appropriate substantive area for the collection of data. In this case, because of the emphasis on therapeutic behaviour change in the early development of self-efficacy theory, a behaviour-change programme was selected as an initial source of data. It was considered that the nature of the experimental task could be a variable of some importance, and that the initial studies at least should use a task similar in its demands to those used by Bandura and his colleagues in their early studies. An assertiveness training programme was selected, as the tasks involved were cognitive and emotional rather than physically or intellectually demanding. By using a task of this nature, parallels with Bandura's work could most easily be drawn. It was felt, however, that it was inadequate to depend entirely on a single substantive area if results were to reflect upon the theory in general. Therefore it was decided that, as well as the assertiveness training programme, further studies in different subject areas would examine the same issues so that some consideration of the effects of subject area could be made.

The assertiveness training programme was, however, the main source of data, and it was set up so that a number of issues could be considered on the basis of its results. The later chapters of this thesis are concerned with a single issue each, examining data both from the assertiveness training programme and from other sources. In order to avoid confusion and repetition, Chapter IV

reviews the current assertiveness-training literature, describes the assertiveness training programme in detail, and presents a number of analyses of the data which examine the programme's effectiveness. It seems necessary to show that the programme is associated with increases in assertiveness so that it can be considered legitimate to examine relationships between changes in efficacy and in behaviour within this context.

Chapters V, VI, VII and VIII are concerned with a close examination of issues connected with self-efficacy theory. Each presents data from at least two studies which pertain to a particular issue; where the assertiveness training programme is discussed, the reader is referred back to Chapter IV for details of method (see Figure I. 1).

Chapters V to VIII examine different aspects of the posited relationship between efficacy and behaviour. The main argument of self-efficacy theory is that efficacy expectations, or highly specific levels of confidence relating to particular behaviours and deriving from a range of informational inputs, are major determinants of those behaviours. This argument has produced a considerable amount of debate. It has been argued that findings supporting it are contaminated by various demand characteristics which produce artificially high correlations between efficacy and behavioural measures, and that the statistical methods used have been inappropriate. At a more theoretical level, the precise nature of the relationships between behaviours, efficacy expectations, and other cognitions has been debated. Variables such as skill level, type of task, type and precision of feedback, the goals set, and the presence of various types of models have also been considered as possibly having some role in determining self-efficacy and its precise relationship with behaviour. Chapter III will discuss these contentious issues in general terms, and Chapters V to VIII present data relevant to them.

Chapter V examines the role of efficacy expectations in predicting the extent of maintenance of behaviour change, using data derived from the assertiveness training programme and from a fitness training programme run in a community setting. Chapter VI examines a methodological issue which is important in reaching valid theoretical conclusions: that of the reactive effects of measurement. Data from another snake handling study, from the main assertiveness training programme, and from another, smaller, assertiveness testing session are used to examine reactive effects on behaviour of the measurement of self-efficacy. Chapter VII compares efficacy expectations with behavioural measures as predictors of later behaviour; again it uses data from the assertiveness training programme and from another source, this time a group of competitive gymnasts. Chapter VIII compares efficacy expectations with outcome expectations as predictors of behaviour, using data from an assertiveness testing session, conducted independently of the training programme, and from a study of snake handling.

Chapter IX, the final chapter in this thesis, summarises the results of the studies presented in the previous four chapters. The use of more than one study for each issue and a range of substantive areas produces results which are variable in their degree of support for self-efficacy theory. No simple conclusion regarding the theory's adequacy can be reached on the basis of these studies. However, the variety of studies suggests a number of variables which may influence the relationships between efficacy and behaviour. Chapter IX considers the possible effects of such variables as skill level, type of performance feedback, goal setting, and modelling on these relationships. It concludes with the argument that, while self-efficacy theory appears to be a useful and widely applicable way of viewing psychological phenomena, a consideration of other variables and their integration into the theory in a systematic way could enhance its generality and applicability.

In summary, this thesis proceeds from a description of the theory, a review of the literature, and a consideration of some issues for the theory, through a description of a programme set up to consider these issues, to a series of chapters presenting data related to each issue. It concludes with a chapter which summarises the findings and suggests areas for further research.

CHAPTER II.

SELF-EFFICACY THEORY

II. 1. INTRODUCTION

This chapter aims to present a brief overview of social learning theories, and to proceed from that to a description of self-efficacy theory. The phrase "social learning theory" as currently used refers mainly to the approach described by Bandura (1977b), which provided the most immediate theoretical basis for self-efficacy theory. However, the history of social learning theories is considerably longer and more diverse than the recency of this publication might suggest. "Social learning theory" may be used to label a variety of similar approaches which have been proposed over several decades. They have been characterised by Rosenthal (1982) as lying midway between the "conditioning" and the "organismic" approaches. To simplify these alternative approaches, it can be said that advocates of the "conditioning" approach (e.g., Skinner, 1977) argue that human behaviour could be completely understood if one had a complete enough knowledge of the reinforcement history of the individual, while those taking "organismic" or developmental approaches (e.g., Piaget & Inhelder, 1966) argue that physiological maturation is the most important determinant of behaviour and of psychological status.

Social learning theories, on the other hand, place the major emphasis on the interaction between the individual and the environment, and in particular view the individual's behaviour as being shaped to a large extent by events in the social environment. Their central common core is the argument that people's interactions with their social environments, including the observation of others within those environments, are major determinants of their behaviour. They differ widely, though, in a number of aspects.

The importance of cognitive interpretations of events in determining response, and the inevitability with which environmental events will affect people's behaviour, are two important points on which these approaches vary. Bandura's (1977b) approach stresses that individuals' responses to environmental events are mediated by their cognitive interpretations of those events, and thus that cognitions interact with environmental events and with behaviour in a complex fashion.

This approach can be contrasted with earlier formulations. Dollard, Miller, Doob, Mowrer and Sears' (1944/1939) work on aggression, for example, which argued that aggressive behaviour was shown when a socially acquired drive was frustrated, did not presume a conscious awareness to be necessarily involved in the imitative learning which produced the drive. Their social learning theory was more closely allied to the Hullian tradition than those which have followed it, and argued that the observation of other people performing certain activities and being rewarded was enough to develop a drive to perform those activities without any conscious processes being necessary. Their assumption of automaticity in the development of drives through imitation has not been followed by other writers, although their emphasis on observational learning has. Rotter's (1954) social-learning approach, for example, argues that individuals develop expectancies concerning their own ability to control their environment in part from their observations of the experiences of others, but it does not argue that they will necessarily imitate those observed behaviours. Only if they observe that others appear able to influence their environment and that the outcomes seem favourable will they be likely to imitate the behaviour of those others.

Thus, there are fundamental differences in the perceived relationship between person and environment. Dollard et al's (1944/1939) approach views

the person as a relatively passive and automatic reactor to events in his or her environment. Although the individual reacts with and to the environment, external events are initially responsible for the activation of behaviour. Contemporary approaches such as Bandura's (1977b) are more strongly interactionist, arguing that the person can alter environmental contingencies or ignore them, and that the person has greater deterministic power over his or her behaviour.

While these approaches differ, they can be considered as related because they view the individual and the environment as approximately equally (though more equally in Bandura's than in Miller and Dollard's formulation) powerful determinants of behaviour. This view may be contrasted, not only with the Skinnerian view (e.g., Skinner, 1977), but also with other "cognitive" approaches to psychology. Sampson (1981) has argued that nominally "interactive" approaches such as Piaget's (e.g., Piaget, 1971) in fact view the individual as instigator of all action and the environment as passively reacting. Such a viewpoint, Sampson argues, is also the basis of most social psychological theorising. The social learning theories, in particular Bandura's approach, can be considered to contrast with the subjective individualism of such approaches and with the objective materialism of traditional learning theories.

II. 2. HISTORICAL DEVELOPMENT OF SOCIAL LEARNING THEORIES

Social-learning approaches are frequently regarded as commencing with the work of Miller, Dollard, and their associates. Dollard et al. (1944/1939) presented an account of aggression from the point of view that it arose through the frustration of drives. These drives were not innate, but were acquired through social interaction, and had as their goals the obtaining of items or performing of activities which were regarded positively in the individual's society.

Miller and Dollard (1941) followed this up with a more general account of social learning and, in particular, the way in which a "drive for imitation" is developed through social reward contingent on imitation. This acquired drive then causes the individual to learn through observation and to develop behavioural patterns which are generally reinforced in his or her particular society. Thus, the resultant behaviour can be considered to result from an interaction between the individual's learning capacities and the reinforcement contingencies current in the relevant environment.

While the work of this group of collaborators has been an important impetus in the later development of social learning theories, the ideas basic to social-learning-theory approaches are much older in their conception, yet considerably more recent in their general adoption. In 1935, Lewin was stressing the importance of examining the "fundamental dynamic relations between the individual and the environment" (Lewin, 1935, p. 68) in the understanding of human development. The inadequacy of "conditioning" or "organismic" models alone to explain human development has also been argued for some time. Lewin cites Stern (1924/1914) as arguing that, "besides 'experience', intrinsic maturation has fundamental significance for child development and . . . besides trial and error there is insightful behaviour" (Lewin, 1935, p. 70).

Woodward (1982) has traced the development of social learning theories back to the 1870s, arguing that they can be seen as stemming directly from Darwin's work, particularly that concerning the expression of emotion (Darwin, 1872). Darwin argued that the emotional behaviour shown by humans and animals was determined by a combination of inheritance and social experience. According to Woodward, the general evolutionary approach, with its emphasis on the interaction between characteristics of the organism and characteristics

of the environment as determinants of the physical characteristics of later generations, led directly to interactionist approaches to human behaviour. The ways in which the social environment affected the individual's activities began to be considered in a systematic manner, and this could be seen as leading directly to the development of social learning theories.

Rosenthal (1982) has also considered the historical development of social learning theories, but has restricted his analysis mainly to North America. He concludes that, within that continent, social learning theories originated with William James. His argument is that the basis of a social-learning approach is an emphasis on mental events and their relationship with events in the environment and with behaviour, and that such an approach was outlined by James as an appropriate direction for the study of psychology. However, he points out that identification of originators in any field is a subjective activity dependent upon the frame of reference chosen, and that a case could be made out for social learning theory originating with Aristotle or with earlier Persian writers, if one selected a broad enough criterion.

Social learning theories may be viewed within a number of historical contexts and characterised in a number of different ways, depending upon one's chosen point of view. It is only relatively recently, however, that they have come to be regarded as important aspects of mainstream psychology. Hilgard and Bower's influential Theories of learning, for example, in its third edition (Hilgard & Bower, 1966), did not mention social learning theories explicitly at all. It did devote four pages to "observational learning", with particular reference to the work of Bandura, and explained that, ". . . since the later nineteenth century, psychologists have recognised observation followed by imitation as a principal mode of learning. However, the idea has had its ups and downs in popularity. . . Except for . . . such psychologists

as Miller and Dollard (1941), the topic of imitation was pushed aside . . ." (Hilgard & Bower, 1966, p. 537). By their fourth (Hilgard & Bower, 1975) and fifth (Bower & Hilgard, 1981) editions, however, they see social learning theories as having become more central to mainstream psychology. Social learning theory is described as ". . . a selective distillation of what is probably a 'consensus' position of moderation on many issues of importance . . ." (Bower & Hilgard, 1981, p. 461), and it is argued that "social learning theory may provide a basis of consensus for much of the learning research in the next decade" (p. 472).

Although social learning theories can be traced back to the last century, and although explicit models were proposed and described decades ago (e.g., Miller & Dollard, 1941; Eysenck, 1957; Rotter, 1954), it can be argued that social-learning approaches did not gain general acceptance until the work of Bandura and Walters (1963). Earlier approaches were generally either ignored or adapted to conform with more central approaches of the time. Eysenck's (1957) theory of human behaviour, for example, originally argued that individual behaviour could be explained by examining the interactive effects of genetically-determined variations in brain physiology and the individual's reinforcement history. Eysenck's theory was not taken up to any great extent by American social learning theorists. This may be because much of Eysenck's work, within the European tradition, has focussed on the development and assessment of generalised patterns of responding (e.g., Eysenck, 1976; Eysenck & Wilson, 1978). Such an approach leads to an emphasis on behavioural stability, while American social learning theorists appear more concerned with the processes of behavioural change (e.g., Bandura, 1977a, 1981b). The failure of Eysenck's approach to be integrated into later American approaches may stem from this difference in emphasis, although there are likely to be other factors which have led to such lack of appeal.

Another social learning theory which has had less of an impact than Bandura's is that proposed by Rotter (1954). Like Eysenck's, this examines the development of generalised patterns of behaviour. Rotter (1954) originally argued that it was the history of social reinforcement which produced general cognitive tendencies of internal or external locus of control. Although Rotter himself has continued to defend this position, it has been in the face of a strong tendency by others to integrate the concept of locus of control into a personality-trait framework (cf. Rotter, 1975). This tendency has probably resulted at least in part from Rotter's (1966) development of a scale to measure generalised expectancies of control, which has been widely used by researchers who do not necessarily accept the theoretical basis on which the concept was developed. The trait approach having been explicitly rejected by other social learning theorists (e.g., Mischel, 1968), this trend in the development of locus-of-control research may explain why Rotter's formulation has not been adopted by contemporary social learning theorists to any great extent.

The writings of Bandura have had a greater and more general effect than those of Rotter and Eysenck somewhat earlier; this greater acceptance may be seen as resulting from a general and growing dissatisfaction with "personality-trait" approaches and with "conditioning" approaches to the subject matter of psychology. Mischel's (1968) influential review concluded that there was little evidence for the existence of "personality traits" or of stable patterns of behaviour which generalised widely across situations, and suggested that the characteristics of the situation were far more important determinants of behaviour. Although Mischel has been credited with a purely situationist approach to human behaviour (e.g., Bowers, 1973; Hogan, 1982), the approach taken by Mischel, and by others who were producing critiques of "personality" psychology at much the same time (e.g., Hunt, 1965), seems more accurately viewed as interactionist. Mischel has argued

that an understanding both of the situation and of characteristics of the individual is required to understand and predict behaviour (Mischel, 1973). Hunt (1965) argued that neither individual differences nor variations in situations alone produced variations in behaviour, but that the interaction of the two was most important. Although there are dissenters (e.g., Allport, 1966), the view that characteristics of the individual and of the situation interact to produce behaviour has gained ascendancy over personality-trait formulations (although Hogan (1982) characterises "traditional personality psychology" and "contemporary cognitive psychology" as roughly equal in importance in current psychology).

At roughly the same time as the development of interactionist approaches to human activity, a major development was occurring within the "conditioning" framework which has had the effect of increasing the congruence between this approach and social learning theory. Cognitions were coming to be accepted as legitimate behaviours with the capacity to affect other, more overt, behaviours. Although such ideas had been suggested earlier (e.g., Homme, 1965), it was not until the early 1970s that they gained acceptance within mainstream behavioural psychology. The concepts that cognitions could be considered as behaviours and that they can and do affect other behaviours, that they can be modified using operant-conditioning techniques, and that their modifications can alter overt behaviours (e.g., Mahoney, 1974) have recently gained wide acceptance.

It may be that it was the widespread acceptance of interactionist theories of human behaviour, together with the behaviourists' increasing interest in cognitive explanations of activity, which resulted in Bandura's social-learning approach gaining wide acceptance while those of Rotter and Eysenck were not so influential at the times whey they were published.

Bandura and Walters' (1973) social-learning approach to aggression was followed up by a more general discussion of social learning theory (Bandura, 1977b) in much the same way that Dollard et al.'s (1939) work on aggression was followed by Miller and Dollard's (1941) more general text. But Bandura's work came at a time when the assumptions underlying it were gaining popularity with mainstream psychology, and thus can be seen as initiating the current study of social learning theory.

While the foregoing analysis has mentioned some factors which may have resulted in the more ready acceptance in the 1960s and 1970s of views such as Mischel's and Bandura's, it does not explain how or why these factors came to be influential. The reasons for the acceptance by behaviourists of an important role for cognitions, and for a widespread rejection of trait approaches, have not been considered. It appears that there has been a general drift away from a view of the person as acting largely in reaction to external forces, and towards a view of the person being more actively involved in controlling setting events and activities. This change can be seen not only in social-learning approaches but also in the growth of social psychological theories which emphasise individual and subjective interpretation of environmental events in the determination of action (e.g., Berkowitz, 1978; Carver & Scheier, 1981). Sampson (1981) has argued that such developments in cognitive psychology are undesirable because they characterise the material environment as having little direct influence on behaviour by comparison with subjective interpretations of events. Such an approach, he argues, leads to a focus on the alteration of subjective states rather than on the potential for changing the objective environment. Bandura's social learning theory cannot be seen as having this strongly subjectivist viewpoint, although it is not in complete opposition to such a view either. However, it is likely that it was the growth of cognitivism which allowed a greater degree of acceptance

of Bandura's writings than of earlier work along similar lines. These changes in psychology may well reflect changes in the wider society towards a greater emphasis on individuality and self-determination which have been chronicled by fashionable sociologists such as Marin (1975) and Wolfe (1976). It appears that there are social and cultural factors which influence the rise and fall of scientific ideas, and it is probable that factors of this kind are partly responsible for the current emphasis within psychology on cognition and social learning. The magnitude of such influences is unclear, however, and the nature of the linkages is a contentious issue (e.g., Hesse, 1980; Laudan, 1977), which places an analysis of such developments outside the scope of this thesis.

II. 3. CONTEMPORARY SOCIAL LEARNING THEORY

Today, Bandura's (1977b) Social learning theory amounts to a definition of the field. Bandura bases his social learning theory on a conception of three-way reciprocal determinism, a dynamic equilibrium between behaviour, situations, and person variables. In particular, he emphasises cognitive evaluation in the production of responses. Bandura rejects other theories either because of their assumptions of the existence of personality traits, which are regarded as having little utility in understanding behaviour, or because they are seen as mechanistic or deterministic, in that the causal processes occur largely outside the individual's awareness or control. Neither the individual nor the environment is seen as the primary instigator of behaviour. Bandura cites the considerable evidence that individuals' responses to environmental events are mediated by their cognitive interpretations of those events (cf. Bandura, 1969), but subjective experience is not seen as substituting entirely for events in the material world. Further, the influence that actions have on the environment and on the individual's later

behaviours is considered. These three types of phenomena, the environment, the individual's interpretations, and his or her actions, are seen as having complex reciprocal influences on each other, and none is considered as prior to the others (Bandura, 1981a).

Assigning one of the active roles to the individual leads to an emphasis on observational learning. The view that the individual actively abstracts information from the environment and uses his or her symbolic capacities to regulate behaviour leads to the argument that at least some of this information will be in the form of others' behaviour; while observation of others does not necessarily imply that imitation will follow, it is a necessary prerequisite of imitation. Bandura (1977b) argues that people will imitate behaviours if they observe that others are positively reinforced for performing them (and if the observer has the requisite motor skills). Further, he argues that observational learning originates most human activity.

It was within this general framework that Bandura proposed self-efficacy theory, which can be seen as a refinement of the social-learning approach. It is based on the same assumptions but seeks to explain human choices and activities in a more specific manner than do the general principles of social learning theory. The following section of this chapter outlines the basis of that theory.

II. 4. SELF-EFFICACY THEORY

Originally proposed by Bandura in 1977 (Bandura, 1977a), the theory has been described and expanded in a number of subsequent publications (Bandura, 1978a, 1978b, 1980, 1982b, Note 1).

As was described in the previous section, the theory is based on reciprocal determinism, a social-learning view involving a pattern of reciprocal

interaction and multidirectional determinism between environment, behaviour, and "other personal factors" (Bandura, 1978c, p. 345) including both cognitions and affective states (Bandura, 1981a). Within the social learning theory framework, self-efficacy theory places its central emphasis on an individual's expectations and beliefs (which result from and in turn influence this multi-directional causal process) as being crucial determinants of behaviour. In particular, it argues that a person's "efficacy expectations", or beliefs about whether he or she has the capabilities to perform particular actions, are major determinants of whether or not that person attempts those actions, how strongly he or she will persist in the face of initial failure, the level of success eventually met with, and the level of intrinsic interest developed.

While the theory is not unique in postulating a central role for cognitions, Bandura argues that his theory differs in two important ways from others with an apparently similar orientation. Firstly, it focusses on the individual's perceived ability to perform specified behaviours, rather than on his or her perception of the outcomes of those behaviours or of the causes of those behaviours. Bandura contrasts his theory with formulations like Rotter's (1954) locus-of-control model. Such theories focus on the behaviour, rather than on the individual's capacities, and Bandura regards them as approaching the problem of understanding human action from the wrong direction. In the person - behaviour - outcome chain involved in the performance of any action, the expectations and attributions dealt with by most other theories focus on the behaviour - outcome link. However, arguably the more important link, particularly to the individual concerned, is the person - behaviour link. The crucial question for the individual is not concerned with the outcome of performing a particular action but with whether he or she can perform that action. If the answer to this question

is negative, the issue of outcome or explanation becomes irrelevant. Efficacy expectations are measures of the person's belief in his or her ability to perform that action.

The second major difference is more fundamental. The situational and temporal specificity of the self-efficacy construct, and the conception that it is modifiable, separates the notion of self-efficacy from personality-trait concepts of self-esteem or self-confidence which it may superficially resemble. The theory, following on Mischel's (1968) influential work on the inadequacy of trait theories to account for much of the observed variance in human behaviour, specifically rejects the notion of general, pervasive personality traits. Rather, highly specific expectancies are seen as being developed for specific behaviours and situations as a result of the individual's experiencing and interpreting events both directly and vicariously. Cognitive interpretations of these events are synthesised into a specific efficacy expectation. This expectation is readily modifiable by the interpretation of new information, which may be obtained from observed changes in the situation or in one's own abilities, from information obtained through the observation of others, or from verbal sources of information. This conception of an efficacy expectation as a changeable and specific belief about a particular activity in a particular setting is far removed from the concept of a "personality trait", which implies an inevitably high degree of cross-situational regularity in behaviour.

Bandura has made this point strongly; however, it seems more an emphasis on the situational and interactionist framework than a total denial of cross-situational consistency. Hogan (1982) has taken theorists such as Bandura to task for producing critiques of an approach which is not in fact held by any trait psychologists; similarly, trait psychologists (e.g., Allport, 1966) have criticised a "situationist" viewpoint which is not in fact held by

the writers they criticise. Rather than dismissing the whole exercise of critique as fruitless, as Krantz (1971) has done, it may be more useful to see the two schools as differing on matters of emphasis, particularly as some recent research reports (e.g., Mischel & Peake, 1982) attempt to reconcile some of the apparent inconsistencies of the two approaches. Bandura does not deny the existence of cross-situational consistency, any more than does Mischel. He does, however, view cross-situational consistency in behaviour as being a property which individuals develop to varying extents through a process of perceiving similarities in relevant aspects of situations and learning to disregard irrelevant differences, rather than as an inevitable outcome of general patterns of behaviour emanating from within the individual.

Self-efficacy theory, then, is based on the premise that people have highly specific expectations concerning their ability to perform any task, and that it is these expectations which determine whether a task is attempted, how much effort is expended on it, and what degree of success will be met in its performance. Provided the individual has "appropriate skills and adequate incentives" (Bandura, 1977a, p. 194) for the performance of a particular task, his or her behaviour can be predicted with a great degree of accuracy from a knowledge of efficacy expectations. (A more detailed consideration of the issues raised by the phrase "appropriate skills and adequate incentives" is included in Chapter III, and Chapter VII presents some relevant data.) Bandura makes it clear that he considers skill levels and incentives to be important in understanding behaviour; he states that "under conditions in which people differ substantially in component capabilities and motivation, skill and incentive factors will also contribute to variance in performance" (1977a, p. 206). Further, he argues that levels of efficacy expectations are determined in part by an individual's awareness

of his or her skill level (Bandura, 1978b), and that feedback on one's skill level is necessary for efficacy expectations to be accurate (Bandura & Cervone, Note 2).

II. 4.1. Sources of self-efficacy

Efficacy expectations are seen as arising from four main sources of information. The most important source is the performance accomplishments of the individual; successful experience with an activity increases efficacy, while failure lowers it, unless the failure occurs within a pattern of repeated successes which have produced a high efficacy strength and resultant persistence. A second source of efficacy information is vicarious experience (observational learning or modelling). Observing someone, or most effectively a series of people who are similar to oneself, succeeding in a task, preferably with a show of effort rather than apparently effortlessly, provides information that the task is within one's capabilities. Seeing failure by similar models, conversely, suggests that the task is too difficult and decreases one's efficacy for that task. The third, less important, source of information is verbal persuasion, including suggestion and provision of information, as well as other linguistic information such as printed material. This source can most readily be overridden by contradictory information from other sources; one is unlikely to believe what one is told if one has experienced or observed events which contradict that information. Least important as a source of efficacy information is the interpretation of emotional state. Physiological arousal was initially listed as a source of efficacy expectations (Bandura, 1977a) but later description of the theory (e.g., Bandura, 1982b) have argued that arousal and associated emotional states arise from, rather than produce, levels of efficacy. Low efficacy will produce anxiety or agitation. The relationship between emotional arousal and efficacy is perhaps better seen as reciprocal;

levels of emotional arousal will be one element which can modify one's perception of one's abilities, while one's assessment of ability will also affect emotional arousal. In general, efficacy expectations can be seen as the result of the individual's combining information from a variety of sources. Efficacy expectations are the product of a synthesis of information from all available sources.

II. 4.2. Dimensions of self-efficacy

Bandura's original formulation described three dimensions along which efficacy expectations could vary: level, or degree of difficulty a person believes himself or herself capable of in any particular activity; strength, the degree of confidence a person has in his or her assessment of capability, and thus a predictor of the extent to which an individual will continue to attempt an activity in the face of failure (and, conversely, a predictor of the extent to which a person will refuse to attempt an activity for which he or she has low efficacy level, in the face of evidence to the contrary); and generality, the extent to which a particular level of efficacy is applied across a range of related activities. While Bandura does not appear to see a contradiction between an emphasis on specificity and a parameter involving generality being applied to the same concept, this has caused a certain amount of confusion. The difference between a personality trait and the existence of a certain level of cross-situational consistency resulting from a certain set of learning experiences has already been considered briefly, but further discussion appears appropriate.

A social-learning approach is based on the concept that people observe the patterns of reinforcement which occur in social situations and are likely to imitate those activities which they perceive to have desirable consequences.

"Efficacy" refers to the strength of the individual's belief that he or she can successfully perform those activities. The individual learns to discriminate a variety of parameters which separate one situation or task from another, and thus can make highly specific judgements about his or her ability with that task in that situation (Bandura & Cervone, Note 2). He or she is also likely to become aware of cross-situational similarities, and is also likely to notice that some variables do not appear to be relevant to success or failure in some tasks. It is this notion of active learning through experience and observation of the range of situations or tasks which may be considered "equivalent" in any specific context which is referred to by the term "efficacy generality". It does not imply that people who develop a high efficacy generality have a "trait" of any sort, nor that efficacy generality within any individual will be the same for different sets of tasks or situations. Although the distinction between having high efficacy generality and having a "trait" of efficacy does not emerge strongly from Bandura's writings, it is clear from the preceding discussion that there is a distinction.

II. 4.3. Self-efficacy analysis of therapeutic techniques

Although self-efficacy theory is regarded as having general application to all forms of human behaviour, it was developed within a therapeutic framework and initially presented as a "unifying" explanation of therapeutic techniques, as it postulates a single underlying mechanism for all therapeutic change. All therapeutic techniques, it is argued, are successful to the extent that they modify efficacy expectations, and, through them, behaviour. Through this theoretical model, Bandura has predicted the relative efficaciousness of various types of therapy. Most effective, he argues, are therapy techniques which are based on performance. As performance accomplishments are the most important and powerful determinants of efficacy expectations,

performance-based therapies will have the most direct effect on self-efficacy and are thus most likely to produce permanent therapeutic changes in behaviour. Performance-based therapies include self-instructed or therapist-instructed in vivo performance, such as working gradually through a hierarchy of progressively more feared items; behavioural rehearsal and coaching to develop and practise skills, for example in social skills training; and participant modelling, in which a model performs the desired behaviour and then guides the individual through the performance, providing whatever assistance is required.

Techniques based on vicarious experience - modelling - are somewhat less effective, as they rely on the observer making the inference that it is appropriate for him or her to identify with the model and imitate him or her. As the model cannot be the same in all salient respects as the observer, this inference will rarely be completely accepted.

Techniques involving verbal persuasion are regarded as less effective. These include suggestions, advice, exhortation, client-centred therapy, rational therapy, and psychoanalysis, as all are based on conversational means. Verbal persuasion may produce a temporary change in efficacy, but if performance levels do not change to match the verbal inputs the effects of persuasion will be weak and transient.

Least effective are those which are based on alteration of emotional arousal, such as relaxation training, systematic desensitisation, flooding and implosion therapy. Bandura (1977a) reviews a number of studies indicating that anxiety and emotional arousal are not causes of behavioural problems, but that cognitions appear to produce both the behaviour and the state of arousal. It is argued that cognitive interpretation of emotional arousal is important in influencing behaviour (e.g., Mahoney, 1974), but that emotional

arousal per se does not have a major influence on behaviour. Although it has since been argued by some (e.g., Rachman, 1980; Wilson, 1982; Zajonc, 1980) that emotional arousal and affect may become more central to our future understanding of behaviour, the view that it is peripheral has wide acceptance, particularly in social learning approaches (Rosenthal, 1982).

Thus, Bandura argues, his theory plays a role in unifying the diverse range of psychotherapeutic techniques by postulating a single underlying mechanism - the alteration of self-efficacy - to explain all behavioural change.

The theory, however, applies generally to behaviour change, not only to those aspects which are traditionally regarded as the province of "therapy". The following chapter reviews the experimental work on the basis of which the theory was developed; a later section continues by outlining subsequent research which has expanded the generality of the theory, and Chapter III concludes with a section describing some of the contentious issues in the area.

CHAPTER III

EXPERIMENTAL AND CONCEPTUAL DEVELOPMENTS AND ISSUES IN SELF-EFFICACY THEORY

III. 1. THE EXPERIMENTAL BASIS OF SELF-EFFICACY THEORY

The original formulations of self-efficacy theory (e.g., Bandura, 1977a) include three studies involving snake phobics which provide empirical support for the arguments presented. Since then, a large number of further studies have extended the theory and applied it in other areas. Since these three studies provide the initial empirical foundation for the theory, they appear worthy of separate attention. This section describes those studies in detail, and the following section (III. 2) presents a more complete review of subsequent research.

III. 1.1. The measurement of self-efficacy

The method of measurement originally used by Bandura and his colleagues has continued to be used, with only minor variations, by almost all researchers in the area. Chapter VI examines critically the validity of this method.

A pencil-and-paper self-report scale is used. The scale contains a series of items which list carefully-defined and highly specific behaviours; Bandura and his colleagues' early studies with phobics used items arranged in hierarchical order of difficulty, but collections of related behaviours without an overall hierarchy have also been used (e.g., Bandura & Schunk, 1981). For each item in the scale, subjects are asked to state whether or not they believe they can perform it, and then, for those items they have indicated their perceived ability to perform, give a subjective level of confidence using a scale from 10 (completely uncertain) through 50 (moderately certain) to 100 (completely certain).' The number of tasks a person indicates ability to

perform gives a measure of efficacy level, and the level of confidence provides the efficacy strength measure. A second scale using different items is used to assess efficacy generality. The items listed on the efficacy scale are repeated exactly in therapy or experiment, so that a precise measure of the match between scale items and behavioural test is obtained. Figure III.1 gives an example of an efficacy scale, one used by Bandura and his colleagues in some of their work with snake phobics (e.g. Bandura & Adams, 1977).

FIGURE III.1. Efficacy scale used by Bandura and his colleagues (e.g., Bandura & Adams, 1977).

Confidence Scale

10	20	30	40	50	60	70	80	90	100
quite uncertain				moderately certain					certain

Tasks	Can Do	Confidence
Look at snake in glass cage from distance	____	____
Look at snake through a wire cover	____	____
Place bare palm against glass near snake	____	____
Place gloved hand on wire cover of cage	____	____
Place bare hand on wire cover of cage	____	____
Look down at snake through partially opened top	____	____
Look down at snake through fully opened top	____	____
Place gloved hand in cage	____	____
Place bare hand in cage	____	____
Touch snake with gloved hand in the cage	____	____
Touch snake with bare hand in the cage	____	____
Lift snake inside the cage with gloved hand	____	____
Lift snake inside the cage with bare hand	____	____
Hold snake with gloved hands outside the cage	____	____
Hold snake with bare hands outside the cage	____	____
Place snake on the floor and return it to cage	____	____
Hold snake in front of face	____	____
Tolerate snake in lap	____	____

III. 1.2. The three initial experiments

III. 1.2.1. Relationship between efficacy and behaviour following modelling

The first experiment to be performed within the self-efficacy framework, described by both Bandura (1977a) and Bandura, Adams and Beyer (1977), examined efficacy changes following the treatment of 33 severe snake phobics who were recruited from the general community through newspaper advertisements. The purpose was to examine the relationship between efficacy changes and behavioural changes, and also to test the hypothesis, predicted by self-efficacy theory, that participant modelling would be more effective than observational modelling. Participant modelling (Bandura, Jeffery & Wright, 1974) involves both the observation of a model and the guided performance of the feared task, assisted by the model and supported by a number of "induction aids", such as gloves in the case of handling a snake. Self-efficacy theory (Bandura, 1977a) argues that enactive experience is more effective in producing efficacy changes and, through them, behavioural changes, than is vicarious experience. Therefore, participant modelling should be a more effective behaviour change technique than observational modelling.

The participants in this experiment went through a behavioural avoidance test (BAT), involving a hierarchy of 29 tasks with a boa constrictor, before the experiment. Those who were capable of reaching into the snake's cage and lifting it with gloved hands were excluded from the study as not being sufficiently snake-phobic. Other pre-treatment tests were a self-rating of fear arousal accompanying both the description and the performance of each item on the hierarchy, and an efficacy-expectation measure similar to that shown in Figure III.1. The number of tasks for which the phobic predicted ability to perform provided a measure of efficacy level. The strength of efficacy was obtained from levels of certainty; stimulus generality measures

were obtained by completing a second efficacy scale relating to another, unfamiliar, type of snake. Situation generality measures were obtained by asking subjects to rate their fear of snake encounters in a variety of natural situations, and their self-efficacy in coping with them. Fear and efficacy levels relating to other animals and to social situations were also obtained.

Participants were divided into matched triads on the basis of their initial BAT score. One subject from each triad received participant modelling treatment, beginning at the highest point reached in the initial BAT. The therapist modelled the behaviour and then helped the subject to perform it, using physical guidance and assistance, aids such as protective clothing, and, if necessary, small immature snakes in place of the adult. These aids were faded out until the phobic could perform the requisite task. The second member of each triad, in the "modelling" condition, merely observed the therapist performing the same behaviours for the same length of time. The third member was assigned to a waiting-list control condition. After treatment, all pre-treatment measures were repeated. The efficacy scale was repeated twice, both before and after the BAT. The BAT was also repeated twice, first with an unfamiliar snake and then with the snake used in treatment.

Overall, significant improvements were found for the two treatment groups, in efficacy level and strength for both familiar and unfamiliar snakes, in approach behaviour, reported fear, and in reported efficacy with regard to other animals and social situations. The "participant modelling" group showed significantly greater improvements than the "modelling" group on 15 of the 18 variables used. The control group showed improvements in approach behaviour and reported fear, but these changes were significantly smaller than for the treatment groups. The double administration of the efficacy test at post-test revealed no differences except for the control group, who had higher efficacy

after the BAT than before it. This finding suggests that the BAT and efficacy measure do affect each other.

Congruence between efficacy expectations and performance was measured by calculating the percentage of trials at post-test in which a subject's prediction (can/cannot perform) corresponded to performance. Correspondence was 89% for the "participant modelling" group, 86% for the modelling group, and 90% for the controls. Congruence was significantly higher for the familiar than for the unfamiliar snake.

During treatment, all "participant modelling" subjects had performed the entire behavioural hierarchy, but their final efficacy did not indicate maximal confidence, and their performance at post-test was less than maximal. It was concluded from this that the efficacy expectations were better predictors of BAT performance than was performance during treatment.

A follow-up one month after the end of the experiment showed that efficacy expectations and approach behaviour had continued to improve, and a 6-month mail follow-up on 70% of subjects showed all perceived their problem to be relieved to some extent, while 41% reported using the treatment procedure with other, unrelated, problems.

The first experiment, then, indicated that efficacy expectations are accurate predictors of behaviour, and also that participant modelling, as predicted by the theory, is a more effective behaviour change method than observational modelling, at least for this particular problem.

III. 1.2.2. Relationship between efficacy and behaviour following systematic desensitisation

A second experiment (Bandura & Adams, 1977) dealt with an unspecified number of snake phobics recruited in the same way from the general population. The stated purpose of this experiment was to determine whether systematic desensitisation "effects changes in avoidance behaviour by creating and strengthening expectations of personal efficacy" (p. 287). In fact, the experiment did not provide evidence relating to the causal links suggested; what was examined was whether efficacy expectations changed during, and whether they were related to success in, systematic desensitisation. Systematic desensitisation (Wolpe, 1973) is based on the dual-process theory of neurotic behaviour. It assumes that phobias are maintained by anxiety arousal, and that exposing a person in a relaxed state to the feared stimulus will result in extinction of the stimulus-anxiety link if a gradual and progressive course of exposure is used. Empirical evidence (e.g. D'Zurilla, 1969; Goldfried, 1963; Meichenbaum, Gilmore & Fedoravicius, 1971) attests to the effectiveness of this technique, but a number of writers (e.g. Bandura, 1978b) question whether it is the autonomic arousal associated with anxiety which causes the phobia, or whether maladaptive cognitions cause both the arousal and the phobia. This experiment, then, investigated whether the same types of efficacy changes occurred following desensitisation as occurred in the previous experiment.

Participants received the same pre-testing as in the earlier experiment, and again all but severe phobics were excluded. All were treated individually using a standard procedure, learning deep muscle relaxation and then proceeding imaginally through a standard desensitisation hierarchy until all items could be imagined without reported anxiety. Post-tests were the same as for the earlier experiment.

Significant improvements were found in all measures at post-test except in perceived efficacy in social situations (a generalisation measure): all other efficacy measures, fear measures, and behaviours showed improvement. Although all completed the desensitisation hierarchy, their final efficacy showed wide variability, and again efficacy expectations (both level and strength) predicted behaviour in the BAT with a high degree of accuracy. The correlation between efficacy strength and approach behaviour was .75, and the congruence between efficacy level and behaviour 84%.

This second experiment indicated that the link between efficacy and behaviour was not confined to performance-based methods of behaviour change, but was equally clear when methods derived from other theories were used.

III. 1.2.3. A closer examination of efficacy and behaviour changes during participant modelling

A third experiment (Bandura, Adams & Beyer, 1977) was conducted to examine more closely the processes of change during therapy, by frequent measurement of efficacy and approach behaviours during participant modelling with snake phobics.

Six severe snake phobics were tested on the 29-item BAT used in the previous experiments. The items were broken down into 11 "blocks" of items. Treatment was conducted individually: each phobic saw the experimenter model all 29 items, and then went through participant modelling for all items in the block at which they had failed in the pre-test. When all items in this block had been mastered, the phobic repeated the complete efficacy scale and BAT. Participant modelling was then repeated for the block on which the phobic failed this time. This process continued until the phobic could perform all items on the hierarchy. Some individuals needed only the first experience with

participant modelling, and reached maximal performance on the second BAT despite not having received participant modelling for some of the more threatening items.

Overall, at all points during therapy, efficacy level matched behavioural level 92% of the time. Even with behaviours which had not been performed at pre-test, and had not been modelled because they were beyond the failed "block", efficacy was 84% accurate. As in the other studies, no data are given on the accuracy with which these behaviours could have been predicted by previous behaviour on the BAT.

III. 1.3. Consideration of the three initial experiments

These three experiments, presented by Bandura as the empirical basis of self-efficacy theory, indicate that, in the treatment of snake phobia, efficacy expectations are highly accurate predictors of behaviour regardless of the method of treatment used, and that this accuracy holds up when close analysis of small sections of therapy is conducted.

These experiments have received a certain amount of criticism (e.g., Poser, 1978; Woolfolk & Lazarus, 1979) on the grounds that they represent "analogue research" and may not apply to real problems in the real world. Bandura (1978b) points out that this is by no means the case. Ninety-seven percent of his participants reported deliberate avoidance of normal activities such as hiking and picnicking in order to avoid snakes, and 80% reported distressing ruminations or nightmares on the subject. None was able to lift a snake in the screening test, although they were wearing gloves and had been assured it was harmless. All volunteered for treatment, all reported that following treatment they had relaxed at least some of the phobia-imposed restrictions on their activities, and all reported at least moderate relief from upsetting thoughts and nightmares.

Bandura (1978a) has argued strongly against the arbitrary division of research into "analogue" and "clinical". The fact that a controlled experimental design is used does not alone justify the label "analogue" (Rachman & Wilson, 1980). Poser (1978) has argued that this is "analogue research" because the problem is relatively rare and circumscribed, and snakes are readily avoided; besides, it is argued, fear of snakes results entirely from lack of experience with them and is perfectly normal (Cooper, Furst & Bridger, 1969). While it may be true that it is perfectly normal to exhibit some alarm or diffidence in an unexpected encounter with an unfamiliar snake, Bandura (1977a) provides ample evidence that his phobics' problems were more severe and debilitating than that. He has defended the use of snake phobics (Bandura, 1978a) in basic investigations of the mechanisms of behaviour change for a number of reasons. First, that snake phobia is a real and serious behaviour problem for some people; second, that it is moderately refractory to therapeutic change; third, that it is relatively easy to measure levels of behaviour and efficacy in a controlled setting; and fourth, that the probability of extra-therapeutic encounters with snakes is slight, so that any changes in behaviour can reasonably be attributed to elements of the behaviour-change programme. The argument in favour of the use of snake phobics, then, is that such research minimises ambiguity and maximises internal validity. In this way it provides evidence for the mechanisms by which change occurs, and forms a basis for the development of more general, applied, procedures.

The issue of "analogue" research is in fact irrelevant to questions concerning self-efficacy theory in its broadest sense. Although the theory was developed from a therapeutic standpoint, and was originally presented as a means of integrating a range of therapeutic methods (Bandura, 1977a), it has much wider applications. Self-efficacy theory has implications for understanding social action groups, personal choices, and motivation (e.g., Bandura, 1982b), and

other workers have applied the theory in a wide range of substantive areas. The theory is seen as a general one for understanding behaviour and the informational inputs that determine that behaviour. Of course therapeutic techniques derived from the theory must eventually be tested in controlled clinical studies before they can be applied in practice (e.g., Wilson, 1981), but there is no reason why participants in theoretically-oriented studies should be a "clinical population" by any criteria.

The following section of this chapter examines reports which have applied and generalised Bandura's findings across a wide range of behavioural domains and subject populations.

III. 2. OTHER EXPERIMENTAL WORK WITHIN THE SELF-EFFICACY AREA

III. 2.1. Self-efficacy measurement with clinical problems

Although the theory can be viewed more generally than from a therapeutic viewpoint, much of the first work following on Bandura's formulation of self-efficacy theory has focussed on the classes of problems traditionally regarded as the domain of the clinical psychologist: various specific phobias, and social skills development.

There has been some further work on the topic of snake phobia. Bandura, Adams, Hardy and Howells (1980) carried out a study with 17 snake phobics, similar in design to those reported in the previous section of this chapter, and found that their earlier findings of a close relationship between efficacy and behaviour were upheld when a different therapeutic method, cognitive modelling, was used. Gauthier and Ladouceur (1981) have also conducted research with snake phobics, but their primary aim was to determine whether the completion of a self-efficacy scale had reactive effects on behaviour; that is, whether

behaviour was affected in any way by the process of completing the efficacy questionnaire. They concluded that there was no reactivity and they found a close relationship between efficacy and behaviour. The issue of reactivity will be explored further in Chapter VI.

Other work has involved a variety of phobias. Bandura et al. (1980) used participant modelling as therapy with a group of 11 agoraphobics and found high congruence between efficacy and behaviour throughout therapy, as well as significant therapeutic improvement. Biran and Wilson (1981) further extended the generality of the theory and provided more evidence for the superiority of guided exposure methods of therapy over purely cognitive methods. Their subjects included people who were phobic of heights, lifts, or darkness, and they found that exposure methods were generally more effective than cognitive restructuring. The match between efficacy and behaviour was reasonably high in all cases, but was significantly higher for the guided-exposure technique (94%) than for the cognitive method (70%). Borque and Ladouceur (1980), working with acrophobics, also found a very close relationship between efficacy and performance during therapy. They used a variety of in vivo methods including participant modelling; they did not find participant modelling to be superior to other exposure methods, but found all to have a significant effect on the problem. They suggested that acrophobia may be readily amenable to change, and that the lack of difference in results between methods could result from a "ceiling effect".

Bandura, Reese and Adams (1982) conducted three studies, one with snake phobics and two with spider phobics, to examine the relationships between efficacy, performance and fear arousal during therapy. They used modelling of items in a hierarchy to induce various levels of efficacy. It was then demonstrated that efficacy levels were closely related to performance and

closely negatively related to physiological and self-report indices of fear level. Participants who had induced levels of efficacy which were lower than maximal were then given participant modelling and re-tested; it was found that efficacy, behaviour, and fear were closely associated throughout this process. Bandura et al. (1982) concluded from this that efficacy mediates coping behaviour and level of arousal. These studies do not support this interpretation of causality, but they do demonstrate once more that efficacy and behaviour are closely linked and that they change in similar ways during therapy.

These researchers, then, provide evidence to support the generality of self-efficacy theory across a range of phobias. Kazdin (1979a, 1982) extended the generality even further by using efficacy measures during social skills training with nonassertive individuals and again showed a close match between efficacy, behavioural, and global self-report measures.

Other researchers have moved away from the traditionally defined "clinical problems" and used efficacy measures in other subject areas.

III. 2.2. Self-efficacy measurement in educational settings

Bandura and Schunk (1981) performed a study with normal schoolchildren to examine the acquisition of arithmetic skills. They compared the setting of small, proximal, readily achievable goals with the setting of distal goals and of no goals. They argued that the careful setting of attainable proximal goals should enhance efficacy, and therefore performance, because the individual would frequently experience the successful attainment of a goal. This positive reinforcement would serve to enhance the individual's sense of efficacy. They predicted that the setting of attainable proximal goals would increase efficacy, and through it interest and ability, in the skill of arithmetic, and their findings corroborated this prediction. The match between efficacy and performance ranged from 51% in the no-goal group to 80% in the proximal-goal group,

supporting the argument that frequent standard-checking and goal-setting would enhance children's self-appraisal ability.

Other researchers have conducted efficacy-based studies in the classroom. Thompson and Smith (1982) performed a study with tertiary students which, while not explicitly within the self-efficacy model, did make use of a rating of specific self-confidence, which can be seen as parallel to the self-efficacy concept. They examined predictors of success in the statistics component of an undergraduate psychology course. Predictor variables included tests of critical thinking, mathematical skills, irrational beliefs (Ellis, 1962), and "self-confidence in approaching the subject matter of statistics" (p. 193). A seven-point scale was used for the self-confidence variable, and its specificity means that it can be seen as analogous to an efficacy strength measure. The correlation between self-confidence and final mark in the statistics course was .47, which was significant, and second only to mathematical skills in the strength of its relationship with performance.

Hackett and Betz (1981) suggested that measures of self-efficacy could be used to understand the vocational choices, and related decisions such as subjects studied and interests pursued, of schoolchildren. They conducted a study (Betz & Hackett, 1981) to examine this possibility. On the basis of Holland's (1973) career classification, they selected 10 pairs of similarly oriented careers, each including one traditionally male occupation and one traditionally female. Students were asked to rate whether they felt capable of completing the training, and of performing the tasks, for each job. Although there was no overall sex difference in these two measures of "career efficacy", males had higher efficacy for the "traditionally male" jobs and females for the "traditionally female" jobs. Betz and Hackett suggest that expectations of personal efficacy are important in career-related decisions and should be

considered by career counsellors and others concerned with career decisions. Of course the question of whether these measures of "career efficacy" actually predicted choice of or success in a career would have to be assessed independently in order to determine the usefulness of these measures.

Other research has also been directed at examining efficacy measures in the classroom. Keyser and Barling (1981) set out to examine the factors which contributed to children's level of self-efficacy. Their work, however, cannot reflect on self-efficacy theory as they used overly general measures which do not conform to the definition of "self-efficacy" as "the belief that one is capable of producing certain actions". Instead, they used an extremely general scale which measured perceived ability in schoolwork. Other measures also seemed rather questionable; for example, the teachers' assessment of their own teaching ability was used to assess "modelling" effects, despite the fact that the activities the teachers were rating were not the same as those rated by the children, and that this questionnaire does not appear to measure self-efficacy either. Although Keyser and Barling (1981) argue that their findings support the validity of self-efficacy theory in the classroom setting, their method is too far removed from that necessitated by the theory for these findings to be used to support the theory.

Work with self-efficacy measures in the classroom has been limited, but what exists is highly diversified and does suggest that self-efficacy could be a useful tool for educationists. Bandura and Schunk's work offers support for the use of constant feedback to develop accurate efficacy; Thompson and Smith show efficacy to predict performance in tertiary study; Betz and Hackett show the importance of school students' efficacy expectations in the making of decisions which will determine their careers and future lives. Keyser and Barling's work is seriously flawed by the use of inappropriate

measures, but the other work reviewed suggests that this area could profit from the application of self-efficacy theory.

Another area in which self-efficacy measures have been used is the growing field of behavioural medicine and the application of behavioural techniques to the prevention of disease by the alteration of dangerous habits.

III. 2.3. Self-efficacy measurement in health-related areas

The use of behavioural methods to alter habits which jeopardise health has become extremely widespread in recent years (Pomerleau & Brady, 1979; Schwartz & Weiss, 1978) and the field of behavioural medicine is continuing to gain recognition and respectability.

As the success rates of health-related behaviour change programmes are often low, especially when long-term adherence to healthy behaviours is used as the criterion (Hunt, Barnett & Branch, 1973), a strong research emphasis has been on the variables which may predict adherence, and self-efficacy has been used by a number of people, particularly in the area of stop-smoking programmes.

DiClemente (1981) measured the smoking-abstinence self-efficacy of 63 heavy smokers shortly after they had stopped smoking. At a 5-month follow-up, he found those who were still not smoking had reported higher self-efficacy than those who relapsed, and that self-efficacy was significantly correlated with number of weeks of successful abstinence and negatively with reported difficulty in maintaining abstinence.

Condiotte and Lichtenstein (1981) measured the stop-smoking and smoking-abstinence efficacy of 78 smokers at the time they began stop-smoking programmes. Efficacy was assessed again at the end of the programmes and found to have increased significantly. They also found a significant correlation between self-efficacy immediately after the programme and weeks of successful abstinence.

Their self-efficacy scale included items assessing the ex-smoker's belief that he or she could remain abstinent in a number of "high-risk situations". They gathered data on the situations which relapsed ex-smokers recalled as those in which they had begun smoking again, and found that these were closely related to the types of situations they had specified as most difficult to remain abstinent in.

Owen, Ewins, Bullock and Lee (1982) found a moderate but significant correlation between scores on a general smoking self-efficacy questionnaire at the beginning of a programme and smoking status two months after the programme had finished, with the more efficacious being more likely to have abstained or reduced cigarette consumption.

Manley and Boland (Note 3), with 94 smokers going through a four-week programme, found that efficacy associated with stopping smoking and remaining a non-smoker increased during the programme and was moderately correlated with success.

McIntyre, Mermelstein and Lichtenstein (Note 4) found that self-efficacy measures at the end of a stop-smoking programme were significant predictors of smoking status at one- and three-month follow-up. Corn (Note 5), on the other hand, did not find a good relationship between self-efficacy and maintenance of non-smoking. However, the bulk of the evidence does indicate that self-efficacy measures are a useful tool for predicting success in abstinence from smoking. No reports exist of self-efficacy being used to determine when people are ready to terminate a supportive stop-smoking programme, but such a concept seems to flow logically from these findings.

Glynn and Ruderman (Note 6) used a similar method to those used in the smoking programmes to examine efficacy during a weight-loss programme. They found that weight decreased and efficacy (concerning ability to resist food in a range of situations) increased during the programme. However,

follow-ups showed that efficacy was not correlated with degree of weight loss subsequent to the programme.

These studies looking at smoking and weight loss programmes are somewhat mixed in their results. Most, but not all, show moderate correlations between efficacy and success in the programmes. None seems strongly supportive of the theory, but none can be used to falsify it. In general, these are surveys, and no attempt is made to isolate self-efficacy from other variables such as acceptability of the programme to the individual, motivation to change, and method used in the programme, all of which might contaminate measures of self-efficacy as well as possibly interfering with the relationship between efficacy and behaviour. Another problem is that all these studies involve people who have volunteered to participate in a behaviour-change programme. Such people may differ in many ways from other members of the population, and these differences may mean that their responses to efficacy questionnaires and subsequent behaviour may not produce results which can usefully be generalised. Within these constraints, however, it can be concluded that, in these populations, there is generally a moderate relationship between efficacy and success in a behaviour change programme.

A somewhat different study within the area of health was performed by Ewart, Taylor, Reese and DeBusk (Note 7). They looked at a group of men who had had myocardial infactions, and examined their efficacy concerning the resumption of various physical activities. Ewart et al. point out that physical activity aids recovery from heart attack, but that many individuals are afraid to resume these activities. They found that their intervention, which involved performing a treadmill test and then attending an educational interview in which staff explained the results of the test and informed them of safe levels of activity, significantly increased individuals' efficacy regarding

physical activity. Efficacy following this session was strongly correlated with self-reports of activity level in later weeks. This study has some of the same problems as the previous ones. It relies on self-reports of activities, which may not be accurate. It is a descriptive survey, and makes no attempt to explore whether the rises in efficacy cause the increased activity, or whether the two are co-effects of some other change. However, it does suggest that people who are unlikely to resume activity following a myocardial infarction can be identified, and perhaps given extra advice or reassurance, and that such a programme might help reduce the incidence of second and third heart attacks.

A self-efficacy study of a different type (Beck & Lund, 1981) shows a relationship between self-efficacy relating to one's ability and the actual use of the dental hygiene techniques of regular toothbrushing and the use of dental floss and disclosing tablets.

Yet another health-related area has been examined from a self-efficacy viewpoint. Pain tolerance tasks have frequently been used to examine self-control capabilities and the effectiveness of various self-control strategies. While this area is not exclusively concerned with health, self-control strategies do have a major application in behavioural approaches to medical problems (e.g., Mitchell & White, 1977). Glasgow, Klepac, Dowling and Rokke (Note 8) have shown that efficacy measures will predict tolerance of pain (using a cold pressor) accurately, and Barrios, Anderson, Pagel and Spear (Note 9) have shown efficacy measures to be more closely related to ability to tolerate pain than are global measures of self-control.

So there is considerable evidence from a number of areas in the general field of behavioural medicine that self-efficacy is an important variable in predicting people's activities. A closely related area, that of physical activity, has also been the subject of efficacy-related studies.

III. 2.4. Self-efficacy measurement in the areas of physical ability and sport

It might be thought that the effects of cognitive variables on physical ability are unimportant by comparison with skill measures, but a range of studies relating self-efficacy and physical ability indicate that this is not the case.

A study by Nelson and Furst (1972), although not couched explicitly in self-efficacy terms, used an arm-wrestling task and found that students who were confident in their arm wrestling abilities won significantly more often than partners who were objectively stronger but less confident about the task. Although not explicitly concerned with self-efficacy, the study did involve highly specific beliefs about particular behaviours, and therefore it seems reasonable to include it here.

A number of studies by a single group of researchers have focussed on the role of efficacy expectations in predicting ability in muscular endurance and strength tasks (Gould & Weiss, 1981; Weinberg, Gould & Jackson, 1979; Weinberg, Yukelson & Jackson, 1980; Weinberg, Gould, Yukelson & Jackson, 1981). They showed that pre-existing or manipulated self-efficacy were accurate predictors of muscular endurance in students. To measure efficacy, they used a scale which listed time periods ranging from 30 seconds to 5 minutes, and students indicated whether or not they believed they could perform the endurance task for each period, and gave confidence ratings. Such a technique conforms to Bandura's specifications for measuring self-efficacy.

Other researchers have shown a relationship between self-efficacy and performance in sporting events. Morelli and Martin (Note 10) looked at 14 top-class athletes, all 800-metre runners. They found that efficacy expectations for competitive performance was significantly related to actual performance, but that efficacy related to training performance was not related to actual training performance, a finding they attributed to the training session tasks

being more complex and less clearly defined, with all athletes performing different activities with different goals, than the tasks involved in competition. It appears that clear and unambiguous feedback on performance level, and clearly specified goals, are important in producing accurate efficacy expectations (Bandura & Cervone, Note 2).

Another study (Barling & Abel, Note 11) examined 40 active tennis players and showed significant correlations between efficacy strength relating to various aspects of tennis performance and others' ratings of their abilities in those aspects.

Feltz, Landers and Raeder (1981) used students rather than trained athletes in a study of the acquisition of a simple diving skill. They found a moderate but significant relationship between efficacy and performance, and also found participant modelling to be the most effective teaching method, as predicted by self-efficacy theory.

Feltz (1982) also used students learning dives in a complex path-analytic study of the relationship between previous performance, efficacy, physiological arousal, reported anxiety, and level of performance. She found that the most accurate causal model was one which assigned efficacy and previous performance the roles of independent and direct influences on performance, with the arousal and anxiety measures of little relevance.

The evidence, then, is that self-efficacy measures are good predictors of behaviour across an extremely wide range of behaviours and situations. Most of the studies reported show high correlations or microanalytic matches between self-efficacy and behaviour. Feltz's (1982) is the only study which attempts to examine Bandura's (1977a) claim that efficacy expectations are causally linked to behaviour. While her study does not show efficacy expectations to be the sole determinants of behaviour, it does offer some evidence for a causal link.

Overall, then, the notion that self-efficacy beliefs are good predictors of behaviour stands up well to attempts to replicate Bandura's findings across a wide range of behaviours and situations. All the work described, with the exception of Feltz (1982), has been within the framework of self-efficacy theory, and has not attempted to test or contest it at a theoretical, methodological, or conceptual level. Because of the utility of explicitly formulated theories in the development and assessment of behaviour change methods (Wilson, 1978), it seems important that a theory such as this should be exposed to consideration at this level. The following section examines some more critical approaches to the theory, outlines arguments which have been made against it, and summarises the relevant empirical findings.

III. 3. CONTENTIOUS ISSUES FOR SELF-EFFICACY THEORY

III. 3.1. Issues in methodology and measurement

A number of questions have been raised concerning the appropriateness and adequacy of the techniques used by Bandura and others to assess self-efficacy.

At the most basic level, Kazdin (1978) has questioned the validity of self-efficacy measurement, and has argued that it may be impossible to assess the validity of self-efficacy scales. He argues that, while the scales have face validity and appear in general to be reliably correlated with actual behaviour, this alone is not sufficient to prove that they measure "self-efficacy", or even that it provides evidence for cognitive structures or events corresponding to such a construct. It is difficult to see, however, how such conclusive conceptual validation could be obtained when "self-efficacy" is unobservable and measures are dependent on self-report. Both Borkovec (1978) and Poser (1978), in critiques of Bandura's original self-efficacy paper, point

out that self-report data have been shown to be readily affected by the demand characteristics of the situation, suggestion effects, and expectations, and Wilson (1978) agrees that there will be major practical difficulties in measuring efficacy accurately. Tryon (1981) points out that people have generally been influenced by social contingencies to show congruence between their verbal reports and their behaviour. These sorts of socially mediated effects make the problem of validating the construct even more difficult.

Bandura (1978b, 1982a) has replied to such criticism with the argument that it is the responsibility of the researcher to establish conditions under which the participant has the strongest incentive to respond honestly. He points out that experimental subjects are capable of biassing their responses in any task, and that it is a general problem in psychological research to produce situations in which there is no incentive to respond other than accurately. This argument has since been followed up by work (Telch, Bandura, Vinciguerra, Agras & Stout, 1982) which begins to examine the social parameters which can affect accuracy of responding.

Such arguments bring one to another major contentious point: the possibility of reactive effects of measuring self-efficacy and behaviour in the same person. Chapter VI of this thesis is devoted to a consideration of this issue and a presentation of relevant data, so the arguments will be presented only briefly here. There are other factors besides the demand characteristics of the situation (Borkovec, 1978) and the socially developed desire for congruence (Tryon, 1981) which could produce artificially inflated levels of congruence between efficacy reports and actual behaviour. Kazdin (1978) and Poser (1978) both point out that the behaviours listed in the efficacy scale are exactly the same behaviours as those performed in tests, and Wilson (1978) argues that it may be necessary in some instances to expose individuals to the

test situation in order that they can make accurate efficacy judgements. Any reactivity must be reflected in artificially high correlations between efficacy and behaviour. Poser (1978) goes so far as to suggest that the completing of a self-efficacy questionnaire would, in the case of a phobic, serve as a minimal form of systematic desensitisation and thus affect later behaviour. However, Bandura (1978b) has replied that systematic desensitisation even in its strongest and most structured forms is not very effective, and that any such effect would be very small. On the other hand, there is evidence (Sherman, 1980) that making predictions about later behaviour can serve to alter that behaviour. The question of reactivity is an important and so far unresolved one, but Chapter VI will treat this issue in more detail and attempt to draw some overall conclusions.

Although demand characteristics and reactive effects are presented here as methodological problems to be avoided, they are also of some substantive interest. The social relationships between individuals in an experimental or therapeutic situation may have important effects on the outcome of that situation. Research to ascertain the relevant parameters and their effects can help to explore issues in social psychology and determine optimal conditions for experimentation or for therapy. However, when the fundamental relationships between other variables are the important issue, such social variables must be kept to a minimum so that others can be explored.

Another issue involved in the accurate and valid measurement of self-efficacy has been raised by both Teasdale (1978) and Kazdin (1978). This refers to Bandura's making a strong distinction between efficacy expectations and outcome expectations. This distinction will be considered in detail in Chapter VIII, so again the issue will be dealt with only briefly here. Teasdale (1978) argues that, although there may be theoretical reasons for separating

the two types of cognition, theoretically naive subjects may be unable to understand the difference between them. Kazdin (1978) has taken issue with Bandura's statement that "given appropriate skills and adequate incentives" (1977a, p. 193), self-efficacy will predict behaviour. Kazdin argued that, if skills and incentives were present, and outcome expectations sufficient, there was no need to postulate the existence of efficacy expectations to explain the occurrence of behaviour. He suggested that there might be no need for the self-efficacy concept. Saltzer (1982), in a speculative paper, has suggested that both efficacy expectations and outcome expectations may be direct determinants of behaviour. She suggests that they operate multiplicatively. These issues will be considered in detail in Chapter VIII, which reviews literature and offers further evidence on the question of the relationship between efficacy expectations, outcome expectations, and behaviour.

Kirsch (1982) makes another point concerning the confounding of efficacy expectations and skill levels. He argues that efficacy measures do not in fact assess one's ability to perform a particular behaviour but rather one's perceived ability to cope with the outcome of that behaviour. His argument is that any person without actual physical handicap is capable of performing, for example, all the items in the snake-phobia self-efficacy scale (see Figure III.1). By using that scale, one is assessing the person's perceived ability to cope with the emotions engendered by the action, and not his or her perceived ability to perform the task, as would be the case for a task such as throwing balls of paper into a bin from a distance.

This argument is similar to that raised by Kazdin (1978), that the behaviour of phobics can be explained with reference to incentives and outcome expectations only. The performance of the task involves trivial levels of physical skill, and the question of one's perceived ability to perform the skill

is irrelevant. Bandura (1978b) replied to this by suggesting that the "skill" of, for example, picking up a snake should be considered as involving more than the physical movements required, but also the requisite control of cognitions and affective states to perform the act in relative comfort. However, it does appear that the relationships between self-efficacy, outcome expectancies, skills, and incentives are likely to be complex and variable, and that such a matter requires careful investigation. Path analysis has been used by Feltz (1982) to begin to examine some of these relationships. Chapter VIII presents some relevant data, and Chapter IX provides further consideration of the matter.

Another point which has come under discussion is the form of statistical analysis to be used in self-efficacy studies. Teasdale (1978), Lang (1978), and Rosenthal (1978), in critiques of Bandura's (1977a) original self-efficacy paper, have all objected to the method of data analysis and the conclusions drawn from it. They point out that measures of agreement are never indicators of causality and cannot provide more than tentative support for Bandura's theory. Bandura (1978b) agrees that his microanalytic method is descriptive rather than inferential. He points out that microanalysis allows for a finer-grained analysis of congruence than does correlation, and that his high microanalytic matches are indicative of a close relationship between efficacy and behaviour.

As Kirsch (1980) has pointed out, however, the percentage-match scores which Bandura obtains are not really interpretable. The level of match in a hierarchy of behaviours which would be predicted by chance varies as the level of behaviour varies, so that behaviour levels near the top and bottom of the hierarchy are associated with lower chance levels of match than are median levels of behaviour. Kirsch takes as an example a hierarchy of ten behaviours. Given a purely random assignment of efficacy level, the chance level of congruence will range from 50% to 72% depending on the number of items performed.

Bandura (1980) replies that it is possible to compute the chance levels for different levels of behaviour; however, he does not present this information in his published work, so this does not dismiss the problem of assessing the meaning of percentage-match scores. Quite apart from the problem of chance levels of responding is that of "ceiling" and "floor" effects. If, instead of examining chance levels as Kirsch does, we make the assumption that efficacy level and behavioural level will be correlated to some extent, these effects must be considered. If most subjects can perform most tasks, then both efficacy level and behavioural level will be close to 100%, and the match cannot be other than high. The same applies if most subjects can perform very few tasks; there is unlikely to be much variability in performance or in prediction, and again percentage matches will be very high. The problem of assessing the meaning of percentage-match scores appears rather similar to the problem of checking the reliability of, for example, two observers' reports of an individual's problem behaviours. Statistically, checking the reliability of two reports is the same problem as calculating the match between two measures relating to the same behaviour. The fact that, in this case, one is a prospective self-report and the other an observation is not relevant to the statistical method used. There is a considerable literature on the use of inter-observer reliability statistics. Birkimer and Brown (1979), for example, outline a simple method for calculating whether agreement is above chance levels, while Hartmann and Gardner (1979) point out that this is a problem for which the chi-square is ideally suited. It would be appropriate and informative for self-efficacy studies to use a 2-by-2 chi-square (efficacy yes/no by performance yes/no) to assess the significance of levels of match. This technique takes the level of responding into account through the use of "expected frequencies" in calculation, and the results can readily be compared and significance levels obtained. Another

refinement would be the calculation of phi coefficients to give an indication of the strength of the relationship. These can readily be compared across populations and samples of different sizes. These two techniques are just as fine-grained as microanalysis, and have a number of advantages over that technique. Throughout this thesis, then, where microanalysis is performed, chi-squares and phi coefficients will also be reported to indicate the size and significance of effects.

In summary, there remain many unanswered questions relating to the method used by Bandura and by others in studies involving self-efficacy theory. Although Bandura's self-report scales appear sensibly designed, there has been no attempt to validate them conceptually. A number of people (e.g.,Ryckman, Robbins, Thornton & Cantrell, 1982) have shown correlations between self-efficacy and more global measures of related constructs, but the question of whether self-efficacy scales are pure measures of self-efficacy, uncontaminated by outcome expectations, incentives or knowledge of skill level, nor by social demand or evaluation anxiety, has not been answered. Clearly self-efficacy must arise in part from some of these influences, and it is difficult to see how they can be separated from each other in assessment. Another, related, problem is the possibility of reactive effects. If measuring efficacy has reactive effects on behaviour, either by raising its level or by making it a close match with the efficacy judgement, there are implications for generalisation. It becomes less justifiable to apply the findings of studies in which self-efficacy judgements are made explicitly to other, more natural, situations in which efficacy is not explicitly assessed.

The question of distinguishing between efficacy expectations and outcome expectations is both methodological and theoretical; is it possible, practically, to get uncontaminated measures of both, and, if so, does their relationship match

the theoretically predicted one? And, finally, the use of statistical techniques which are powerful, informative, and appropriate to the issue they attempt to address is an important methodological issue. Many of these issues, as well as the theoretical issues to be considered in the following section, will be addressed more fully in the following chapters.

III. 3.2. Theoretical points of contention

Theoretical and methodological issues are often closely connected, and many of the issues mentioned in the previous section as requiring careful consideration from a methodological point of view also have a theoretical side to them.

A major theoretical question is that of the relationships between efficacy expectations, outcome expectancies, skill level, incentives, and previous behaviour level in the production of any particular behaviour. Bandura (1977a) initially stressed that efficacy expectations were the most central determinants of behaviour, and some earlier critical reviews (e.g., Kazdin, 1978) have taken him to task for neglecting the other variables. This neglect is perhaps only an underemphasis of the more familiar predictors in order to stress the importance of the new concept, and in later papers Bandura has spelt out more clearly how he sees these variables relating to each other. The theory of self-efficacy stems from a social learning theory (Bandura, 1977b) perspective. This is characterised by an argument for the reciprocal determinism of situations, behaviours, and person variables. Bandura (1981a) has argued against the "search for pure unidirectional determinants" of behaviour, on the grounds that there is constant feedback and reciprocal modification of behaviours, cognitions, and situations. Within this framework, the links between efficacy expectations and other variables are complex. Efficacy expectations and behaviour are strongly mutually connected; Bandura (1977a) argues that the most effective

way of altering efficacy expectations is by producing behaviour changes. Behaviour change induced by therapeutic techniques produces changes in efficacy which in turn serve to alter behaviour in more natural settings. Despite this constant interaction, it is argued that efficacy expectations are the more immediate determinants of behaviour and thus are more accurate predictors of behaviour than are previous performance levels. Previous behaviours may have been affected by situational constraints, fatigue, or other temporary states, while, the argument is, the person's efficacy expectations are less situation-bound. In making an efficacy judgement, the person can take into account his or her previous behaviour, but also a knowledge of any situational constraints and an awareness of other factors which may lead to a different behaviour in the future. Chapter VII will provide some evidence which reflects on this argument.

The relationship between efficacy expectations and outcome expectations has been a more contentious subject. Early commentaries on self-efficacy theory (e.g., Kazdin, 1978; Teasdale, 1978) argued that outcome expectations must play an important role in influencing behaviour, either independently or through their effects on efficacy expectations.

Wolpe (1978) argued that the perceived consequences of the behaviour and of its result are important in determining behaviour, and on this point Poser (1978) stressed the importance of examining the history of the individual in some detail in order to see if there have been, for example, any disastrous outcomes or persistent failures in the area under consideration. Kazdin (1978) even questioned the utility of having the two separate concepts of efficacy and outcome expectations. He argued that the two are closely interdependent. If one has low efficacy expectations, then one will most likely expect a negative outcome of the proposed behaviour. He suggested that outcome expectations

alone can account for persistence and effort, and that coping skills could be seen as resulting from level of outcome expectations without the necessity of invoking the concept of efficacy at all. He argued that most phobics do not believe themselves to be incapable of performing the feared tasks, but rather have an unrealistically disastrous conception of the probable outcome. He concludes that "efficacy" is no more than a person's cognitive appraisal of outcome. Bandura (1978b) replies to this with the argument that the behaviour to which phobics address themselves is more than the physical movements involved. It is trivial, he says, to argue that, since the skeletal movements are simple, people do not doubt their ability to perform feared tasks.

Bandura (e.g., 1982b) has argued further that efficacy and outcome expectations are readily distinguishable by their behavioural effects. The four possible combinations of high or low efficacy and outcome expectations will produce quite different sets of responses. Low efficacy combined with low outcome expectancy will lead to behavioural deficit; high efficacy and low outcome expectancies to diversification and increased effort; low efficacy and high outcome expectations to depressed responding; and high efficacy and high outcome expectancies to confident action. Bandura appears to regard the question as more a matter of emphasis than contradiction, and considers that outcome expectations are important in determining action. However, he argues, outcome expectations are not immediate determinants of behaviour, but rather act as one of the many sources of information which the individual uses in forming efficacy expectations. Thus, like behaviours, they will be predictors of later behaviour but less direct and less accurate than are efficacy expectations, the immediate determinants of behaviour.

Since these arguments took place, some empirical studies concerning the relationships between efficacy and outcome expectations have appeared. Davis and Yates (1982) have obtained results which support Bandura strongly,

while Devins, Binik, Gorman, Dattel, McClosky, Oscar and Briggs (1982) have results which offer limited support. Both these studies are considered in detail in Chapter VIII, which deals with the question of efficacy and outcome expectations.

There are other doubts about the efficacy/outcome distinction. Borkovec (1978) interprets Bandura's reference to "successful performance" in the definition of efficacy as implying "without feelings of anxiety"; this, he says, produces the tautologous and unhelpful argument that performance without anxiety leads to anxiety reduction. Bandura, however, argues that this interpretation is invalid, saying that efficacy expectations refer to the performance of behaviour, not to whether or not feelings of anxiety will be experienced.

It seems that a great deal of the argument concerning the distinction between efficacy and outcome expectations results from a lack of clarity in definition. This appears an important distinction to make and to keep clear, and it is important that the self-report scales used in efficacy-related studies make this distinction quite clear. The issue of the relationship between efficacy expectations and outcome expectancies will be considered in more detail in Chapter VIII, and evidence presented which reflects on the question.

The question of the roles of skills and incentives in determining later behaviour has also undergone some debate. Bandura's (1977a) original statement that, "given adequate skills and appropriate incentives" (p. 193), efficacy expectations would be major determinants of later behaviour, was criticised by a number of people. Kazdin (1978), for example, suggested that, if skills were adequate, incentives appropriate, and outcome expectations high, there was no need to postulate any further cognitive entity in order to predict that behaviour would occur.

Bandura (1978b) has argued that this is an oversimplification of his argument. Perceived skill level and efficacy expectations must have a mutual influence on each other, in the same way that actions and efficacy expectations are mutually determined. It can also be argued that one can have high skill level, strong incentives, and a positive outcome expectation and still not perform a particular behaviour. The debilitating effects of test anxiety provide one example of this situation, although it can be argued (e.g., Kirkland & Hollandsworth, 1980) that such anxiety results from a deficit in some higher-order skill such as appropriate organisation of time.

To turn to the question of incentives: it is probably most parsimonious to consider "incentives" as outcome expectations, in that incentives are the expected rewards for performing certain behaviours. Thus, the argument already applied to outcome expectancies applies here. Kirsch (1982) makes an interesting point on the relationships between incentives, efficacy and action. He conducted an experiment in which snake phobics were asked to give efficacy judgements of their ability to perform items on a hierarchy of snake-related behaviours or of their ability to throw balls of paper into a wastepaper basket from progressively greater distances. He then asked them if they would change their judgements if a variety of incentives were offered, ranging from an offer of $5 to their life's depending on the performance. Kirsch found that people's putative efficacy expectations increased markedly for the snake-handling tasks when they imagined these incentives to be offered but did not change for throwing paper into the wastepaper basket. He concluded from this that efficacy expectations are not behavioural determinants but predictions of ability. However, he appears to be confusing efficacy expectations, outcome expectations, and knowledge of skill level. Because the physical skill involved in snake handling is trivial, one's efficacy can be increased by the offer of incentives. In the case of

paper-throwing, however, the physical skill required for greater distances is more substantial. Participants use their knowledge of their own throwing skills and realise that no amount of added incentive will increase that skill. Efficacy expectations, however, are only indirectly predictors of ability level: more directly they are predictors of effort and persistence, and through them the development of skill. If Kirsch had asked participants whether they thought they would be able to perform the throws in a week's time, efficacy expectations might have increased as the incentive increased; people might have been willing to practise in order to gain the offered incentives, and thus be more confident in their ability to perform the tasks. This study indicates clearly the complex interrelationships between efficacy expectations, outcome expectations, skill level, incentive and behaviour which makes the drawing of firm conclusions about them on the basis of a single study an unwise course of action.

A similar confusion has led people to criticise self-efficacy theory on the grounds that it argues that all problems are caused by deficits in self-efficacy. Kazdin (1978) and Teasdale (1978) argue that, if the requisite skills and incentives for the performance of a particular behaviour do not exist, it is pointless to increase efficacy alone and expect this to alter behaviour. However, this is again oversimplifying Bandura's argument. He does not claim that efficacy expectations are independent of skills or of incentives, but rather that all are interdependent. Efficacy expectations are seen as the most immediate determinants of behaviour and the aim of therapy must be to alter these, but it will frequently be the case that in order to alter efficacy expectations one must work on skills or on incentives.

A somewhat more basic theoretical point is the question of whether efficacy expectations are causal determinants of behaviour, or simply passive predictors. Bandura has always argued that they are determinants, but there

is no evidence for this. The facts that they change during behaviour change programmes in the same way as performance, and that altering efficacy will alter behaviour, do not prove causality. There is always the possibility of a third variable, one which produces both the efficacy expectation and the behaviour. Eysenck (1978), for example, has argued that all behaviour change stems from physiological events, and that efficacy expectations are mere epiphenomenal side-effects of the physiological processes which cause certain behaviours. At this point, the argument leaves the field of psychology for that of philosophy, as much of the disagreement stems from whether one is philosophically inclined to accept that a cognitive event can have any causal relationship with a behavioural event. Such debate is beyond the scope of this thesis; the identitist account implicitly espoused by Bandura is the one which accords best with the naive realism of everyday life, but it is not necessarily any better or worse than a more parsimonious approach.

Another basic point was raised by Smedslund (1978a,b). He argues that the propositions forming the basis of self-efficacy theory are logically necessary, rather than empirically testable, and thus that attempts to validate it empirically are pointless. Bandura (1978d) has replied that it is the relationships between the propositions, rather than the propositions themselves, which are logically necessary, and that empirical research can still determine the truth or otherwise of these propositions. Arguments concerned with the philosophy of theory construction also fall outside the scope of this thesis, however.

This section has outlined the major methodological and theoretical issues which self-efficacy theory has produced. A large number of issues have been raised, and it is not possible to address all of them in a single thesis. Questions with the most immediate relevance to the application of the theory appear to be those dealing with the relationships between self-efficacy, outcome

expectations, skills, incentives, and behaviour, and with the problems of measuring these variables. Therefore, the following chapters will begin to explore these problems, while more philosophical and epistemological questions will be set aside. The chapter which follows immediately, however, makes a diversion from self-efficacy theory to describe the development of an experimental situation in which these problems could be examined.

CHAPTER IV

DEVELOPMENT OF AN ASSERTIVENESS TRAINING PROGRAMME AS A VEHICLE FOR EXAMINING ASPECTS OF SELF-EFFICACY THEORY

IV. 1. INTRODUCTION

In order to examine some of the methodological and theoretical questions raised by a review of the self-efficacy literature, it was necessary to select a substantive area for the collection of data. When this series of studies was being planned, in 1980, there was no published work showing relationships between self-efficacy and behaviour in other than therapeutic situations such as the treatment of snake phobia. For this reason, it was decided to avoid radically different subject areas, such as intellectual tasks, on the grounds that there would be wide variations in levels of skill and motivation which could attenuate the effects of efficacy.* Bandura (1977a) had suggested that this might be the case, and there was no evidence at the time to suggest that efficacy would be an important predictor of performance in such tasks. It seemed most reasonable, at least initially, to select an experimental situation in which the probability of a good match between efficacy and behaviour was, on the basis of previous research, fairly high.

Therefore, a behaviour change programme involving an area within the traditional province of behaviour therapy was decided upon as the most appropriate vehicle for an examination of self-efficacy. After considering the practical constraints under which such a programme would have to be run, it was decided that a student population was the only one which would allow ready

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* A preliminary study conducted during the planning stages of this thesis did attempt to examine self-efficacy in the performance of an intellectual task involving modular addition. This study is not included in the body of the thesis because of methodological inadequacies: the experimental manipulations were not successful, and the method used to assess self-efficacy was later assessed as inappropriate. However, consideration of the problems associated with this study led to the more adequate design of further studies. A brief description of the study is included, for the sake of completeness, in Appendix G.

access to a large enough sample. It was argued that the most widespread behavioural problems among students were academic and social in nature; as intellectual tasks had already been rejected as unsuitable, the social skill of assertiveness was selected as one which is useful in academic life and which many students appear to lack. Thus, it was decided that an assertiveness training programme be designed and run for the purpose of collecting data which could be used to examine aspects of self-efficacy theory.

In order to design an effective assertiveness training programme, it was necessary to examine the theoretical and empirical literature available in the area, and the following sections comprise a brief review of this literature.

IV. 1.1. The definition and measurement of assertiveness

Definitions of "assertiveness" have been characterised by vagueness, generality, and a lack of operational precision. Wolpe and Lazarus (1966) made one of the earliest attempts at definition when they described "assertive behaviour" as "all socially acceptable expressions of personal rights and feelings" (p. 39), thus including both negative assertion and the expression of positive emotion. Wolpe (1973) later reworded this definition as "the proper expression of any emotion other than anxiety toward another person" (p. 81). This definition, however, seems simultaneously too narrow and too broad to fit a common-sense view of assertiveness, as it does not include any unemotional expression of wants or refusals, nor such statements as "stop that; you make me nervous", while it does include various manipulative and hostile behaviours as the "proper" expression of contempt or hatred. Later definitions have focussed on the concept of "standing up for one's rights". Both Jakubowski-Spector (1973) and Alberti and Emmons (1974) have defined assertiveness in terms of exercising one's own rights without violating those of others. But, as Heimberg, Montgomery, Madsen and Heimberg (1977) point out, it is not clear what exactly constitutes one's

"rights". Heimberg et al. (1977) criticise all these definitions as being vague and value-laden, preferring their own vague, value-laden definition of "effective problem solving" (p. 954).

Eisler, Miller and Hersen (1973) have taken a more empirical approach, taking samples of behaviour which are generally agreed to be "assertive" or "nonassertive" and seeking consistent, objectively definable, differences between them. They used standardised role-play situations with psychiatric patients and identified the following as characteristics of appropriately assertive responses: more pronounced affect, less compliance, more frequent requests for altered behaviour by the partner, longer responses, louder speech, and shorter response latencies than those judged to be nonassertive. Their approach did not seek to differentiate "assertive" from "aggressive" responses, but this objective approach has been used to assess the effectiveness of assertion training (e.g., Hersen, Eisler, Miller, Johnson & Pinkston, 1973). Romano and Bellack (1980) used a similar technique with a sample of female psychiatric outpatients and non-patients, videotaping standardised role-plays and identifying the behaviours which distinguished assertive from nonassertive responses. They found the following behaviours to be characteristic of the more assertive responses: greater use of intonation, more facial expression, more upright posture, more smiles, and more physical gesture. It is interesting to note that both these lists of behaviours include few verbal behaviours, with paralinguistic and nonverbal cues predominating.

These empirical studies, as well as the semantic arguments of others, go some way towards an idea of what assertive behaviour is; however, there is no generally-accepted valid, operational definition, and most workers use a semantic definition supported by indicators of inter-rater reliability.

While role-play tests and objective measurements are generally used in assessment, there are also several widely-used self-report inventories. Most

consist of lists of behaviours generally agreed upon as "assertive" or "non-assertive", and people are asked to state whether or not they are capable of these behaviours or regularly engage in them. The Wolpe-Lazarus scale (Wolpe & Lazarus, 1966), the Rathus Assertiveness Scale (Rathus, 1973), the Bakker Assertiveness-Aggressiveness Inventory (Bakker, Bakker-Rabdau & Breit, 1978), the College Self-Expression Scale (Galassi, DeLo, Galassi & Bastien, 1974) and its adult variant (Gay, Hollandsworth & Galassi, 1975) are all of this form; the Gambrill and Richey Assertion Inventory (Gambrill & Richey, 1975) is similar but asks for ratings of the degree of discomfort one would feel in each situation as well as the probability of behaving in an assertive manner.

None of these self-report scales seems markedly better than the others in measurements of reliability and validity (Kern & MacDonald, 1980), and the choice of a scale for any study appears best made from a consideration of the population type. The scale chosen should be validated for that population, and have a suitable reading level (Andrasik, Heimberg, Edlund & Blankenberg, 1981).

IV. 1.2. The nature of assertiveness and assertiveness deficits

There has been some debate on the question of whether problems of nonassertiveness stem from a lack of the requisite skills or from a cognitive deficit which prevents skills from being used appropriately. Hersen, Eisler and Miller (1973), in an early review, concluded that nonassertiveness stemmed from a lack of the social and interpersonal skills required to function successfully. However, more recent studies have provided evidence against this view. Both Nietzel and Bernstein (1979) and Schwartz and Gottman (1976) showed that, given circumstances which are sufficiently non-threatening, nonassertive individuals can produce responses which are as assertive as those produced by assertive individuals, and can recognise levels of assertiveness equally well. Bordewick and Bornstein (1980) showed that students at all levels of assertiveness

were equally capable of recognising appropriate assertive responses. Alden and Cappe (1981) also found that nonassertive students could role-play assertiveness at normal levels, although they rated themselves as low in capability and high in anxiety. Similarly, Westefeld, Galassi and Galassi (1980) found that asking students to produce as assertive a response as they could think of resulted in equally high assertive responding for both high-assertive and low-assertive individuals. Jakubowski (Note 12) attempts to reconcile these findings with the earlier conclusions by suggesting that nonassertive individuals do have the component social and interpersonal skills, but lack the higher-level skill of being able to use these skills appropriately; she suggests that problems often occur with timing and with an inappropriate degree of assertiveness being used.

So it would appear that nonassertiveness stems to at least some extent from cognitive problems in making use of existing skills. Thus one might expect assertive behaviour to be a useful task for examining the links between self-efficacy and behaviour. If level of assertiveness appears to be a function of cognitive state, and less importantly of skills and knowledge, self-efficacy is likely to be closely related to performance. For this reason, it was decided that assertiveness training would be an appropriate area for the examination of self-efficacy beliefs and their relationship to behaviour. A review was made of the assertiveness training techniques currently in use, so that an effective training programme could be designed, and the following section outlines the findings of this review.

IV. 1.3. Assertiveness training techniques

As Rich and Schroeder (1976) pointed out, "Assertiveness training is not a unique or even well-defined behavioural training procedure" (p. 1085). A wide variety of techniques is used, though most are based on some form of behavioural rehearsal. A review by Heimberg et al. (1977) concluded that assertiveness

training, whatever its actual form, was successful in producing reliable behavioural changes in all populations investigated, including students, psychiatric inpatients, and people with various phobias and interpersonal problems.

Overt, structured behaviour rehearsal with therapist feedback seems to be the basic method used (e.g., McFall & Marston, 1970). A study by Rimm, Snyder, Depue, Haanstad and Armstrong (1981) concluded that "training", involving supervision and feedback from a therapist, was more effective than merely having the opportunity to rehearse responses; that is, that some guidance appeared to enhance the effectiveness of practice. Others have experimented with variations on behavioural rehearsal. McFall and his associates conducted a series of experiments examining the effectiveness of various components of assertiveness training. They found that a combination of rehearsal, therapist modelling, and explicit coaching in appropriate responses was highly effective (McFall & Lillesand, 1971); modelling, however, did not add to the effectiveness of a combination of rehearsal and coaching (McFall & Twentyman, 1973). This would appear to be a "ceiling effect" rather than a demonstration that modelling is ineffective, as there is evidence (e.g., Hersen et al., 1973; Pentz & Kazdin, 1982; Young, Rimm & Kennedy, 1973) that modelling is effective as a primary treatment.

Linehan, Goldfried and Goldfried (1979) found that the addition of some cognitive restructuring techniques improved the effects of skills training, which tends to support the concept of nonassertiveness as a cognitive, rather than only a skills, deficit.

There is also considerable evidence that covert rehearsal will effect significant changes in assertiveness (McFall & Lillesand, 1971; McFall & Twentyman, 1973), and that it is no less effective than overt rehearsal (e.g.,

Rosenthal & Reese, 1976; Kazdin, 1980), although a combination of both has been found to be most effective (Kazdin, 1982). Kazdin (1974, 1976, 1979a) has shown covert modelling to be effective, particularly if the model is imagined to receive reinforcement for assertive behaviour, if a variety of models is imagined, and if images are elaborated by the individual. Nietzel, Martorano & Melnick (1977) also found covert modelling to be effective, particularly if it included training in dealing with noncompliance. Kazdin and Mascitelli (1982) found that covert modelling alone was effective, but that its effect was enhanced if homework practice, overt rehearsal, or both were included in a therapeutic programme.

The main method in use continues to be overt rehearsal, as this appears most acceptable to participants in assertiveness training (Kazdin, 1980).

The following section describes the assertiveness training programme which was designed for use with students in order that the relationship between efficacy expectations, behaviour, and maintenance of behaviour change could be examined in the context of a behaviour-change programme.

IV. 2. DEVELOPMENT OF THE ASSERTIVENESS TRAINING PROGRAMME

The training programme was designed to test a series of hypotheses derived from self-efficacy theory. Results pertaining to different aspects of the theory are reported in Chapters V, VI, VII and VIII, along with other studies examining these theoretical issues in different situations. For the sake of clarity, the entire programme will be described here in detail, and later sections referring to it will contain abbreviated reminders of the relevant sections of the procedure. The programme involved participation in six individual sessions of behavioural rehearsal and discussion of assertiveness, followed by a maintenance test three months later.

Those results presented later in this chapter are related to a number of hypotheses concerning assertiveness training and not directly related to self-efficacy theory. These results are presented in order that the appropriateness of this programme as a vehicle for examining the relationships between self-efficacy and behaviour change can be examined. Hypotheses are presented explicitly later in this section.

IV. 2.1. Selection of participants

The College Self-Expression Scale (CSES: Galassi et al., 1974), with minor wording changes to suit an Australian university population, was administered to 262 students enrolled in a first year psychology course. A copy of the questionnaire, together with all questionnaires and materials used in the assertiveness training programme, will be found in Appendix A. The CSES was chosen because it was specifically designed and validated for college populations (Galassi, Hollandsworth, Radecki, Gray, Howe & Evans, 1976) and its readability level (Andrasik et al., 1981), approximately Year 11, seemed most appropriate to first year students. Those students who scored at least half a standard deviation below the mean of this group, and who were female and aged 21 or less, were selected for participation in the study. None refused to take part. Females only were selected because of evidence (e.g., Crassini, Law & Wilson, 1979) that males and females show different patterns of assertiveness and would be likely to respond differently in role-plays with a female experimenter; there were more females than males enrolled in the course, and choosing females would maximise the available population. Individuals under 21 only were involved because the items in the CSES and in the role-playing tasks were in many cases particularly appropriate to younger people (e.g., parents insisting on one's getting home early; problems with first dates), and it was difficult to generate situations which were equally appropriate to young and to mature-aged

students. Forty-seven students who met these criteria began the study, and all but one, who took a job and withdrew from university, completed it. Their mean age was 17 years 10 months, and their mean initial score on the CSES 103 (mean z = -1.09). Participants were paid $15 each for attending the six sessions.* The payment was made to ensure that dropping out was kept to a minimum (students were to be paid nothing if they attended less than 6 sessions), and, as Borkovec and O'Brien (1976) have recommended, they were not informed of the payment until they had agreed to participate in the study.

IV. 2.2. Preparation of role-play scenes

A collection of stimulus situations in which assertive responses would be appropriate was built up in the following way. An initial item pool consisted of all the items in five assertiveness inventories (Galassi et al., 1974; Gambrill & Richey, 1975; MacDonald, 1978; Rathus, 1973; Wolpe & Lazarus, 1966). Items which did not involve verbal responses were rejected, as were all those with no relevance to young female Australian university students. Those which necessitated a male stimulus voice were also deleted, to eliminate the possible effects of differential responding to males and to females. Some further items were deleted because they were almost identical to other items included from other scales. The remaining 44 were randomly assigned to five sets of eight and one of four. Each item was re-written in a standard format, in which the situation was described briefly, and which ended with a "stimulus statement" in direct speech to which the participant would respond. For example,

> "It's the third week in a row that your practical partner hasn't turned up. Each week you've done all the work on your own, even though it's taken longer and been a real nuisance." This week, you're just about finished

* This research was supported by a University of Adelaide Research Grant.

when she comes in and says,
'Oh, sorry I'm late, I've been so busy. And I can't come next week either. Just let me have the notes, will you?' "

Transcripts of all 44 items are included in Appendix A.2.

Stimulus situations were to be presented either by audiotape or orally by the experimenter. The experimenter prepared a tape of each of the six sets of items. These tapes will be referred to by the numbers 1 to 6. Each tape began with the following instructions:

"In this session you will hear described a number of situations requiring an assertive response. At the end of each description you will hear a click, and you will have 60 seconds in which to respond. Your response will be recorded."

There then followed the set of items, each followed by a sixty-second pause during which the participant could respond. If stimulus situations were to be presented orally, as was the case in some conditions, the experimenter read to the participant a written transcript of the material on the tape.

IV. 2.3. Factorial design of the programme

A number of hypotheses relating to assertiveness training were tested by using a series of variations on the basic role-playing procedure. These hypotheses are peripheral to the main issues concerning self-efficacy theory; however, it was considered important to establish that the assertiveness training programme was an effective one and that it produced similar effects to those documented in previous research. If this could be shown to be the case, the validity of self-efficacy-related findings derived from this programme would not be in question.

The first hypothesis related to the effectiveness of modelling in assertiveness training. The evidence existing to date is somewhat contradictory, with McFall and Twentyman (1973) suggesting that modelling is of little importance when added to a programme, and others (e.g.,Hersen, Eisler & Miller, 1974) indicating that it is extremely important. Therefore a Modelling vs. No modelling factor was included in the design. Those students in the "Modelling" condition observed a videotape of a female undergraduate student listening to a recording and responding verbally to each of eight stimulus situations. The student was selected because of her high level of assertiveness and because she was similar in several ways to the students involved in training, a point which has been shown to enhance modelling effects.

A second hypothesis related to the use of live or taped stimuli in the behavioural rehearsal. Galassi and Galassi (1976) compared live and taped stimuli and found that students reported significantly less discomfort with a taped stimulus than with a person to whom they had to respond. This suggested that individuals who were trained in assertiveness using tapes might still experience debilitating discomfort in "live" assertiveness situations, and thus that the "tape" method would not produce changes as generalised and useful as that produced by "live" rehearsal. On the other hand, the use of tapes in an experiment ensures that all individuals receive the same input and reduces the amount of error variance. Since several further assertiveness studies were planned to follow this one, it was decided that an empirical test should be made of the relative effects of live and taped stimulus situations on level of assertiveness produced.

The third factor of this design was concerned with appropriate methodology rather than with aspects of assertiveness training. This methodological factor related to the need to assess generalisation of assertiveness change. It is

generally considered (e.g.,Stokes & Baer, 1977) that generalisation of a skill to settings and events other than those encountered in training will not occur automatically and must be specifically taught as part of a behaviour change programme. Kirschner (1976) reported that, following assertiveness training, students showed only limited stimulus generalisation. Hersen et al. (1974) found that training nonassertive psychiatric patients specifically for generalisation resulted in slight, but not significant, improvements in the amount of generalisation shown, but they concluded that generalisation was a problem in assertiveness training which needed further work.

It was not the intention of this programme to examine the effects of programming for generalisation, but it did seem necessary to assess the extent of generalisation. For this purpose, a "generalisation" set of situations was used. At the initial testing (Session 1) participants responded to a standard test tape. At the final session, participants repeated this test tape and also completed the "generalisation" tape. "Test" and "generalisation" tapes were randomised across participants in order to control for differences in difficulty. Half used Tape 1 as a test tape and Tape 6 for generalisation, while this order was reversed for the others.

Thus there were three orthogonal factors included in the design of the programme: modelling or none, taped or live presentation, and order of presentation of tapes. The results presented in this chapter assess the effects of the assertiveness training programme on measures of assertiveness and self-efficacy. Further analyses examining aspects of the relationship between self-efficacy and assertive behaviour will be left to later chapters. The hypotheses to be examined in this chapter are as follows. Firstly, that the assertiveness training programme will be associated with increases in measures of assertiveness and related self-efficacy, and that these increases will be

generalised to similar tasks and will be maintained over time. It is necessary that this hypothesis be supported if the assertiveness training programme is to be considered an effective behaviour-change programme. Secondly, the effects of exposure to a model will be examined, and thirdly, any differences in effectiveness between live and taped presentation of stimuli will be assessed. The second and third hypotheses are not directional, as previous research has produced mixed results.

This section has outlined only those hypotheses which are not relevant to self-efficacy theory. The hypotheses which are relevant to this theory will be presented in later chapters which refer back to this one. The following section provides an outline of the entire procedure of this study.

IV. 3. METHOD

IV. 3.1. Participants

The participants in this study have already been described in Section IV. 2.1. All were female university students enrolled in first year psychology, who met the criteria of nonassertiveness described in that section. 26 students participated in the first ten-week term of the university year, and a further 20 in the second term. No control group was used, and this may be considered a variant of the "recurrent institutional cycle" design (Campbell & Stanley, 1963).

IV. 3.2. Procedure

Participants carried out the experiment individually, with the experimenter present at all sessions. Each attended six half-hour sessions over a six-week period. Those 26 who attended in the first term of the university year were also asked to return for a follow-up session three months after their training programme finished, and 21 did so. The others were not asked to return for

follow-up testing, as three months after they had finished the six sessions they were in the midst of final examinations. All sessions were tape recorded with the participants' prior knowledge and consent. A summary of the procedure over the six sessions is given in Table IV.1., and a description follows.

TABLE IV.1. Complete Procedure Summary. There are three orthogonal factors in the complete design: order of tape, in which the first and last tapes are alternated between participants; model vs. none, in which one half of the participants observe a modelling videotape; and presentation mode, in which stimulus scenes are presented either orally or by audiotape. Cells divided by a diagonal bar indicate sessions in which the two conditions of that factor receive differential treatment. Reactivity was assessed in Sessions 3, 4 and 5, when only 4 of the 8 items were included in the efficacy scale.

Session	Factor			Measures		Number of Role Play Items
	Order of Tapes	Model vs None	Presentation Mode	CSES	Efficacy Measure	
pre-test				✓		
1	Tape 1 / Tape 6	-	Tape		8 items	8
2	Tape 2	Model / None	Tape / Live		4 items	4
3	Tape 3	-	Tape / Live		4 items	8
4	Tape 4	-	Tape / Live		4 items	8
5	Tape 5	-	Tape / Live		4 items	8
6	Tape 1, then 6 / Tape 6 then 1	-	Tape	✓	1x8 items	2 x 8
Follow-up	Tape 1 / Tape 6	-	Tape	✓	8 items	8

Session 1. This served as a baseline session. All had completed the CSES at a group screening one to three months previously, and this was not repeated as there is evidence (Kern & MacDonald, 1980) that the scale is reliable over this time period. Each participant completed a "self-rating scale" designed to measure efficacy level and strength for the test tape she would use (either Tape 1 or Tape 6). The "self-rating scale" consisted of eight items matching the items on the appropriate tape. Each scene was described briefly, and the participant was asked to state for each one whether or not she believed she could deal with it in an appropriately assertive manner, and, if so, to rate her confidence on a scale from 0 (quite uncertain) to 100 (certain). This provided measures of efficacy level and strength. Figure IV.1. gives an example of the format of this questionnaire, and all questionnaires used are included in Appendix A.3. After completing the scale, the participant listened to the test tape and responded to each item. The experimenter did not give feedback at this session.

Session 2. Session 2 was the first "training" session. The participant read the following definition of the concept of "assertiveness":

> Every person should be accorded the right to be treated with respect and consideration by others. An aggressive person is someone who denies this right to others. A nonassertive person is someone who does not exercise this right for herself. An assertive person, however, is someone who behaves in a way that ensures that right is preserved both for her and for the people with whom she interacts.

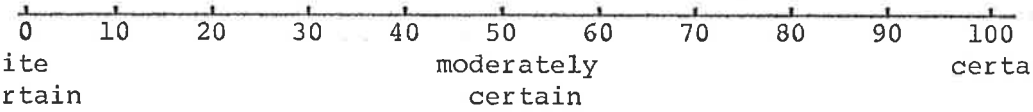
This information was discussed to ensure it was understood. Following this, participants in the "Model" condition watched a videotape of the model responding to whichever tape they had used in Session 1. Participants were encouraged to comment on the model's behaviour. After this, all participants

FIGURE IV.1. Examples of items to assess efficacy level and strength, taken from Tape 1.

5. You order a toasted cheese sandwich in the refectory. The woman behind the counter brings a toasted ham sandwich, and you particularly wanted cheese. Do you think you could handle this situation in an appropriately assertive manner?

YES/NO

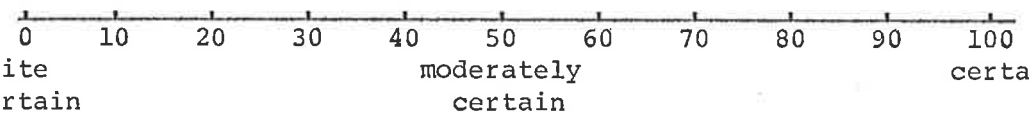
If yes: rate your degree of confidence on this scale.



6. You have been to a concert which you enjoyed very much. Next day you are discussing it with a new acquaintence who thinks it was dreadful. You'd like to disagree. Do you think you could do this in an appropriately assertive manner?

YES/NO

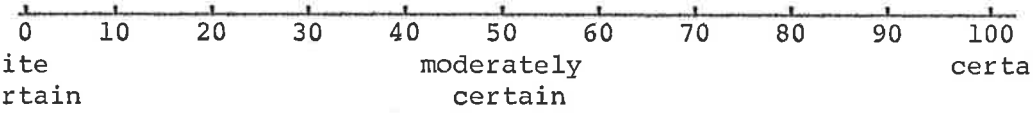
If yes: rate your degree of confidence on this scale.



7. On your way to a meeting, you drop into a friend's place and find a group of people drinking wine. They offer you a glass, but you'd rather keep a clear head. Do you think you can refuse in an appropriately assertive manner?

YES/NO

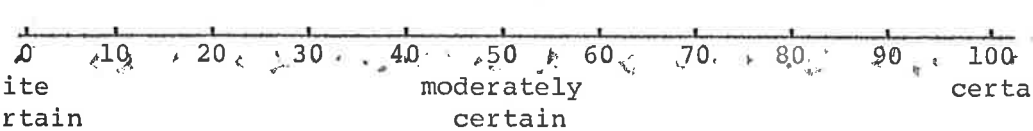
If yes: rate your degree of confidence on this scale.



8. You're watching a good television programme with your mother. You want to get really involved in it, but your mother keeps making comments about the actors, which you find really annoying. Do you think you could ask her to stop in an appropriately assertive manner?

YES/NO

If yes: rate your degree of confidence on this scale.



completed the "self-rating scale" for Set 2, which contained four items matching the four items in Set 2 (Set 2 was shorter than the others because of the time taken up by the videotape).

Those in the "tape" condition heard and responded to Tape 2, while those in the "live" condition listened to the experimenter read each situation, and responded to her as if to the person in the role-play situation. Following each response, all were encouraged to comment on their responses, to consider what might be the outcome of such a response, and to consider other responses they might have preferred to make as well as other responses suggested by the experimenter. The experimenter completed the session by suggesting to the participant that she attempt some observation of her own behaviour and that of others and try to identify examples of assertive, nonassertive, and aggressive behaviour, and their consequences.

Sessions 3, 4 and 5. Each session began with a brief discussion of situations and activities involving assertiveness which had occurred to the participant since the previous session. The participant then completed a "self-rating scale" involving four items selected randomly (but not varied across participants) from the eight items on the corresponding tape. She listened and responded to the eight items in Set 3, 4 or 5 at each session. Those in the "tape" condition listened to a tape on each occasion, while those in the "live" condition listened to the same material read by the experimenter, and responded directly to her. Responses were discussed as in Session 2.

Session 6. Session 6 was a final testing session. Participants repeated the self-rating scale and tape they had used in Session 1 (this constituted Session 6a), and then repeated the procedure with the "generalisation" tape (this constituted Session 6b). Finally, they repeated the CSES, to assess changes in global assertiveness.

Follow-up session. Twenty-one of the 26 students participating in the first term returned for a follow-up session three months after Session 6. The follow-up session was a repeat of Session 6a. The self-rating scale and tape used in Session 1 were repeated, and the participant completed the CSES once more.

IV. 3.3. Audiotape rating

A graduate student, blind to the purposes of the experiment, rated responses to all items on each of three variables. The variables were:

FIGURE IV.2. Scales used in assessing the assertiveness and appropriateness of each response made during assertiveness training.

ASSERTIVENESS

0	No response; statement such as, "I wouldn't answer"
1	Incomplete, unassertive response
2	Complete but unassertive response
3	Response is assertive in content but unassertive in style (pausing, stammering, getting words mixed, etc.)
4	Clear assertive response
5	Clear assertive response, showing explicit consideration of other
6	Hostile, aggressive or offensive response

APPROPRIATENESS

0	Entirely inappropriate to the situation
1	Very inappropriate
2	Moderately inappropriate
3	Not quite a reasonable way to respond
4	A reasonably appropriate way to respond
5	A very appropriate way to respond
6	Completely appropriate to this particular situation

assertiveness and appropriateness, each on a scale from 0 to 6 (see Figure IV.2. for the scales used); and latency to begin responding, measured in tenths of a second. The experimenter rated a random sample of 28 items on the same measures, and agreement appeared satisfactory. Mean differences per item between the raters were: for assertiveness, .6 of a scale point; for appropriateness, .4 of a scale point; for latency, 1.6 seconds. Percentage accuracies (smaller total divided by larger total) were: for assertiveness, 86%; for appropriateness, 88%; for latency, 88%.

IV. 4. SELECTED RESULTS

This section outlines the results of the study which are not related to specific hypotheses concerning self-efficacy theory. Such results are reported in later chapters concerned with these hypotheses: however, analyses relating to the outcome of the assertiveness training programme and to issues in assertiveness training are reported here so that its effectiveness as a vehicle for studying self-efficacy can be assessed.

IV. 4.1. Preliminary analyses and assertiveness changes

Students participating in the first term did not differ from those in the second term on any of the initial variables (see Table IV.2). Nor were there significant initial differences between participants in the various conditions (see Table IV.2). Thus, it appears that randomisation procedures were successful, and that Tape 1 and Tape 6 were equivalent in difficulty.

Repeated-measures analysis of variance was used to assess changes during the programme. For each dependent variable, average scores were computed for each individual within each session. Repeated-measures analysis of averaged scores from all sessions (including the two parts of Session 6 as two sessions) showed highly significant changes in all dependent variables, as shown in Table IV.3.

TABLE IV.2. Means and standard deviations of initial measures for Assertiveness Training Study, with F ratios comparing individuals in:-
(a) Term I or Term II
(b) "Model" or "No Model" condition
(c) "Tape" or "Live" condition
(d) Order 1 (Tape 1 first) or Order 2 (Tape 6 first).

Variable	Mean	Standard deviation	F(a)	F(b)	F(c)	F(d)
CSES	103.8	12.8	0.14	0.96	2.83	0.21
Efficacy level	0.75	0.12	0.07	0.01	0.54	3.64
Efficacy strength	43.6	16.1	1.31	0.05	1.35	1.43
Assertiveness	3.33	0.60	0.04	1.23	1.70	1.46
Appropriateness	4.48	0.47	0.08	0.63	0.16	0.10
Response latency	2.90	3.13	0.01	1.40	0.85	1.44

In all cases, df = 1,44 and the obtained F is not significant (critical $F_{\alpha=.05} = 4.06$)

TABLE IV.3. Repeated-measures analysis-of-variance tables for changes in dependent variables across all six sessions for Assertiveness Training Study. Individual averages were computed for each session.

Variable	Source of Variation	df	Mean Square	F
Efficacy level	between people	45	1089	
	within people	276	184.6	
	between measures	6	2827	22.4*
	residual	270	125.9	
	total	321	311.4	
Efficacy strength	between people	45	0.0811	
	within people	276	0.0287	
	between measures	6	0.3287	14.9*
	residual	270	0.0221	
	total	321	0.0361	
Assertiveness	between people	40	1.036	
	within people	246	0.303	
	between measures	6	3.093	13.2*
	residual	240	0.234	
	total	286	0.406	
Appropriateness	between people	38	1.191	
	within people	234	0.165	
	between measures	6	1.912	16.1*
	residual	228	0.119	
	total	272	0.309	
Response latency	between people	40	6.913	
	within people	246	1.768	
	between measures	6	14.30	9.83*
	residual	240	1.455	
	total	286	2.488	

* $p < .0001$

Repeated-measures analyses were also performed using only Session 1 and Session 6a, which involved identical tasks, and again all variables showed significant changes (see Table IV.4). The final CSES scores (mean = 122, standard deviation = 16) were still significantly lower than the population mean of 127 ($t = 2.09$, $df = 45$, $p < .05$), but they were significantly greater than at the start of the programme, and when they were converted to z-scores it was found that 32 participants (70%) had z-scores greater than -.5, and 41 (89%) greater than -1.

TABLE IV.4. Means and standard deviations of all dependent variables in Session 1 and Session 6a for Assertiveness Training Study, and results of repeated-measures t-tests assessing significance of change.

Variable	Session 1		Session 6(a)		t (df=45)
	Mean	S.D.	Mean	S.D.	
CSES	103.8	12.8	122.4	16.1	57.0**
Efficacy level	0.75	0.12	0.93	0.10	53.6**
Efficacy strength	43.6	16.1	59.1	15.5	65.0**
Assertiveness	3.33	0.60	3.95	0.36	57.7**
Appropriateness	2.90	3.13	1.32	0.45	14.3*

* $p < .0005$ ** $p < .0001$

The relationships between the outcome variables were assessed using correlations. The correlation between assertiveness and appropriateness was .74, that between assertiveness and response latency -.24, and that between appropriateness and response latency - .26. While all these correlations are significant beyond the .001 level of probability, the actual percentage of variance common to latency and the other measures is very small (approximately 5%), while assertiveness and appropriateness have approximately half their variance in common.

IV. 4.2. Generalisation and maintenance of assertiveness changes

Generalisation was measured in Session 6, when the participants repeated the tape they had used in Session 1 and then completed a second tape. Tape order was randomised across participants, and there was no difference in difficulty of the two tapes (see Table IV.2). Related-samples t-tests compared generalisation data (Session 6b) with data from Session 1 and Session 6a. Table IV.5. summarises the results of these tests, which indicate that the increased performance in Session 6a did generalise to performance in Session 6b. Participants were somewhat less confident about their performance in Session 6b, and tended to respond more slowly, than in Session 6a, but their performance was significantly better on all measures in Session 6b than it was in Session 1.

TABLE IV.5. Generalisation strength in Assertiveness Training Study.

Variable	MEAN			t	
	Session 1	Session 6(a)	Session 6(b)	1 vs 6(b)	6(a) vs 6(b)
Efficacy level	.750	.927	.902	4.79***	-1.10
Efficacy strength	43.6	59.1	54.8	4.29***	-2.68**
Assertiveness	3.32	3.95	3.78	4.50***	-1.91
Appropriateness	4.48	5.03	4.92	5.44***	-1.76
Response latency	2.87	1.32	1.48	-3.34**	2.45**

Note: Repeated-measures t-tests (n=46) comparing Session 6(b) (generalisation measure) with initial and final testing scores.

* $p < .05$ ** $p < .01$ *** $p < .001$

Twenty-one students participated in follow-up testing three months after completing the experiment. Maintenance was assessed by comparing data from this session with data using the identical stimulus tape in Sessions 1 and 6a. Table IV.6. summarises the findings of these analyses, which show that the participants scored higher on all variables at follow-up than they did at the initial testing, and that there were no significant changes in these measures over the three-month maintenance period, except that participants showed significantly higher efficacy strength at follow-up testing than they had done at the end of the programme.

TABLE IV.6. Maintenance strength in Assertiveness Training Study.

Variable	MEAN			t	
	Session 1	Session 6(a)	Maintenance	1 vs M	6(a) vs M
Efficacy level	.750	.926	.949	4.97***	1.28
Efficacy strength	43.6	59.6	63.9	9.76***	5.70***
Assertiveness	3.39	3.94	3.98	4.46***	0.97
Appropriateness	4.39	4.96	4.99	4.78***	0.43
Response latency	2.86	1.31	1.32	-3.38**	0.10
CSES	104	117	118	57.0***	0.02

Note: Repeated-measures t-tests (n=21) comparing follow-up (M) with initial and final testing scores.

** $p < .01$ *** $p < .001$

IV. 4.3. Effects of the experimental conditions on assertiveness changes

Analyses were conducted to determine whether the use of taped or live presentation, and the exposure or non-exposure to the model, had any effect on changes in assertiveness or self-efficacy. For each dependent variable, a three-way analysis of covariance (Tape/Live x Model/None x Tape Order) was performed, using totals for Session 6a as the dependent variables and totals on the same variable for Session 1 as the covariate. Analysis of covariance was used in order to avoid the biassing effects of initial differences between individuals on the dependent variables. It was preferred to the use of analysis of variance using change scores as this is more subject to distortion (Winer, 1971). CSES scores in Session 6 were subject to the same form of analysis, with initial CSES scores used as the covariate. Table IV.7. presents all the main effects obtained in this series of analyses, each with 23 subjects in each cell. The inclusion of a model in Session 2 appears to have had a positive effect on all variables, but this reached significance only for the performance variables, and not for the self-reports. The use of live rather than taped presentation in Sessions 3, 4 and 5 appears to have had slight beneficial effects.

TABLE IV.7. Mean scores in Session 6 of Assertiveness Training Programme, for each dependent variable, broken down by each independent variable separately.

Variable	Condition								
	Model			Presentation			Order		
	Model	No model	F	Live	Taped	F	Tape 1	Tape 6	F
Efficacy level	0.95	0.91	3.05	0.95	0.91	1.18	0.90	0.96	2.78
Efficacy strength	61.0	57.4	1.14	66.0	52.3	11.11**	60.0	58.2	3.12
Assertiveness	4.03	3.88	4.54*	4.01	3.89	0.29	3.92	3.98	0.02
Appropriateness	5.20	4.86	8.64**	5.00	5.05	0.25	5.17	4.89	5.80*
Response latency	1.25	1.39	4.23*	1.19	1.45	2.79	1.35	1.30	0.04
CSES	122	122	0.01	129	116	8.47**	125	119	3.26

Note: F ratios are obtained from analyses of covariance, using initial scores as covariates. df = 1,42 in each case.

* $p < .05$ ** $p < .01$

The order in which the tapes were used, and therefore the actual tape used for testing, seems not especially influential, suggesting that the two tapes are fairly equal in difficulty. Participants responding to Tape 1 are rated higher on appropriateness, but otherwise there are no differences.

Of all 24 possible two- and three-way interaction effects, only the interaction of Model/No model and Tape Order on CSES scores reached significance (see Table IV.8.). Post-hoc analyses indicated that there was no difference between "Tape 1" and "Tape 6" participants who had not observed the model, but in the "Model" condition those participants who used Tape 6 as a test tape had lower final CSES scores than did those who had completed Tape 1. There seems no theoretical or methodological reason for such a finding, and in the absence of any such interactions for the other dependent variables, this is probably best viewed as an artifact.

TABLE IV.8. Interactions on Session 6 scores between independent variables (Model/No model; Live/Taped presentation; Order of presentation) in Assertiveness Training Programme.

Variable	F ratio			
	Model x Presentation	Model x Order	Presentation x Order	Model x Presentation x Order
efficacy level	3.03	2.43	0.49	0.66
efficacy strength	0.23	1.43	0.60	2.45
assertiveness	3.06	0.81	0.28	0.07
appropriateness	1.47	2.20	0.81	0.01
response latency	0.05	2.92	1.00	0.26
CSES	0.44	9.26*	0.26	2.74

* $p < .01$

Note: F ratios are obtained from analyses of covariance, using initial scores as covariates. Cell sizes are between 10 and 12 for two-way interactions, and between 4 and 7 for three-way interactions.

IV. 5. DISCUSSION OF SELECTED RESULTS

This section summarises and discusses the findings of this study which are not related to specific hypotheses concerning self-efficacy and which were outlined in the previous section.

IV. 5.1. Summary of selected results

The analyses reported in this chapter assess the effectiveness of randomisation procedures and of the assertiveness training programme, thus indicating the extent of its appropriateness as a basis for consideration of efficacy changes and their relationship to changes occurring during an assertiveness training programme.

These analyses indicate that participants were effectively randomised across conditions, that extending the programme across two terms did not have any significant biassing effects, and that the two tapes which were used interchangeably as "test" and "generalisation" tapes were equivalent in difficulty.

Participants showed significant increases in assertiveness, appropriateness, speed in beginning responses, self-efficacy, and a self-report assertiveness inventory during the course of the programme. The increases generalised to a similar task and were maintained three months after the programme finished.

Exposure to a model in Session 2, and the use of live rather than taped presentation in Sessions 3, 4 and 5, had some beneficial effects on assertiveness, but these effects were in general small and inconsistent across variables. They did not appear to be additive, as the interaction of the two factors did not reach statistical significance for any dependent variable.

Overall, then, the randomisation procedures were satisfactory, assertiveness changes were large and stable, and the other factors involved had effects which were small or moderate. This seems to justify the use of data collected

during this training programme to examine some hypotheses derived from self-efficacy theory.

IV. 5.2. Reflections on the assertiveness training literature

The findings of this study indicate that the use of an assertive model produces small increments in assertiveness increase, even by comparison with an effective assertiveness training programme without modelling. Previous evidence on this subject has been somewhat contradictory, with evidence appearing that modelling is effective as a primary treatment technique (e.g., Hersen et al., 1973), but that it does not serve to increase the effectiveness of a combination of other techniques (McFall & Twentyman, 1973). The study reported here indicates that a single modelling session added to a programme of behavioural rehearsal and coaching will produce small but significant increments in the effectiveness of that programme. This finding is in contradiction to McFall and Twentyman's finding, as modelling does appear to have an effect additive to that of a behaviour-rehearsal programme. It is possible, however, that McFall and Twentyman's basic programme was more powerful than the "No model" programme in this study, and thus a ceiling was reached in that study but not in this. An alternative explanation is that the model used in this study was more effective or more salient than the models used by McFall and Twentyman. Overall, it seems unwise to reject the usefulness of modelling as a component of an assertiveness training programme, as the evidence seems to be that it has at least minor effects. Further, the students in this study reported finding it interesting and entertaining to see someone else performing the experimental task, and it may serve to increase participant interest in a programme.

The question of the use of taped rather than live input was also considered. Overall, the use of live input seemed to increase confidence levels

without changing actual performance. This seems important in assertiveness training, because of the evidence reviewed earlier (e.g., Alden & Cappe, 1981) that nonassertiveness results from cognitive interpretations and perceptions of oneself. So it appears that live training should be used in preference to taped training in therapeutic programmes. However, when research is conducted it is methodologically more desirable to standardise training scenes in order to reduce variation. Since the "live" presentation seems to have affected only confidence and not actual performance, it would seem that the use of standard, taped, scenes would not produce behavioural results which are markedly different from those produced under the more natural conditions of live presentation. And provided all individuals receive taped input, the relationship between efficacy and behaviour, although possibly not the same as in a "live" situation, will be stable and appropriate for examination. Therefore, one might conclude that, while assertiveness training may best be conducted "live", it is not unjustifiable to conduct further experiments concerned with aspects of assertive behaviour using taped input.

Another issue raised by these results stems from the finding that, though the dependent variables are significantly intercorrelated, the response latency measure has a rather weak relationship with the others. Response latency forms a part of the Behavioural Assertion Test (Eisler et al., 1973), and it has been shown to differentiate levels of assertiveness in psychiatric patients (e.g., Eisler, Hersen, Miller & Blanchard, 1975). However, this study suggests that it may be a less important criterion with university students, whose assertion problems are in general less severe. In later assertiveness studies, the response-latency variable will be retained, in order to see whether this finding is particular to this group of students or is a more general one.

IV. 5.3. Conclusion

In conclusion, the assertiveness training programme appears an appropriate substantive area for the collection and analysis of data relevant to self-efficacy theory. As a number of different hypotheses were examined in this study, dealing with a number of issues within self-efficacy theory, further analyses of the data will be split across Chapters V, VI, VII and VIII, in each of which a different aspect of self-efficacy theory is examined, and a section of this study is presented together with data from other experiments.

The next chapter concentrates on the first of these issues, a question relating to the utility of self-efficacy theory: do self-efficacy measures predict performance, and can they be used to predict maintenance following behaviour change?

CHAPTER V.

THE USE OF SELF-EFFICACY MEASURES TO PREDICT THE EXTENT OF MAINTENANCE OF BEHAVIOUR CHANGE

V. 1. INTRODUCTION

Chapter IV has made a necessary diversion to describe in detail a behaviour change programme within which self-efficacy measures and their relationship to performance can be examined. This chapter returns to some issues raised by self-efficacy theory. Some of the theoretical issues - questions of whether efficacy expectations are better predictors of behaviour than are overt, observable, behaviours, and of whether efficacy expectations are more accurate than other cognitive measures as predictors - are dealt with in Chapters VII and VIII, while the methodological question of reactivity is discussed in Chapter VI. This chapter concentrates on a more practical issue, the question of whether measures of self-efficacy will predict the extent to which newly-acquired behaviours are maintained over time. Again it will be necessary to make a brief diversion in order to discuss the issue of maintenance, before returning to self-efficacy theory and its relationship to the problem.

V. 1.1. Maintenance of behaviour change

The point that academic behavioural psychology is primarily concerned with demonstrations of immediate control over behaviour and has neglected the more practical issue of producing permanent alterations in behaviour has been made frequently (e.g., Atthowe, 1973; Stokes & Baer, 1977). Despite the fact that the investigation of maintenance of behaviour change was discussed as a high priority during the early development of the behaviour modification field (Baer, Wolf & Risley, 1968; Bandura, 1969), researchers have tended to ignore the problem. Reviews by Keeley, Shemberg and Carbonell (1976) and Cochrane

and Sobol (1976) indicated that, of those research articles published in behavioural journals which dealt with therapeutic behaviour change in humans, only about 10% provided data of any sort on maintenance rates. Since then, the incentives to perform follow-up studies have increased (Kazdin, 1979b), and another, similar, study by LaDouceur and Auger (1980) showed that about 25% of relevant studies were presenting evidence concerning maintenance.

One reason for the continuing lack of enthusiasm for the subject may be that maintenance rates, when they are measured, are not generally high. In the area of health-related behaviour change, it is generally agreed that the number of people maintaining a new and healthy behaviour for twelve months can be expected to be around 30% of those making the initial change (Hunt, Barnett & Branch, 1971; Lee, Owen & Innes, 1981; Stunkard & Penick, 1979). Recently, reports of behavioural interventions specifically designed to enhance transfer to natural settings and maintenance across time have been reported (e.g., Owen, 1983) but these are still in developmental stages and have not yet shown consistent results. It is possible that the radically behavioural approach is not the most appropriate; recent work with fitness programmes has indicated that different people respond differently to standard behavioural interventions. In a study comparing a standard fitness programme with a programme which included maintenance-inducing addenda, Lee et al. (1981) found no overall difference in their effectiveness. However, when participants were divided into two groups on the basis of their Type A scores (Glass, 1977), an interaction was found: high scorers, characterised by more competitive behaviours, were more successful in the normal class, while low scorers, with less desire to compete, functioned better in the "maintenance" class which emphasised self-defined goals and an individual approach. Such a finding suggests that the wholesale application of behavioural techniques may not be appropriate, and that a more individual approach to maintenance may be more successful.

It could be argued from this finding that participants in fitness classes should be assessed using a measure of the Type A behaviour pattern and assigned to classes which are likely to maximise their chances of attaining and maintaining healthy habits. However, the use of broad personality questionnaires seems questionable in the light of other research. Chambliss and Murray (1979a,b) have produced very similar findings for smoking-cessation and weight-loss programmes using the personality variable of Health Locus of Control (Wallston, Wallston & DeVellis, 1978). This variable was included in Lee et al.'s fitness study, but did not produce any main or interaction effects when individuals of different scores and in different courses were compared. Should one therefore conclude that Pattern A responding is important in predicting ability to get fit, Health Locus of Control in predicting ability to lose weight or stop smoking, and some other personality variable to be important in distinguishing among people trying to stop drinking or get rid of obsessive ruminations?

Adopting such a piecemeal approach with the range of "personality traits" which could be imagined to relate to ability to maintain behaviour changes could lead to the design of an ever-increasing range of behaviour change programmes to suit people of various combinations of behaviour types. It seems more appropriate to look at individual differences which are specifically related to the behaviour in question. It seems reasonable in this context to look at self-efficacy, as self-efficacy theory is based in part on the argument that specific beliefs will be more important than general patterns of responding in determining specific behaviour, a view which has wide empirical support (Bandura, 1969). There is evidence from the area of pain tolerance that specific self-efficacy measures are better behavioural predictors than are global measures (Barrios, Anderson, Pagel & Spear, Note 9). Further, self-efficacy theory provides a model for developing techniques to alter levels of self-efficacy, and

there is abundant evidence, reviewed in Chapter III, that self-efficacy reports are excellent predictors of behaviour in the short term. If it can be shown that self-efficacy beliefs will predict the extent of long-term maintenance, then it seems feasible that self-efficacy measures can be used to make decisions concerning termination of behaviour change programmes, number and extent of "booster sessions" following therapy, and other matters concerned with maintenance which are normally decided on the basis of clinical judgement or rules of thumb.

Evidence relating self-efficacy to extent of successful maintenance and to specific situations in which adherence is most likely to break down does now exist for the case of smoking cessation (Condiotte & Lichtenstein, 1981; DiClemente, 1981). However, at the time this study was being planned, in 1980, there was no such evidence and it was decided that a study examining this relationship should be performed. The intention was to design and carry out a behaviour change programme which included measures of self-efficacy and to examine levels of maintenance following the programme. For the reasons outlined in Section IV.1, an assertiveness training programme was designed and run with a group of students in order to test a range of hypotheses concerned with aspects of self-efficacy theory. This programme incorporated a three-month follow-up test of maintenance, and it was decided to use this as a vehicle for examining the accuracy with which efficacy expectations predict maintenance of behaviour change.

V. 2. MAINTENANCE STUDY I - MAINTENANCE OF ASSERTIVE BEHAVIOUR

The entire assertiveness training programme is described in detail in Chapter IV. This section summarises relevant sections of the method.

V. 2.1. Method

V. 2.1.1. Participants and apparatus

These have already been described in detail in Sections IV.2 and IV.3. Forty-six female students, with a mean age of 17 years 10 months, were identified as nonassertive on the basis of a mass administration of the CSES, a global measure of assertiveness, to a class of 262 first-year psychology students. They participated in a six-week programme of role-playing, using role-play situations derived from items in a number of assertiveness inventories. Twenty-one of them returned for maintenance testing three months after the completion of the programme.

V. 2.1.2. Procedure

Participants were seen individually by the experimenter for six half-hour sessions over a six-week period. During each session, participants completed "self-rating scales" designed to measure efficacy level and strength for each of a series of situations requiring an assertive response of some kind. They then listened to descriptions of situations matching the items in the self-rating scale and responded verbally to each one. The description sets were recorded on audiotape for Sessions 1 and 6, so that all students received identical input. In Sessions 2 to 5, a randomly-selected half of the participants heard tapes of each set of situations, while for the other half the information was read to them "live" by the experimenter. Discussion of responses and possible alternatives completed each session. A different set of items was used in each

session except that, in Session 6, the participant repeated the taped set she had used in Session 1 and then repeated the entire procedure of efficacy measurement and performance with a second tape in order to assess generalisation. A randomly-selected half of the participants used Tape 1 in Session 1 and repeated it in Session 6, before using Tape 6 as a generalisation measure. For the other half, the order of tapes was reversed so that Tape 6 was the repeated task and Tape 1 the generalisation measure. The CSES was also repeated in Session 6.

Owing to time constraints, it was not possible for all to participate concurrently. 26 students participated during the first ten-week term of the university year, and 20 during the second term. Three months after the sixth week of the programme, those students who had participated in the first term were asked to return for maintenance testing, and 21 did so. The 20 participating in the second term were not asked to return, as three months after the second programme finished they were sitting their final examinations, and it was considered unrealistic to expect them to participate in testing at that time.

At the maintenance assessment session, students repeated the "self-rating scale" and tape they had used in Session 1 (either Tape 1 or Tape 6) and completed the CSES once more.

V. 2.1.3. Audiotape rating

A graduate student, blind to the purposes of the experiment, rated responses to all items on each of three variables: assertiveness, on a scale from 0 to 6; appropriateness, on a scale from 0 to 6; and latency to begin response, measured in tenths of a second. Full descriptions of the rating scales and techniques, and agreement measures between judges, are given in Section IV.3.3.

V. 2.2. Results

V. 2.2.1. Preliminary remarks

Analyses examining the effectiveness of randomisation procedures, and those assessing the extent of assertiveness changes, have been reported in Section IV.4, and the findings are summarised here.

Students participating in the first and second terms did not differ on initial CSES scores, self-efficacy, or any of the "performance" measures for their first tape. Nor were there differences between participants in the "tape" and "live" conditions, nor between those responding to Tape 1 and those using Tape 6. This indicated that Tape 1 and Tape 6 were equivalent in response difficulty, and therefore that it was legitimate to use one to assess the generality of changes in scores on the other.

Significant increases in self-efficacy and performance measures were found when performance on the tape repeated in Session 6 was compared with performance on the same tape in Session 1, and also when mean scores for each of the six sessions were compared. CSES scores in Session 6 were significantly higher than those at the beginning of the programme.

Scores on the "generalisation" tape in Session 6 were significantly higher on all variables, both performance and self-report, than scores on the test tape in Session 1. Compared to the repeated performance on the test tape in Session 6, performance on the "generalisation" tape was characterised by significantly lower efficacy strength and significantly longer response latencies, but no difference in efficacy level, assertiveness score, or appropriateness score.

The twenty-one students who returned for follow-up testing three months later repeated their "test" tape. Scores on all variables were found to be significantly higher than scores on the same tape in Session 1; there were no

significant differences between performance on the "test" tape in Session 6 and performance on the same tape at follow-up, except that efficacy strength had increased significantly. CSES at follow-up was found to be significantly higher than at Session 1, but not significantly different from the scores at Session 6. Thus, the assertiveness training programme was associated with significant increases in assertiveness and efficacy which had some generality and were maintained at three-month follow-up.

V. 2.2.2. Efficacy as a predictor of behaviour: item matches

Microanalysis (Bandura, 1977a) of items was used to assess the match between individual efficacy predictions and the performance items with which they were matched. In this technique, predictions of individual items are compared with performance scores on those items, in order to establish whether prediction matches performance. This item-by-item technique is a more stringent test of the predictor's accuracy than are techniques such as correlation which combine predictor and outcome variables across a range of items. In order to assess the match between predictor and performance, all variables are dichotomised. Thus, for any two variables, there are four possible combinations: a "yes" prediction and a "yes" performance; a "no" prediction and a "no" performance; a "yes" prediction and a "no" performance; a "no" prediction and a "yes" performance. The first two cases are classified as matches, the last two as "misses".

Using this method, the match between each efficacy prediction and its associated performance item was assessed. All variables were dichotomised. Efficacy level was already a dichotomy; efficacy strength was split, with scores of 50 or above classified as positive. The appropriateness scale was split so that scores of four or above were classed as appropriate; the assertiveness scale was split in the same way, except that scores of 6

TABLE V.1. Measures of microanalytic match between the two efficacy measures and the two performance measures in Maintenance Study I, over all sessions combined.

	Assertiveness				Appropriateness			
	Chi square	% accurate	Phi coefficient	n	Chi square	% accurate	Phi coefficient	n
Efficacy level	755**	85.5	0.65	1792	653**	89.7	0.60	1788
Efficacy strength	243**	72.5	0.37	1792	567**	87.4	0.56	1788

** $p < .001$

Note: Number of cases is less than total number of items performed by all participants in all sessions (= 2560) because of missing cases caused by participants failing to complete forms correctly, tape players malfunctioning, and the fact that efficacy was measured for only half of the items in Sessions 3, 4, and 5.

(= aggressive) were classified with those below 4 as nonassertive. Owing to the nonlinear nature of the distribution of "latency" scores, the corresponding problem with dichotomising the scores meaningfully, and the fact that response latencies were not closely related to any other performance variables, it was decided not to include latency scores in these analyses. Table V.1 shows the overall item match for all items in all sessions, including follow-up. All chi-square values are highly significant, and the phi coefficients are moderate to high, indicating that efficacy measures are indeed accurate predictors of behaviour at a microanalytic level. Percentage matches and chi squares were also calculated separately for each session, for efficacy level as a predictor of assertiveness and appropriateness. Although there was some increase in

TABLE V.2. Microanalytic match between efficacy level and performance measures for each session separately in Maintenance Study I.

	Assertiveness				Appropriateness			
	Chi* square	% accurate	Phi coeff.	n (items)	Chi* square	% accurate	Phi coeff.	n (items)
Session 1	126.6	83.1	0.59	368	118.4	84.7	0.57	366
2	63.4	81.1	0.59	180	89.5	87.7	0.71	179
3	22.1	85.4	0.35	178	30.0	92.7	0.41	178
4	15.6	85.0	0.29	180	24.4	89.5	0.37	180
5	35.1	84.8	0.44	180	44.3	86.7	0.50	180
6a	145.7	91.0	0.91	360	187.0	94.0	0.72	360
6b	78.5	86.3	0.48	346	137.7	92.2	0.63	345
M	43.3	95.2	0.51	167	43.7	97.1	0.51	167

* $p < .001$ in each case

Note: The number of items is less than the actual number of role-plays performed because of missing cases caused by participants failing to complete forms correctly, tape players malfunctioning, and the fact that efficacy was measured for only half the items in Sessions 3, 4 and 5.

accuracy across time (assertiveness: $F_{6,246} = 2.10$, $p = .054$; appropriateness: $F_{6,234} = 3.47$, $p = .003$), matches within individual sessions were all extremely high, ranging from 81.5% to 97.0%. All individual X^2 scores were significant at or beyond the .001 level of probability. Details appear in Table V.2.

V. 2.2.3. Efficacy as a predictor of maintenance

In order to judge whether efficacy scores could predict level of maintenance, efficacy judgements given for the "test" tape in Session 6 were compared with performance ratings of the same tape in the follow-up session, using the same microanalytic technique, so that specific items were matched. Table V.3

TABLE V.3. Maintenance Study I - microanalytic match between efficacy measured at Session 6 and performance on the same items at three-month maintenance testing.

	Assertiveness				Appropriateness			
	Chi square	% accurate	Phi coeff.	n	Chi square	% accurate	Phi coeff.	n
Efficacy level	95.7**	95.8	0.76	168	153.4**	98.2	0.96	167
Efficacy strength	35.1**	82.6	0.46	168	36.4**	82.6	0.47	267

** $p < .001$

presents the overall item matches for all 21 follow-up participants, across all 8 items. Clearly the relationships between efficacy and behaviour are strong, particularly for efficacy level. If Tables V.1. and V.3. are compared, it can be seen that the item match between Session 6 predictors and follow-up performance is greater in three of the four cases than is the overall item match comparing efficacy and behaviour within sessions. Comparisons of chi-square values are not legitimate because of the different numbers of items involved, but both phi coefficients and percentage-accuracy scores indicate a stronger match for the maintenance predictions, except in the case of efficacy strength predicting level of appropriateness.

Correlational analyses were also performed; session totals were computed for efficacy level and strength for the test tape at Session 6, and for assertiveness and appropriateness, at the maintenance testing session. Table V.4. presents

TABLE V.4. Maintenance Study I - correlations between total efficacy scores for Session 6 and total performance scores for the same items at three-month maintenance testing.

	Follow-up	
Session 6	Assertiveness	Appropriateness
Efficacy level	.72**	.65**
Efficacy strength	.46*	.48*

* $p < .05$ ** $p < .001$

the resultant correlations. Those between efficacy level and later performance are very high, while those between efficacy strength and performance are moderate but still significant.

V. 2.3. Discussion of "maintenance of assertive behaviour" study

V. 2.3.1. Summary of results

The analyses reported in the previous section indicate a strong relationship between efficacy expectations and performance measures, both at a micro-analytic and at a correlational level. When efficacy expectations from Session 6 are used to predict performance at three-month follow-up, a strong and highly significant match is found.

V. 2.3.2. Discussion of these results

These findings give some support to the idea that efficacy measures could be used a predictors of maintenance following behaviour change. However, the actual level of maintenance found in this programme is very high. Overall performance at follow-up testing was very similar to that at the end of the programme. It is possible, then, that the close match is confounded by a lack of variation following the termination of the programme. It is well known that maintenance rates following health-related behaviour change programmes are typically as low as 30 to 50% in the first six months (Lee & Owen, Note 13). These much larger changes in behaviour between the end of a programme and assessment of maintenance could mitigate the relationship between efficacy and behaviour. For this reason, it was decided that a second study should be conducted using a behaviour change programme which, on the basis of previous research, was less likely to be successful in producing high maintenance rates. A fitness training programme was chosen, and it was decided to measure individuals' self-efficacy, including questions specifically directed at level of

confidence that exercise could be maintained, and then to examine maintenance rates six months after the termination of the fitness programme.

V. 3. MAINTENANCE STUDY II - MAINTENANCE FOLLOWING FITNESS TRAINING

V. 3.1. Introduction

V. 3.1.1. Benefits of physical fitness

Programmes to promote physical activity are widespread, and there is evidence that regular exercise will protect against coronary heart disease (Morris, Everitt, Pollard, Chave & Semmence, 1980). Obesity, a significant risk factor in the development of many diseases, including heart disease and diabetes, is reduced by exercise, both through direct expenditure of energy (Stuart & Davis, 1972), and through reductions in appetite and increases in metabolic rate which persist for some time following exercise (Allen & Quigley, 1977). There is also some evidence that exercise protects one from stress-related illnesses by increasing the body's tolerance to the physiological changes common to both exercise and the stress response (Eliot, Forker & Robertson, 1976). Exercise may also have mental health benefits, relieving depression and anxiety-related disorders (Buffone, 1980; Folkins & Sime, 1981; Ledwidge, 1980), and there is speculation that it can produce altered states of consciousness (e.g., Egger, 1979; Glasser, 1976).

V. 3.1.2. Maintenance problems

Despite the proven and putative benefits of exercising, most people do not exercise regularly, with only 16% of adult males and 9% of adult females reporting sufficient regular exercise to improve or maintain cardiovascular fitness (National Heart Foundation of Australia, 1981). Community-based

fitness courses are gaining in popularity, but previous research with the exercise courses to be examined in this chapter has shown that only 50% of participants who volunteer to return for fitness tests 12 months after completing a course had maintained their level of fitness. For two-year follow-up assessment the figure was 30%, and at three years 5% (Lee et al., 1981). This finding appears to be typical for such courses. For example, Carmody, Senner, Manilow and Matarazzo (1980) found 70% adherence after four months of an ongoing programme and 54% after eight months. This study examines a slightly different phenomenon from the one addressed in this chapter, as it assesses adherence to a continuing programme rather than maintenance following the cessation of a short-term programme, but the similarity of these findings suggests that maintenance of exercising is a general problem.

The purpose of the study to be reported was to determine whether self-efficacy could be used to predict levels of maintenance following a fitness course. "Ceiling" effects would be avoided by the low natural rate of maintenance, and a replication of the previous study in a more natural and less controlled study would provide some indication as to whether the use of efficacy as a predictor of maintenance was feasible in natural settings.

V. 3.2. Method

V. 3.2.1. Participants

The population for study comprised all those people who had enrolled for "comprehensive fitness" classes at the Institute for Fitness Research and Training in September of 1981. 222 people, 135 women and 87 men, were enrolled in fifteen different classes in a number of locations around Adelaide. Trainees from these classes are recruited from the general public, and previous work (Lee, Note 14) has indicated that they are mainly white collar and

professional workers, with a mean age of approximately 38 years, and an age range from teens to mid-seventies. Each class meets for two one-hour sessions a week for twelve weeks, and qualified instructors lead the groups through individually graded programmes of stretching and aerobic exercise.

V. 3.2.2. Procedure

In the first week of the programme, trainers were asked to administer self-efficacy questionnaires to the trainees in their programmes. This was done in the first week rather than the last because of the pattern of attendance common to these classes. Evidence from an earlier study (Owen, Note 15) has indicated that trainees at IFRT attend, on average, about 7 of the first 8 training sessions of their course, but only about 4 of the last 8. In order to ensure that a large enough sample would be available for assessment of self-efficacy, it was decided that an initial self-efficacy measure would have to be used.

The relationship between fitness trainers and the organisational centre of the Institute for Fitness Research and Training is a fairly loose one, and requests for information from classes are not necessarily followed up. On this occasion, trainers actually distributed questionnaires in eight of the fifteen classes, a total of 114 people. Of these, 50 returned completed self-efficacy forms. This, of course, is less than a quarter of the total number enrolled in courses at the time, and there is no evidence to suggest that it is not a particularly biassed subgroup. However, given the looseness of the organisational structure, it seems that this is about the level of return to be expected without destroying some particular characteristics of the situation which make it a natural, uncontrolled setting. It was decided to proceed with the study, bearing in mind that this sample could well be biassed. The people whose trainers were interested enough in research, or conscientious enough, to hand

out the questionnaire, and who were sufficiently conscientious to return them, may well be more committed to exercising or more strongly motivated. While there is no reason to suppose that the relationship between efficacy and behaviour will be different for this sample than for the population as a whole, there is no reason to suppose that it will be the same.

The self-efficacy questionnaire used is included in Appendix B.1. It consisted of eight questions, which measured the strength of the individual's efficacy that he or she could attain an increased level of fitness, incorporate exercising into the pattern of his or her daily life, maintain that pattern of exercise, and cope with disruptions such as holidays or illness without ceasing regular exercise.

A brief one-page maintenance questionnaire was designed to obtain the following information: whether the trainee was still exercising; if so, whether alone or in a group; if not, what had influenced him or her to stop; the number of occasions in the previous week on which the trainee had exercised vigorously for 15 mintues or more, the type of activity, and the length of time spent; whether the trainee had suffered any injuries which had affected exercising patterns. A copy of the questionnaire is included in Appendix B.2. Six months after the final session of the exercise course, those people who had completed self-efficacy questionnaires at the beginning of the course were contacted by phone, and the questionnaire completed by the experimenter on the basis of the trainee's verbal reports.

V. 3.3. Results

V. 3.3.1. Preliminary analyses

Thirty-eight people (11 men and 27 women), or 76%, were contacted. Contact took an average of 2.2 phonecalls to home or business numbers. Five (10%) were found to be outside the State throughout the four weeks of follow-up, and it took an average of 2 phonecalls to establish this. Seven (14%) could not be contacted after an average of 3.9 attempts.

Of the 38 located, 22 (58%) reported that they were still exercising regularly, 5 alone and 17 with a formal or informal group. These 22 were exercising an average of 2.7 times a week (mean including non-exercisers = 1.5 times) for an average total period of 2.7 hours (mean including non-exercisers = 1.6 hours). 8 of those followed up reported minor injuries, and 3 serious injury or illness.

V. 3.3.2. Efficacy as a predictor of maintenance

The self-efficacy scale included eight questions, only two of which (items 5 and 6) dealt specifically with maintenance following the programme. The correlation between the two maintenance items was .92, and Cronbach's alpha for the entire scale was .86. It was decided to use the mean of Items 5 and 6 and the scale mean separately as predictors of maintenance, and to perform analyses separately for each.

Table V.5 sets out the mean scores on these predictors for subgroups of the ex-trainees. There were no differences between males and females in initial efficacy, nor between those successfully located for follow-up and those not located. Of the dichotomous outcome variables, there was no significant difference in efficacy for those reporting persistence with exercise and those reporting no exercise, although there was a trend for those still exercising to have had slightly higher initial efficacy. A very slight trend was apparent

TABLE V.5. Maintenance Study II - efficacy scores averaged across entire self-efficacy scale (mean efficacy) and across maintenance items only (maintenance efficacy), for subgroups defined by sex, success of follow-up, and dichotomous follow-up variables.

Variable		n	Mean efficacy		Maintenance efficacy	
			mean	F	mean	F
Sex:	female	34	71.3	0.11	69.5	0.63
	male	16	69.7		64.4	
Whether contacted:	yes	38	71.6	0.57	68.3	0.07
	no	12	67.7		66.4	
Report exercising now:	yes	22	75.1	2.53	70.4	0.46
	no	16	66.9		65.3	
Report injuries:	yes	11	73.0	0.29	71.8	0.49
	no	27	70.1		66.7	
Exercising:	alone	5	91.7	5.70*	87.5	2.88
	in group	17	71.0		66.5	

* $p < .05$

for injuries, with those reporting injury characterised by very slightly higher initial efficacy. Those who reported that they exercised alone had had significantly higher mean efficacy than those exercising in formal or informal groups, but this difference was not significant for those efficacy questions relating to maintenance only.

TABLE V.6. Maintenance Study II - correlations between efficacy measures and reported level of exercise at six-month follow-up.

	Mean efficacy	Maintenance efficacy
Reported time spent exercising	-.01	.11
Reported number of exercise periods	.14	.22

Note: n = 38 in each case. In no case does the relationship between the variables reach an acceptable level of significance.

Correlational analyses were carried out between mean efficacy and maintenance efficacy on the one hand, and reported hours of exercising and number of exercise sessions on the other. Table V.6 summarises these correlations. All are small, and none reaches an acceptable level of statistical significance.

V. 3.3.3. Summary of results

The rate of maintenance of exercise within this population was found to be 58%. Self-efficacy measured at the beginning of the three-month course was not an accurate predictor of extent of exercising six months after the course finished. Of those people still exercising, those exercising independently had had significantly higher mean initial efficacy than those exercising in groups, although this difference was not significant when the efficacy items involving maintenance only were examined.

V. 4. DISCUSSION OF MAINTENANCE STUDIES I AND II

The first study reported in this chapter, dealing with maintenance following assertiveness training, found that self-efficacy was a highly accurate predictor of performance at follow-up. The second study, which dealt with maintenance following an exercise course, failed to show strong relationships between efficacy and behaviour. There are many differences between the two studies which may begin to explain these discrepant results.

The first and most obvious difference is the difference in tasks and the different levels of involvement required for maintenance of each. Assertive responding is largely a cognitive task which requires the learning of a number of cognitive skills. It is possible that an individual, having developed these skills during a training programme, could demonstrate them three months later without necessarily having practised them regularly in the meantime. In order to maintain the physical skills and capacities involved in exercising, however, it is necessary to continue making use of those skills at least three times a week for periods of at least fifteen minutes at a time (American College of Sports Medicine, 1978). It is possible that the fact that the exercisers had to continue in this way, organising time each week for the maintenance of this activity, could mitigate the relationship between self-efficacy and reported activity. Exercising is an activity which occurs in a natural setting in which any number of external and uncontrollable events can prevent exercising or interfere with a regular programme of exercise (Owen, 1983). Such events as illness, pregnancy, change of employment hours, and changes in other activities may be unforeseen at the beginning of a fitness course but may prove insurmountable obstacles to continued exercising.

A second, related, reason for the discrepant results could be the different methods of assessment of maintenance. In the assertiveness study, participants

were asked to return for a maintenance test; it is possible that, although they were able to produce assertive responses in that situation, they were not regularly acting assertively in natural situations. For the exercisers, a phone call was made without warning, so that they were reporting on their usual level of activity, rather than, as those in the "assertiveness" study might be doing, producing behaviours which differed from their usual responses in order to coincide with what they believed the experimenter expected. This difference in method may produce differences in the obtained relationship between efficacy and performance. The second method has more ecological validity and is less intrusive and artificial than the first, though the results fail to support the idea that self-efficacy can predict maintenance.

Another difference relates to the time at which efficacy measures were taken. In the assertiveness training study, efficacy at the end of the training programme was used as a predictor of maintenance, but in the exercising study efficacy measures were taken at the beginning of the programme. This timing is not of course ideal, but in an applied setting with very few constraints on participants it can be necessary to make compromises in design in order to carry out research at all (Cowen, 1978). The efficacy questionnaire did include items which asked specifically about the individual's belief in his or her ability to maintain a pattern of exercising. However, at the beginning of the course, a participant may have little idea of the requirements of the course, of whether he or she will find it enjoyable, or of practical problems which may be encountered. Thus, efficacy responses at this point may be relatively uninformed judgements and may be radically different from the more educated assessments made after some experience with exercising.

A difference in the actual wording of the questionnaires is that in the exercising study participants were specifically asked to predict whether or not

they would maintain their exercising habits, while in the assertiveness study predictions of performance in the short term were taken and applied to later performances. However, one would expect that the effect of this difference would be to decrease the relative accuracy of the assertiveness efficacy judgements as predictors of maintenance, rather than to produce the reverse effect found in this chapter. This suggests that this may not be a particularly important point.

Another issue previously mentioned which seems likely to be important is that of the actual level of behaviour and rate of maintenance. Maintenance rates in the assertiveness study were very high, and performance ratings at the end of the programme were approaching maximal levels. By comparison, the maintenance rate in the exercise study was only 58%. This rate is characteristic of findings in this area (Lee & Owen, Note 13). It is possible that in the assertiveness study there is a "ceiling effect". Differences in performance between the final session of the programme and the maintenance session are minimal, and the fact that efficacy at the end of the programme predicts maintenance so well may result from this extremely high maintenance rate rather than from the long-term accuracy of self-efficacy as a predictor.

Thus, overall, the evidence that efficacy can be useful in predicting maintenance is not strong. While the assertiveness study does indicate a strong relationship, a number of methodological points such as the artificiality of the situation and the high maintenance rate serve to weaken the conclusions which can be drawn. However, there are suggestions in these data that efficacy could be useful in predicting assertiveness. It is possible that a more satisfactory result would have been obtained in the exercising study if efficacy measures had been taken at the end of the programme and were based on a more informed knowledge of the individual's capabilities. These data cannot

be used to reject the notion that efficacy expectations could be used to make decisions concerning the time at which behaviour change programmes should be terminated. It does appear that there is a relationship between self-efficacy and the level of independent maintenance of the relevant behaviour. But it must be pointed out that the data offer rather less support for this argument than might at first appear. The fact that, between subjects, efficacy does to some extent predict maintenance does not necessarily mean that, for any one subject, changing efficacy will change the level of maintenance. While this seems probable in the light of the findings of this chapter, further research examining this point specifically must be conducted.

In conclusion, then, these studies indicate that efficacy is a good predictor of maintenance in a tightly-controlled laboratory study, but less so in a field setting where a range of uncontrollable and unexpected events can influence maintenance. Much of the initial work on self-efficacy theory has been conducted in relatively tightly controlled situations high in internal validity but perhaps not ideal in external validity. While this is essential when the purpose of the study is to examine basic relationships between variables (Bandura, 1979), such studies have been criticised (e.g., Kazdin & Rogers, 1978) as having little to tell about how these relationships actually work in field settings. Many factors which can alter these relationships will come into play in such settings. Because of the practical and theoretical importance of being able to predict levels of maintenance in individuals, it seems worthwhile continuing investigations in order to elaborate more fully the extent to which efficacy is a useful predictor. The timing of measurement and the tailoring of programmes on the basis of efficacy scores are two subjects to be considered. Research in the area of stopping smoking has produced results which suggest that there may be a relationship between efficacy and maintenance in natural settings. DiClemente (1981), for example, has shown moderate but significant relationships

between stop-smoking efficacy and maintenance of non-smoking, in an applied study which has considerable external validity as well as a rigorous design. Such reports were not available when this study was planned, but they indicate that it would be premature to reject the notion that efficacy measures can be useful predictors of maintenance in natural settings. Possibilities for further research in this area are discussed more fully in Chapter IX.

The following chapter follows up a particular threat to the internal validity of self-efficacy research and therefore to its possible applicability in field settings. This issue is the question of whether there are reactive effects of the measurement of self-efficacy on behaviour.

CHAPTER VI.

REACTIVITY IN MEASURING SELF-EFFICACY

VI. 1. INTRODUCTION

The previous chapter has presented evidence to suggest that measures of self-efficacy can serve as accurate predictors of behaviour. However, it can be argued that the act of measuring efficacy can serve to alter behaviour so that it conforms with reported efficacy, and it is this suggestion which is examined in this chapter. If the findings of experiments involving explicit measurement of self-efficacy are to be applicable to everyday events in which self-efficacy is not actually measured, it must be shown that the process of measurement does not distort behaviour in any systematic way.

The standard form of measurement of self-efficacy, described in Section III.1.1, has been criticised by Borkovec (1978) and Poser (1978), who point out that there is ample evidence for the distortion of self-reports through the demand characteristics of the situation, suggestion, and expectation. Bandura (1978b) tends to minimise this possibility, pointing out that it is the responsibility of the researcher to establish conditions under which the subject has the strongest incentive to respond honestly. He points out that subjects are capable of biassing their responses in any task, and that it is a general problem in psychological research to produce situations in which there is no incentive to respond other than honestly. This has been followed up by work by Telch et al. (1982) which indicates the importance of minimising evaluation anxiety in producing accurate reports of self-efficacy. They examined a group of snake phobics who were led to believe that their self-efficacy reports were for their own use only (low evaluation) or to be used to assess their progress (high evaluation). Contrary to their prediction, they found a higher level of congruence in the low-evaluation group than in the high-evaluation group.

This difference in congruence disappeared after a brief treatment experience with a snake. Their interpretation of this unexpected finding was that individuals in the high-evaluation group were motivated to comply with a social norm of conservatism or modesty in predicting their own abilities in a strange situation, and that the effects of this social norm were quickly overridden by the effects of experience. This finding is in direct contradiction to the suggestion of Tryon (1981), who argued that there is a strong social norm that congruence between report and action should be high, and that this norm will tend to produce artificially high efficacy/behaviour relationships.

Tryon (1981) has suggested that high matches between efficacy and behaviour may be explicable by the subjects' perception of congruence between verbal and motor behaviours as a socially desirable quality. Bandura (1982a) has replied to this argument by pointing out the precautions taken in his own experimental work to avoid such contaminating effects. He argues that the wording of the assessment questionnaire, which emphasises capability rather than behavioural intention, the use of "private" recording of judgements, and the use of different experimenters at different points in the data-collection process will all serve to minimise such effects.

However, there are other factors besides the social demand characteristics of the situation which could produce reactive effects. Kazdin (1978) and Poser (1978) both point out that the behaviours listed in the efficacy scale are of necessity exactly the same behaviours as those in performance tests. If there is any reactivity between the two, this should be reflected in artificially high correlations between efficacy and behaviour. Also, if the completion of an efficacy scale affects behaviour, this casts doubt on the applicability of experimental findings to settings in which explicit efficacy

ratings are not made. Although Bandura (1978b) has dismissed reactive effects as unlikely and probably trivial in size, there is some experimental evidence that the act of predicting possible future behaviour can serve to modify that behaviour. Sherman (1980) has shown that, when people are asked to predict their social behaviours, they tend to respond with predictions that are more "socially desirable" than are the actual behaviours of similar people. In three related studies, he found that most people predicted that, if asked, they would refuse to write an essay expressing opinions to which they were opposed; they would refuse to sing The Star Spangled Banner over the telephone; and they would agree to collect money for cancer research. When they were put into the posited social situations, they tended to act in a socially desirable way that matched their predictions (both at a correlational and at a micro-analytical level) and differed significantly from the behaviour of people who had not previously made any predictions about their behaviour in those situations. This study indicates that the making of predictions about behaviour can produce significant effects on behaviour.

Evidence more directly related to measurement of self-efficacy also exists. Bandura (1978b, 1982b) cites Brown and Inouye (1978) as offering some evidence that making self-efficacy predictions about behaviour does not alter that behaviour. However, they have only fifteen subjects for this particular analysis. And all fifteen had been exposed to a person modelling the required behaviour, the solving of anagrams. The effects of observing the model between completing the efficacy scale and performing the behaviour may well have been enough to counteract any reactive effects of taking the test. Further, although Brown and Inouye found that efficacy beliefs and behavioural persistence differed systematically across conditions, there was no corresponding difference in actual performance. They claim to have controlled performance by making

the task difficult, but they offer no evidence to support this contention, and it seems that efficacy levels varied across conditions while actual level of performance did not. This must cast some doubt on the contention that efficacy responses will not be affected by temporary events such as experimental manipulations.

Gauthier and Ladouceur (1981) have looked more adequately at the question of the reactivity of efficacy reports. Their study dealt with snake phobics, and involved two identical behaviour tests interspersed with either an efficacy measure or a "distractor" item. They found no difference in performance in the second behavioural test between people who had completed the efficacy questionnaire and those who had not. Further, it made no difference whether efficacy was reported on paper, or orally to the experimenter. Gauthier and Ladouceur concluded that completion of the efficacy measure did not affect later behaviour.

This experiment, however, can be criticised on several grounds. First, it concentrates on the reactivity of the questionnaire on the behaviour test, and ignores the possible reactivity of having to perform the test on responses to the questionnaire. Wilson (1978) has pointed out that it may be necessary for an individual to perform the test before he or she has adequate information to formulate an efficacy rating, and that this necessary procedure may produce difficulties in obtaining uncontaminated measures of efficacy. Second, this study involves efficacy level alone, and ignores strength. It is possible that effects would show in efficacy strength measures before they appeared in efficacy level measures. People may respond to reactive influences by changing the confidence they have in their ability to perform particular items, rather than by changing the number of items they believe they can perform. Thirdly, the double administration of the behaviour test produced large and significant

changes in behaviour over time, which may serve to obscure any more subtle effects.

So, while there is evidence which suggests that tests of efficacy are nonreactive, there are problems of experimental design which prevent this evidence from being conclusive.

It is also possible, as Wilson (1978) has implied, that performance of the behavioural test may have reactive effects. Indeed, there is experimental evidence to support this contention. In a study involving treatment for snake phobia, Bandura et al. (1977) used a post-treatment test including an efficacy measure, a behavioural test, and another, identical, efficacy measure. When efficacy levels at these two testings were compared, a significant increase in efficacy was found in the control group. Bandura and Schunk (1981), examining the acquisition of subtracting skills in children, also administered efficacy tests immediately before and after their behavioural post test. They found significant changes in efficacy level for two of their three experimental groups, one group showing significantly higher efficacy after the behavioural test than before, and the other showing lower efficacy.

This evidence seems to indicate that a behavioural test is more than just an independent, non-reactive measure of behaviour; performance of a test affects one's beliefs and expectations about one's ability to perform the behaviours involved. So there is some evidence that performing a behavioural test may affect responses to an efficacy questionnaire; and there is good reason to suppose from the Sherman data, which may apply to efficacy studies, that making predictions about behaviour can alter that behaviour.

The question of whether or not efficacy measures are reactive is clearly important in making inferences from experimental situations in which efficacy is measured to natural situations in which no explicit measures of efficacy

are taken. The studies to be described in this chapter address the question of the reactivity of self-efficacy measures and, in the first case, of behavioural testing.

VI. 2. REACTIVITY STUDY I - SNAKE PHOBIA

The first study was designed to use tests as similar as possible to Bandura and colleagues' early studies with snake phobics. An eighteen-item questionnaire identical to that used by Bandura (e.g., Bandura et al., 1977) was obtained, and the same eighteen items were used to construct a behavioural hierarchy.

Four experimental conditions were involved. Participants in the first condition completed the questionnaire only, knowing they would not actually be asked to perform any of the behaviours involved. The second condition consisted of the behavioural test only. In the third condition, completion of the questionnaire was followed by performance of the behavioural test, as would normally be done to assess efficacy and performance, and participants in the fourth condition completed the behavioural test first, followed by the questionnaire.

If either measure was not influenced by reactive effects, one would expect no significant differences in responses on that measure across conditions. If completion of the questionnaire had some effects on behaviour, one would expect individuals in the third condition, who by completing the questionnaire had made a commitment or set themselves a goal to reach a certain behavioural level, to perform significantly more items than those in the second or fourth, who had not made any such commitment before acting. If performance of the task affected questionnaire responses, a difference in questionnaire responses would be expected between the last two conditions. The direction of this

difference could not be predicted on a priori grounds, as the existing evidence shows significant effects in both directions. One would also predict that questionnaire response level would be higher for people in the first condition than those in the others, as these participants are aware that their responses are not to be compared with actual behaviour at any stage, and may therefore be less conservative about their abilities.

VI. 2.1. Method

VI. 2.1.1. Participants

It was considered unethical to assign phobic students to the experiment as part of their course requirements, since exposure to snakes could have been an unpleasant experience for some. Therefore, advertisements were placed around the campus asking for phobic volunteers. Since no therapeutic benefits were offered, there was great difficulty in obtaining volunteers. Following the recommendations of Kraemer (1981), it was decided that a sample size of 10 per group would be an adequate minimum with which the study could proceed. Only 39 could be obtained, but it was decided to proceed on that basis. Twenty females and nineteen males, with a mean age of 20.9 years, took part. Twenty were first year psychology students, and the rest were students in other courses, clerical staff, and other interested people.

VI. 2.1.2. Design

Participants were assigned to the following four conditions randomly, except that it was ensured that five females were included in each group.

Q. Questionnaire only (n = 10)

B. Behavioural test only (n = 10)

QB. Questionnaire, then behavioural test (n = 10)

BQ. Behavioural test, then questionnaire (n = 9)

VI. 2.1.3. Experimental animal, rooms, apparatus, and measures

The snake used was a Woma Python (aspidites ramsayi), a harmless snake found in central Australia. It was light brown in colour and approximately 1.5 metres in length. For the purposes of the experiment, the snake was placed in a glass terrarium measuring 1 x .75 metres in base area, with sides approximately .75 metres high, kept empty except for a bowl of water. The terrarium was placed in an otherwise empty research room in the South Australian Museum. Following each experimental trial, the snake was returned to its own cage. A pair of leather gardening gloves was used for those items in the hierarchy specifying actions to be performed with gloved hands.

The measures were based as nearly as possible on those taken by Bandura and his colleagues (e.g., Bandura et al., 1977) in their studies of snake phobia. The questionnaire, to be found in Appendix C.1., listed 18 activities which could be performed with a snake, arranged in a hierarchy from "look at snake in a glass cage from a distance" through approaching the cage, touching and lifting the snake with and without gloves, to the final item, "tolerate snake in lap". Participants indicated whether or not they believed they could perform each item with a harmless snake; for those items they indicated ability to perform, they also gave a confidence rating from 1 to 100, as previously described. This provided measures of efficacy level and strength. The behavioural test involved the same eighteen items in the same order.

VI. 2.1.4. Procedure

Each person participated in a single individual session. The participant was met in an office, and the purpose of the experiment was explained as follows:

> "This experiment examines a method which is used to assess degree of fear of snakes. The method consists of

two parts, a questionnaire listing behaviours and a performance trial involving the same behaviours. Normally a person completes the questionnaire and then does the behavioural test. What I'm interested in is whether these two parts give the same answers alone as they do together, or whether they are different, so I'm getting people to do just one part and not the other, or both of them, and seeing if there are any differences in response over all. In the particular condition that you are in, you will be doing:
(Condition Q) just the questionnaire. You won't be asked to perform any of the activities listed on the questionnaire.

(Condition B) just the behavioural test.

(Condition QB) the questionnaire, and then the behavioural test.

(Condition BQ) the behaviour test first, and then the questionnaire."

The task description was made quite explicit so that participants would have no doubt as to whether they would have to perform any actual behaviours with the snake. It was considered that this explicitness would be unlikely to affect responses, as each participant was involved in one condition only and did not know how others had responded.

Participants in Condition Q then completed the questionnaire, were debriefed and left. Those in Condition B were conducted to the room in the Museum where the snake was housed. The experimenter read out each behaviour in the hierarchy, and allowed the participant as many attempts as were needed to perform the behaviour or to decide not to perform it. The experimenter volunteered the information that the snake was not venomous, and if asked gave instructions on how best to grasp and hold the snake, but she did not model any behaviours or urge or encourage the participants to complete behaviours.

When a participant declined to perform an item, the behavioural test was stopped.

Participants in Condition QB completed the questionnaire in the experimenter's office and then were conducted to the Museum and performed the behavioural test in the same way. Those in Condition BQ went through the performance test first, and then returned to the experimenter's office to complete the questionnaire, under instructions to imagine for each item not what they had just done but rather what they would be capable of if asked to repeat the behavioural test.

VI. 2.2. Results

Means and standard deviations for efficacy and behavioural measures are set out in Table VI.1 for the groups separately and for the entire sample.

TABLE VI.1. Means and standard deviations for the behavioural and efficacy variables in Reactivity Study I.

Condition	Variable					
	Behaviour level		Efficacy level		Efficacy strength	
	mean	S.D.	mean	S.D.	mean	S.D.
Q (n=10)	-	-	15.3	3.9	68.8	13.6
B (n=10)	9.7	1.4	-	-	-	-
QB (n=10)	11.7	3.9	13.9	4.3	72.0	12.7
BQ (n=9)	12.9	3.3	13.3	3.6	82.2	16.4
Overall (n=29)	11.4	3.2	14.3	3.9	74.3	15.0

"Behaviour level" and "efficacy level" means are the average number of items (out of 18) performed or rated as possible. "Efficacy strength" means are the mean confidence per item.

VI. 2.2.1. Item and total matches

For conditions QB and BQ, in which participants performed both parts of the test, the average number of questionnaire items of which individuals believed themselves capable was 13.6, and the average number of items performed on the behavioural test was 12.7. The difference between these means was significant ($t = 2.20$, $p = .04$). The correlation was .76 ($p < .001$). Microanalysis of the match between efficacy level and behaviour were also performed, and percentage matches, chi squares, and phi coefficients for the two conditions separately and combined were computed. Efficacy strength was dichotomised at the scale midpoint for each item, and these microanalytic analyses repeated using efficacy strength and behavioural level. All microanalytic results are presented in Table VI.2.

TABLE VI.2. Microanalytic measures of item match between behaviour and efficacy measures for Conditions QB and BQ in Reactivity Study I.

Condition	Variable					
	Efficacy level			Efficacy strength		
	% accurate	Chi square	Phi coefficient	% accurate	Chi square	Phi coefficient
QB (n=180)	83.4	68.1*	.62	85.5	83.3*	.68
BQ (n=162)	95.1	119.6*	.82	93.2	116.9*	.85
Overall (n=342)	88.9	187.7*	.72	89.2	195.2*	.76

* $p < .001$

VI. 2.2.2. Reactive effects

Questionnaire measures. For each participant who completed the questionnaire, efficacy level was defined as being equal to the number of tasks he or she indicated ability to perform, regardless of level of certainty. The efficacy strength measure was computed by summing all the certainty ratings and dividing by the efficacy level, to give an average measure of efficacy strength for that individual. The overall mean for level was 14.2, and for strength 71.1. Efficacy strength and level had an intercorrelation of .54 ($p = .002$). These two variables were analysed for the three conditions (Q, QB, and BQ) in which the questionnaires were completed. A two-way analysis of variance (Sex by Condition) was performed on each. Table VI.3 sets out the results of these analyses, as well as for a similar analysis involving the behavioural measure, to be described below. There were no significant main or interaction effects for either efficacy variable.

TABLE VI.3. Summary results of analyses of variance: Reactivity Study I.

Effect	Variable		
	Efficacy level	Efficacy strength	Behavioural level
	F	F	F
Condition (df = 2,23)	0.65	2.45	2.63
Sex (df = 1,23)	0.56	0.54	0.19
Sex x Condition (df = 2,23)	2.10	1.90	1.47

No F ratio reaches an acceptable level of significance (critical F (df = 2,23) = 3.40, α = .05: critical F (df = 1,23) = 4.26, α = .05
The two "efficacy" analyses compare Conditions Q, QB and BQ (n=29); the "behavioural" analysis compares Conditions B, QB and BQ (n=29).

Behavioural measures. Behavioural level was defined as being equal to the number of behaviours successfully performed. With a mean of 11.4 overall, and 12.3 for Conditions QB and BQ only, its correlation with efficacy level was .76 ($p < .001$) and with efficacy strength .62 ($p < .005$). Behavioural level was analysed across Conditions B, QB, and BQ. Again a Sex by Condition analysis of variance was performed, and again there were no significant effects (see Table VI.3). Because there were considerable differences in variance between the conditions on this measure, square root, reciprocal arcsine, and logarithmic transformations, as recommended by Winer (1971) were performed, and the same analysis repeated with the transformed scores. The results of these analyses did not differ from that of the raw data.

VI. 2.3. Discussion of Reactivity Study I

In this experiment, efficacy questionnaires did not have significant reactive effects on behaviour, and the performance of the behaviour, or knowledge that the behaviour must be performed, did not have significant effects on questionnaire responses. However, it would be incorrect to conclude that there was no reactivity. Although the obtained variance ratios are too low for one to argue for a positive reactive effect, they are in two of the three cases (behaviour level and efficacy strength) too high for a firm conclusion of "no effect" to be reached. A variance ratio of 2, while indicating no significant differences between groups, is not sufficiently small to argue for equivalence. Only in the case of efficacy level ($F < 1$, $p = .5$) can one argue for equivalence between the groups. So this finding supports neither a strong reactivity nor a strong non-reactivity hypothesis. Rather, it can be seen together with those instances of reactivity and non-reactivity outlined in the introduction to this chapter, and considered as further evidence that there

frequently are reactive effects in efficacy studies, some large and some small. The directions of the reactive tendencies described earlier and found in this study show no clear overall pattern. Bandura and Schunk (1981) and Gauthier and Ladouceur (1981) found a significant increase in one experimental group and a significant decrease in another, while Bandura et al. (1977) found an increase for their control group and no effect for their experimental group. The present study found slightly higher efficacy strength and lower efficacy level in those people who completed the efficacy scale after the behavioural test. Efficacy level, as expected, was highest in the group which completed the efficacy scale only, but their efficacy strength was lowest. These differences, of course, did not approach statistical significance. The behavioural level was highest for those completing the behavioural test and then the questionnaire, and lowest for those completing the behavioural test only. It is difficult to see, however, how it could have been the knowledge that one must later complete a questionnaire which affected the behaviour. Again, this difference is not significant.

The available data do not allow one to reach a definite conclusion regarding the reactivity or otherwise of these tests. It seems that the size and direction of reactive effects may depend upon various factors, possibly including the nature of the task, its importance to the participant, and the circumstances under which the tests are taken. Telch et al. (1982) have offered evidence to show that the relationship between rated efficacy and performance can be altered by altering the extent to which participants believe themselves to be under evaluative surveillance. It is possible that the same could be true for the reactivity of the measure. If a participant believes that completing an efficacy form is part of a personal evaluation, or that the match between efficacy and performance will be closely examined, it seems possible that reactive effects could occur.

The importance which the participants attach to the behaviour may also be relevant. While all participants in this study reported a fear of snakes, they were not an excessively phobic sample. Of the 29 who performed the behavioural test, only 18 (62%) fulfilled Bandura's criterion for phobia: inability to lift the snake with gloved hands within the cage (Bandura & Adams, 1977). Most probably did not regard fear of snakes as being a problem of great importance in their lives. It is possible that people performing more salient behaviours might show different patterns of reactivity.

For this reason, it was decided to repeat the experiment using a behaviour which might be considered of more central importance to most people. Snake phobia is a relatively circumscribed, though potentially serious, problem. Many phobics manage to organise and restrict their lives so that contact with snakes becomes extremely unlikely. Social problems, such as nonassertiveness, are somewhat different. The normal nonassertive person cannot completely avoid all situations in which assertiveness might be demonstrated; therefore it seems likely that nonassertive people are aware of their own abilities and of normal standards of behaviour involved with their problem area to a greater extent than are snake phobics. This contention is supported by the evidence described in Chapter IV that students of differing levels of assertiveness are equally capable of recognising appropriate assertive behaviour (Bordewick & Bornstein, 1980), and that they can produce assertive responses for hypothetical situations (Alden & Cappe, 1981; Nietzel & Bernstein, 1979; Schwartz & Gottman, 1976).

It seems likely that completing an efficacy scale for assertiveness, involving reading an item and deciding whether or not one could make an assertive response, would involve imagining oneself in that situation. This could serve as a minimal form of imaginal rehearsal, which Kazdin (1982) has shown is effective in altering levels of assertiveness. While a nonassertive

person can imagine a social situation quite clearly, many snake phobics may not be able to imagine what it is like to touch or hold a snake, since they have never actually done so. Therefore, if imaginal rehearsal is occurring, it will have more effect for the nonassertive person than for the snake phobic. Thus, while efficacy measures appear not to be reactive with snake phobics, they may be reactive with social skills. The following study examines this possibility.

VI. 3. REACTIVITY STUDY II - ASSERTIVENESS TRAINING*

This section involves data which were collected during the Assertiveness Training Study described in detail in Chapter IV. Relevant sections of the method will be summarised below, and a full description of the entire study is found in Section IV.3. In this study, nonassertive female students underwent six weeks of assertiveness training. During each session, they made efficacy predictions of their performance in specific situations and then role-played those situations. In the third, fourth, and fifth weeks, efficacy expectations were measured for a randomly-selected half of the role-play situations, and not for the other half. The issue to be examined in this chapter is whether behaviour in the role-played situations would vary depending on whether or not efficacy predictions had been made for particular items.

It should be pointed out that these students were selected on the basis of low assertiveness, but differ from a clinical population in that they did not actively seek out treatment. It is likely that their levels of assertiveness are higher than those of a clinical population and for that reason this can be seen as an analogue study. However, the intention of the study is not to assess treatment outcomes but to examine a methodological point, and, as Bandura (1979) points out, a well-controlled study with a sub-clinical population

*Reactivity Studies II and III are also available as: Lee, C. Reactivity of measures of self-efficacy in tasks involving assertiveness. Behavioural Psychotherapy, in press.

is more useful for this purpose than a less controlled clinical study.

VI. 3.1. Method

VI. 3.1.1. Participants and apparatus

These have already been described in detail in Chapter IV. The participants were 46 female students who had been identified as low-assertive on the basis of a mass administration of the CSES. The situations used in role-plays during assertiveness training were derived from items included in five assertiveness inventories. They had been re-written in a standard format which required a verbal response from the participant, and were presented either orally or via audiotape to the participant. A detailed description of them is found in Section IV.2.2, and transcripts are included in Appendix A.2.

VI. 3.1.2. Procedure

Participants were seen individually by the experimenter for six half-hour sessions over a six-week period. All sessions were tape recorded with the participant's knowledge and consent. In each session, participants completed the "self-rating scale" which served as a measure of efficacy. These scales have also been described in detail in Chapter IV. A different scale was used for each session, and items on the scales matched items in the role-play task. After completing the scale, the participant listened to a series of role-play situations macthing the items on the efficacy scale, and responded verbally to each one. They were asked to respond in a way they felt was appropriate to them and as assertive as possible (an assertive response being defined as one upholding the rights of all people involved to be treated with respect and consideration). Discussion of responses and possible alternatives completed the session.

Of particular relevance to this set of analyses is that, while in Sessions 1, 2, and 6 they answered efficacy items for all role-play items, this was not the case for Sessions 3, 4, and 5. In these sessions, four of the eight items were selected randomly for inclusion in the self-efficacy scale; thus, when the participants carried out the role plays, they responded to four items concerning which they had made efficacy judgements, and four "new" items.

All responses to all items were independently rated for assertiveness, appropriateness, and latency to begin response. The experimenter performed a reliability check on these ratings. The rating procedure is described in detail in Chapter IV.

VI. 3.2. Results

VI. 3.2.1. Preliminary remarks

The results presented in Chapter IV indicate that participants did become significantly more assertive during the programme, and that this change was maintained at a follow-up three months later. Efficacy ratings matched behaviour closely, both at a correlational and at a microanalytical level.

VI. 3.2.2. Reactivity of efficacy measures

Two sets of performance scores were calculated for each of Sessions 3, 4 and 5: Set A, the averaged assertiveness, appropriateness, and latency scores for those items which had been included in the efficacy scale; and Set B, averaged performance scores for the remaining four items. Because of the curvilinear nature of the latency scores, and their inverse relationship with the other predictors ($r = -.18$ with assertiveness and $-.16$ with appropriateness), the reciprocal of averaged latency was used in multivariate analyses. A three-way multivariate analysis of variance (item set x taped/oral presentation x session) was conducted.

TABLE VI.4. Means and standard deviations for each performance variable in Reactivity Study II, broken down by item set (A denotes efficacy measures taken, B denotes not taken) and Session (3, 4 or 5).

		Session		
		3	4	5
Performance variable: Assertiveness				
Set A	mean	4.22	4.00[a]	3.88
	S.D.	0.38	0.51	0.65
B	mean	3.44	3.64	3.97[a]
	S.D.	0.59	0.63	0.48
Performance variable: Appropriateness				
Set A	mean	5.27	5.03[a]	4.99[a]
	S.D.	0.46	0.51	0.65
B	mean	4.73	4.96[a]	5.01[a]
	S.D.	0.66	0.55	0.51
Performance variable: Latency				
Set A	mean	1.07[a]	1.35[a]	1.38[a]
	S.D.	0.60	0.81	0.84
B	mean	2.22	1.76	1.29[a]
	S.D.	1.42	1.26	0.76

[a] means which do not differ significantly from each other (Duncan's Multiple Range test, $\alpha = .05$).

Table VI.4 gives the means and standard deviations for each dependent variable, categorised by item set and session (means for mode of presentation are not given as this variable is not of theoretical interest, and was included in the analysis as a check that it was not introducing extraneous effects).

Table VI.5 summarises the results of the multivariate analysis, and Table VI.6 the results of corresponding univariate analyses.

TABLE VI.5. Summary table from multivariate analysis of variance for Reactivity Study II, in which the dependent variables assertiveness, appropriateness and latency to begin response (this variable was reciprocally transformed) are analysed across levels of item set (efficacy measured/not measured) and session (3, 4 or 5).

Effect	Wilk's lambda	Chi square	df	p
Item set	0.800	48.1	3	< .001
Session	0.914	19.6	6	.003
Set x Session	0.751	61.8	6	< .001

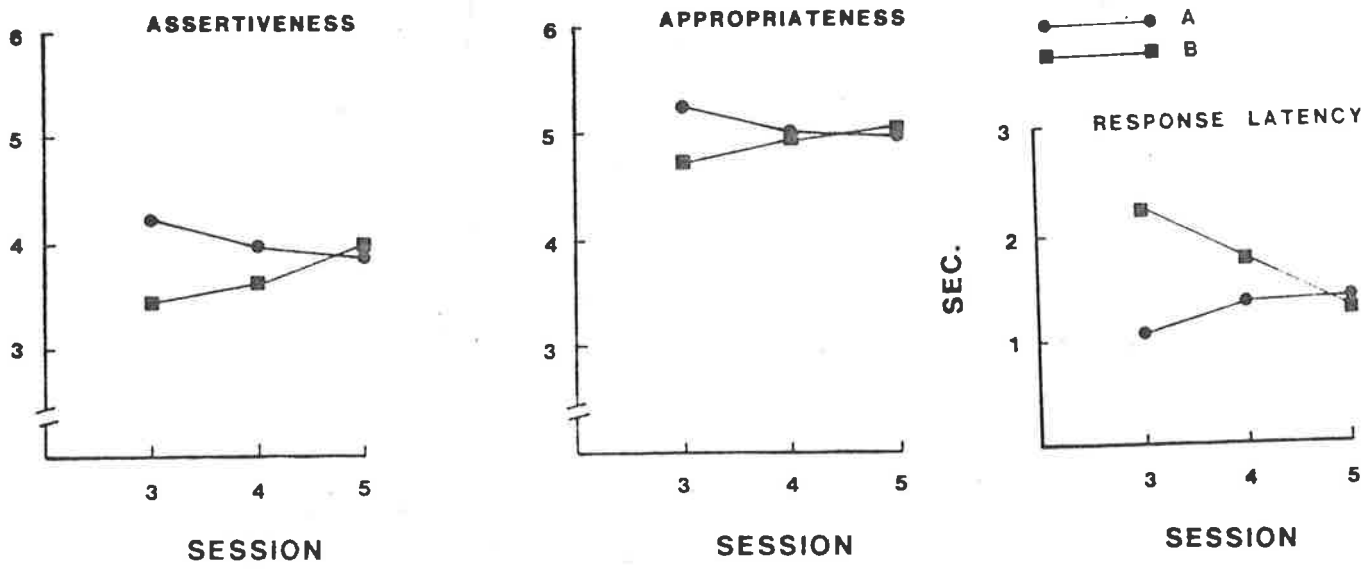
TABLE VI.6. Summary table of analyses of variance for Reactivity Study II: Assertiveness, appropriateness, and latency by item set (efficacy measured/not measured), Session (3, 4 or 5), and presentation mode (tape/live).

Effect	df	Assertiveness F	Appropriateness F	Latency F
Item set	1,220	36.9**	17.5**	25.7**
Session	2,220	1.24	0.01	3.70*
Presentation mode	1,45	2.74	1.27	1.53
Set x Session	2,220	19.3**	13.4**	13.9**
Set x Mode	1,220	0.14	0.37	0.05
Session x Mode	2,220	0.50	0.98	1.59
Set x Session x Mode	2,220	0.27	0.39	0.05

* $p < .05$ ** $p < .001$

There were no significant main or interaction effects for presentation type, either univariate or multivariate. The multivariate analysis showed a main effect for item set, for session, and for their interaction. Univariate tests using conservative degrees of freedom (Greenhouse & Geisser, 1959) showed significantly greater assertiveness and appropriateness, and significantly shorter latencies, for those items included in Set A. Improvements over time were significant for latency only, and the interaction was significant for all three variables. These interaction effects are shown graphically in Figure VI.1. Initially large, positive, reactive effects decrease across the three sessions and become small and negative by Session 5.

FIGURE VI.1. Graphic presentation of means for each performance variable in Reactivity Study II, broken down by Session and by item set (A denotes those items for which efficacy was measured, B those for which it was not).



Duncan's multiple range tests were performed on each of the three sets of cell means. Table VI.4 indicates the homogeneous subsets identified in this way.

Further analyses compared assertiveness level for those items for which self-efficacy measures were taken with efficacy level. Assertiveness scores were first divided by five to produce comparable means. Efficacy judgements were significantly higher than actual performance in each session (Session 3: $t = 4.53$; Session 4: $t = 6.11$; Session 5: $t = 6.51$; $p < .001$ in each case).

VI. 3.2.3. Summary of results of Reactivity Study II

This study shows strong relationships between efficacy and performance measures. Those items included in the efficacy scale have significantly enhanced performance scores overall, but a session-by-session analysis indicates that the reactive enhancement decreases significantly over time.

VI. 3.3. Discussion of Reactivity Study II

The results of this study indicate that there is some reactive effect of rating one's efficacy on later performance in situations requiring assertiveness. The strong main effect for item set indicates that responses were enhanced for those items included in the efficacy scale, but the strong interaction effects are less straightforward. Inspection of cell means indicates that the effect of completing the questionnaire is great in Session 3, rather less in Session 4, and in Session 5, although there is no significant difference between the means, there is a slight but consistent tendency for participants to perform worse on items for which they have already answered efficacy questions. The main effect can be interpreted as resulting from the participants having read the items before encountering them in role-play and having an opportunity to consider, or practise imaginally, their responses. But the interaction effect is more problematic.

One might argue for a generalisation effect which increases during assertiveness training; the advantage of having considered an item before having to role-play it might be highly specific at first, but as familiarity with the situation and skill in assertive response increase, this advantage might "spread" and apply equally to all of the somewhat similar items. The plausibility of such an argument, however, is reduced when one examines the results of the post hoc tests (see Table VI.4). The interaction is caused by both a significant increase in performance for Set B, and a significant decrease in performance for Set A. It is difficult to reconcile this decrease with a "generalisation" explanation. For the same reason, one must reject the idea that a "ceiling effect" is responsible.

Items were assigned randomly to sessions and to sets A and B; however, all participants received the same sets of items in the same conditions, and it is conceivable that purely fortuitous differences in the item sets are responsible for the effects. A post-hoc analysis of item difficulty tends to refute such a possibility. Blind rating of item difficulty by a female graduate student indicated no significant differences between the cells ($X^2 = 1.89$, $p \simeq .5$).

One must conclude that completing the efficacy scale is initially helpful to a participant's performance but becomes less so over time. Two possible ways in which this might occur appear worth considering. First, it is possible that reading and rehearsing the item is helpful in the early stages of skill acquisition, when assertive responding is still a highly artificial skill, and becomes less so as the skill becomes more automatic to its performer. It is feasible that, in this case, reading and rehearsal would become detrimental as assertiveness increased, as conscious rehearsal could interfere with automatic patterns of responding. Alternatively, this finding may result from increasing familiarity with the situation. In Session 3, students may still be sufficiently uncertain as

to what is expected of them to find any additional information helpful. By Session 5, they may be totally familiar with the setting, and in some cases may have become bored with the procedures. Initial exposure to an item may merely serve to heighten disinterest when it appears in a role play, and thus produce performance deficits.

The within-subjects design of this study, in which increases in skill are occurring concurrently with increases in familiarity, makes it impossible to distinguish between the "level of skill" explanation and the "familiarity" explanation. A second assertiveness experiment was therefore carried out in an attempt to separate the two and to explain more clearly the reasons for the occurrence of reactive effects. In the next experiment, students of differing levels of assertiveness were selected and exposed once only to the role-play task, thus keeping familiarity with the situation constant and varying level of skill.

VI. 4. REACTIVITY STUDY III - ASSERTIVE BEHAVIOUR*

Female university students were used once more. They were selected randomly, so that a range of assertiveness levels would be represented. Each participated in a single half-hour role-playing session similar to those involved in Study II; a randomly-selected half of these students completed an efficacy scale for all the role-play items, while the other half did not complete an efficacy scale. It was hypothesised that those completing an efficacy scale would respond differently from those not doing so; that is, that there would be reactive effects of measurement. If the interaction effect found in Study II was correctly explained by the "level of skill" suggestion, an interaction between scale completion and level of assertiveness should be found in Study III. But if the "familiarity" explanation was correct, no interaction should occur in Study III.

*Reactivity Studies II and III are also available as: Lee, C. Reactivity of measures of self-efficacy in tasks involving assertiveness. Behavioural Psychotherapy, in press.

VI. 4.1. Method

VI. 4.1.1. Participants

Sixty female students, with a mean age of 18 years 3 months, were selected on a random basis from an introductory psychology class, and participated as part of course requirements.

VI. 4.1.2. Apparatus

Stimulus situations were presented to all participants by an audiotape similar to those used in Study II. Mean levels of assertiveness in responding to the 44 items of Study II were used to select eight items with a wide range of difficulty. Appendix D contains copies of the self-efficacy questionnaire and of the role-play scripts used in this study. A stimulus tape using these eight scenes was made in the same format as those used in Study II, except that forty instead of sixty seconds were allowed for response time. This change was made because participants in Study II had very rarely used more than thirty seconds to complete their responses, and reported feeling uncomfortable waiting for the following item.

This experiment was conducted in two adjoining research rooms. The first was used for explanation and completion of the questionnaires. Participants performed the main part of the experiment alone in the second room, which contained only a chair and a desk on which were placed the tape recorders.

VI. 4.1.3. Procedure

Each participant was seen individually for a single half-hour session. The experimenter explained that the purpose of the study was to collect normative data on levels of assertiveness, and the participant completed the CSES. A randomly-selected half of the participants then completed an eight-

item questionnaire measuring efficacy expectations for the eight items included in the role-play task. This questionnaire was identical in format to those used in Study II. The other participants did not complete a second questionnaire.

The experimenter then explained the rest of the procedure. A description of the role-play situations and of the participant's task were given; it was emphasised that the participant should reply in direct speech, saying whatever she felt she would say in such a situation. The participant was then conducted to the second experimental room, where the experimenter started the tape recorders and then left. The participant carried out this part of the study alone, and returned to the first room after the tape had finished.

All participants were debriefed concerning the purpose of the study and later were supplied with a summary of the results.

VI. 4.1.4. Audiotape rating

Since the experimenter had not been present during the taping, and participants were identified on the tapes only by number, it was considered that she would not be biassed in rating the participants' performance. She rated all responses on the same three variables as in Study II. A graduate student, blind to the purposes of the experiment, independently rated a random sample of ten students as a reliability check. Agreement appeared satisfactory. Mean differences per item between the raters were: for assertiveness, .5 of a scale point; for appropriateness, .7 of a scale point; for latency, .75 seconds. Percentage accuracies were: for assertiveness, 98%; for appropriateness, 96%; for latency, 78%.

VI. 4.2. Results

VI. 4.2.1. Preliminary remarks

There was no significant difference in level of assertiveness as measured by the CSES between those students who completed the efficacy scale and those who did not (F (df = 1,58) = 1.90, p = .2). The mean CSES score was 128.0 (S.D. = 18).

VI. 4.2.2. Item and total matches

Microanalysis of the match between efficacy measures and performance measures were carried out for those 30 students who completed the efficacy scale. Variables were dichotomised as for Study II, and percentage of items correctly predicted, chi-square values, and phi coefficients were computed for both assertiveness and appropriateness. These are given in Table VI.7.

TABLE VI.7. Measures of association between efficacy and performance measures for Reactivity Study III.

	Assertiveness			Appropriateness		
	% accurate	Chi square	Phi coefficient	% accurate	Chi square	Phi coefficient
Efficacy level	81.3	53.9**	.47	81.7	34.2**	.38
Efficacy strength	76.3	47.3**	.44	75.4	19.1**	.28

** $p < .001$ n = 240

As well as the item matches, total scores were obtained for each person on assertiveness, appropriateness, latency and efficacy strength and level where available. Correlations among these measures are shown in Table VI.8.

TABLE VI.8. Correlations between performance measures and efficacy measures for Reactivity Study III.

	Efficacy strength	Assertive-ness	Appropriate-ness	Response latency	CSES score
Efficacy level (n=30)	.69***	.66***	.46**	-.34*	.31*
Efficacy strength (n=30)		.44**	.37*	-.42*	.59***
Assertive-ness (n=60)			.54***	-.47***	.43***
Appropriate-ness (n=60)				-.36**	.27*
Response latency (n=60)					-.18

* $p < .05$ ** $p < .01$ *** $p < .001$

VI. 4.2.3. Reactive effects

Participants were divided into three groups of twenty on the basis of their CSES scores. A 2-way multivariate analysis of variance (low/medium/high CSES x efficacy measured/not) was carried out for the three performance measures, response latency having been reciprocally transformed. There was a significant main effect for the measurement of efficacy; the main effect for CSES category was not significant, nor was the interaction of the two. Table VI.9 summarises the results of the multivariate analysis.

TABLE VI.9. Summary table from multivariate analysis of variance for Reactivity Study III, in which the dependent variables assertiveness, appropriateness, and latency to begin to respond (this variable was reciprocally transformed) are analysed across levels of item set (efficacy measured/not measured) and assertiveness level (low/medium/high).

Effect	Wilk's lambda	Chi square	df	p
Item set	0.85	3.82	3	.05
Assertiveness	0.83	10.8	6	.13
Set x Assertiveness	0.79	10.8	6	.06

Univariate analyses, summarised in Table VI.10, showed significantly greater appropriateness and shorter response latency for those completing efficacy scales; the increment for assertiveness did not reach significance ($F = 3.3$, $p = .08$). Univariate Fs for CSES category and its interaction with scale completion in no case reached a conventional level of significance.

TABLE VI.10. Summary of two-way analyses of variance (assertiveness level x efficacy measured/not measured) for Reactivity Study III.

Effect	df	Assertiveness F	Appropriateness F	Latency F
CSES	2,54	3.60*	1.12	0.81
Efficacy measured	1,54	3.26	7.88**	4.91*
CSES x Efficacy measured	2,54	2.77	0.34	1.02

* $p < .05$ ** $p < .01$

FIGURE VI.2. Graphic presentation of means for each performance variable in Reactivity Study III, broken down by CSES level and by experimental condition (A denotes those students whose efficacy was measured, B those whose efficacy was not).

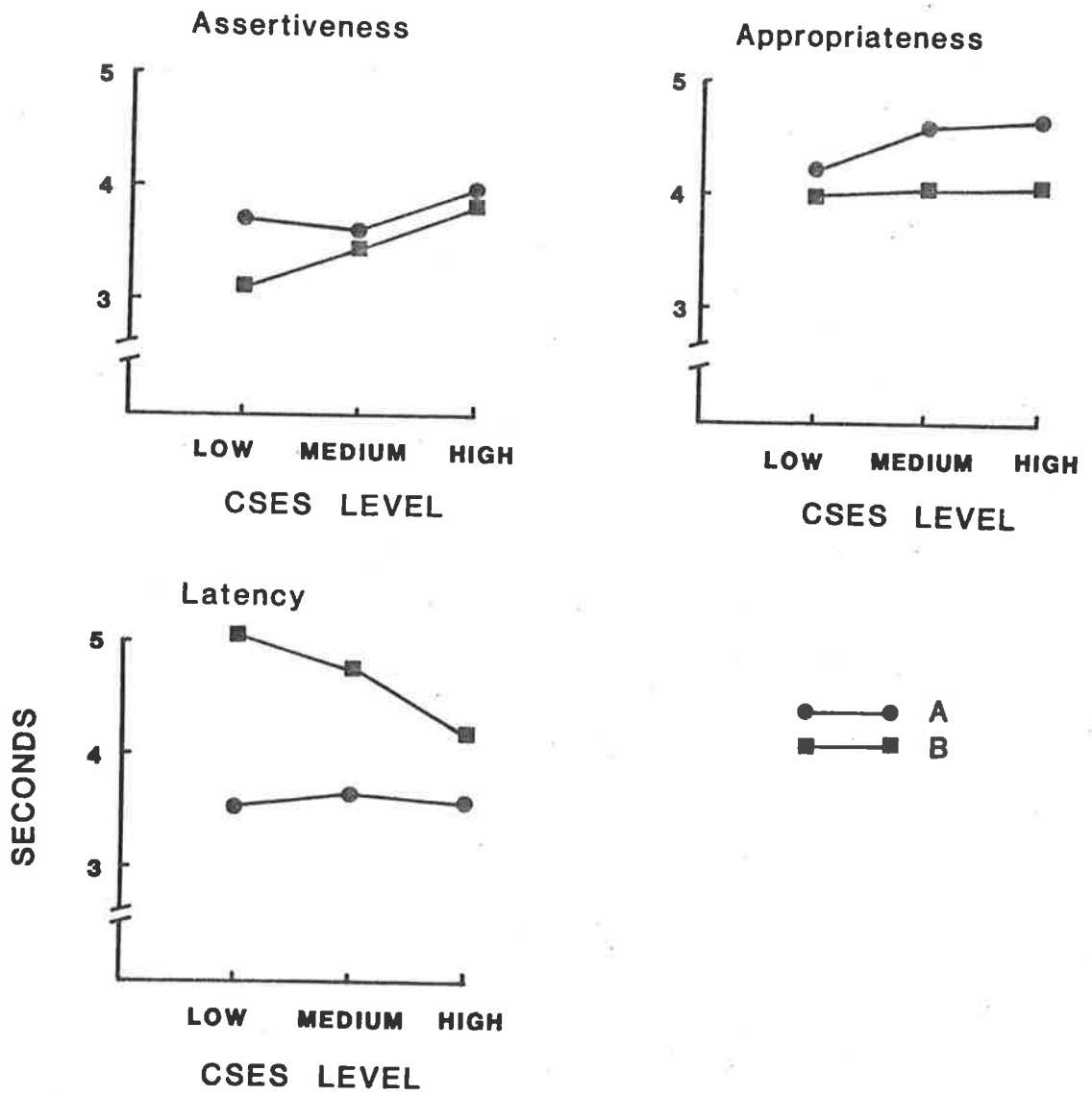


Figure VI.2 presents graphically the cell means for these analyses. A further analysis compared efficacy level with assertiveness level for those participants who had completed efficacy scales. Assertiveness scores were first divided by five to produce comparable means. Efficacy judgements were significantly higher than actual performance ($t = 8.22$, $p < .001$).

VI. 4.2.4. Summary of results of Reactivity Study III

Strong relationships occur again in this study between efficacy and performance measures. There is evidence for a simple reactive effect of completing an efficacy questionnaire, but no evidence that this reactive effect is different at different levels of assertiveness.

VI. 5. GENERAL DISCUSSION OF THE THREE REACTIVITY STUDIES

The results of the three studies described in this chapter are mixed and somewhat contradictory. Study I, with snake phobics, shows small reactive effects which do not reach a conventional level of significance and which do not follow any consistent pattern. Study II shows consistent changes in reactivity during the course of an assertiveness training programme. Study III finds consistent reactive effects, but suggests that the changes found in Study II cannot be explained by differing levels of assertiveness. It seems likely, in the light of Study III, that the findings of Study II can be interpreted as resulting from increasing familiarity with the task of completing the scale and role-playing a number of scenes. The overall conclusion to be reached from these three studies is that reactive effects of the measurement of self-efficacy can and do occur. They do not appear to be related to level of skill.

The fact that reactive effects were significant for the "assertiveness" studies but not for the snake-handling study could be explicable in a number of different ways. It is possible that this results from differences in the tasks; as suggested before, the cognitive processes involved in considering and completing a self-efficacy scale may have more effect on the largely cognitive skill of role-playing assertiveness than on the snake-handling task, which involves physical and affective components as well. This, of course, is purely speculative, and it may be that the difference in findings stems from

procedural differences. The smaller number of cases involved in the snake-handling study means that a larger effect would be required to reach statistical significance than is the case in the other two studies, and it is possible that this alone could explain the different findings.

It should be recognised that there are also some constraints on the interpretation of the second and third studies. First, Study II examines non-assertive students undergoing a process of relatively rapid change in assertiveness, while Study III looks at students of varying levels of assertiveness who are not undergoing such change. It is possible that there are differences between the use of a skill which is developing rapidly and the use of a similar, but stable, skill. This would mean that the findings of Study III need not reflect accurately on those of Study II. Further, Study III was not presented to the participants as "therapy" but as an attempt to gather normative data. This may have reduced the demand on these students to produce highly assertive responses. In the same way, Study I was presented to students as an assessment of the measuring technique rather than as an attempt to alter their behaviour towards snakes.

Study II, on the other hand, was more closely analogous to a therapeutic situation, and participants may have felt under pressure to produce assertive responses. This difference in perception of the situation may have caused participants to react differently to the questionnaires and produced the more complex effects found only in Study II.

It may be possible that individuals who actually seek therapy may respond differently again. Although the individuals in Study II were low in assertiveness, they were not a clinical population, and although Study III indicates that levels of reactivity are not influenced by levels of assertiveness, it may be that the demand characteristics and social expectancies surrounding therapy would alter

reactive effects in a severely non-assertive population. Another problem is the relatively small number of data points in Study III, which may obscure small effects. A further point is that, in all three studies, the efficacy ratings which produced reactive effects were more positive than were the actual behaviours associated with them. This was true regardless of the direction of the reactive effect. It appears that these people tended to overestimate their abilities; this may not be generally the case with efficacy judgements but may only apply with mild behavioural deficits. If it is overestimation which leads to reactive effects, rather than the making of judgements per se, it seems likely that such effects will be more common in analogue studies than in clinical trials.

However, within these constraints, a number of points may be made.* It is clear that in these experiments completion of an efficacy questionnaire has reactive effects, perhaps more so for cognitive skills than for the skill of snake handling. Telch et al. (1982) have shown that these reactive effects can be minimised by the use of somewhat elaborate and deceptive techniques. But a more interesting point is the possibility that this reactivity could be used to enhance the effectiveness of therapy. Study II suggests that the use of the efficacy scale in the early stages of assertiveness training may be beneficial. Bandura's reciprocal-determinism account of the relationship

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* These studies raise two points which, although not related to reactivity, have implications for the measurement of assertiveness. First, while the variables in Studies II and III are strongly and consistently interrelated, the response latency measure has a rather weak and variable relationship with the others. This point was raised in Chapter IV and appears to be substantiated by the analyses presented in this chapter. Response latency forms a part of the Behavioral Assertion Test (Eisler, Miller & Hersen, 1973), and it has been shown to differentiate levels of assertiveness in psychiatric patients (e.g., Eisler et al., 1975). However, these two studies indicate that it may be a less important criterion with university students, whose assertion problems are in general less severe. Secondly, it was found with the "normal" population of Study III that only assertiveness and efficacy strength had reasonably strong relationships with the self-report scale. Appropriateness of response was only moderately correlated. This suggests that the CSES may be less able to distinguish inappropriate from appropriate assertion in "normal" people than it is to distinguish the "normal" from the low assertive. The CSES may be more useful in screening for problems than in differentiating among normally assertive individuals.

between efficacy and behaviour (Bandura, 1977a) predicts that increases in appropriate behaviour which result from the demand characteristics of completing a scale should produce increases in efficacy, which in turn should lead to greater and more persistent improvements in behaviour. There is evidence that non-assertiveness appears to stem from cognitive deficits rather than actual lack of skills. Thus it is possible that the reactive increase in assertiveness, although small and short-lived itself, might be sufficient to increase efficacy to a point where changes would begin to occur, at least in mildly distressed individuals. This might only have clinically significant effects with problems which are relatively mild and result from reduced efficacy only, and not more severe problems complicated by deficits in the required skills or by a system of reinforcers which support the problem behaviour. However, the suggestion raises a number of interesting questions. If such benefit does occur, does it generalise and persist beyond the therapeutic setting? Does the use of efficacy scales become counterproductive as skills increase, as the findings of Study II would suggest, and, if so, at what point should they be discontinued? Can the wording of the efficacy scale be modified to maximise desirable reactivity? All these questions are, of course, highly speculative. However, it is interesting to consider that efficacy scales, as well as providing information for the therapist, may be of use to the client as well.

While these studies can do little more than suggest the possibility of therapeutic benefits, they do clearly indicate that there are consistent reactive effects of measuring efficacy. This must be kept in mind when interpreting the findings of studies in this area, and attempts should be made to reduce reactivity to a minimum when it is desired to generalise findings beyond the immediate subject of an experiment. Keeping these cautions in mind, however, it was decided to proceed to studies examining some of the more theoretical

questions raised by self-efficacy theory. The following chapter begins to examine the issue of whether efficacy expectations are in fact more accurate as predictors of behaviour than are traditionally-used behavioural measures.

CHAPTER VII.

DIFFERENTIAL ACCURACY OF EFFICACY AND BEHAVIOUR AS PREDICTORS OF LATER BEHAVIOUR

VII. 1. INTRODUCTION

The previous chapters have reviewed studies and presented evidence that efficacy scales, if administered appropriately, can be used to predict behaviour with a reasonable degree of accuracy. However, they have not examined the issue of whether efficacy judgements are better predictors than are appropriate behavioural measures. This chapter addresses that question.

VII. 1.1. Arguments, evidence and problems

Self-efficacy theory considers efficacy expectations to be better predictors of future behaviour than are previous behaviours. Behaviour, it is argued, may be influenced by transitory factors such as presence of influential others, situational constraints and ambiguities, ill-defined goals, and temporary states such as fatigue. Efficacy expectations should therefore provide a purer measure of an individual's belief in his or her capabilities, and, given adequate skills and a desire to perform, should predict future behaviour more accurately than does previous behaviour.

This argument, if substantiated by data, clearly has important practical implications. It provides an objective rationale for the use of self-efficacy measures alone in situations where direct behavioural measures are prohibitively difficult to obtain, and also suggests that the use of efficacy measures in combination with behavioural tests could lead to improvements in the accuracy of predictions. This has practical applications, for example in making decisions on when to terminate therapy and in predicting the long-term maintenance of behaviour change, as has already been discussed in Chapter V. Further, if

this argument is substantiated, it provides an important justification for the theory. A basic tenet of science has always been that a theoretical explanation should be as simple as possible and invoke as few variables as possible to explain any phenomenon (Charlesworth, 1982). Such an argument is used to reject psychological theories which invoke more processes or entities than rival theories (e.g., Skinner, 1953, 1977), and it is considered the responsibility of the more complex theory to prove its superiority over the simpler. Self-efficacy theory, because it accepts cognitions as important elements to be considered in the understanding of behaviour, must justify itself in comparison with more radical behavioural theories.

Further to the arguments of parsimony are those of the epiphenomenalists who reject the notion that cognitive entities such as efficacy expectations can have any causal relationship with material events such as behaviours (e.g., Eysenck, 1978). From this point of view, then, evidence that efficacy reports are more accurate predictors of behaviour than are previous overt behaviours would provide justification for the retention of the theory.

There is some experimental evidence already in existence in support of this aspect of the theory. Some researchers (e.g., DiClemente, 1981) have used correlational techniques to show that efficacy accounts for a greater percentage of the variance in later behaviour than does behaviour, but have not shown a significant difference in predictive power. Bandura and his colleagues have performed three studies which, although problematic, are rather more adequate tests of this question.

Bandura et al. (1977), examining treatments of snake phobia, included a one-month follow-up in their design. As part of a fuller analysis, they compared behaviour at the end of treatment with efficacy at that time as predictors of behaviour at follow-up. A hierarchy of behaviours involving

approaching and handling a snake was used, and all 29 people had successfully completed the hierarchy either during the experiment or during supplementary training. However, not all had maximal efficacy expectations. An examination of the item-by-item match between behaviour at the end of treatment and behaviour at follow-up on the one hand, and between efficacy at the end of treatment and behaviour at follow-up on the other, gave error rates, for a similar threat, of 21% for efficacy and 28% for behaviour. For a dissimilar threat, the error rates were 24% for efficacy and 52% for behaviour. Efficacy expectations were significantly more accurate than behaviours for the dissimilar threat and for both threats combined, but not for the similar threat alone. Bandura et al. (1980) also provide evidence, from the treatment of eleven agoraphobics, that self-efficacy is a better predictor of post-treatment test behaviour than are behavioural measures (10% versus 26% error rate). A more recent report of three studies (Bandura, Reese & Adams, 1982) includes comparison data for one of the three studies. This is similar to the Bandura et al. (1977) study. Snake phobics were assessed before, during, and after a behaviour change programme, and it was found that behaviour at post test was more congruent with self-efficacy than with behaviour during therapy (88% versus 77% accuracy). This difference was statistically significant. However, all three of these studies can be criticised on methodological grounds.

The effect found in the Bandura et al. (1977) study depends entirely on the inaccuracy of previous behaviours as predictors of behaviours towards a "dissimilar threat" (p. 133), but it is not clear what this threat is. Presumably it is an unfamiliar snake, but it is not clear whether this same "unfamiliar snake" is used for all three of the relevant measures: predictor behaviour, predictor efficacy, and test performance. This condition is necessary for their use of microanalytic (item-by-item) statistical techniques to be appropriate.

The comparison in the Bandura et al. (198) study of agoraphobics can be criticised on similar grounds. They say that "the behavioural tests were standardised by clearly specifying the community settings. . . . , the sequence . . . . , and the criteria of successful performance" (p. 54). But they add, "to evaluate the generality . . . . the community settings chosen for the behavioural tests differed from those used in the field mastery treatment" (p. 54). Presumably the efficacy expectation scales used did not differ between field tests and assessment tests. If behaviours carried out in settings deliberately chosen to be different from test settings are compared with behaviours in those test settings, it is not surprising that there will be differences. And if efficacy scales are identical, it is equally unsurprising that efficacy measured in one situation will match the other situation quite well. Microanalytic techniques are inappropriate for such a design.

The Bandura et al. (1982) study suffers from a similar problem. In this study, different snakes were used in test and treatment phases, so that the behavioural predictors were derived from behaviours with a different snake from that used in criterion testing. Bandura et al. (1982) argue that this is appropriate because "the two snakes were shown, in a previous study (Bandura et al., 1980), to be of equivalent threat value as measured by subjects' avoidance behaviour and fear arousal" (Bandura et al., 1982, p. 8). However, an examination of this previous study reveals no data to support this claim. It is said only that "the two snakes were shown, in a separate study, to be of equivalent threat value" (Bandura et al., 1980, p. 45) and that the second snake was used "to assess the generality of changes" (p. 45). It seems inappropriate that the same snake be used both to gauge generality in 1980 and to assess congruence in 1982. Again, a correlational rather than a microanalytic approach would have been more appropriate in the Bandura et al. (1982) study.

It is only appropriate to use item-match techniques if the matched items are identical. Otherwise, a less fine-grained analysis, such as a correlational technique, must be used. In these studies, written and enactive items may differ in any number of salient aspects (such as size or liveliness of snake in the first and third studies, or presence of particular types of people in the second) which may affect various people differently. Since item-by-item match will be distorted by any such differences, microanalysis is inappropriate. As Kirsch (1980) has pointed out, correlational analyses involving aggregate scores will not be affected by such differences. Further, correlations can readily be compared with chance levels, while percentage-match scores in a hierarchy have chance levels which will vary as the level of efficacy and behaviour varies. The question arises of whether the findings of Bandura and his colleagues can be replicated with correlational analyses. This chapter presents two studies which have been conducted with this aim. Can Bandura's findings that efficacy is a better predictor than behaviour be replicated using more appropriate analyses, and does this finding generalise to different target behaviours in different settings?

VII. 2. RELATIVE PREDICTIVE ACCURACY OF BEHAVIOURAL MEASURES AND EFFICACY REPORTS. EFFICACY/BEHAVIOUR STUDY I - ASSERTIVENESS TRAINING*

The first study forms a part of the assertiveness training investigation already described in detail in Chapter IV. In this programme, forty-six female university students who had been identified as unassertive underwent six sessions of assertiveness training. During each session they made efficacy predictions of

*A report of this study is also available as: Lee, C. Self-efficacy and behaviour as predictors of subsequent behaviour. Behaviour Research and Therapy, in press.

their performance in specific situations and then role-played those situations. With efficacy measures matching role-play situations within sessions, micro-analysis of the relationship between efficacy and behaviour within sessions could be performed, and a close match was hypothesised. Efficacy ratings and behavioural scores were averaged within sessions, and correlational methods used to assess changes in averaged scores, and to determine whether efficacy or behaviour in previous sessions explained more of the variance in behaviour in later sessions. It was hypothesised, following Bandura's findings, that averaged efficacy would be a better predictor of subsequent behaviour than averaged behaviour scores in previous sessions.

The following section outlines those sections of the method which are relevant to this hypothesis; a complete description of the study can be found in Chapter IV.

VII. 2.1. Method

VII. 2.1.1. Participants and apparatus

These have already been described in detail in Section IV.3. Forty-six female students, with a mean age of 17 years 10 months, who were identified as nonassertive, were involved in the study. The forty-four role-play situations which were used in training sessions were derived from items in a number of assertiveness inventories and re-written in a standard format to which a verbal response could be made.

VII. 2.1.2. Procedure

Participants were seen individually by the experimenter for six half-hour sessions over a six-week period. Twenty-six students participated during the first ten-week term of the university year, and 20 during the second. Those

who participated during the first term were asked to return for a follow-up session three months after their training programme finished, and 21 did so. All sessions were tape-recorded with the participants' knowledge and consent.

In each session, participants completed a "self-rating scale" (see Appendix A.3.) which provided measures of efficacy level and strength. Following completion of the efficacy scale, the participant listened to role-play situations matching the items on the efficacy scale, and responded verbally to each one. Discussion of responses and possible alternatives completed each session.

In the sixth session, each participant repeated the efficacy measure and stimulus set she had used in the first session (part a), and also carried out a generalisation test by responding to an efficacy scale and corresponding tape which she had not previously heard (part b). The initial and generalisation tapes were randomised across participants. In the sixth session participants completed the College Self-Expression Scale for the second time, the first having been completed during selection of participants. All responses were tape-recorded and later rated for assertiveness, appropriateness, and response latency, as described in Section IV.3.3.

VII. 2.2. Results

VII. 2.2.1. Preliminary remarks

The results presented in Chapter IV indicate that participants did become significantly more assertive during the programme, and that this change was maintained at a follow-up three months later. Efficacy ratings matched behaviour closely both at a correlational and at a microanalytical level.

VII. 2.2.2. Efficacy expectations as predictors of behaviour

Microanalysis of individual items was used to assess the match between the efficacy prediction made and the ratings of the response to that item. A complete description of these analyses can be found in Section V.2.2.2., and the results are summarised here.

Efficacy strength, measured on a scale from 0 to 100, and level, measured as a dichotomy, were closely related (r = .713). Assertiveness and appropriateness ratings were dichotomised at the scale midpoints, except that an "assertive" score of 6 (= aggressive) was classified as "non-assertive". Percentage matches with efficacy level were 85.5% for assertiveness, and for appropriateness 89.7%. The overall X^2 across all items was 755.4 for assertiveness (n = 1792) and 652.8 for appropriateness (n = 1788), both significant beyond the .0001 level. Phi coefficients were .65 and .60 respectively.

Overall, the correlations between a single efficacy level rating and the rating of assertiveness for that item was .60, and between efficacy level and appropriateness .50. Correlations with efficacy strength were .48 for assertiveness and .40 for appropriateness. All these correlations are significant beyond the .001 level.

VII. 2.2.3. Comparison of efficacy with previous behaviour as predictors of subsequent behaviour

Microanalysis: Since identical items were repeated at Sessions 1, 6(a), and the maintenance test, a microanalytic analysis across time was possible. Three predictors - efficacy level in Session 1, behaviour in Session 1, and efficacy level in Session 6 (a) - were used as predictors of behaviour in Session 6 (a). Also, efficacy and behaviour in Session 6 (a) and efficacy at follow-up were used as predictors of behaviour at maintenance testing.

TABLE VII.1. Microanalysis of behavioural and efficacy measures as predictors of later behaviour on identical items in Efficacy/Behaviour Study I.

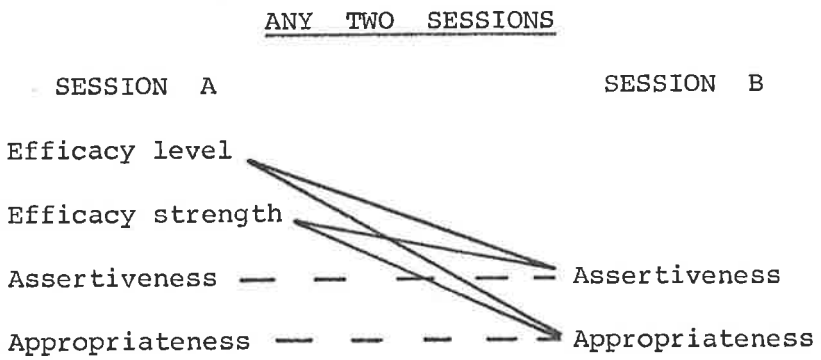
Predictor	n	Assertiveness χ^2	Assertiveness % accurate	Assertiveness Phi coeff.	Appropriateness χ^2	Appropriateness % accurate	Appropriateness Phi coeff.
			Predicted: Session 6(a)				
Session 1							
Assertiveness	360	215.2	77.4	0.77	111.9	75.8	0.56
Appropriateness	358	121.3	80.2	0.58	150.1	81.3	0.65
Efficacy level	360	45.4	77.5	0.36	34.9	77.1	0.31
Session 6(a)							
Efficacy level	360	197.6	92.2	0.74	161.7	94.7	0.67
			Predicted: Follow-up				
Session 6(a)							
Assertiveness	159	136.8	91.2	0.93	139.3	91.8	0.94
Appropriateness	159	82.6	91.9	0.72	84.4	93.1	0.73
Efficacy level	167	130.7	95.9	0.88	126.8	98.3	0.87
Follow-up							
Efficacy level	167	130.7	95.9	0.88	126.8	98.3	0.87

Note: All χ^2 are significant beyond the .0001 level. The last two rows are identical, as no participants changed their responses to efficacy level items between Session 6 and follow-up.

Table VII.1 summarises the accuracy of the three predictors in each case. While efficacy and behaviour are both accurate predictors of subsequent behaviours, efficacy appears on the whole to be slightly better in terms of percentage accuracy, but worse in terms of χ^2 and phi coefficients, which are more sensitive measures as they take chance levels into account. Measures taken in Session 1, while significantly accurate predictors of Session 6 performance, are not as accurate as those taken in Session 6 to predict maintenance-test performance. This may probably best be explained by the different degrees of behaviour change occurring in the intervals.

Correlation: Average scores for each individual within each session were computed for efficacy level, efficacy strength, assertiveness, and appropriateness. The accuracy with which these averaged scores predicted scores in later sessions was assessed as follows. For all possible pairs of sessions (counting Session 6 parts a and b as two sessions, and including the follow-up session, there are 28 pairs), individuals' averaged efficacy level, efficacy strength, assertiveness, and appropriateness in the earlier session were correlated with assertiveness and appropriateness in the later session. As indicated in Figure VII.1, pairs of related correlations were then selected.

FIGURE VII.1. Diagram of correlations used to examine the relative predictive power of efficacy and behavioural measures in Efficacy/Behaviour Study I. Lines joining variables indicate the six lagged correlations obtained for each pair of sessions. Dotted lines are used to represent behaviour/behaviour correlations, and complete ones efficacy/behaviour correlations. Each pair of correlations used in the series of t-tests described in the text involved one behaviour/behaviour and one efficacy/behaviour correlation.



Each pair of correlations consisted of one efficacy/behaviour correlation and one behaviour/behaviour correlation. Within each pair, the two second measures were identical and the first measures came from the same session as each other, thus being measures derived from the same task. As there are two efficacy measures (level and strength) and two behavioural measures (assertiveness and appropriateness) it was possible to consider four such pairs of correlations for each pair of sessions (see Figure VII.1). Each pair of correlations within each pair of sessions was compared using a t-test for differences between related correlations (McNemar, 1969). Table VII.2 presents the results of these 112 tests. All significant differences are in the same direction: all indicate that the behavioural measure at time "a" is a better predictor than the efficacy measure at time "a" of behaviour at time "b".

Comparing assertiveness with efficacy level as predictors of assertiveness, only 2 of 28 tests show significantly greater accuracy for the behavioural measure (see Table VII.2, section a). When assertiveness is compared with efficacy strength as a predictor of subsequent assertiveness (section b), 7 of the 28 tests shown a significant advantage of the behavioural measure. For appropriateness measures, previous appropriateness is a significantly better predictor than efficacy level in 15 of 26 cases (section c) and a significantly better predictor than efficacy strength in 17 of 28 cases (section d). In no instance is an efficacy measure a significantly better predictor than a behavioural measure. There are, of course, statistical problems in the presentation of 112 related t-tests, and the probability of making a Type I error becomes quite high. For this reason, a more conservative, nonparametric test, the sign test (Siegel, 1956), was also used. Pairs of correlations were classified according to the sign of the t-value, indicating only the direction of the difference and ignoring its size. Table VII.3 shows this classification, as well as a breakdown by significance

TABLE VII.2. T-values obtained from comparing related correlations in Efficacy/Behaviour Study I.

See next page.

Notes: A positive t-value indicates that the behaviour/behaviour correlation is higher than the efficacy/behaviour correlation. All significant values indicate that the behavioural measure has a significantly higher correlation than does the efficacy measure with subsequent behaviour.

N = 47, except for maintenance session (M) n = 21.

* P < .05 ** P < .02 *** P < .01 **** p < .001

Predicted session (Session 'b')

Predictor session (Session 'a')

	2	3	4	5	6a	6b	M
1	0.14	1.09	0.25	-1.41	-1.25	2.01	-0.26
2		1.34	1.23	2.74	1.03	****3.09	0.78
3			*2.05	0.32	1.47	0.41	4.31
4				0.31	0.79	1.41	-0.02
5					0.61	-0.29	0.39
6a						1.38	0.65
6b							-0.43
F							

(a) Assertiveness compared with efficacy level as predictors of subsequent assertiveness

Predicted session (Session 'b')

Predictor session (Session 'a')

	2	3	4	5	6a	6b	M
1	1.12	1.35	0.38	0.44	-0.34	**2.63	0.90
2		1.22	0.47	**2.54	0.27	1.32	*2.07
3			1.80	*2.03	1.67	1.04	****3.56
4				*2.28	1.93	1.74	0.87
5					0.48	1.12	1.59
6a						1.24	*2.23
6b							1.32
F							

(b) Assertiveness compared with efficacy strength as predictors of subsequent assertiveness

Predicted session (Session 'b')

Predictor session (Session 'a')

	2	3	4	5	6a	6b	M
1	1.82	*2.12	**2.55	0.53	0.79	*2.02	-1.45
2		**2.54	0.43	*2.06	0.92	***3.26	1.33
3			****3.78	***2.74	***2.98	***2.85	1.87
4				**2.63	***3.46	****3.64	-0.77
5					1.55	*2.42	-0.18
6a						***2.27	-0.91
6b							-0.82
F							

(c) Appropriateness compared with efficacy level as predictors of subsequent appropriateness

Predicted session (Session 'b')

Predictor session (Session 'a')

	2	3	4	5	6a	6b	M
1	***2.82	*2.38	***2.88	1.67	1.54	***3.29	-0.48
2		***2.99	1.60	***2.74	1.03	***3.09	0.77
3			****4.93	****4.16	***2.72	****3.95	1.80
4				****4.59	****4.28	****4.29	0.23
5					*2.06	****4.10	0.78
6a						****3.58	-0.13
6b							1.26
F							

(d) Appropriateness compared with efficacy strength as predictors of subsequent appropriateness

TABLE VII.3. Summary of the results of 112 t-tests comparing behavioural and efficacy measures as predictors of later behaviour in Efficacy/Behaviour Study 1.

	$p>.05$	$p\leq.05$	$p\leq.02$	$p\leq.01$	$p\leq.001$	Total
t value positive	58	11	5	13	12	99
t value negative	13	0	0	0	0	13

Note: A positive t-value indicates that the behavioural measure was more accurate. Sign test (ignoring size or significance of t-value): $N = 112$, $x = 13$, $z = 7.09$, $p < .0001$.

level. The sign test produces a z value of 7.09, indicating a highly significant tendency for the behaviour/behaviour correlation to be larger than the efficacy/behaviour correlation over all pairs of sessions.

VII. 2.3. Discussion of Study I

These results do not support the contention that efficacy is a better predictor of behaviour than are previous tests of behaviour. Both predictors are shown to be highly accurate, but there is a consistent tendency for behaviour to be more accurate than efficacy.

These results appear to support the argument that efficacy measures are not pure measures of expectation, as Bandura suggests. They may be influenced by transitory factors such as presence or absence of significant others, expectations of evaluation, familiarity with the situation, and so forth.

There may well be other factors besides expectation which affect behaviour. Bandura's original formulation of self-efficacy theory (Bandura, 1977a) states that "given appropriate skills and adequate incentives" (p. 194), efficacy expectations are a major determinant of behaviour. Further, "Under conditions in which people differ substantially in component capabilities and

motivation, skill and incentive factors will also contribute to variance in performance" (p. 206). It is questionable whether the individuals involved in this study did all have equivalent skills and motivations. All scored low on the CSES, but there was a difference of approximately two standard deviations between the highest and lowest scores. Although there is evidence (e.g., Alden & Cappe, 1981) that nonassertive individuals do have assertiveness skills in their repertoires, there is further evidence (e.g., Jakubowski, Note 12) that they lack the skills involved in deciding when and how to behave in an appropriately assertive manner. Thus, even if all individuals in this study had equivalent levels of "assertiveness" skills, they may have varied greatly in "assertiveness application" skills. With regard to motivation, it is true that all participants agreed to participate in the study when asked, and, as Borkovec and O'Brien (1976) have recommended, were not offered payment until they had agreed to participate. However, it seems possible that not all were similarly motivated. Since all were characterised by a nonassertive difficulty in refusing requests, it is likely that there were at least some who were poorly motivated but felt obligated to agree to participate.

The uncertainty surrounding these two important factors leads to the design of a second study dealing with the question of the relative predictive accuracy of efficacy and behavioural measures. The population and task for this study were chosen so that motivation levels would be uniformly high, and skill levels would be reasonably high, with readily measurable variations. In this way it was hoped that the interfering effects of differences in motivation could be avoided, and those of differences in skill level accounted for.

VII. 3. RELATIVE PREDICTIVE ACCURACY OF BEHAVIOURAL MEASURES AND EFFICACY REPORTS. EFFICACY/BEHAVIOUR STUDY II - COMPETITIVE GYMNASTICS*

This study involves a group of young athletes involved in women's artistic gymnastics. The prediction of performance is an important issue in competitive sports, and there is a great deal of mainly anecdotal and single-case evidence (e.g., Rushall, 1980) to suggest that training performance is not always a good predictor of competition performance. A view popular among sporting theorists is that unexpectedly poor performance results from the athlete's arousal level being above his or her optimum because of the effects of audience, fear of evaluation, inexperience, and so forth, and a number of writers (e.g., Nideffer, 1981) have described and recommended ways in which the athlete can be taught to recognise and modify inappropriate arousal.

There is also evidence relating efficacy expectations and performance level in competitive sports (e.g., Morelli & Martin, Note 10). Morelli and Martin studied the efficacy beliefs and performance of ten top-level 800-metre runners. They found high correlations between performance efficacy and competition performance ($r = .79$), and much smaller ones between previous competition performance and criterion competition performance ($r = .23$). Coaches' ratings of athletes' expected performance and level of conditioning were also strongly correlated with criterion performance. Efficacy relating to training activities and actual performance in training were not highly correlated: Morelli and Martin argue that this is explicable by the complexity of the training situation, in which athletes are working for different goals from those aimed at in competition, and comparisons with others are harder to make.

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*A report of this study is also available as: Lee, C. 'Self-efficacy as a predictor of performance in competitive gymnastics. Journal of Sport Psychology, 1982, 4, 405-409.

Returning to the issue of the role played by skills and incentives: it has been argued (Kazdin, 1978) that efficacy expectations must always be confounded with levels of skill and incentive, and it might appear that in a task requiring a high level of skill and incentive one's efficacy prediction would be even more confounded than in the case of phobia-related activities. However, one must assume that phobics and others make use of their knowledge of their own skill level and desire to succeed in framing efficacy expectations, so there is no logical reason for assuming athletes' predictions to be more confounded by self-awareness than those of other people. It is the accuracy of their awareness, rather than the amount of physical skill involved, which is important. Further, there is evidence from a wide range of sports, including wrestling (Gould, Weiss & Weinberg, 1981; Highlen & Bennett, 1979), racquetball (Meyers, Cooke, Cullen & Liles, 1979) and gymnastics (Mahoney & Avener, 1977), that confidence is highly correlated with performance. All these studies have shown that athletes' levels of confidence can be used to distinguish between successful and non-successful participants, even at extremely high levels of skill. It is quite clear that cognitive factors are important in skilled sporting performance.

As Mahoney (1979) has pointed out, an advantage of using sports as experimental tasks is that one can obtain precise measures of skill level and account for variations accurately. A further advantage of gymnastics in particular as an experimental task is that it is an individual sport, and thus the behaviour of team-mates and opposition will have little direct effect on individuals' measured levels of performance. The study involved fourteen young, fairly inexperienced, gymnasts in training for their first major competition. For efficacy measures, each estimated her score in this competition. The predictions were made publicly to a coach, but this is unlikely to have affected their predictive accuracy. Both Weinberg et al. (1980) and Gauthier and

Ladouceur (1981) have shown that neither the level of efficacy expectations nor the relationship between efficacy and performance is altered if predictions are made publicly rather than privately. Previous competition scores were also collected, and predictions made by the coach. The question to be examined was whether gymnasts' efficacy expectations were as accurate as predictors of later scores as were previously obtained scores.

VII. 3.1. Method

VII. 3.1.1. Participants

Fourteen girls, aged between 7 and 12, with a mean age of 9 years 8 months, were involved. They were training at the Novice grading, the lowest level of competitive gymnastics in Australia. All had trained from 5 to 8 hours weekly for periods ranging from 5 weeks to 2 years, with a mean time of one year and eight months. Eleven had competed in minor events; the other three had never been in a formal competitive situation. All had been training at least once a week with a qualified coach with 10 years' experience, for periods ranging from 4 to 37 weeks, with a mean of 19 weeks. It was this coach who made the "coach's predictions" for this study, although several other coaches also worked with the girls.

VII. 3.1.2. Procedure

1. General comments. The gymnasts were training for the South Australian Novice Championships. This was the main annual event for this grading, involving compulsory exercises (i.e., exercises in which every competitor performed the same routine) on vault, uneven bars, beam, floor, and tumbling. The gymnasts competed in age groups: under 8, under 9, and under 13. Scores in this competition served as the criterion. The scoring method was standard

for gymnastics: exercises were marked out of 10 by each of four accredited judges; the highest and lowest scores were deleted, and the remaining two averaged to produce a final mark.

2. Variables obtained. Previous performance: Scores awarded at inter-club competitions during the year previous to the Novice Championships were obtained. Previous scores out of 10 were obtained for the five apparatus, or for as many as were available (mean = 4.1). Where several scores were available on the same apparatus, the most recent score awarded for the same exercises was used.

Gymnasts' estimates: Seven days before the competition, each gymnast estimated her score on each apparatus. Gymnasts were permitted to discuss their estimates with each other, but not with their coach. Estimates were made publicly to the coach, who recorded but did not comment on them.

Coach's estimates: Seven days before the competition, the coach also estimated each girl's score on each apparatus. She had available to her the gymnasts' previous scores, but not the estimates they had made.

Competition performance: each girl performed on the five apparatus in the competition. Each age group competed separately, against between 47 and 82 other gymnasts. Each performance was scored out of ten by four accredited judges. A different set of judges scored each apparatus and judges scored different apparatus for different age groups.

Other information: Age, number of previous competitions, length of training with the coach involved, and length of time in competitive training, were collected for each gymnast.

VII. 3.2. Results

VII. 3.2.1. Preliminary remarks

Scores on the five apparatus were totalled to give a score out of 50. This was also done for the estimates and previous scores. Where less than five previous scores were available, the total was weighted to produce a score out of 50. Cronbach's alpha coefficient of reliability across the five apparatus was .85, so this will not have had a significant distorting effect on totals.

VII. 3.2.2. Absolute differences

Means and standard deviations of the predictors and of the performance scores are shown in Table VII.4.

TABLE VII.4. Means and standard deviations of predictor variables and outcome variable (competition score) for Efficacy/Behaviour Study II, and correlations between predictors and competition score.

Variable	Mean	Standard deviation	Correlation with competition score
Previous performance	36.3	2.80	+.34
Gymnast's estimate	41.4	1.78	+.55*
Coach's estimate	38.3	2.31	+.79**
Age in years	9.7	1.59	+.58*
Number of competitions	3.4	2.44	-.39
Weeks with this coach	18.6	14.5	-.55*
Total years of training	1.8	0.80	+.40
Competition score	35.3	2.06	-

* $p < .05$ ** $p < .02$ (2-tailed)

Because of the judging method used, it was decided that differences in absolute scores were less important than the correlations between them. Gymnastic judging is not totally objective, and the level of scoring varies between competitions, particularly at the lower levels, where judges in one competition might decide to ignore such minor faults as slight lack of body tension while judges in another might penalise them. For example, one of the participants in this study had scored 8.3 for tumbling and been placed sixth in a small inter-club competition six weeks before the major event. In this, she performed the same exercise, receiving only 7.6, but was placed second in a much larger field. The simplest explanation for this lies not in some general fall in standard but in an increase in the strictness of judging for the more important competition. Such decisions are made in a "judges' conference" at the beginning of each competitive session. The following analyses, therefore, examine correlations rather than absolute levels.

VII. 3.2.3. Correlational analyses

Table VII.4 presents the correlations between the predictors and performance measure. Previous performance did not correlate significantly with competition score, but the coach's predictions and gymnasts' predictions did. The differences between these correlations, however, are not significant (performance compared with gymnast's estimate: $t = 0.56$; performance compared with coach's estimate: $t = 1.90$). A stepwise multiple regression examined the predictive power of all the variables combined, but only the coach's estimate, and to a lesser extent the number of previous competitions, contributed much variance. Table VII.5 presents a summary of the regression.

Competition score was related significantly to age (see Table VII.4) with older girls scoring higher. There was also a negative correlation between score and weeks spent working with this particular coach; however, since the

TABLE VII.5. Summary table of stepwise multiple regression predicting competition score in Efficacy/Behaviour Study II.

Step	Variable entered	Multiple r	% variance accounted for	overall F	signifi-cance
1	Coach's estimate	.794	63.1	15.4	.004
2	Number of competitions	.861	74.1	11.5	.004
3	Previous performance	.875	76.6	7.7	.013
4	Total years of training	.893	79.7	5.9	.028
5	Weeks with this coach	.912	83.3	5.0	.051
6	Age	.913	83.4	3.3	.132
7	Gymnast's estimate	.914	83.6	2.2	.280

older girls, who scored higher, had spent less time with this coach ($r = -.68$, $p = .006$), and since the partial correlation (controlling for age) was not significant ($r = .04$), this is best seen as an artifact. Competitive score was not related to the number of previous competitions or number of years' involvement with the sport.

Several additional analyses were performed in order to determine whether any of the other variables accounted for inaccuracies in estimates. The coach's estimates, gymnasts' estimates, previous scores, and competition scores were converted to z-scores in order to standardise them. The differences between competition z-score and z-scores for coach's estimate, gymnast's estimate, and previous score were calculated. These difference scores were indicators of the amount of inaccuracy of each predictor. The modulus of each difference score was correlated with each of the other variables (moduli were used so that the absolute size of the inaccuracy was the variable considered, and size and

TABLE VII.6. Correlations between inaccuracy of estimates and other predictor variables and outcome measure for Efficacy/ Behaviour Study II.

Variable	Inaccuracy in coach's estimate	Inaccuracy in gymnast's estimate	Inaccuracy in previous score
Age	-.07	-.31	-.16
Number of competitions	-.40	+.55*	+.37
Weeks with this coach	-.42	+.52*	-.18
Total years of training	-.42	+.13	-.36
Competition score	+.09	+.03	-.58*

* $p < .05$ (2-tailed)

direction were not confounded). These correlations are shown in Table VII.6. Difference between previous performance and competition performance was not related to age, years of gymnastics, time spent with this coach, or number of competitions. The previous score was a less inaccurate predictor for those who scored more highly than for those who scored worse: that is, the scores of those who performed well could be more accurately estimated from previous scores than could the scores of those who performed badly. Errors in the coach's estimates did not relate significantly to any of those variables, although she was somewhat more accurate in predicting the scores of those who had been involved in gymnastics for longer, had competed more often, and had been training with her longer. Errors in the gymnasts' estimates were related to number of competitions and weeks spent with this coach, with those gymnasts who had been involved longer making less accurate estimates. Again, this is best seen as an artifact resulting from the fact that those who had been involved longer were younger ($r = -.70$). The partial correlations controlling for age were not significant (gymnast's inaccuracy with number of competitions: $r = .28$; gymnast's inaccuracy with weeks spent with this coach: $r = .30$).

VII. 4. DISCUSSION OF EFFICACY/BEHAVIOUR STUDIES I AND II

Study II shows that young competitive gymnasts are capable of predicting their performance in major competitions with a high degree of accuracy. Their accuracy appears not to be affected by their age, but those with more experience seem to be less accurate than those with less. Previous performance does not predict performance to a significant level of accuracy for this group.

The findings of the second study are in marked contrast with those of the first, which showed previous performance to be more accurate than efficacy. This is despite the suggestion that the cognitive skill of assertiveness might be more amenable to influence by expectation levels than the physical skill of gymnastics.

While efficacy and performance can both predict later performance, it does not appear that one is overwhelmingly better than the other in either of these two studies. It seems probable that the different findings of the two studies result from differences in the subject populations, particularly levels of skill and incentive, and the tasks. Participants in the first study were selected on the basis of low levels of skill in the target behaviour; the task they performed was one with which they were unfamiliar and which they found difficult cognitively and emotionally. In the second study, however, the participants had been selected from a recreational class because they demonstrated high levels of skill; their task was one they had practised many times and they were relatively confident of their abilities. Any difficulties they found in performing the tasks were physical, rather than cognitive or emotional.

A further difference between the two tasks is that of accuracy and type of feedback. Feedback as to whether one has acted assertively is not instant and unequivocal, as is feedback as to whether one has touched a snake. There is evidence (e.g.,Epstein, 1980; Gormally, 1982) that people show wide

variability in their judgements of the appropriateness and positive value of assertive behaviour by others, so that people exhibiting assertive behaviours would be unlikely to receive consistent feedback. In the training sessions, the experimenter attempted to supply immediate, consistent, and unambiguous feedback. However, in natural settings, the relationship between assertiveness of response and success in achieving one's goal is unlikely to be very strong. This means that feedback on achieved level of assertiveness, as well as its desirability, is likely to be variable. In gymnastics, however, it is immediately obvious whether one has completed a required movement. The gymnasts in this study were under continual supervision during training by qualified coaches, and these coaches were able to supply feedback on fine points which are not obvious to a performer of this level. Gymnasts were encouraged to comment on each other's performance as well. A standard part of training was "competition rehearsal", in which each gymnast in turn performed her routines as she would in competition, and the coach provided feedback in the form of an estimate of the score, a list of the main positive and negative aspects, recommendations for improvement, and supervised repetition and correction of poorly executed sections. Thus, it seems reasonable to assume that the gymnasts were receiving feedback which was more immediate, unambiguous and specific than that available to the participants in assertiveness training. Although Bandura does not specifically mention the accuracy of feedback in his analysis of the development of efficacy, it seems clear that learning about one's ability through performance accomplishments and vicarious experience, and developing efficacy expectations on that basis, requires accurate and consistent feedback. Indeed, Bandura and Schunk (1981) found in a classroom study that children who set themselves many proximal goals, and were thus able to assess their progress more frequently, were more accurate in their efficacy expectations than were other children who set few,

distal goals. Bandura and Cervone (Note 2) have since argued that it is necessary to have goals and to receive feedback on one's performance attainments relative to those goals in order to develop accurate efficacy expectations at all.

The finding in Study II that the more skilled gymnasts were more accurate in their efficacy judgements suggests that skill levels also could play an important mediating role in the development of accurate efficacy expectations.

The evidence presented in this chapter does not support complete reliance on efficacy measures as the best predictors of behaviour wherever skills and incentives are adequate. Rather, it suggests that variations in skill level, in motivation, and in the ease and accuracy with which one can assess one's own abilities will affect the relationship between efficacy expectations and behaviour.

There is ample evidence that efficacy will predict behaviour accurately in a wide range of situations. Even if, in certain situations, behaviour is a better predictor, efficacy is usually accurate. These two studies do indicate that efficacy retains its usefulness as a predictor under more appropriate statistical treatment than that used by Bandura and his colleagues, and extend the generality of the theory's applicability to new situations, tasks, and populations. It appears that the most useful conclusion to be drawn from the data presented in this chapter is that the clinician or researcher should obtain both behavioural and self-efficacy predictors of later behaviour wherever possible. Careful consideration of the situation, the task, the individual's skill level, and the availability of accurate, consistent feedback should help to decide which of the two predictors would be more useful in any one instance.

The following chapter examines once again the claim that efficacy expectations will always be highly accurate predictors of behaviour. It

examines the differential accuracy of efficacy expectations and outcome expectations in predicting behaviour, and also follows up the theme of this chapter more closely by comparing efficacy and outcome expectations as predictors of later behaviour at different levels of motivation and skill.

CHAPTER VIII.

DIFFERENTIAL ACCURACY OF EFFICACY EXPECTATIONS AND OUTCOME EXPECTANCIES AS PREDICTORS OF BEHAVIOUR

VIII. 1. INTRODUCTION

Self-efficacy theory is only one of a number of current theoretical approaches which seek to explain the relationships between cognitive events and subsequent behaviours. In particular, the effects of expectancies on behaviour can be considered in a number of ways, and there is a variety of views concerning the important parameters of these expectancies.

For example, Rotter's (1966) locus-of-control approach holds that people differ in relatively enduring and consistent ways in their tendency to see themselves or other forces as having control over events, and that these tendencies determine how they respond in situations of all kinds. The theory of learned helplessness, in its earlier form (Seligman, 1975), attributes expectancies to the individual's history of reinforcement, while its later, cognitive, formulation (Abramson, Seligman & Teasdale, 1978) emphasises how a person perceives instances of reinforcement or nonreinforcement in determining that person's later expectancies about ability to affect the environment. These approaches differ in how they see expectations developing from events, but they all agree that people have general, pervasive, and consistent differences in their beliefs about the effectiveness of their actions and their ability to cope across a wide range of situations, and that these expectations arise from the way in which they have interpreted other events in the past.

Other conceptions of the relationship between expectancies and behaviours do not take an individual-differences approach but examine events

in the social or physical environment which produce expectancies of one sort or another.

Attribution theories (e.g., Jones, Kanouse, Kelley, Nisbett, Valins & Weiner, 1972) argue that the expectancies one develops about the results of actions are related to the way in which one perceives the causes of the outcomes of those actions. Depending upon aspects of one's social environment, one can attribute outcomes either internally or externally; rather than arguing for the existence of individual differences and consistent patterns of attributions within individuals, attribution theorists are concerned with determining the social conditions which will result in attributions of one sort or another and to examine their effects on behaviour.

In postulating specific and alterable expectations, attribution theories have something in common with self-efficacy theory. Self-efficacy theory argues for the existence of highly specific expectations about ability to perform highly specific actions, these expectations arising from previous experience and other forms of learning. However, this is not to say that self-efficacy and attribution theories have much else in common: there is another important way in which self-efficacy theory differs from most other theories concerning expectancies.

VIII. 1.1. Efficacy expectations as distinct from outcome expectations

This important difference relates to the type of expectancies considered to be important. Bandura's theory is concerned with examining the person--response link, the individual's belief in his or her ability to produce particular responses, while most other theories place their emphasis on the response--outcome link and examine individuals' belief in the effectiveness of various responses or in the causes of outcomes. Figure VIII.1, derived from

FIGURE VIII.1. Diagram representing the difference in explanatory emphasis between self-efficacy theory and other cognitive explanations. Derived from Bandura (1977a), p.193.

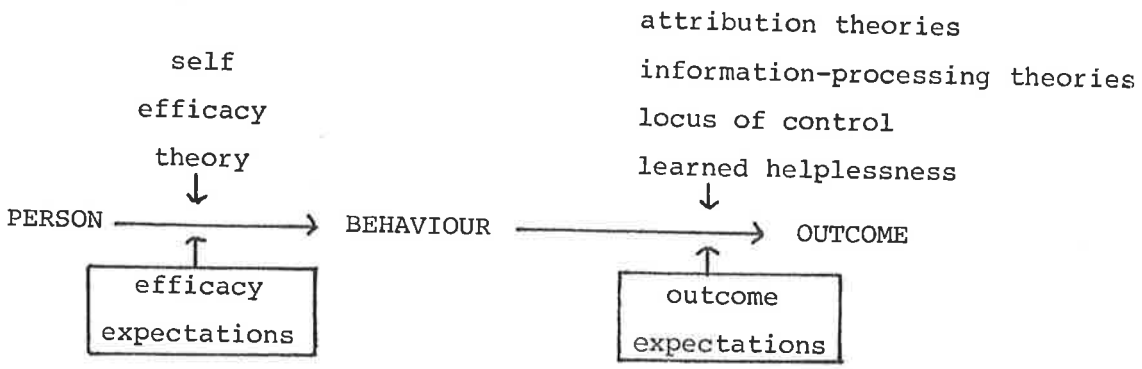

Figure 1 (p. 193) of Bandura's (1977a) description of self-efficacy theory, presents this difference schematically.

Bandura is concerned with the person's belief in his or her ability to produce particular responses, while other theories, he argues, are concerned with the effectiveness of those responses. These beliefs, "efficacy expectations" and "outcome expectations", are sharply distinguished by Bandura. Efficacy expectations are defined as "the conviction that one can produce the behaviour required to produce (certain) outcomes" (Bandura, 1977a, p. 193), and outcome expectations as "a person's estimate that a given behaviour will lead to certain outcomes" (p. 193). Thus outcome expectations are seen as independent of the individual's belief in his or her capabilities.

It has been argued that outcome expectations should not be ignored by self-efficacy theory. Teasdale (1978) has queried the practical distinction between efficacy and outcome expectations, arguing that one cannot have efficacy expectations concerning a particular goal without also having outcome

expectations concerning the perceived effectiveness of the behaviours involved. It seems clear that there is a logical distinction between the two concepts, but he argues that it may be impossible to distinguish the two empirically. Kazdin (1978) suggests that outcome expectations alone may predict behaviour without the need to postulate efficacy expectations. He argues that persistence and effort may well be explained by reference to what a person believes will be the outcome of an action, regardless of whether that person believes he or she is capable of performing it. He also questions whether it is possible to assess efficacy without confounding it with outcome expectations, known skill level, and incentives.

Bandura's (1978b) reply argues that these two types of expectancy can readily be distinguished by the way in which variations in them affect behaviour. When efficacy expectations are low, a low outcome expectation will be accompanied by a withdrawal from the situation and a high outcome expectation is unlikely to be acted upon. If efficacy is high, low outcome expectations will be associated with the intensification and variation of effort, and high outcome expectations with successful performance.

Bandura later extended this interaction model to include the affective states which would result (Bandura, 1982b). Low efficacy combined with low outcome expectations will produce resignation and apathy, while when combined with high outcome expectations it will produce self-devaluation, despondency and depression. High efficacy, combined with low outcome expectations, does not produce negative affect, except perhaps indignation, but results in active attempts to overcome the situation; a combination of high efficacy and high outcome expectations produces assured, confident action. Efficacy, Bandura argues, is a more important determinant, as the way in which a person develops, interprets, and reacts to his or her outcome expectations is determined by efficacy.

If the theory is to make this strong distinction, it seems feasible that both efficacy expectations and outcome expectations will be important in determining later behaviour. A number of empirical papers examining this suggestion have appeared recently. Davis and Yates (1982) manipulated both efficacy expectations and outcome expectations in a study which involved students completing anagrams. As Bandura (1982b) has predicted, depressive affect and performance deficits appeared only in the condition in which efficacy expectations were low and outcome expectations high. An applied study by Devins, Binik, Gorman, Dattel, McClosky, Oscar and Briggs (1982) involved the measurement of efficacy and outcome expectations in individuals suffering from end-stage renal disease. Contrary to Bandura's prediction, they found that both low efficacy and low outcome expectations were associated individually with negative moods, and there was no interaction between the two. This study, however, used global trait-like measures to assess expectancies, contrary to Bandura's emphasis that efficacy expectations are highly specific (Bandura, 1977a) and this may mean that their measures were not accurately assessing the constructs.

A speculative paper by Saltzer (1982) advances the hypothesis that efficacy expectations and outcome expectations are multiplicatively related, on the grounds that if either has a value of zero no behaviour will occur. She postulates a rather complex model in which the two variables contribute equally at an immediate level to the determining of action.

So there are various views on the precise relationships and relative importance of these two variables.

VIII. 1.2. Self-efficacy theory compared with learned-helplessness theory

The original formulation of learned-helplessness theory (Seligman, 1975) argued that helplessness, depression and inaction resulted from a lack of contingency between behaviours and outcomes; that is, it focussed on the response-outcome relationship. However, the reformulated, cognitive, version (Abramson, Seligman & Teasdale, 1978) shifts the emphasis to the interpretation of failure by the individual. It argues that if a person's efforts do not achieve the desired results, and if the person makes an internal, stable and general attribution of that failure (that is, to permanent and pervasive failings of the self), then helplessness, depression and inaction will follow. Bandura (1982b) has argued that the theory is inadequate in both its original and its reformulated versions; it provides a causal model for depression but does not explain under what circumstances an individual will come to make such stable, internal and general attributions. Self-efficacy theory, he argues, is a more comprehensive account as it describes and can predict how efficacy expectations develop, through activity, observation, verbal learning and the interpretation of physiological arousal, from the earliest childhood experiences to the most recent events in a person's life (Bandura, 1981b). It has the further advantage of being highly specific and explaining situational variations in behaviour.

Davis and Yates (1982) outline the models of depression produced by reformulated learned-helplessness theory and by self-efficacy theory. They show that learned-helplessness theory predicts depressive behaviour and affect if the person-response expectancy (a concept approximating that of self-efficacy) is low, regardless of the response-outcome expectancy. On the other hand, self-efficacy theory predicts depression only if the person-response expectancy (efficacy expectation) is low and the response-outcome expectancy (outcome expectation) is high.

Davis and Yates performed an experiment which manipulated levels of efficacy expectation and of outcome expectation, using a group of undergraduate students whose task was to solve anagrams. Difficulty of anagram was manipulated to affect efficacy expectations, and information about the percentage of students solving the anagrams was varied to induce differences in outcome expectations. Their findings supported Bandura's theory; a combination of performance deficits and self-reported depressive affect occurred only in the condition combining low efficacy expectations with high outcome expectations.

Such a finding strengthens the position of self-efficacy theory considerably; however, it does suggest a possibility that Bandura, by emphasising efficacy expectations, has not placed sufficient emphasis on the importance of information about outcome expectancy in the prediction of behaviour. It provides evidence to support the argument of Saltzer (1982) that both efficacy expectations and outcome expectancies are important in determining and predicting behaviour, although of course it does not reflect on the accuracy or inaccuracy of her multiplicative model.

Another theory, taking a different approach to the relationship between efficacy and outcome expectations, is described in the following section.

VIII. 1.3. Self-efficacy theory compared with Carver & Scheier's "attention and self-regulation"

Carver and Scheier (1981) present an information-processing theory of the processes by which behaviours come to be automated and regulated by continuous feedback loops and internal standards. In the context of this theory, they regard efficacy expectations as partial determinants of outcome expectations, which in turn are the immediate determinants of behaviour.

They see outcome expectations as determined jointly by efficacy expectations (themselves resulting from previous experience, modelling, and verbal inputs), knowledge of a behaviour's likely consequences, and the constraints of the situation.

This would appear to be a direct disagreement with self-efficacy theory: Bandura's theory regards outcome expectations as partial determinants of efficacy expectations, which determine behaviour, while Carver and Scheier regard efficacy expectations as partial determinants of outcome expectations, which are direct determinants of behaviour.

This disagreement, however, appears to be a matter of definition. Bandura defines "outcome expectation" as "a person's estimate that a given behaviour will lead to certain outcomes" (Bandura, 1977a, p. 193), while Carver and Scheier define it as "the perceived likelihood of a desired outcome occurring" (Carver & Scheier, 1981, p. 239). Bandura's definition separates beliefs about one's ability to perform actions from beliefs about the outcomes of those actions, while Carver and Scheier's combines the two into an outcome-oriented belief.

Carver and Scheier argue that their viewpoint is superior because it takes into account situational constraints which may prevent one from using one's skills adequately, while Bandura's does not. But Bandura (1978b) points out that efficacy expectations are not arrived at in a vacuum, and that knowledge of situational constraints and one's ability to deal with them will in part determine efficacy expectations, and need not be considered with reference to outcome expectations in his model.

On the other hand, there appear to be problems with Carver and Scheier's compounding of beliefs about the self and beliefs about the behaviour. Bandura's theory can predict whether a person who is failing

to meet a goal will give up and withdraw from the situation or continue to intensify and diversify effort, while Carver and Scheier's theory always predicts withdrawal or alteration of the goal if outcome expectancies are low.

While the two theories appear to produce incompatible predictions, it is not possible to conduct an empirical test to compare the predictions of self-efficacy theory and of Carver and Scheier's self-regulation theory. The differences in definition of the important variables mean that comparison between the two theories cannot occur at an empirical level.

VIII. 1.4. Efficacy expectations and outcome expectations

It seems that if self-efficacy theory, and other theories, make a strong distinction between efficacy expectations and outcome expectations, it is quite possible, particularly in the light of findings such as Davis and Yates' (1982), that both will play important roles in determining the level of behaviour in a given situation.

The experiments to be described in this chapter attempt to measure both efficacy expectations and outcome expectancies, and to examine the predictive power of both. The predictive accuracy of each separately will be considered, and analyses will also be conducted to examine whether a combination of both is a more accurate predictor than either alone. Both a multiplicative combination, as suggested by Saltzer (1982), and a linear combination will be considered. Returning to a question raised in Chapter VII, the second experiment will include a measure of skill, and the relative predictive accuracy of this variable will also be considered.

VIII. 2. RELATIVE PREDICTIVE ACCURACY OF OUTCOME EXPECTANCIES AND EFFICACY REPORTS. EFFICACY/OUTCOME STUDY I - SNAKE HANDLING*

It was decided to use a snake-handling task in the first experiment as there is already considerable evidence (e.g., Bandura & Adams, 1977) that efficacy expectations are closely related to a level of behaviour with snakes, at least in the case of phobics. As Bandura (1978b) has pointed out, experimental tasks involving snakes of the type he has used have the advantage of being readily and unambiguously quantifiable. Further, a recent paper by Kirsch (1982) offers evidence to suggest that outcome expectancies are salient in making decisions about handling snakes. Kirsch asked fifty snake-phobic students to give reasons for their refusal to handle snakes, and found that 92% of the responses involved the outcomes of the action, while only 8% concerned inability to cope with the task. Thus, the outcome expectations involved in snake handling may be quite salient, and this task should provide a strong test of Bandura's argument, that efficacy expectations are more important than outcome expectations in predicting behaviour.

The aim of this experiment, then, is to determine whether efficacy expectations, outcome expectations, or some additive or multiplicative combination of both, is the best predictor of behaviour with a snake.

The experimental task involved attempting a hierarchy of behaviours involving a snake. The hierarchy consisted of 18 items and was based on one used by Bandura and his colleagues (e.g., Bandura et al., 1977). Before attempting this hierarchy, participants completed self-report scales designed to measure efficacy expectations and outcome expectations. The definition

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* A report of this study is also available as: Lee, C. Efficacy expectations and outcome expectations as predictors of performance in a snake-handling task. Cognitive Therapy and Research, in press.

of "outcome expectations" was somewhat problematic, as in such an experimental situation there is relatively little question as to the outcome of a behaviour such as touching a snake. It was decided that the most salient outcome in such a situation would be the cognitive and affective state of the participant, which could presumably range from fear, horror and disgust to interest, fascination and enjoyment. Therefore, participants were asked to rate how positive or negative performing each task would make them feel, as a measure of their expectations of the outcome of performing each item.

Participants were male students. Males only were chosen because it was considered possible that there might be sex differences in response which could confound more interesting results, and males were more readily available than females.

VIII. 2.1. Method

VIII. 2.1.1. Participants

Thirty-three male students enrolled in an introductory psychology class participated in the experiment as part of course requirements. Their mean age was 19 years 6 months. An additional student was approached but refused to take part on the grounds that he was extremely afraid of snakes and would find the process very unpleasant.

VIII. 2.1.2. Experimental animal, rooms and apparatus

The snake used was a carpet python (Morelia spilotes variegata), a non-venomous snake found throughout Australia. It was patterned in black, grey, yellow and green, and approximately 1.7 metres in length. The snake was housed in a wooden case with a glass front, measuring approximately two metres in height, one metre in width, and 60 cm in depth. The case contained a basking platform, a branch, water, and temperature control

apparatus. This stood in a research room in the South Australian Museum, which also contained several other snakes and lizards in glass terraria. A pair of thick cotton gardening gloves was available for items specifying actions to be performed with gloved hands.

VIII. 2.1.3. Procedure

Each student participated alone in a single half-hour session. The experimenter explained to each participant that the purpose of the experiment was to gather normative data on responses to harmless snakes, pointed out that he would not have to perform those behaviours he found alarming or unpleasant, and told him he was free to refuse to participate. Only one chose not to participate.

Students then completed an efficacy scale based on one used by Bandura and his colleagues (see Appendix E.1.), with some minor wording changes to suit the physical characteristics of this setting. The scale consisted of eighteen items arranged hierarchically from "Look at snake in glass case from a distance", through approaching, touching and handling the snake with and without gloves, to the final items, "Tolerate snake in lap". For each item, the participant indicated whether or not he felt he could perform that task at that time (efficacy level), and, if yes, rated his confidence on a scale from 0 to 100 (efficacy strength). Students also completed an "outcome valence" scale, included in Appendix E.2. This listed the same eighteen items, and students rated how they would feel as a result of performing each item, using a scale running from 0 (very negative) through 50 (neutral) to 100 (very positive). The order in which the efficacy and outcome scales were administered was randomised across participants.

After completion of the questionnaires, the participant accompanied the experimenter to the room where the snake was housed. Once there, the experimenter read out each behaviour in the hierarchy, and allowed the participant as many attempts as necessary to perform the behaviour or to decide not to complete it. The experimenter volunteered the information that the snake was non-venomous, and if asked gave instructions on handling, but she did not model any behaviours or urge participants to continue. When a participant declined to perform an item, the behavioural test was stopped. Students were debriefed as to the purpose of the study, and were later supplied with a summary of the results.

VIII. 2.2. Results

VIII. 2.2.1. Preliminary analyses

Total scores were obtained for efficacy level, efficacy strength, outcome valence, and number of items successfully performed. Means and standard deviations for these variables are listed in Table VIII.1. T-tests

TABLE VIII.1. Means and standard deviations for variables included in Efficacy/Outcome Study I, and results of t-tests for order effects.

Variable	Mean	Standard deviation	t value
Efficacy level	15.5	3.72	0.01
Efficacy strength	1213.4	383.4	0.79
Outcome expectancy	923.8	344.7	1.62
Items performed	15.9	3.26	0.09

were performed to assess differences between the two subgroups which had completed the two questionnaires in different order. There were no significant differences between the groups on any measure, as shown in Table VIII.1.

VIII. 2.2.2. Item matches

So that microanalysis of the match between all predictors and the performance measure could be performed, efficacy strength and outcome expectancy were dichotomised at the scale centre for each item. Percentage of performance items correctly predicted, chi-square values, and phi coefficients were calculated for each predictor variable. Accuracy levels are shown in Table VIII.2. All predictors are strongly and significantly associated with performance at a microanalytic level, with the match for the two efficacy measures being rather stronger than that for the outcome measure.

TABLE VIII.2. Measures of association between predictors and performance in Efficacy/Outcome Study I.

Variable	% items correctly predicted	χ^2	Phi coefficient
Efficacy level	92.4	257.5	0.66
Efficacy strength	82.3	159.6	0.52
Outcome expectancy	67.2	85.6	0.38

Note: The percentage of items correctly predicted, obtained chi-square, and phi coefficient are given for each predictor variable. All chi-squares are significant beyond the .0001 level. Total number of items = 594.

VIII. 2.2.3. Correlational analyses

Total scores for each individual on the predictor measures and on the performance measure were calculated and their intercorrelations determined. Table VIII.3 shows the correlation matrix. The predictors are all strongly intercorrelated, and highly correlated with the performance measure, with the

TABLE VIII.3. Correlations between individual total scores on all predictors and performance measure for Efficacy/Outcome Study I.

	Efficacy level	Efficacy strength	Outcome expectancy	Performance level
Efficacy strength	.81**	-		
Outcome expectancy	.58**	.72**	-	
Performance level	.82**	.66**	.47*	-

Note: n = 33 * $p < .01$ ** $p < .001$

efficacy measures showing a stronger relationship. T-tests for related correlations were performed to assess the significance of these differences. It was found that efficacy level was significantly more highly correlated with performance than was outcome expectancy ($t = 3.65$, $p < .001$), but that efficacy strength was not a better predictor than outcome expectancy ($t = 1.82$, $p = .1$).

Two stepwise multiple regressions were performed to determine whether some linear combination of efficacy and outcome measures would be a better predictor of performance than either variable alone. Since efficacy strength and level were very highly intercorrelated, it was considered inappropriate to include both in any one analysis (cf. Darlington, 1968). Therefore one regression used efficacy level and outcome expectancy as predictors of

TABLE VIII.4. Summary table of multiple stepwise regression, using efficacy level and outcome expectation to predict performance level in Efficacy/Outcome Study I.

Step	Variable entered	Multiple correlation	% variance accounted for	F ratio	Significance
1	efficacy level	.82	67.3	63.87	< .0001

Note: Following step 1, the partial correlation between outcome expectation and performance was -.009, and the regression analysis was terminated.

TABLE VIII.5. Summary table of multiple stepwise regression, using efficacy strength and outcome expectation to predict performance level in Efficacy/Outcome Study I.

Step	Variable entered	Multiple correlation	% variance accounted for	F ratio	Significance
1	efficacy strength	.66	43.8	24.20	< .0001

Note: Following step 1, the partial correlation between outcome expectation and performance was -.011, and the regression analysis was terminated.

performance, and the other used efficacy strength and outcome expectancy. Tables VIII.4 and VIII.5 summarise the results of the two regression analyses. In both, the efficacy measure was entered at the first step, accounting for 67% and 44% of the total variance for efficacy level and efficacy strength respectively. In each case, the partial correlation between outcome expectancy and the unexplained variance in performance was less than .01, so that the second step of each regression accounted for less than .01% of the variance in performance.

Outcome expectations were multiplied by each of efficacy level and efficacy strength. The correlation between the products and the behavioural score were: for the product of efficacy level and outcome expectation, .59; for the product of efficacy strength and outcome expectation, .51. Neither of these correlations is as large as those between efficacy alone and behaviour. T-tests for related correlations indicate that both efficacy level ($t = 3.12$, $p < .01$) and efficacy strength ($t = 2.28$, $p < .05$) are better predictors of performance alone than when multiplied by outcome expectations.

VIII. 2.3. Discussion of Efficacy/Outcome Study I

In this study, efficacy measures are better predictors of performance than are outcome-expectation measures. A linear combination of efficacy and outcome measures accounts for no more variance than does efficacy alone, and the product of the two predictors accounts for significantly less. These findings are opposed to the suggestion of Saltzer (1982) that efficacy and outcome expectations are multiplicatively related to performance, and to the suggestion that outcome expectations provide predictive data additional to that obtained from efficacy expectations.

The task used in this study was deliberately artificial; it was chosen to be a readily quantifiable activity which would not be confounded by previous experience and knowledge. However, the artificiality of the situation may mean that these findings are specific to such an experimental task and such a population. The participants were selected randomly and not on the basis of fear of snakes, and it may be possible that demand characteristics of the situation outweighed their reluctance to perform some items. One might argue that the less fearful participants could perceive the task as a kind of "dare". Having specified the number of items they thought they could perform,

they may have felt compelled to do so. The judgements of how they expected to feel about performing the tasks might be considered less important, in that ignoring them could show a socially desirable disregard for negative emotions. The use of male subjects by a female experimenter could have exacerbated this tendency. Such argument is, of course, purely speculative, but it may explain these results. Because such a rival explanation seemed feasible, it was decided to repeat the experiment using a different population and a task which was more important to the individuals involved, more likely to be practised in natural situations, and somewhat less of a challenge.

VIII. 3. RELATIVE PREDICTIVE ACCURACY OF OUTCOME EXPECTANCIES AND EFFICACY REPORTS. EFFICACY/OUTCOME STUDY II - ASSERTIVE BEHAVIOUR*

A task involving social skills was chosen because the work with assertiveness training described in earlier chapters has shown a close relationship between efficacy expectations and assertive behaviours. Selection of participants on a random basis would ensure a fairly wide range of assertiveness levels, and allow consideration of the relationship between efficacy and outcome expectations at different levels of skill. The study used self-report scales to measure efficacy and outcome expectations for each of seven simulated assertiveness situations. In this case, outcome expectations were construed as expectations that the successful completion of an assertive response would lead to positive, neutral, or negative consequences overall.

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* A report of this study is also available as: Lee, C. Accuracy of efficacy and outcome expectations in predicting performance in a simulated assertiveness task. Cognitive Therapy and Research, in press.

The participants were female students; females only were involved as there is evidence (Crassini, Law & Wilson, 1979) that males and females have different patterns of assertiveness, and females were more readily available.

Students completed a global assertiveness measure, and the efficacy and outcome scales, and then role-played each situation. Analyses were performed to assess whether efficacy expectations, outcome expectancies, the global assertiveness measure, or some combination of the three, was the best predictor of assertiveness. Further analyses, to examine whether the relationships between these variables changed at different levels of assertiveness, were also carried out.

VIII. 3.1. Method

VIII. 3.1.1. Participants

Forty female students, with a mean age of 19 years 9 months, were selected on a random basis from an introductory psychology class, and participated as part of course requirements.

VIII. 3.1.2. Apparatus

1. Audiotape. Stimulus situations were presented to all participants on an audiotape which had been recorded by the experimenter. The tape began with the following instructions.

> "On this tape you will hear described a number of situations requiring an assertive response. At the end of each description you will hear a click and you will have forty seconds in which to respond. Your response will be recorded."

There followed seven descriptions of situations in each of which an assertive verbal response would be appropriate, each followed by a forty-second pause. The situations used were chosen from the forty-four items used in the assertiveness training study described in Chapter IV. Mean levels of assertiveness for each item used in that study were used to select seven items with a wide range of difficulty. Table VIII.6 shows the mean levels of assertiveness and appropriateness achieved by the nonassertive students on these seven items. The items were identical in wording to those used in the assertiveness training study. Transcripts of the items are included in Appendix F.1. All students heard the same tape, and a second tape recorder was used to record both the stimulus and the participant's response.

TABLE VIII.6. Mean scores (on scales from 0 to 6) obtained by nonassertive students during assertion training (see Chapter IV) for the seven items selected for Efficacy/Outcome Study II.

Item	Mean assertiveness score	Mean appropriateness score
1	4.20	5.00
2	1.78	3.93
3	4.13	5.20
4	3.20	4.33
5	3.31	4.60
6	3.60	4.32
7	3.96	4.96

2. Tape recorders. Two small portable cassette recorders were used, one to play the stimulus tape and the other to record both stimulus and response.

3. Rooms. The experiment was conducted in two adjoining research rooms. The first was used for explanation and completion of questionnaires. Participants performed the verbal part of the experiment alone in the second room, which contained only a chair and a desk upon which were placed the tape recorders.

VIII. 3.1.3. Procedure

Each participant was seen individually for a single half-hour session. The experimenter explained that the purpose of the study was to collect normative data on levels of assertiveness, and the participant completed the College Self-Expression Scale (CSES: Galassi et al., 1974). She then read the definition of assertiveness included in Appendix A.4., and completed a seven-item questionnaire designed to measure efficacy and outcome expectations. Each item began with a description of one of the items on the audiotape. This was followed by an efficacy question and an outcome expectancy question. The efficacy question was, "Regardless of what the outcome might be, do you think you are capable of responding assertively in this situation?". Participants answered "yes" or "no" to provide a measure of efficacy level, and, if yes, completed an efficacy strength scale running from 0 (completely uncertain) to 100 (completely certain). The outcome expectancy question was worded, "If you were to respond in an assertive way to this situation, do you think the outcome would be . . . .". A scale from 0 (very negative) through 50 (neutral) to 100 (very positive) was provided for the participant's response. Half the participants answered the efficacy question

before the outcome expectancy question for each item, while this order was reversed for the others. The questionnaire used is included in Appendix F. 2.

After the questionnaire was completed, the experimenter explained the rest of the experiment. A description of the role-play situation and of the participant's task were given; it was emphasised that the participant should reply in direct speech, saying whatever she felt she would say in such a situation. The participant was conducted to the second experimental room, where the experimenter started the tape recorders and then left. The participant carried out this part of the experiment alone, and returned to the first room when the tape had finished.

All participants were debriefed as to the purpose of the study and later supplied with a summary of the findings.

VIII. 3.1.4. Audiotape rating

Since the experimenter had not been present during the taping, and participants were identified on the tapes only by number, it was considered that she would not be biassed in rating participants' performance. She rated all responses on the same three variables which had been used in the assertiveness training study (see Section IV. 3.3). The measures were: assertiveness, on a scale from 0 to 6 (0 = no response, 1 - 3 various levels of nonassertiveness, 4 - 5 assertive; 6 aggressive); appropriateness, on a scale from 0 to 6 (0 - 3 inappropriate, 4 - 6 appropriate); and response latency, measured in tenths of a second. The scales used for rating assertiveness and appropriateness can be found in Figure IV.2. A graduate student, blind to the purpose of the experiment, independently rated a random sample of nine students on the same measures as a reliability check. Reliabilities appeared satisfactory. Mean differences per item between the raters were: for

assertiveness, .5 of a scale point; for appropriateness, .7 of a scale point; for latency, .65 seconds. Percentage-agreement scores were: for assertiveness, 97%, for appropriateness, 89%; for latency, 94%.

VIII. 3.2. Results

VIII. 3.2.1. Preliminary analyses

Analyses were conducted to determine whether there were any differences between the two subgroups which had completed the efficacy questions first or the outcome expectancy questions first. Individual totals were obtained for all variables. There were no differences for any of the questionnaire measures, and differences for the performance measures were not significant. Results of these analyses, as well as means and standard deviations for the entire sample, are shown in Table VIII.7.

TABLE VIII.7. Means and standard deviations for variables included in Efficacy/Outcome Study II, and results of t-tests for order effects.

Variable	Mean	Standard deviation	t (df = 39)
CSES	129.1	25.9	0.10
Efficacy level	5.78	1.33	0.35
Efficacy strength	392.2	120.0	0.14
Outcome expectancy	421.2	92.2	0.37
Assertiveness	26.0	4.69	1.92
Appropriateness	32.0	5.32	1.47
Latency	21.7	14.2	1.71

Note: No t value is significant

VIII. 3.2.2. Item matches

So that microanalysis of the match between predictors and performance measures could be performed, all variables were dichotomised in the same way as in previous studies. Efficacy level was already a dichotomy; efficacy strength and outcome expectancy were split at the centre of the scales. The appropriateness scale was split, with scores of 4 or above being classed as "appropriate". The assertiveness scale was split in the same way, except that scores of 6 (= aggressive) were classed with those below 4 as "non-assertive". Percentage of items correctly predicted, chi square values, and phi coefficients were computed for both assertiveness and appropriateness. Table VIII.8 shows these values for each of the predictor variables. Both efficacy measures were moderately related to performance at a microanalytic level, while the match for outcome valence was rather weaker.

TABLE VIII.8. Measures of association between predictor and outcome variables for Efficacy/Outcome Study II.

Predictor	Assertiveness			Appropriateness		
	% items correct	χ^2	Phi coefficient	% items correct	χ^2	Phi coefficient
Efficacy level	76.4	52.6**	.43	80.7	45.9**	.40
Efficacy strength	67.9	29.6**	.33	65.7	20.7**	.27
Outcome expectancy	59.3	5.53*	.14	59.3	3.76	.12

Note: Total number of items = 280.
* $p < .05$ ** $p < .001$

VIII. 3.2.3. Correlational analyses

Scale scores on each of the predictor and performance variables were correlated, and Table VIII.9 gives the result correlations. Outcome expectancy

TABLE VIII.9. Correlations between individual total scores on all predictors and performance measure for Efficacy/Outcome Study II.

	CSES	Efficacy level	Efficacy strength	Outcome expectancy	Assert-iveness	Appropri-ateness	Latency
Efficacy level	.73***	-					
Efficacy strength	.79***	.83***	-				
Outcome expectancy	.44**	.55***	.64***	-			
Assertive-ness	.55***	.73***	.64***	.40**	-		
Appropri-ateness	.39**	.59***	.49***	.33**	.80***	-	
Latency	-.15	-.14	-.23	-.08	-.44**	-.49***	

Note: n = 40
* p < .05 ** p < .01 *** p < .001

was significantly correlated with both efficacy strength and efficacy level, and the two efficacy measures were strongly intercorrelated. All predictor variables were significantly correlated with both assertiveness and appropriateness, which were strongly intercorrelated. Latency of response was not significantly related to any predictor variable, although it was correlated with assertiveness and appropriateness.

These results indicate that efficacy measures correlate more highly with performance measures than do outcome expectancy measures. T-tests for related correlations were performed to assess the significance of these differences. It was found that neither of the two efficacy measures was a

significantly better predictor of appropriateness than was the outcome expectancy measure (t values = 1.38 and 0.80). Efficacy strength was not significantly more highly correlated with assertiveness than was outcome expectancy (t = 0.96), but efficacy level was significantly more accurate (t = 2.08, p = .04).

A series of stepwise multiple regression analyses was performed to determine whether some linear combination of efficacy and outcome measures would be a better predictor of performance than either of them alone. Since efficacy level and strength were highly intercorrelated, it was considered inappropriate to include both in any one analysis (cf. Darlington, 1968). For each of the three performance variables, then, two multiple regressions were performed, one using efficacy level, outcome expectancy, and CSES scores as predictors, the other using efficacy strength, outcome expectancy, and CSES score.

TABLE VIII.10. Summary tables of multiple stepwise regressions, using (a) efficacy level, outcome expectancy and CSES score and (b) efficacy strength, outcome expectancy and CSES score to predict assertiveness in Efficacy/Outcome Study II.

Step		Variable entered	Multiple r	% variance accounted for	Overall F	Significance
a	1	efficacy level	.725	52.5	38.74	< .001
	2	CSES	.725	52.6	18.88	< .001
b	1	efficacy level	.636	40.4	23.77	< .001
	2	CSES	.640	40.9	11.77	< .001

Note: Following the second step, the partial correlations between outcome expectancy and assertiveness were .002 and .007 for the two regressions respectively, and the analyses were stopped at this point.

TABLE VIII.11. Summary tables of multiple stepwise regressions, using (a) efficacy level, outcome expectancy, and CSES score and (b) efficacy strength, outcome expectancy and CSES score to predict appropriateness in Efficacy/Outcome Study II.

Step		Variable entered	Multiple r	% variance accounted for	Overall F	Significance
a	1	efficacy level	.586	34.3	18.30	< .001
	2	CSES	.589	34.7	9.02	< .001
	3	outcome expectancy	.589	34.7	5.84	.003
b	1	efficacy strength	.487	23.7	10.90	.002
	2	outcome expectancy	.488	23.8	5.31	.010

Note: Following the second step in regression "B", the partial correlation between CSES and appropriateness was .006, and the analysis was stopped at this point.

TABLE VIII.12. Summary tables of multiple stepwise regressions, using (a) efficacy level, outcome expectancy and CSES score and (b) efficacy strength, outcome expectancy and CSES score to predict response latency in Efficacy/Outcome Study II.

Step		Variable entered	Multiple r	% variance accounted for	Overall F	Significance
a	1	CSES	.152	2.3	0.80	.378
	2	efficacy level	.157	2.5	0.42	.661
b	1	efficacy strength	.231	5.3	1.92	.175
	2	outcome expectancy	.246	6.1	1.07	.356
	3	CSES	.255	6.5	0.74	.535

Note: Following the second step in regression "A", the partial correlation between outcome expectancy and latency was -.0005, so the analysis was stopped at this point.

Tables VIII.10, VIII.11, and VIII.12 summarise the results of the regressions predicting the three outcome variables. For assertiveness and appropriateness of response, all four regressions were significant, accounting for 52.6% and 40.9% of the variance in assertiveness, and 34.7% and 23.8% of the variance in appropriateness. In all four cases, the efficacy measure was the first variable to be entered in the stepwise regression. The outcome measure and CSES score were entered at later steps but in no case did the addition of either of these variables increase the percentage of variance accounted for by more than 0.5%. The two multiple regressions predicting latency to begin response indicated that no combination of predictors reached significance in accounting for latency scores (see Table VIII.12); the two regressions respectively accounted for 2.5% and 6.5% of the variance in latency.

Outcome expectations were multiplied by each of efficacy level and efficacy strength. The correlations between these resultant predictors and the three performance variables are shown in Table VIII.13.

A comparison with Table VIII.9, which gives the correlations between individual predictors and performance variables, indicates that these correlations are approximately equal to those obtained by correlating the efficacy score alone with the performance variables.

TABLE VIII.13. Correlations between multiplicative combinations of predictor variables and performance variables in Efficacy/Outcome Study II.

Predictor	Performance Variable		
	Assertiveness	Appropriateness	Latency
Efficacy level x Outcome expectancy	.64**	.55**	-.13
Efficacy strength x Outcome expectancy	.58**	.49**	-.18

** $p < .001$

VIII. 3.2.4. Effects of skill level

To assess whether the relationships between efficacy, outcome expectancy, CSES measures, and performance varied as skill level varied, a further set of multiple regressions was performed. The six multiple regressions - using efficacy level, outcome expectancy, and CSES, or efficacy strength, outcome expectancy and CSES to predict each of assertiveness, appropriateness, and latency - were repeated for each of two halves of the population. Those individuals scoring above the median score on the CSES were included in one set of regressions, and those scoring below in the other set. Thus the question of whether these relationships varied with skill level could be examined.

The four resulting regressions for the variable of assertiveness all showed the efficacy variable entered at the first step (see Tables VIII.14 and VIII.15). Three of the four regression equations accounted for over 50%

TABLE VIII.14. Summary tables of multiple stepwise regressions, using (a) efficacy level, outcome expectancy and CSES score and (b) efficacy strength, outcome expectancy and CSES score to predict assertiveness in those individuals scoring below the median on the CSES in Efficacy/Outcome Study II.

Step		Variable entered	Multiple r	% variance accounted for	Overall F	Significance
a	1	Efficacy level	.673	45.3	13.2	.002
	2	CSES	.723	52.2	8.19	.004
	3	Outcome expectancy	.723	52.3	5.12	.013
b	1	Efficacy strength	.736	54.2	18.9	< .001
	2	CSES	.746	55.6	9.40	.002
	3	Outcome expectancy	.748	56.0	5.93	.008

TABLE VIII.15. Summary tables of multiple stepwise regressions, using (a) efficacy level, outcome expectancy and CSES score and (b) efficacy strength, outcome expectancy and CSES score to predict assertiveness in those individuals scoring above the median in the CSES in Efficacy/Outcome Study II.

Step		Variable level	Multiple r	% variance accounted for	Overall F	Significance
a	1	Efficacy level	.749	56.1	21.7	< .001
	2	CSES	.755	56.9	10.6	.001
	3	Outcome expectancy	.758	57.4	6.74	.004
b	1	Efficacy strength	.239	5.74	1.03	.323
	2	CSES	.250	6.26	0.53	.596
	3	Outcome expectancy	.261	6.84	0.37	.778

of the variance and produced significant F ratios, while the regression using efficacy strength, outcome expectancy, and CSES to account for variability in assertiveness in those scoring above the CSES median was not significant and accounted for only 7% of the variance overall.

A similar pattern was found for the four regressions predicting appropriateness (see Tables VIII.16 and VIII.17). In three cases, the efficacy measure was entered at the first step and accounted for a significant proportion of the variance. In the fourth regression, again that using efficacy strength, outcome expectancy and CSES to predict the scores of those above the median, the outcome expectancy measure was entered at the first step and the efficacy measure at the second. This regression equation did not account for a significant proportion of the variance.

The four regressions predicting variability in latency to begin a response were not significant and accounted for 0.5%, 8.5%, 2.9%, and 2.5% of the variance respectively.

TABLE VIII.16. Summary tables of multiple stepwise regressions, using (a) efficacy level, outcome expectancy and CSES score, and (b) efficacy strength, outcome expectancy, and CSES score to predict appropriateness in those individuals scoring below the median on the CSES in Efficacy/Outcome Study II.

Step		Variable entered	Multiple r	% variance accounted for	Overall F	Significance
a	1	Efficacy level	.485	23.5	4.91	.042
	2	Outcome expectancy	.520	27.0	2.77	.094
	3	CSES	.521	27.1	1.74	.206
b	1	Efficacy strength	.453	20.5	4.12	.059
	2	Outcome expectancy	.497	24.7	2.46	.119
	3	CSES	.500	24.9	1.55	.245

TABLE VIII.17. Summary table of multiple stepwise regressions, using (a) efficacy level, outcome expectancy and CSES score, and (b) efficacy strength, outcome expectancy and CSES score to predict appropriateness in those individuals scoring above the median on the CSES in Efficacy/Outcome Study II.

Step		Variable entered	Multiple r	% variance accounted for	Overall F	Significnace
a	1	Efficacy level	.714	51.0	17.7	.001
	2	Outcome expectancy	.767	58.8	11.4	.001
b	1	Outcome expectancy	.379	14.4	2.85	.110
	2	Efficacy strength	.430	18.5	1.81	.195

Note: Following the second step, the partial correlations between CSES and appropriateness were .02 and .004 for regressions "A" and "B" respectively, and the analyses were stopped at this point.

Thus, the results of these twelve regressions are very similar to those of the six using the entire population. The relationships do not appear to vary substantially between the high-assertive and low-assertive individuals, except that efficacy strength appears to be a somewhat less important predictor among the high-assertive than among the low-assertive individuals. The percentage of variance accounted for in the two halves of the population is in general less than that accounted for when the whole population is used, but such a result is likely to be due to the smaller group sizes in the second series of analyses.

VIII. 4. DISCUSSION OF EFFICACY/OUTCOME STUDIES I AND II

VIII. 4.1. Summary of results

Both studies presented in this chapter are concerned with the relative predictive accuracy of measures of efficacy and of outcome expectancy. The main results for the two studies are identical: efficacy measures and outcome expectancy measures each account for a significant proportion of the variance in performance variables (except in the case of latency to begin response in the second study, a variable which shows little relationship with other variables in this and previous studies, as has been discussed in Section VI.5). Multiple regression analyses indicate that a linear combination of predictor variables does not account for a significantly greater proportion of variance in performance variables than does either efficacy level or efficacy strength. Similarly, a multiplicative combination of efficacy and outcome measures does not account for any more variance in the performance variables than does an efficacy measure alone. The efficacy measures are slightly, but in general not significantly, more accurate predictors than the outcome

expectancy measures. The additional analyses in Study II suggest that the overall findings are not substantially altered when either high or low skilled people are considered alone.

VIII. 4.2. Discussion

The findings presented in this chapter provide support for Bandura's argument that efficacy expectations are more central in determining behaviour than are outcome expectations. In every case, the relationship between efficacy and behaviour was stronger than that between outcome expectancy and behaviour. While the relationships are correlational only, and do not provide direct evidence for patterns of causality, they are consistent with Bandura's causal model. It should be stressed that these studies do not test Carver and Scheier's (1981) theory, as their definition of "outcome expectation" is not met by the variables in these studies. However, these studies do support self-efficacy theory. Bandura has always made it clear that efficacy expectations are not the sole determinants of behaviour, and that skill and incentive levels can play a part in determining behaviour (e.g. Bandura, 1977a). However, the results of Study II and those reported in Chapter V indicate that general measures of skill level, by comparison with efficacy, are not very accurate predictors of behaviour, and that the relationships between efficacy, outcome expectancy and behaviour remain very similar across a wide range of ability levels.

The arguments presented in the introduction to this chapter suggest that efficacy expectations and outcome expectancies have independent roles in determining behaviour, and that by taking both into account it is possible to predict behaviour more accurately than by reference to efficacy expectations alone. Such an argument is not strongly supported by these studies.

Rather, it seems that efficacy alone will account for as much variance as will the use of both measures.

This is as predicted by self-efficacy theory, and lends support to the view that efficacy expectations are of central importance in behaviour change programmes. However, outcome expectations are almost as highly correlated with performance as are efficacy expectations. This suggests that attention should be paid to both classes of cognition during therapy; therapeutic programmes should be designed to increase feelings of personal efficacy and to alter beliefs in the effectiveness of the target behaviours. The method of participant modelling, which Bandura (1977a) argued to be the most effective method of behaviour change, clearly provides information to the participant which could alter both efficacy and outcome expectations. Observing the model perform feared behaviours, and trying them oneself, serves to increase self-efficacy, while discovering that there are no untoward consequences of the target behaviour must increase positive outcome expectancies. It would be interesting to compare the effects of different behaviour change techniques on efficacy expectations, outcome expectations, and behaviour to examine further the roles played by these cognitions.

In both the studies reported in this chapter, there are high correlations between outcome expectations and efficacy measures. One might argue that this could result from participants' inability to distinguish clearly between the two concepts (Teasdale, 1978), but the results are too consistent in showing the superiority of efficacy for this to be plausible. Given the social learning theory concept of reciprocal interaction between cognitive variables, behaviours and environments (Bandura, 1978c), it seems inevitable that one's outcome expectations and one's efficacy expectations will be related. Efficacy expectations arise from performance, from observation, and from linguistic

inputs (Bandura, 1977a); surely these same factors will influence outcome expectancies. This is not to say that there is no theoretical or practical distinction between the two, nor that it is impossible to score highly on one dimension and low on the other. It is simply to say that there is probably some naturally-occurring, nonorthogonal, relationship between the two variables. Cognitive dissonance theory (e.g., Aronson, 1978) would predict that people who believe they cannot perform a certain task (low efficacy) are likely to devalue the outcome of that task (low outcome expectations) while people who are confident in their abilities are likely to view the outcomes of those particular actions more favourably. Of course, there are extreme cases in which the outcome expectation is less susceptible to change by cognitive re-appraisals or by alterations in the environment. For example, a shipwrecked non-swimmer is unlikely to devalue the outcome of swimming safely to shore because he or she feels incapable of doing so. But in less drastic cases, it seems feasible that perceived inability to do something will be associated with a lowered regard for its results.

Saltzer (1982) suggested that there would be a multiplicative relationship between efficacy and outcome expectations, and that the two would be orthogonal. These findings offer no support for such a suggestion. Rather, outcome expectations can be seen as partial determinants of efficacy expectations, which in turn produce behaviour. This means that, while both will be related to behaviour, efficacy expectations will be more important. This interpretation also suggests that attempts to manipulate them independently, as Davis and Yates (1982) have done, may not provide information which can usefully be applied in natural settings, as the two may not act independently in such situations.

This emphasises the point that therapy should be concerned to alter both efficacy expectations and outcome expectations; if outcome expectations help to determine efficacy, then therapists should examine and, where necessary, alter beliefs about the outcomes of target behaviours.

It should be emphasised that the participants involved in the two studies described in this chapter were not a clinical population. They were chosen at random from a population of university students, did not in general have behavioural problems, and did not seek out therapy. Further, the data are not collected from behaviour-change programmes, but from isolated experimental sessions. It may be possible, as was suggested in Section VI.5, that the relationships between cognitive variables and behaviour may be different in a clinical population undergoing therapy from those occurring in this population.

However, within these constraints, these two studies can be interpreted as indicating that efficacy expectations are better predictors of later behaviour than are outcome expectancies, although the two variables are highly correlated, and that additive and multiplicative combinations of the two variables are not better predictors than efficacy expectations alone.

The following chapter, the final one in this thesis, will review the findings of the studies presented in Chapter IV to VIII, reach an overall conclusion as to how well self-efficacy theory is supported by these findings, suggest ways in which the theory might be modified, and outline suggestions for further research in this area.

CHAPTER IX.

SUMMARY AND CONCLUSIONS

IX. 1. OUTLINE OF ISSUES IN SELF-EFFICACY THEORY

IX. 1.1. Introduction

Self-efficacy theory is a social-learning approach to understanding the relationships between cognitions, in particular efficacy expectations, and behaviour. Its initial aim was to unify the fragmented field of behaviour change by postulating a single mechanism, the alteration of efficacy expectations, to account for changes in behaviour, no matter what the theoretical orientation of the behaviour-change method. The theory, however, should not be seen as specifically concerned with therapy, but is regarded as having general application in the understanding and alteration of behaviour.

Efficacy expectations are highly specific beliefs about one's ability to perform particular actions or groups of related actions; provided one has the requisite skill and sufficient incentive, one's efficacy expectations will determine whether or not one attempts a particular behaviour, what degree of persistence one will show in the face of initial failure, and how successful one will finally be. An efficacy expectation can be seen as an integration of information from a number of sources. The most important are one's own performance accomplishments, past and present; somewhat less influential are the observed accomplishments of others; less important again are linguistic inputs; and of least importance one's cognitive interpretation of one's level of arousal and emotional state, which itself will be strongly influenced by one's interpretation of information from other sources.

Efficacy expectations, then, are seen as a synthesis of the information available to the individual from current and past events, and are proximal determinants of behaviour.

A great deal of work in a range of substantive areas has appeared within the self-efficacy framework. The theory has also been the subject of some criticism and debate; this thesis has aimed to present the arguments raised and to present some evidence which may help to resolve or clarify these points of contention. The following section of this chapter outlines the main issues which have been considered in this thesis, and Section IX.2 will provide more detailed summaries of the studies conducted and the results obtained.

IX. 1.2. Contentious points considered in this thesis

Chapter III has outlined current research work and conceptual issues for self-efficacy theory. There is evidence from a wide range of behavioural domains that efficacy expectations can be measured and that they do predict behaviour; however, a number of criticisms have been made of the theory.

There are some important methodological points which are inextricably mixed with theoretical points and with the interpretation of empirical evidence; these require clarification. The issue of the validity of self-efficacy measures (Kazdin, 1978) and the question of what exactly they measure is one of both methodological and theoretical importance. Related to this are methodological questions of reactivity of measurement (Borkovec, 1978; Poser, 1978) and of the effects of other forces, such as the social desirability of showing a high level of congruence between verbal report and behaviour (Sherman, 1980; Tryon, 1981).

Also related to this central question of what self-efficacy measures actually measure is the more theoretical question of the distinction between efficacy expectations and other cognitions. A number of people (e.g.,Teasdale, 1978) have questioned the distinction between efficacy and outcome expectations. This has been argued from a theoretical point of view, with the

suggestion that it may not be necessary to postulate efficacy expectations independently of outcome expectations in order to develop a model for the understanding of behaviour (e.g., Kazdin, 1978). It has also been argued from a methodological perspective that, even if efficacy and outcome expectations are separate cognitive entities, efficacy expectation questionnaires may not assess efficacy expectations alone but some combination of efficacy and outcome expectations.

Further contention has surrounded the argument that efficacy expectations are proximal determinants of behaviour, and are more accurate predictors than are previous behaviours. The studies purporting to demonstrate this are flawed for a number of reasons, and the questions remain unanswered.

Thus, there are numerous questions surrounding self-efficacy theory, and this thesis has attempted to examine some of them. The following section describes the studies conducted and the results obtained from them.

IX. 2. OVERALL SUMMARY OF RESULTS

In order to examine aspects of the relationship between self-efficacy and behaviour, it was necessary to select substantive areas for the collection of data. It was decided that an assertiveness training programme be designed and run, in order to provide a situation in which behaviour and efficacy could be measured regularly and changes in them recorded. This training programme provided data which reflected upon a number of issues within self-efficacy theory; in order to avoid problems of generalisation from a single study, which although internally valid is too specific for external validity to be established, additional experiments and studies in different subject areas were also conducted to examine the same issues under different conditions.

Chapter IV of this thesis describes in detail the development and running of this assertiveness training programme. The aim of this chapter was to describe the programme and present data which indicated its effectiveness as a behaviour change programme, and therefore its appropriateness as a vehicle for the examination of issues within self-efficacy theory. It was found that there were significant increases in assertiveness during the six-week programme, as measured by a global self-report scale, external ratings of taped interactions, and students' reported efficacy. These increases were maintained at a three-month follow-up session. A number of issues from the assertiveness training literature were also examined, and the findings from this study were consistent with those reported in the literature. This suggests that the programme was an effective and orthodox assertiveness training programme, and therefore that data collected from it could legitimately be used to examine aspects of self-efficacy theory.

Having established the appropriateness of the main study for this purpose, the thesis proceeded in Chapter V to an assessment of the usefulness of self-efficacy measures as predictors of maintenance of behaviour change. Self-efficacy was found to be a good predictor of maintenance in the assertiveness training study, but a number of alternative explanations, such as a ceiling effect resulting from the high maintenance rate, were possible. Therefore, efficacy expectations were examined as predictors of maintenance in another, more naturalistic, behaviour-change situation, the development of regular patterns of exercise through attendance at fitness classes. In this case, efficacy was found to be a much less accurate predictor of maintenance. It was suggested that this discrepancy in findings could result from the fact that the exercising study was concerned with a relatively low-probability behaviour in an uncontrolled setting, in which any number of

unexpected events could alter situations and affect the maintenance of exercise in a way which could not be predicted by the trainee. There is evidence from other studies (e.g., Condiotte & Lichtenstein, 1981) that self-efficacy will reliably predict maintenance of non-smoking in equally uncontrolled and natural settings. Therefore, although the reported study did not show efficacy expectations to be very accurate predictors, it seems unwise to reject the notion that they can be so in applied settings, and it was concluded that the use of efficacy expectations in making decisions concerning maintenance was an issue worthy of further consideration.

Chapter VI returned to the problematic methodological point of the possibility of reactive effects in measuring efficacy. The existing evidence on this point was rather unclear, and three studies were conducted in an attempt to clarify the issue. The first study involved snake phobics performing tasks based closely on those used by Bandura and his colleagues (e.g., Bandura & Adams, 1977) in their early work on self-efficacy theory. Phobics completed either an efficacy scale only, or a behavioural test only, or both. Reactive effects were assessed by comparing performance on the test or scores on the scale for those who had completed that section only with those who had completed both sections. Although no positive reactive effects were found, there were differences between the groups too large for a conclusion of non-reactivity to be reached. It was argued that the characteristics of the snake-handling task might reduce reactivity; in particular, the unfamiliar nature of the activities could serve to minimise the reactive effects of having considered them and completed a questionnaire beforehand. Therefore, it was decided to conduct further studies within the area of assertiveness, a field of activity with which most people are more familiar.

The second study in Chapter VI was an analysis of the assertiveness training study described in Chapter IV. During each of three of the sessions of the assertiveness training programme, participants had role-played eight scenes requiring the use of social skills, but had completed efficacy measures concerning only four of these. Analyses were conducted to determine whether there was any difference in performance between those items for which efficacy had been measured and those for which it had not. It was found that there was a significant enhancement in performance on those items for which efficacy had been measured. Independent post-hoc tests showed that the two sets of items were equivalent in difficulty, which supported the idea that this difference resulted from the act of completing the efficacy questionnaires. A further effect was found in this study: the size of the reactive effect changed over time. Performance on the "efficacy" items was initially much higher than performance on the "no-efficacy" set, but this reactive effect had decreased by the second session and had disappeared entirely by the third session, with performance on the "efficacy" set being slightly worse than performance on the "no-efficacy" set. This interaction with time resulted both from a significant increase in performance on the "no-efficacy" sets and a significant decrease in performance on the "efficacy" sets. This decrease made interpretation of the interaction problematic: two explanations were possible. It could be argued that the act of completing an efficacy scale could be advantageous at low levels of skill, when assertive responding was a somewhat artificial behaviour and a chance to consider the situation beforehand would help the individual, while at higher levels of skill the behaviour might be more automatised and the action of considering the situation before role-playing it could interfere with automatic patterns of responding. Alternatively, it could be argued that the effect could result

from increasing familiarity with the experimental situation, in that any additional information such as a chance to consider the role-plays in advance would be helpful initially, but that as the sessions progressed and the situation became more familiar, considering the role-plays beforehand could reduce interest in responding when the role-play was performed, and thus reduce level of performance.

These two explanations were confounded in this study, as participants were increasing in skill and in familiarity with the task at the same time. Therefore, a third reactivity study was carried out in an attempt to distinguish between the two hypotheses. This study used a social-skills role-playing task again, but participants were selected at random from introductory psychology classes and participated in a single session each. This meant that the degree of familiarity with the situation was kept constant, while level of skill in assertiveness varied across participants. Half the participants completed a self-efficacy scale before the role-playing task, while the other half did not. A simple reactive enhancement of performance was found, and this enhancement did not interact in any way with the skill level of the participant. Thus, it was concluded that the interaction effect found in the study was more likely a result of increasing familiarity with the situation than of level of skill.

It was concluded from this series of studies that there were reactive effects of the measuring of efficacy, and that care should be taken to reduce these effects in the design of experiments in this area. There was speculation on the possibility of using this reactivity to increase initial performance in the development of a new skill and therefore to enhance efficacy and increase the effectiveness of behaviour change programmes. It was pointed out, however, that the participants in the studies in this chapter

were not a clinical population, and that the usefulness of reactive effects in such a population would have to be established independently.

Bearing in mind these cautions concerning reactive effects, Chapter VII continued to develop the argument of the thesis. Self-efficacy theory argues that efficacy expectations are better predictors of behaviour than are measures of previous behaviour. If this is the case, it provides an important justification for the theory. While there already exists evidence to support such a contention, this evidence is flawed by the use of inappropriate designs and statistical analyses. Chapter VII describes two studies which attempt to avoid such problems in examining this issue. The first study was, again, an analysis of data collected during the assertiveness training programme. Behavioural measures and efficacy measures obtained in earlier sessions were used as predictors of behavioural measures in later sessions. The degree of accuracy of the two types of predictor were compared. It was found, in direct contradiction to the theory's prediction, that there was an overwhelming tendency for the behavioural measures to be more accurate predictors than the efficacy measures. A second experiment was carried out in a quite different substantive field in order to see whether this finding generalised. In the second study, young gymnasts were asked for their efficacy expectations concerning their performance in a competition. Previous competition scores were also collected, and analyses conducted to determine whether the performance measure or the efficacy measure was a better predictor of subsequent performance. In this study, efficacy was found to be a better predictor, although the difference in accuracy did not reach statistical significance because of the small sample size.

The contradictory results of these two studies indicated that there is no simple answer to the question of whether efficacy expectations or

behavioural measures are better predictors of subsequent behaviour. Rather, the relationships are likely to vary depending upon differences in such things as type and level of task assessed, the skills and incentives of the individual involved, and the ease and accuracy with which the individual can assess his or her performance. It was at this point that it began to become clear that a consideration of the parameters of such variables and the way in which they affected the relationships between efficacy and performance could enhance the applicability of the theory in a wider range of settings.

Chapter VIII again examined the predictive accuracy of efficacy expectations, this time comparing them with outcome expectations, which a number of psychological theories regard as important determinants of behaviour. Two studies were conducted, one involving a snake-handling task and the other a social-skills role-playing exercise. In both studies, measures of both efficacy and outcome expectations were taken, and compared as predictors of the experimental task. Both studies showed that efficacy expectations were better predictors than outcome expectations, and that mathematical combinations of the two did not account for more variance than did efficacy expectations alone. It was concluded from these studies that efficacy expectations are better predictors than are outcome expectations of future behaviour.

The nine studies included in this thesis deal with a range of issues pertaining to self-efficacy theory and result in conclusions which variously do and do not support the theory as it stands. The following section attempts to integrate these findings into an overall assessment, and discusses a number of areas which appear to require further research in order to improve the theory.

IX. 3. INTEGRATION, IMPLICATIONS, AND DIRECTIONS FOR FURTHER RESEARCH

The studies presented in this thesis can be divided into two groups: the three methodological studies in Chapter VI which examine aspects of reactivity, and the other six, which examine the theoretical issues of the relationships between behaviours, efficacy expectations, other cognitions, levels of skill, and subsequent behaviour. Methodological and theoretical questions are frequently confounded, however, and cannot be considered separately from each other. Appropriate method will depend upon the theoretical questions considered (Chalmers, 1976), while theoretical questions cannot be examined unless issues of experiment and experimental design have been resolved; otherwise, alternative explanations of effects are always possible. Thus, all nine studies can be seen as concerned with related aspects of the same issue: that of the relationship between self-efficacy, as measured by the self-report scale, and other variables such as behaviour and other cognitions.

The studies presented in Chapter VI, together with evidence from other research, indicate that there frequently are reactive effects of measuring efficacy expectations, some large and some small. Reactivity Study II suggests that the size and direction of reactive effects will be influenced by the individual's level of familiarity with the situation; Reactivity Study III examines the effects of different levels of skill but concludes that, at least for the skill of assertiveness, this is not an important parameter of reactive effects.

Merely noting the existence of reactive effects and attempting to eliminate them is hardly sufficient. This methodological point has implications for theoretical investigations. It appears from the other studies in this thesis

that a number of variables, possibly including skill level and task familiarity, along with others which might interact with levels of reactivity, may have important effects on the relationship between efficacy and behaviour. If these effects are to be assessed correctly, the influence of differential levels of reactivity will have to be taken into account. Other parameters not considered in this thesis might also have variable effects on reactivity; for example, an individual's expectancies of therapeutic benefits might be related to the size of a reactive effect.

A further implication of these reactive effects, already mentioned in Chapter VI, is the possibility of using reactivity to one's advantage to enhance the effectiveness of therapy. If there are demand characteristics of completing an efficacy scale early in a therapeutic programme which result in improvements in behaviour, then the administration of the efficacy scale could be used deliberately to alter behaviour. Such a suggestion can only be tentative, and a range of studies would be required to assess its possible utility. It is possible that such effects would occur only if the behavioural problem were minor and resulted largely from reduced efficacy, rather than from a lack of requisite skills or reduced incentive to change. It should also be noted that, in the three studies reported in Chapter VI, efficacy strength was always higher than behavioural level. This may be an important condition for the positive reactive effects found in that chapter, and may be one which occurs only in relatively mild problem areas. Such questions need to be resolved before it can be established that therapeutic reactive effects could reliably be produced. The questions raised in Chapter VI, of the generality and persistence of the effect, of the optimal timing of reactive measurement, and of the optimal wording of the scale, could then be considered. The speculative nature of such suggestions is clear, but the point could bear

further research, and it is interesting to consider that such methodological points can have theoretical and practical implications.

All the other studies presented in this thesis are concerned more directly with the theme of the accuracy of self-efficacy as a predictor of subsequent behaviour. Chapter V examines self-efficacy as a predictor of maintenance of behaviour change, Chapter VII compares the predictive power of efficacy expectations with that of behavioural measures, and Chapter VIII compares efficacy expectations with outcome expectations as predictors of later behaviour. The results presented in these three chapters are variable in the support they provide for self-efficacy theory. Efficacy expectations are found to be good predictors of maintenance in one substantive area, and not in another. They are found to be worse predictors than behavioural measures in one situation, and better in another. The two studies dealing with outcome expectations do agree in finding efficacy expectations to be better predictors than outcome expectations of later behaviour.

The variations in these findings suggests that other variables must be taken into account in considering the relationships between efficacy and behaviour. A simple model, in which efficacy expectations are seen as the sole proximal determinants of behaviour in any situation, is clearly inadequate for accounting for such variable findings. Further research to identify other important variables, and to examine the ways in which these variables interact with efficacy expectations to determine behaviour, would do much to help expand and refine self-efficacy theory and to increase its generality and usefulness as a way of understanding behaviour and behaviour change.

Although the results of the various assertiveness experiments presented in this thesis suggest that skill level is of little importance in the relationship between efficacy and behaviour, it would be premature to reject

it entirely as a relevant variable. The assertiveness studies have measured general assertiveness skill by means of a self-report inventory, which certainly does not correlate perfectly with enactive measures of skill. A more direct measure of skill level may produce different results. Further, it has been demonstrated (e.g., Alden & Cappe, 1981) that people who are low in assertiveness are characterised by a reluctance to use assertiveness skills, a negative expectation of their consequences, and a low rating of their own ability to use the skills, rather than a lack of the requisite skills themselves.

Another study using measures of skill was the study of gymnasts reported in Chapter VII. In this, there was an independent behavioural measure of skill with which efficacy levels could be correlated. In this study, efficacy level was related strongly to skill level, but in this case the measure of skill was highly specific and identical to the predicted variable. However, despite this specificity, there was no relationship between accuracy of efficacy judgement and level of skill.

So the data presented in this thesis suggest that skill level will not have an important bearing on the relationship between efficacy and behaviour. However, further research in this area, selecting individuals who differed clearly in level of skill on tasks which can readily be evaluated, will be necessary before a final conclusion on the role of skill level can be reached.

The importance of skill level in influencing the relationship between efficacy and behaviour may vary depending on the type of task involved. It is possible, for example, that complex tasks require relatively high levels of skill before efficacy becomes an accurate predictor. A high level of skill and knowledge may be needed in order to obtain accurate information on which to base efficacy judgements. Further, with some complex activities, the outcome may be under individual control only if the level of skill is

sufficiently high. For example, an experienced archer can control exactly where an arrow strikes the target, while luck and chance factors play more of a role with the beginner.

This discussion leads to another possibly important variable, that of the type of feedback available to the individual. The accuracy, immediacy, valence, and precise form of feedback on performance level or other aspects of behaviour may influence the relationships between efficacy and performance. This was suggested in Chapter VII as a possible explanation for the differences in findings between the two studies presented in that chapter. The issue of feedback appears an important one. Carroll and Bandura (1982) have recently described the process of observing a skill, attempting it, self-monitoring, and self-correcting in a social learning theory framework. They argue that learning through modelling requires developing a conception of the action through observation, followed by a process of attempting, conception-matching and correcting in which the new action is tried and performance matched against a mental template. They cite evidence in support of this argument which shows modelling to be more effective if the action being modelled is encoded symbolically by the observer. They also present evidence that visual feedback of one's own performance enhances learning, and they suggest that both a model and precise performance feedback are required for optimal learning. Bandura and Cervone (Note 2) argue that it is necessary to have both goals and feedback in order for performance motivation to be high and learning to be most efficient. They found that efficacy had a closer match with performance when the individual had explicit goals and accurate performance feedback than when either of these was missing.

Further research on the question of the importance of goals, accurate modelling, and feedback should clarify the relationship between these, efficacy, and performance. Issues to be examined might include the consistency of

feedback, its immediacy and precision, informational and affective aspects of feedback, the extent to which it is evaluative and the valence of that evaluation, and the extent to which it could readily be comprehended by the individual. A consideration of these factors and the influence they had on the relationship between efficacy and performance would clarify more precisely the role played by performance feedback in the development of efficacy. Recommendations for the optimal form of feedback to be given during therapy or learning processes could be made on the basis of such an understanding. The use of false feedback might also be considered, although it has been argued (e.g., Bandura, 1977a) that false feedback will have only small and temporary effects if it is contradicted by information from other sources.

Bandura and Cervone (Note 2) argue that goals are important as well as feedback in the accuracy of efficacy judgements; Carroll and Bandura (1982), on the other hand, argue that modelling is necessary as well as feedback. It seems that the two may be aspects of the same cognitive process: the development by the individual of a "model" or "template" of the required performance level, against which his or her own performance, by way of the performance feedback, can be compared. Such a suggestion could also be clarified by further research. Consideration of the informational aspects of goals and modelling could be combined with a consideration of the parameters of feedback previously discussed to further clarify the ways in which these sources of information can interact with each other, and the way in which they interact with efficacy and behaviour.

Making an efficacy judgement involves sampling one's own recalled experience in order to make a statement about expectations. Individual differences in skill level, experience, and availability of feedback, as well as

differential salience of prevent events, are likely to influence both the level and accuracy of judgements. Thus, efficacy level and its accuracy are likely to be confounded, particularly in complex tasks for which efficacy is based on many informational inputs. The identification of sources of information on which efficacy judgements are based, and of the ways in which they combine, appears worth careful examination. Such research in controlled laboratory studies could indicate which sources of information may be important in therapeutic behaviour change, and thus provide a basis for the development of therapeutic techniques.

It is clear from the preceding discussion that a simple interpretation of self-efficacy theory, in which efficacy expectations are seen as the only proximal determinants of behaviour, and the efficacy-behaviour relationship little affected by other variables, is inadequate. This is not to argue that the theoretical approach is inadequate, but merely to suggest that it requires further elaboration in order to take into account more of the complexities of natural situations.

IX. 4. CONCLUSIONS

This thesis has reviewed literature and presented evidence pertaining to Bandura's self-efficacy theory. While the existing literature is mainly supportive of the theory, there are some contentious points. The experimental work presented, in the main, supports the theory, showing consistently high matches between efficacy and behaviour, and showing efficacy expectations to be better predictors of behaviour than other cognitions. But again there are some points where the data fail to support the theory.

This theory appears a useful one: it has been applied successfully over a wide range of substantive areas, and has accurately predicted the

relative effectiveness of various modes of therapy. The variables involved are sufficiently objectively defined that experimental precision can be obtained, and unambiguous tests of the theory's predictions conducted. The theory takes into account cognitive events in the explanation of behaviour without losing precision of measurement (although there are some methodological problems associated with the measurement of these cognitions). Whether cognitions should legitimately be considered in an explanation of behaviour is a question which is unlikely to be answered to the satisfaction of all schools of thought (Goldiamond, 1976; Wolpe, 1978); however, there is a large body of evidence (cf. Bandura, 1969) to show that the way in which an individual interprets information has an important effect on the way in which he or she behaves in response to it, so there is evidence that cognitions do seem to affect behaviour, and it is this proposition which forms the basis of social learning theory and of self-efficacy theory. Further, such a model accords with a common-sense approach to human behaviour at a molar level. Thus, if it is this human behaviour in which one is primarily interested, the theory seems an appropriate one.

While the theory appears useful and has received wide support, there has been considerable debate concerning some aspects of it. This thesis has examined some of these contentious aspects. It has presented evidence on the issue of reactivity, showing that reactive effects do occur, at least initially, in the measurement of self-efficacy. It has examined the issue of the differential predictive accuracy of efficacy expectations and measures of previous behaviour; in this area, the experimental findings have indicated that the question does not have a simple answer, and that each can be more accurate than the other in certain circumstances. A number of variables which may influence these relationships were considered; further research

will be required to examine the ways in which these variables may have an effect. In particular, there is a need for more clinical research to examine the effects of these variables in therapeutic situations. The thesis also presented data pertaining to the issue of the differences between and relative predictive accuracy of efficacy and outcome expectations. These data indicate that efficacy and outcome expectations can be measured separately. The two measures are highly correlated, but there are theoretical reasons why this should be the case, and the correlation need not arise from inaccuracies in measurement. Efficacy expectations are shown to be better predictors of later behaviour than are outcome expectations, and models which have combined the two variables to form one predictor do not receive any empirical support.

Overall, the conclusion reached is that self-efficacy theory stands up well to close examination, but that it could benefit from further elaboration. In particular, the influence of other variables on efficacy, behaviour, and the nature of their interrelationship should be examined systematically and integrated at a theoretical level. Performance feedback, level of skill, task complexity, modelling, goal setting, and social demand are a few variables which emerge from the work presented in this thesis as possibly important in this context. Further research clarifying their effects and integrating them into the theoretical model will increase the accuracy and applicability of self-efficacy theory.

LIST OF APPENDICES

APPENDIX A.1.

NAME: _____ AGE: _____

SEX: _____

The College Self-Expression Scale.

The following inventory is designed to provide information about the way in which you express yourself. For each question, please put a tick in the box which best reflects how you would usually act.

		Almost Always or Always	usually	some-times	seldom	Never, Rarely
1.	Do you ignore it when someone pushes in front of you in line?	☐	☐	☐	☐	☐
2.	When you decide you no longer wish to go out with someone, do you have marked difficulty telling the person of your decision?	☐	☐	☐	☐	☐
3.	Would you exchange a purchase you discover to be faulty?	☐	☐	☐	☐	☐
4.	If you decided to change your university subjects to a field of which your parents would not approve, would you have difficulty telling them?	☐	☐	☐	☐	☐
5.	Are you inclined to be over-apologetic?	☐	☐	☐	☐	☐
6.	If you were studying and your brother or flatmate were making too much noise, would you ask him to stop?	☐	☐	☐	☐	☐
7.	Is it difficult for you to compliment and praise others?	☐	☐	☐	☐	☐
8.	If you are angry at your parents, can you tell them?	☐	☐	☐	☐	☐
9.	Do you insist that people you live with do their fair share of the cleaning?	☐	☐	☐	☐	☐
10.	If you find yourself becoming fond of someone you are dating, would you have difficulty expressing these feelings to that person?	☐	☐	☐	☐	☐
11.	If a friend who has borrowed $5.00 from you seems to have forgotten about it, would you remind this person?	☐	☐	☐	☐	☐
12.	Are you overly careful to avoid hurting other people's feelings?	☐	☐	☐	☐	☐

APPENDIX A.1. cont.

		Almost Always or Always	usually	some-times	seldom	Never, Rarely
13.	If you have a close friend whom your parents dislike and constantly criticize, would you inform your parents that you disagree with them and tell them of your friend's assets?	☐	☐	☐	☐	☐
14.	Do you find it difficult to ask a friend to do a favor for you?	☐	☐	☐	☐	☐
15.	If food which is not to your satisfaction is served in a restaurant, would you complain about it to the waiter?	☐	☐	☐	☐	☐
16.	If a friend or flatmate, without your permission, eats food he or she knows you have been saving, can you express your displeasure to him or her?	☐	☐	☐	☐	☐
17.	If a salesman has gone to considerable trouble to show some merchandise which is not quite suitable, do you have difficulty in saying no?	☐	☐	☐	☐	☐
18.	Do you keep your opinions to yourself?	☐	☐	☐	☐	☐
19.	If friends visit when you want to study, do you ask them to return at a more convenient time?	☐	☐	☐	☐	☐
20.	Are you able to express love and affection to people for whom you care?	☐	☐	☐	☐	☐
21.	If you were in a tutorial and the tutor made a statement that you considered untrue, would you question it?	☐	☐	☐	☐	☐
22.	If a person of the opposite sex whom you have been wanting to meet smiles or directs attention to you at a party, would you take the initiative in beginning a conversation?	☐	☐	☐	☐	☐
23.	If someone you respect expresses opinions with which you strongly disagree, would you venture to state your own point of view?	☐	☐	☐	☐	☐
24.	Do you go out of your way to avoid trouble with other people?	☐	☐	☐	☐	☐
25.	If a friend is wearing a new outfit which you like, do you tell that person so?	☐	☐	☐	☐	☐
26.	If after leaving a store you realize that you have been "short-changed", do you go back and request the correct amount?	☐	☐	☐	☐	☐

APPENDIX A.1. cont.

		Almost Always or Always	usually	some-times	seldom	Never, Rarely
27.	If a friend makes what you consider to be an unreasonable request, are you able to refuse?	☐	☐	☐	☐	☐
28.	If a close and respected relative were annoying you, would you hide your feelings rather than express your annoyance?	☐	☐	☐	☐	☐
29.	If your parents want you to go somewhere with them at the weekend, but you have made important plans, would you tell them of your preference?	☐	☐	☐	☐	☐
30.	Do you express anger or annoyance toward the opposite sex when it is justified?	☐	☐	☐	☐	☐
31.	If a friend does an errand for you, do you tell that person how much you appreciate it?	☐	☐	☐	☐	☐
32.	When a person is blatantly unfair, do you fail to say something about it to him?	☐	☐	☐	☐	☐
33.	Do you avoid social contacts for fear of doing or saying the wrong thing?	☐	☐	☐	☐	☐
34.	If a friend betrays your confidence, would you hesitate to express annoyance to that person?	☐	☐	☐	☐	☐
35.	When a shop assistant waits on someone who has come in after you, do you call his attention to the matter?	☐	☐	☐	☐	☐
36.	If you are particularly happy about someone's good fortune, can you express this to that person?	☐	☐	☐	☐	☐
37.	Would you be hesitant about asking a good friend to lend you a few dollars?	☐	☐	☐	☐	☐
38.	If a person teases you to the point that it is no longer fun, do you have difficulty expressing your displeasure?	☐	☐	☐	☐	☐
39.	If you arrive late for a meeting, would you rather stand than go to a front seat which could only be secured with a fair degree of conspicuousness?	☐	☐	☐	☐	☐
40.	If your date calls on Saturday night 15 minutes before you are supposed to meet and says that she (he) has to study for an important exam and cannot make it, would you express your annoyance?	☐	☐	☐	☐	☐
41.	If someone keeps kicking the back of your chair in a movie, would you ask him to stop?	☐	☐	☐	☐	☐

APPENDIX A.1. cont.

		Almost Always or Always	usually	some-times	seldom	Never, Rarely
42.	If someone interrupts you in the middle of an important conversation, do you request that the person wait until you have finished?	☐	☐	☐	☐	☐
43.	Do you freely volunteer information or opinions in class discussions?	☐	☐	☐	☐	☐
44.	Are you reluctant to speak to an attractive acquaintance of the opposite sex?	☐	☐	☐	☐	☐
45.	If you lived in an apartment and the landlord failed to make certain necessary repairs afer promising to do so, would you insist on it?	☐	☐	☐	☐	☐
46.	If your parents want you home by a certain time which you feel is much too early and unreasonable, do you attempt to discuss or negotiate this with them?	☐	☐	☐	☐	☐
47.	Do you find it difficult to stand up for your rights?	☐	☐	☐	☐	☐
48.	If a friend unjustifiably criticizes you, do you express your resentment there and then?	☐	☐	☐	☐	☐
49.	Do you express your feelings to others?	☐	☐	☐	☐	☐
50.	Do you avoid asking questions in class for fear of feeling self-conscious?	☐	☐	☐	☐	☐
51.	Are you less assertive in general than you would like to be?	☐	☐	☐	☐	☐

APPENDIX A.2. Role-play scripts - Tape 1.

1. You are having trouble with your first practical write-up; you're really not quite sure how to organise all the information. There's no time to ask about it during your tute, so you go to your tutor's room later for some advice. When you go in, she says,

'Hullo, what can I do for you?'

2. A friend of yours has been acting strangely. She seems to be avoiding you, and walks off whenever you come into sight. She's acting as if you've offended her, but you can't think what you might have done. You decide you should have it out with her, because she's a good friend. So you go up to her in the refectory and sit down next to her. She says,

'Well, it's you.'

3. You are in a psychology tutorial and your tutor states that Freud's ideas have no relevance in today's society. You've just read a book about Freud and his influence on modern psychology and you think there's a case in his favour. Your tutor says,

'There's absolutely no point in studying Freud any more.'

4. You've agreed to sell raffle tickets to aid the Salvation Army, and you decide to get all your friends to buy one each. You're standing outside a lecture theatre when a friend comes up to join you and says,

'Hi, how are things?'

5. You order a toasted cheese sandwich in the refectory. It takes a while, and eventually the woman behind the counter comes back and gives you the sandwich. But it's ham, and you really don't like ham. She says,

'There you are.'

6. You're talking to a new acquaintance about a concert you both attended last night. She is criticizing it quite strongly, but you really thought it was an excellent concert and enjoyed it very much. She says,

'So, really I found it a terrible bore. I'm sorry I went, aren't you?'

7. On the way to a club meeting, you drop into a friend's place and find a group of people sitting drinking wine. They offer you a glass, but you really do want to keep a clear head for the meeting. Your friend says,

'Oh come on. One glass won't hurt.'

8. You're watching a really good television programme with your mother. You really want to get involved in the story, but your mother keeps making comments about the actors which really annoy you and you wish she'd stop. She says,

'Goodness - that man in the hat - wasn't he in that other show we were watching the other night? Remember?'

APPENDIX A.2. cont. Role-play scripts - Tape 2.

1. You've written an essay which seems quite good to you. When you get it back, you find you only just passed, and your tutor has written, 'This is good, but all the ideas are from Plutchik whom you haven't even cited. This is plagiarism. You've never even heard of Plutchik, and resolve to go and discuss it with her. When you go to her room she says,

   'Well, what can I do for you?'

2. You're trying on dresses in a shop. There's one that looks great on the rack, but when you put it on it just looks dull and ordinary. Just then the assistant comes in and tells you that you look fantastic. She says,

   'My, you look lovely. I'm sure you'd wear a dress like that all the time.'

3. You find out that a friend has been spreading false and hurtful rumours about you, and you feel very upset about it. You run into her, and she says;

   'Oh, hi.'

4. A lecturer is working out a problem on the board. You think she's made a mistake in her calculations. She says,

   'And so you see the answer will be 24.'

APPENDIX A.2. cont. Role-play scripts - Tape 3.

1. Your favourite record has been missing and you're quite sure your sister has taken it and left it somewhere. You're in the middle of getting very angry with her when you see the record has just slipped down the back of the cabinet, just as she is saying,

   'Look, I did not take your record, and I don't know where it is.'

2. You were carrying a library book on your bike when it slipped off onto the road and was damaged. You decide you can't just put it back through the chute so you go and tell the librarian about it. When you approach the desk, she says,

   'May I help you?'

3. You're with two friends and they start criticising another friend who isn't present. You think what they're saying is untrue and unkind, and that it isn't fair to talk about someone like that. On of them says,

   'Oh, she really can be a bitch when she wants to, can't she?'

4. It's the third week in a row that your prac partner hasn't showed up. Each week you've done all the work on your own, even though it's taken longer and been a real nuisance. This week you've just about finished when she comes in and says,

   'Oh, sorry I didn't come - I've been so busy - and I can't come next week either, OK? Just let me have the notes, will you?'

5. You and a friend are planning to go to the beach. At the last moment, your friend's car breaks down, and if you're going to go you'll have to borrow your mother's. You go to ask her and she says,

   'You still here? I though you were off to the beach.'

6. You're having lunch with a friend. She says she needs $20 to buy a new pair of jeans. You've got the $20 in your pocket, but you were planning on buying something special with it. She says,

   'You couldn't lend me $20, could you? I'd pay you back on Monday.'

7. All your friends are taking the afternoon off and going to the bar. You'd really enjoy going with them, but you have an assignment due in tomorrow and you know you wouldn't finish it later. One of your friends says,

   'Well, coming?'

8. You see a T-shirt in a shop window priced at $7. You go in and ask for one, and the shop assistant wraps it up and says,

   'That'll be $9.95, thankyou.'

APPENDIX A.2. cont. Role-play scripts - Tape 4.

1. You are going to ride your bike over to a friend's place and spend the afternoon together. You're getting ready to go when your sister asks to borrow your bike for the afternoon. You really want to go, and it's too far to walk, but you did say you'd lend it to her some times. She says,

   'You said last week I could use your bike sometimes, so I thought I'd take it and drop in on some friends now, OK?'

2. You are choosing an engagement present for friends. The saleslady has been very helpful and has spent half an hour showing you things that might do; she's even been out to the storeroom and looked through the new stock. She's really made an effort, but somehow nothing is quite right. She says,

   'Well, I don't think there's anything more I can show you now. What's the final decision?'

3. You are at a party, standing on your own. Someone you don't know comes up to you and says,

   'I feel dreadful. I don't know anyone here at all.'

4. Your tutor has been explaining what's required of you in an essay. You're not quite sure whether you're meant to discuss one point of view in detail or several in broader terms. She says,

   'OK, everyone know what to do, then?'

5. You've been cooking food to take to a party and have made a terrible mess in the kitchen. You've just finished cooking and are about to start cleaning the place up when your mother comes in and says,

   'Trust you to leave a mess like this for someone else.'

6. You have four essays due in a two-week period, and there's really no way you can get them all done in time. You haven't been sick or anything, but you really need an extension, so you go to see a tutor. When you go into her room, she says,

   'Hello. How's the essay going?'

7. You've just heard you got a distinction for a term exam. You're feeling really pleased with yourself and would like to share that pleasure with your friends. A friend comes up to you and says,

   'Hello, what's new?'

8. You're feeling really lively and happy and you're wearing new clothes that you know make you look attractive. A friend comes up to you and says,

   'Hi, you're looking good today.'

APPENDIX A.2. cont. Role-play scripts - Tape 5.

1. You once lent your library card to a friend, who didn't return the books on time and cost you ten demerit points. Now she wants to borrow it again, and you're pretty sure that she wouldn't return these books on time either. She says,

   'I just want your library card for five minutes, OK?'

2. You've done several essays in one subject and, although you tried much harder for the last one, your marks are staying about the same. The tutor's comments aren't very helpful, so you decide to talk to her about how you could improve. You go to her office and she says,

   'Well, what can I do for you?'

3. You bought a pair of shoes and when you got them home you found one of the heels had come off in the box. The next day you take them back to the shop to replace them, and the saleslady says,

   'Can I help you?'

4. A friend has owed you $5 for weeks and you think she might have forgotten about it. You want the $5 back because you're short of cash. You run into her in the refectory and she says,

   'Hi, haven't seen you for ages.'

5. Living at home is really becoming a pain. All your friends have their own places, and they seem to have much more fun than you do. You have the opportunity to move in to a flat with two good friends, but you're not sure that your mother will like you leaving home. You're sitting thinking about it when she comes in and says,

   'Hello, you're looking serious.'

6. You've got an exam next week and you really need to do some work for it. You've just settled down for an evening's study when a friend comes round and asks you to go to a movie with her. You really do need to study. She says,

   Oh come on. You can study tomorrow.'

7. A friend has just been to the hairdresser and her new short hairstyle suits her very well. You think it's very attractive and would like her to know you think so. She comes up to you and says,

   'Hi, how are things?'

8. Your essay is due in first thing tomorrow and you know you can get it finished with two more hours' solid work. You've just started working when a very talkative friend comes over and says she wants to talk to you about her boyfriend. You know if you start talking you won't get back to the essay for ages and then you'll have to stay up half the night and finish it. She says,

   'Hey, I must ask your advice. You know what Dave said yesterday?'

APPENDIX A.2. cont. Role-play scripts - Tape 6.

1. You're in the refectory and you're really in a hurry to get something to eat before a tute. You're just about to be served. A woman who you know is a tutor in one of your courses - though not your tutor - pushes in front of you and says,

'I'll have a large white coffee please.'

2. You see in the paper that your local library is looking for an untrained assistant to help with cataloguing during January. You'd like the job, so you go into the library to enquire. You go up to the desk and the librarian says,

'Can I help you?'

3. You buy a $5 book and pay for it with a $20 note. The shop assistant gives you the wrong change. She says,

'And $5 change.'

4. Your parents give you a weekly allowance, but it's not as much as your friends get and you find it difficult to do all the things they do, like go to the movies regularly. You're sitting at home when your mother comes in and you decide that now is the time to ask for more allowance. She says,

'You're looking very thoughtful.'

5. You've been babysitting regularly for some good friends for over three years now and you've always been willing to turn up at short notice. They pay you well and you usually enjoy babysitting. But tonight you are planning to go to a movie on your own, and half an hour before you were going to go the mother rings you and asks you to babysit as a special favour. She says,

'I know it's short notice, but you're always so reliable, and the kids do like you coming over.'

6. Something's come up and you have to make a phone call urgently. You look in your purse but find you don't have a 10 cent piece. There's a stranger coming towards you and you decide to ask her for some change. You say,

'Excuse me.' and she says, 'Yes?'

7. There's an exam next week and you know you'll need to go over the course fairly thoroughly before then. A friend is doing the same course, but she's missed several lectures and will need to borrow someone's notes. She wants to borrow yours, but you know she won't return them before the exam and you need them yourself. She says,

'OK if I borrow your notes for a few days?'

8. You've been playing squash with a group of friends and you have to go because you've promised to meet someone. Just as you're leaving, a friend asks you to give her a ride home. It's out of your way and you don't really have time. She says,

'You wouldn't mind dropping me off at home, would you?'

?PENDIX A.3. SELF-RATING.

AME. _____ Session.1.

You're having trouble writing up a practical and you feel you should go to your tutor's room and ask for some advice. Do you think that you could do this in an appropriately assertive manner?

YES/NO

If yes: rate your degree of confidence on this scale.

0	10	20	30	40	50	60	70	80	90	100
quite uncertain					moderately certain					certain

A friend of yours has been avoiding you and acting as if you've offended her, but you can't think of what you might have done to upset her. Do you think that you could do this in an appropriately assertive manner?

YES/NO

If yes: rate your degree of confidence on this scale.

0	10	20	30	40	50	60	70	80	90	100
quite uncertain					moderately certain					certain

In a tutorial, your tutor makes a flat statement. You've just read a book which contradicts this and you'd like to mention it. Do you think that you could do this in an appropriately assertive manner?

YES/NO

If yes: rate your degree of confidence on this scale.

0	10	20	30	40	50	60	70	80	90	100
quite uncertain					moderately certain					certain

You have some raffle tickets for a charity. Do you think you could ask a friend to buy one in an appropriately assertive manner?

YES/NO

If yes: rate your degree of confidence on this scale.

0	10	20	30	40	50	60	70	80	90	100
quite uncertain					moderately certain					certain

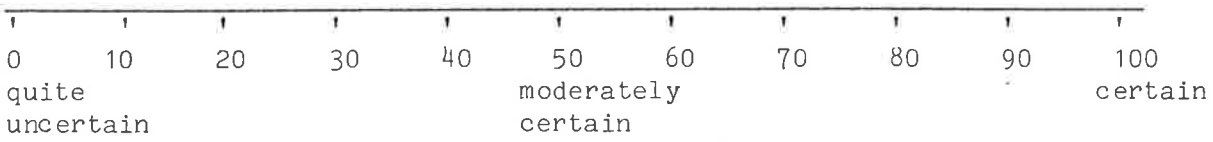
APPENDIX A.3. cont.

You order a toasted cheese sandwich in the refectory. The woman behind the counter brings a toasted ham sandwich, and you particularly wanted cheese.

Do you think you could handle this situation in an appropriately assertive manner?

YES/NO

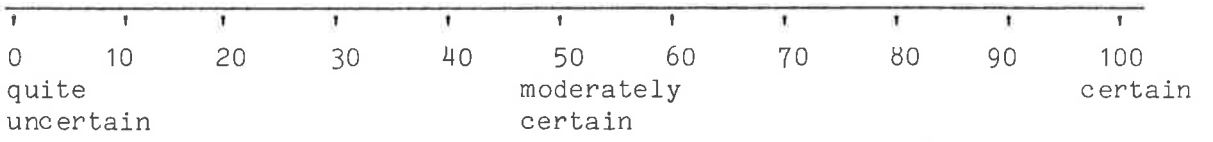
If yes: rate your degree of confidence on this scale.



You have been to a concert which you enjoyed very much. Next day you are discussing it with a new acquaintence who thinks it was dreadful. You'd like to disagree. Do you think you could do this in and appropriately assertive manner?

YES/NO

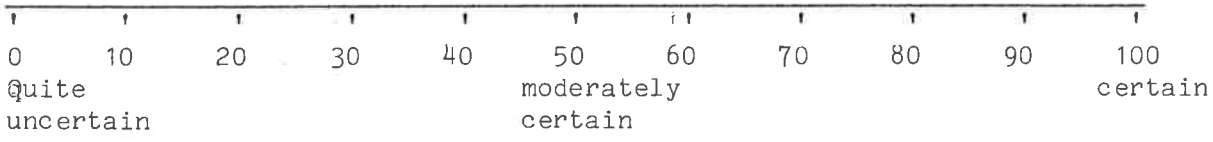
If yes: rate your degree of confidence on this scale.



On your way to a meeting, you drop into a friend's place and find a group of people drinking wine. They offer you a glass, but you'd rather keep a clear head. Do you think you can refuse in an appropriately assertive manner?

YES/NO

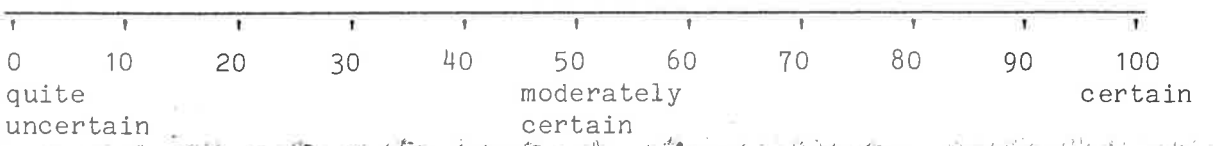
If yes: rate your degree of confidence on this scale.



You're watching a good television programme with your mother. You want to get really involved in it, but your mother keeps making comments about the actors, which you find really annoying. Do you think you could ask her to stop in an appropriately assertive manner?

YES/NO

If yes: rate your degree of confidence on this scale.



PPENDIX A.3. cont. SELF-RATING

AME. _____ Session 2.

You've written what you think is a very adequate essay. When you get it back, you find you've only just passed and your tutor has commented that most of your work seems to have been copied. This isn't true. Do you think you could discuss this with your tutor in an appropriately assertive way?

YES/NO

If yes: rate your degree of confidence on this scale.

0	10	20	30	40	50	60	70	80	90	100
quite uncertain					moderately certain					certain

You're trying on dresses in a shop. There's one that just looks dull and ordinary to you. but the shop assistant praises your appearance in it lavishly. Do you think that you could disagree with her in an appropriately assertive manner?

YES/NO

If yes: rate your degree of confidence on this scale.

0	10	20	30	40	50	60	70	80	90	100
quite uncertain					moderately certain					certain

You find out that a friend has been spreading false and hurtful rumours about you, and you resolve to have it out with her. Do you think you could do this in an appropriately assertive manner?

YES/NO

If yes:rate your degree of confidence on this scale.

0	10	20	30	40	50	60	70	80	90	100
quite uncertain					moderately certain					certain

A lecturer is working out a problem on the board and you think there's a mistake in the calculation. Do you think you could point this out in an appropriately assertive manner?

YES/NO

If yes: rate your degree of confidence on this scale.

0	10	20	30	40	50	60	70	80	90	100
quite uncertain					moderately certain					certain

PPENDIX A.3. cont.

SELF-RATING

AME. _____ SESSION 3.

. You have accidentally damaged a library book. You decide you shouldn't really just put it back in the chute but should go and talk to the librarian about it. Do you think you could do this in an appropriately assertive manner?

YES/NO

If Yes: rate your degree of confidence on this scale.

0	10	20	30	40	50	60	70	80	90	100
quite uncertain					moderately certain					certain

. Suppose you are with two friends who start criticising another friend who isn't present. You think what they are saying is untrue and unkind, and that you should not condone what they are saying. Do you think you could handle this situation in an appropriately assertive manner?

YES/NO

If yes: rate your degree of confidence on this scale.

0	10	20	30	40	50	60	70	80	90	100
quite uncertain					moderately certain					certain

. All your friends are taking the afternoon off and going to the bar. You'd enjoy it, but you have work that has to be done. Do you think you could refuse their invitation in an appropriately assertive manner?

YES/NO

If yes: rate your degree of confidence on this scale.

0	10	20	30	40	50	60	70	80	90	100
quite uncertain					moderately certain					certain

. You see a T-shirt in a shop window priced at $7, but when you buy one you are charged $10. Do you think you could question the price in an appropriately assertive manner?

YES/NO

If yes: rate your degree of confidence on this scale.

0	10	20	30	40	50	60	70	80	90	100
quite uncertain					moderately certain					certain

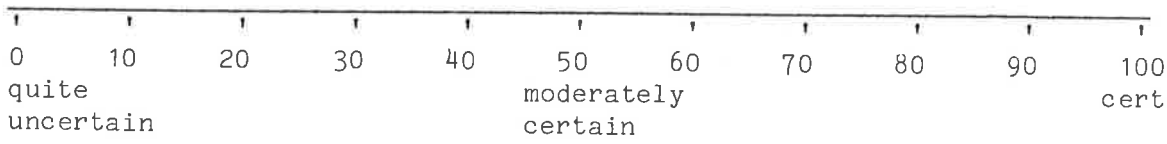
APPENDIX A.3. cont. SELF-RATING

NAME. _____ SESSION 4.

You told your sister she could borrow your bike any time you didn't need it, but the first time she asks you've already planned to go out on it to visit a friend. Do you think you could answer her request in an appropriately assertive manner?

YES/NO

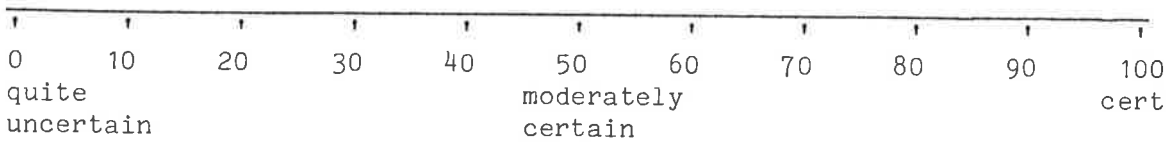
If yes: rate your degree of confidence on this scale.



You've been looking for a present for friends, and the saleslady has spent half an hour being very helpful and showing you all sorts of things, but nothing seems quite suitable. Do you think you could tell her this in an appropriately assertive manner?

YES/NO

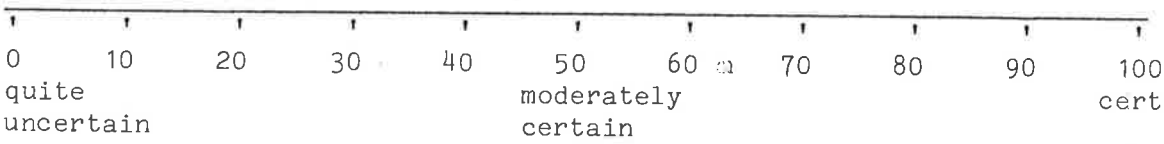
If yes: rate your degree of confidence on this scale.



There are four essays due in over a two-week period, and you decide you need an extension for one of them. Do you think you could ask your tutor for an extension in an appropriately assertive manner?

YES/NO

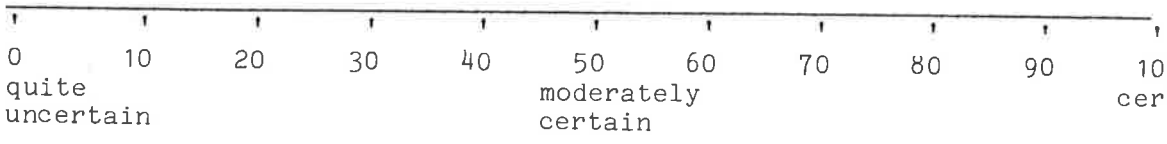
If yes: rate your degree of confidence on this scale.



You've just heard you got a distinction in an important exam, and you'd like to share your pleasure with a friend. Do you think you could express this in an appropriately assertive manner?

YES/NO

If yes: rate your degree of confidence on this scale.



PPENDIX A.3. cont.

SELF-RATING

AME. _____ SESSION.5.

. No matter how hard you try in one subject, you keep getting low passes, and your tutor's comments aren't very helpful. You decide to go to her room and discuss it with her. Do you think that you could do this in an appropriately assertive manner?

YES/NO

If yes: rate your degree of confidence on this scale.

0 10 20 30 40 50 60 70 80 90 100
quite uncertain — moderately certain — certain

. The heel has come off a new pair of shoes before you've even worn them, so you decide to take them back. Do you think you could do this in an appropriately assertive manner?

YES/NO

If yes: rate your degree of confidence on this scale.

0 10 20 30 40 50 60 70 80 90 100
quite uncertain — moderately certain — certain

. You'd like to leave home but you're not sure how your mother would take it. An apportunity arises for you to move into a flat with two good friends, and you decide to discuss this with your mother. Do you think that you could do this in an appropriately assertive manner?

YES/NO

If yes: rate your degree of confidence on this scale.

0 10 20 30 40 50 60 70 80 90 100
quite uncertain — moderately certain — certain

. You have to finish an essay tonight, but a very talkative friend drops by and tells you she'd like to have a talk about her boyfriend. You decide the essay must take precedence. Do you think you could explain this to her in an appropriately assertive manner?

YES/NO

If yes: rate your degree of confidence on this scale.

0 10 20 30 40 50 60 70 80 90 100
quite uncertain — moderately certain — certain

APPENDIX A.3. cont. SELF-RATING

NAME. _____ SESSION.6

1. You're in the refectory and you want some food in a hurry as you're going to a tute. A woman who you know is a tutor in one of your courses- but not your tutor- pushes in. Do you think you would be able to handle this situation in an appropriately assertive manner?

YES/NO

If yes: rate your degree of confidence on this scale.

0 10 20 30 40 50 60 70 80 90 100
quite uncertain — moderately certain — certain

2. You see in your local paper that the library is looking for an untrained assistant to help with cataloguing during January. You'd like the job. Do you think you could go to the library and make enquiries in an appropriately assertive manner?

YES/NO

IF YES: rate your degree of confidence on this scale.

0 10 20 30 40 50 60 70 80 90 100
quite uncertain — moderately certain — certain

3. You are accidentally shortchanged by $10. Do you think you could bring this to the attention of the shop assistant in an appropriately assertive manner?

YES/NO

If yes: rate your degree of confidence on this scale.

0 10 20 30 40 50 60 70 80 90 100
quite uncertain — moderately certain — certain

4. Your parents give you a weekly allowance, but it's not as much as your friends get and you can't always afford to do the things they do. You decide to ask your mother for more allowance. Do you think that you could do this in an appropriately assertive manner?

YES/NO

If yes: rate your degree of confidence on this scale.

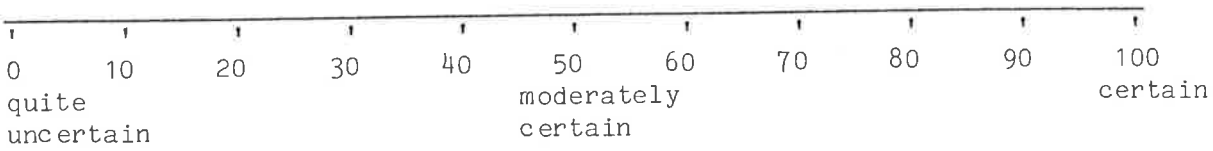
0 10 20 30 40 50 60 70 80 90 100
quite uncertain — moderately certain — certain

5. You've been babysitting regularly for some good friends over the past three years, and have always been prepared to turn up at short notice.

You enjoy it and they pay you well. Tonight you're planning to go out on your own, and you're just getting ready when they ring up and ask you to babysit. Do you think you could refuse this request in an appropriatly assertive manner?

YES/NO

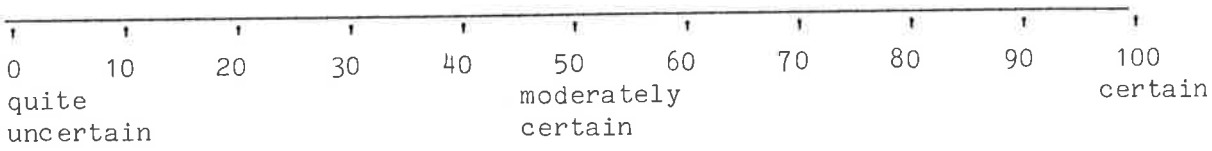
If yes: rate your degree of confidence on this scale.



6. Something's come up, and you have to make a phone call urgently. You find you don't have a 10 cent piece, and decide to ask a stranger for change. Do you think that you could do this in an appropriately assertive manner?

YES/NO

If yes: rate your degree of confidence on this scale.

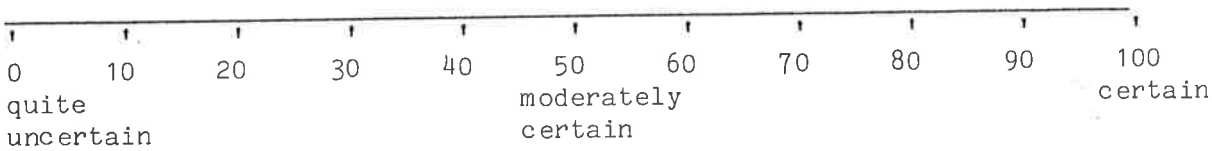


7. There's an exam next week and you know you'll need to go over the course fairly thoroughly before then. A friend is doing the same course, but she's missed several lectures and will have to borrow someone's notes.

You don't want to lend yours because you'll need them yourself. Do you think that you could refuse her request in an appropriately assertive manner?

YES/NO

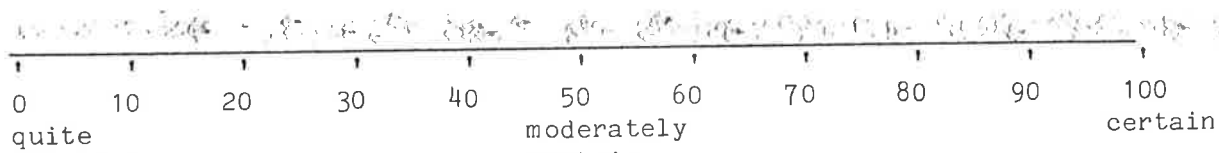
If yes: rate your degree of confidence on this scale.



8. You've been playing squash with a group of friends, and you have to go because you've promised to meet someone. Just as you are leaving, a friend asks you to give her a ride home. It's out of your way and you don't really have time. Do you think that you could refuse her request in an appropriately assertive manner?

YES/NO

If yes: rate your degree of confidence on this scale.



APPENDIX A.4. Definition of "assertiveness" supplied to participants.

Every person should be accorded the right to be treated with respect and consideration by others.
An aggressive person is someone who denies this right to others.
An unassertive person is someone who does not exercise this right for herself.
An assertive person, however, is someone who behaves in a way that ensures that right is preserved both for her and for the people with whom she interacts.

APPENDIX B.1. Initial self-efficacy questionnaire.

FITNESS EXPECTATIONS

Please answer the following questions by putting a cross (X) at the point on each 0 to 100 scale that best describes how certain you feel about what you can achieve in exercise habits and fitness.

1. Do you think that you can significantly increase your level of fitness by the end of this 12 week fitness course?

certainly no — certainly yes

0 20 40 60 80 100

2. Do you think that you can organise your life so that exercise becomes a natural part of your day to day activity?

certainly no — certainly yes

0 20 40 60 80 100

3. Do you think that you will find hard physical exercise enjoyable by the end of the 12 week course?

certainly no — certainly yes

0 20 40 60 80 100

4. Do you think that, by the end of the course, you will be exercising at least 3 or 4 times a week at times other than your fitness class?

certainly no — certainly yes

0 20 40 60 80 100

5. Do you think that you will be exercising regularly (at least 3 or 4 times a week) after the course has finished?

AT 3 MONTHS

certainly no — certainly yes

0 20 40 60 80 100

6. Do you think you will be exercising regularly (at least 3 or 4 times a week)?

AT 12 MONTHS

certainly no — certainly yes

0 20 40 60 80 100

7. Do you think that you will be able to continue exercising during times like holiday trips, changes in work schedule or in your family and personal life?

certainly no — certainly yes

0 20 40 60 80 100

8. Do you think that you will be able to regain fitness after times off exercising in the future?

certainly no — certainly yes

0 20 40 60 80 100

APPENDIX B.2. IFRT Follow-up Questionnaire.

Name _____

1. Are you still following a regular pattern of physical activity?

2. If not, what factors influenced your stopping?

3. If yes, are you exercising alone or with a formal or informal group? (please specify:)

4. Please list each occasion you have engaged in vigorous physical activity in the past week.

Occasion	Activity	Time Spent
1		
2		
3		
4		
5		
6		
7		

5. Is this pattern of exercise typical for you? If not, how is it different?

6. Have you had an injuries or aches and pains which have influenced your exercising pattern? Please specify, however slight.

Thankyou for your help.

APPENDIX C.1. Self-efficacy questionnaire.

The attached form describes activities that could be performed with a snake. Under the column Can Do, check (√) the tasks you expect you could do if you were asked to perform them now.

For the tasks you check under Can Do, indicate in the column Confidence how confident you are that you could do them. Rate your degree of confidence by recording a number from 10 to 100 using the scale given below:

10	20	30	40	50	60	70	80	90	100
quite uncertain				moderately certain					certain

Remember, rate what you expect you could do and your confidence if you were asked to perform the tasks now.

APPENDIX C.1. cont.

Confidence Scale

10	20	30	40	50	60	70	80	90	100
quite uncertain				moderately certain					certain

Tasks	Can Do	Confidence
Look at snake in glass cage from distance		
Look at snake through a wire cover		
Place bare palm against glass near snake		
Place gloved hand on wire cover of cage		
Place bare hand on wire cover of cage		
Look down at snake through partially opened top		
Look down at snake through fully opened top		
Place gloved hand in cage		
Place bare hand in cage		
Touch snake with gloved hand in the cage		
Touch snake with bare hand in the cage		
Lift snake inside the cage with gloved hand		
Lift snake inside the cage with bare hand		
Hold snake with gloved hands outside the cage		
Hold snake with bare hands outside the cage		
Place snake on the floor and return it to cage		
Hold snake in front of face		
Tolerate snake in lap		

APPENDIX C.2. Behaviour Checklist

Subject number _____

1. Look at snake in glass cage from a distance _____
2. Look at snake in glass cage close up _____
3. Place bare palm against glass away from snake _____
4. Place gloved hand on glass near snake _____
5. Place bare hand on glass near snake _____
6. Look at snake through partially opened side _____
7. Look at snake through fully opened side _____
8. Place gloved hand in cage _____
9. Place bare hand in cage _____
10. Touch snake with gloved hand in cage _____
11. Touch snake with bare hand in cage _____
12. Lift snake inside cage with gloved hand _____
13. Lift snake inside cage with bare hand _____
14. Hold snake with gloved hands outside the cage _____
15. Hold snake with bare hands outside the cage _____
16. Place snake on the floor and return it to the cage _____
17. Hold snake in front of face _____
18. Tolerate snake in lap _____

APPENDIX D.1. Role-play script.

1. You are going to ride your bike over to a friend's place and spend the afternoon together. You're getting ready to go when your sister asks to borrow your bike for the afternoon. You really want to go, and it's too far to walk, but you did say you'd lend it to her sometime. She says,

   'You said last week I could use your bike sometimes, so I thought I'd take it and drop in on some friends now, okay?'

2. A lecturer is working out a problem on the board. You think she's made a mistake in her calculations. She says,

   'And so you see the answer will be 24.'

3. It's the third week in a row that your prac partner hasn't showed up. Each week you've done all the work on your own, even though it's taken longer and been a real nuisance. This week you've just about finished when she comes in and says,

   'Oh, sorry I didn't come - I've been so busy - and I can't come next week either, OK? Just let me have the notes, will you?

4. You are choosing an engagement present for friends. The saleslady has been very helpful and has spent half an hour showing you things that might do; she's even been out to the storeroom and looked through the new stock. She's really made an effort, but somehow nothing is quite right. She says,

   'Well, I don't think there's anything more I can show you now. What's the final decision?'

5. A friend has owed you $5 for weeks and you think she might have forgotten about it. You want the $5 back because you're short of cash. You run into her in the refectory and she says,

   'Hi, haven't seen you for ages.'

6. Living at home is really becoming a pain. All your friends have their own places, and they seem to have much more fun than you do. You have the opportunity to move in to a flat with two good friends, but you're not sure that your mother will like you leaving home. You're sitting thinking about it when she comes in and says,

   'Hello, you're looking serious.'

7. You find out that a friend has been spreading false and hurtful rumours about you, and you feel very upset about it. You run into her, and she says,

   'Oh, hi.'

8. You have four essays due in a two-week period, and there's really no way you can get them all done in time. You haven't been sick or anything, but you really need an extension, so you go to see a tutor. When you go into her room, she says,

   'Hello. How's the essay going?'

APPENDIX D.2.

Assertiveness Study
Self-Rating

Name _____

Each of the eight questions involves a hypothetical situation in which an assertive response might be appropriate. Please read the description of the situation and then complete each part of the question.

1. You told your sister she could borrow your bike any time you didn't need it, but the first time she asks you've already planned to go out on it to visit a friend.

   Regardless of what you think the outcome might be, do you think you would be capable of responding assertively in this situation?

   YES/NO

   If yes, rate your confidence on the following scale:

   0 10 20 30 40 50 60 70 80 90 100
   quite uncertain — moderately certain — certain

2. A lecturer is working out a problem on the board. You think she's made a mistake in the calculation and would like to question her.

   Regardless of what you think the outcome might be, do you think you would be capable of responding assertively in this situation?

   YES/NO

   If yes, rate your confidence on the following scale:

   0 10 20 30 40 50 60 70 80 90 100
   quite uncertain — moderately certain — certain

3. Your practical partner doesn't come to the pracs and you have to do all the work yourself. She comes in, asks you to give her the notes, and says she won't come next week either.

   Regardless of what you think the outcome might be, do you think you would be capable of responding assertively in this situation?

   YES/NO

   If yes, rate your confidence on the following scale:

   0 10 20 30 40 50 60 70 80 90 100
   quite uncertain — moderately certain — certain

APPENDIX D.2. cont.

4. You've been looking for a present for friends, and the saleslady has spent half an hour being very helpful and showing you all sorts of things, but nothing seems quite suitable. She is now asking what you have chosen.

Regardless of what you think the outcome might be, do you think you would be capable of responding assertively in this situation?

YES/NO

If yes, rate your confidence on the following scale:

0 10 20 30 40 50 60 70 80 90 100

quite uncertain — moderately certain — certain

5. You lent a friend $5.00 some time ago and she seems to have forgotten about it. You want the money back because you're short of cash. You run into her in the refectory.

Regardless of what you think the outcome might be, do you think you would be capable of responding assertively in this situation?

YES/NO

If yes, rate your confidence on the following scale:

0 10 20 30 40 50 60 70 80 90 100

quite uncertain — moderately certain — certain

6. You'd like to leave home but you're not sure how your mother would take it. An opportunity arises for you to move into a flat with two good friends, and you decide to discuss it with your mother. She comes into your room as you are thinking about this.

Regardless of what you think the outcome might be, do you think you would be capable of responding assertively in this situation?

YES/NO

If yes, rate your confidence on the following scale:

0 10 20 30 40 50 60 70 80 90 100

quite uncertain — moderately certain — certain

7. You find out that a friend has been spreading false and hurtful rumours about you. You're feeling upset by this and you happen to meet her.

Regardless of what you think the outcome might be, do you think you would be capable of responding assertively in this situation?

YES/NO

If yes, rate your confidence on the following scale:

0 10 20 30 40 50 60 70 80 90 100

quite uncertain — moderately certain — certain

8. You have four essays to hand in in the next two weeks. Although you haven't been sick, this is too much to handle and you decide to see a tutor and ask for an extension.

Regardless of what you think the outcome might be, do you think you would be capable of responding assertively in this situation?

YES/NO

If yes, rate your confidence on the following scale:

0 10 20 30 40 50 60 70 80 90 100

quite uncertain — moderately certain — certain

APPENDIX E.1.

The attached form describes activities that could be performed with a snake. Under the column Can Do, check (√) the tasks you expect you could do if you were asked to perform them now.

For the tasks you check under Can Do, indicate in the column Confidence how confident you are that you could do them. Rate your degree of confidence by recording a number from 0 to 100 using the scale given below:

0	10	20	30	40	50	60	70	80	90	100
quite uncertain					moderately certain					certain

Remember, rate what you expect you could do and your confidence if you were asked to perform the tasks now.

APPENDIX E.1. cont.

Confidence Scale

0	10	20	30	40	50	60	70	80	90	100
very negative					neutral					very positive

Tasks	Can Do	Confidence
Look at snake in glass cage from distance	____	____
Look at snake in glass case from close up	____	____
Place bare palm against glass away from snake	____	____
Place gloved hand on glass near snake	____	____
Place bare hand on glass near snake	____	____
Look at snake through partially opened side	____	____
Look at snake through fully opened side	____	____
Place gloved hand in cage	____	____
Place bare hand in cage	____	____
Touch snake with gloved hand in the cage	____	____
Touch snake with bare hand in the cage	____	____
Lift snake inside the cage with gloved hand	____	____
Lift snake inside the cage with bare hand	____	____
Hold snake with gloved hands outside the cage	____	____
Hold snake with bare hands outside the cage	____	____
Place snake on the floor and return it to cage	____	____
Hold snake in front of face	____	____
Tolerate snake in lap	____	____

APPENDIX E.2. Valence Scale

Below is a list of activities that could be performed with a snake. For each item, consider the following question. If you were to perform it (regardless of how likely or unlikely you feel that to be), do you think the outcome would be:

0	10	20	30	40	50	60	70	80	90	100
very negative					neutral					very positive

Rate your feeling of positiveness or negativeness by recording a number from 0 to 100 for each item in the 'valence' column.

Tasks	Valence
Look at snake in glass cage from distance	_____
Look at snake in glass case from close up	_____
Place bare palm against glass away from snake	_____
Place gloved hand on glass near snake	_____
Place bare hand on glass near snake	_____
Look at snake through partially opened side	_____
Look at snake through fully opened side	_____
Place gloved hand in cage	_____
Place bare hand in cage	_____
Touch snake with gloved hand in the cage	_____
Touch snake with bare hand in the cage	_____
Lift snake inside the cage with gloved hand	_____
Lift snake inside the cage with bare hand	_____
Hold snake with gloved hands outside the cage	_____
Hold snake with bare hands outside the cage	_____
Place snake on the floor and return it to cage	_____
Hold snake in front of face	_____
Tolerate snake in lap	_____

APPENDIX E.3. Behaviour Checklist.

Subject number _____

1. Look at snake in glass cage from a distance _____
2. Look at snake in glass cage close up _____
3. Place bare palm against glass away from snake _____
4. Place gloved hand on glass near snake _____
5. Place bare hand on glass near snake _____
6. Look at snake through partially opened side _____
7. Look at snake through fully opened side _____
8. Place gloved hand in cage _____
9. Place bare hand in cage _____
10. Touch snake with gloved hand in cage _____
11. Touch snake with bare hand in cage _____
12. Lift snake inside cage with gloved hand _____
13. Lift snake inside cage with bare hand _____
14. Hold snake with gloved hands outside the cage _____
15. Hold snake with bare hands outside the cage _____
16. Place snake on the floor and return it to the cage _____
17. Hold snake in front of face _____
18. Tolerate snake in lap _____

APPENDIX F.1. Role-play script.

1. You are going to ride your bike over to a friend's place and spend the afternoon together. You're getting ready to go when your sister asks to borrow your bike for the afternoon. You really want to go, and it's too far to walk, but you did say you'd lend it to her sometime. She says,

   'You said last week I could use your bike sometimes, so I thought I'd take it and drop in on some friends now, okay?'

2. A lecturer is working out a problem on the board. You think she's made a mistake in her calculations. She says,

   'And so you see the answer will be 24.'

3. You are choosing an engagement present for friends. The saleslady has been very helpful and has spent half an hour showing you things that might do; she's even been out to the storeroom and looked through the new stock. She's really made an effort, but somehow nothing is quite right. She says,

   'Well, I don't think there's anything more I can show you now. What's the final decision?'

4. A friend has owed you $5 for weeks and you think she might have forgotten about it. You want the $5 back because you're short of cash. You run into her in the refectory and she says,

   'Hi, haven't seen you for ages.'

5. Living at home is really becoming a pain. All your friends have their own places, and they seem to have much more fun than you do. You have the opportunity to move in to a flat with two good friends, but you're not sure that your mother will like you leaving home. You're sitting thinking about it when she comes in and says,

   'Hello, you're looking serious.'

6. You find out that a friend has been spreading false and hurtful rumours about you, and you feel very upset about it. You run into her and she says,

   'Oh, hi.'

7. You have four essays due in a two-week period, and there's really no way you can get them all done in time. You haven't been sick or anything but you really need an extension, so you go to see a tutor. When you go into her room, she says,

   'Hello. How's the essay going?'

APPENDIX F.2. Self-efficacy and outcome expectation questionnaire.

Note: This questionnaire was used for half the students, while for the others parts (a) and (b) of each question were reversed.

Assertiveness Study
Self-Rating

Name _____

Each of the eight questions involves a hypothetical situation in which an assertive response might be appropriate. Please read the description of the situation and then complete each part of the question.

1. You told your sister she could borrow your bike any time you didn't need it, but the first time she asks you've already planned to go out on it to visit a friend.

   a) If you were to respond in an assertive way to this situation, do you think the outcome would be:

0 10 20 30 40 50 60 70 80 90 100
very negative — neutral — very positive

   b) Regardless of what you think the outcome might be, do you think you would be capable of responding assertively in this situation?

YES/NO

If yes, rate your confidence on the following scale:

0 10 20 30 40 50 60 70 80 90 100
quite uncertain — moderately certain — certain

APPENDIX F.2. cont.

2. A lecturer is working out a problem on the board. You think she's made a mistake in the calculation and would like to question her.

a) if you were to respond in an assertive way to this situation, do you think the outcome would be:

0 10 20 30 40 50 60 70 80 90 100

very negative — neutral — very positive

b) Regardless of what you think the outcome might be, do you think you would be capable of responding assertively in this situation?

YES/NO

If yes, rate your confidence on the following scale:

0 10 20 30 40 50 60 70 80 90 100

quite uncertain — moderately certain — certain

3. You've been looking for a present for friends, and the saleslady has spent half an hour being very helpful and showing you all sorts of things, but nothing seems quite suitable. She is now asking what you have chosen.

a) if you were to respond in an assertive way to this situation, do you think the outcome would be:

0 10 20 30 40 50 60 70 80 90 100

very negative — neutral — very positive

b) Regardless of what you think the outcome might be, do you think you would be capable of responding assertively in this situation?

YES/NO

If yes, rate your confidence on the following scale:

0 10 20 30 40 50 60 70 80 90 100

quite uncertain — moderately certain — certain

APPENDIX F.2. cont.

4. You lent a friend $5.00 some time ago and she seems to have forgotten about it. You want the money back because you're short of cash. You run into her in the refectory.

a) if you were to respond in an assertive way to this situation, do you think the outcome would be:

0 10 20 30 40 50 60 70 80 90 100

very negative — neutral — very positive

b) Regardless of what you think the outcome might be, do you think you would be capable of responding assertively in this situation?

YES/NO

If yes, rate your confidence on the following scale:

0 10 20 30 40 50 60 70 80 90 100

quite uncertain — moderately certain — certain

5. You'd like to leave home but you're not sure how your mother would take it. An opportunity arises for you to move into a flat with two good friends, and you decide to discuss it with your mother. She comes into your room as you are thinking about this.

a) if you were to respond in an assertive way to this situation, do you think the outcome would be:

0 10 20 30 40 50 60 70 80 90 100

very negative — neutral — very positive

b) Regardless of what you think the outcome might be, do you think you would be capable of responding assertively in this situation?

YES/NO

If yes, rate your confidence on the following scale:

0 10 20 30 40 50 60 70 80 90 100

quite uncertain — moderately certain — certain

APPENDIX F.2. cont.

6. You find out that a friend has been spreading false and hurtful rumours about you. You're feeling upset by this and you happen to meet her.

a) if you were to respond in an assertive way to this situation, do you think the outcome would be:

0 10 20 30 40 50 60 70 80 90 100

very negative — neutral — very positive

b) Regardless of what you think the outcome might be, do you think you would be capable of responding assertively in this situation?

YES/NO

If yes, rate your confidence on the following scale:

0 10 20 30 40 50 60 70 80 90 100

quite uncertain — moderately certain — certain

7. You have four essays to hand in in the next two weeks. Although you haven't been sick, this is too much to handle and you decide to see a tutor and ask for an extension.

a) if you were to respond in an assertive way to this situation, do you think the outcome would be:

0 10 20 30 40 50 60 70 80 90 100

very negative — neutral — very positive

b) Regardless of what you think the outcome might be, do you think you would be capable of responding assertively in this situation?

YES/NO

If yes, rate your confidence on the following scale:

0 10 20 30 40 50 60 70 80 90 100

quite uncertain — moderately certain — certain

APPENDIX G. Preliminary Study - The relationship between efficacy and performance in a modular addition task.

The purposes of this study were to determine whether self-efficacy was an accurate predictor of performance in this particular intellectual task, to examine the possibility of increasing efficacy by telling participants that the results of previous testing suggested they would do particularly well in this type of task, and to see whether this increase in efficacy had any effect on performance.

An intellectual task was selected because there were tentative plans at this stage for the thesis to be concerned with efficacy and academic performance. It was necessary that the task be of a type which was unfamiliar to most participants, so that they would be likely to believe the experimental manipulation. The task selected was based on one used by Hunt, Lunneborg and Lewis (1975) to assess verbal intelligence, and involved modular addition in bases 7, 12 and 26.

Method

Participants : 63 students, 43 female and 20 male, enrolled in an ordinary psychology course, participated as part of course requirements. Their ages ranged from 17 to 39 years, with a mean of 18.9 years.

Apparatus : A DEC PDP8 computer was programmed to produce a series of modular addition problems on a visual display unit. Participants were seated alone in a room with the visual display unit and a keyboard which they used to type their answers. The computer recorded response times (time from appearance of problem to first letter of answer being typed) and correctness of response.

Procedure : Students participated individually. The experimenter introduced the task as an attempt to collect normative data on a new experimental task. For those in the high-efficacy condition, she also mentioned that the student had been selected on the basis of previous tests, and she believed from those test results that the student would find the task quite easy. The participant completed a questionnaire designed to measure self-efficacy and then performed the modular addition task alone in a small research room.

Results

The manipulation did not produce significant differences in efficacy, as measured by the scale, between those who had received it and those who had not ($t = 0.07$). There were no differences between these two groups on the number of correct responses ($t = 0.05$), but those in the high-efficacy condition responded significantly slower ($t = 6.26$, $p = .01$). The correlations between measured efficacy and performance were : for number of correct responses, $r = .44$, $p = .001$; for total response time, $r = -.08$, $p = .2$.

APPENDIX G. cont.

Discussion

The manipulation was not effective in increasing efficacy. Its only effect was to increase response time, which suggests that it was increasing participants' evaluation anxiety and causing them to respond more slowly, though not more accurately, than the other participants. This may explain why response time did not correlate with reported efficacy, while correct responses, which were unaffected by the manipulation, did correlate with efficacy.

This study has serious flaws which preclude the drawing of any conclusions concerned with self-efficacy theory. Firstly, the manipulation did not have the expected effect, but did have some effect on participants and may have contaminated the relationships between the variables in unpredictable ways. Secondly, the questionnaire used to measure self-efficacy was designed before a thorough review of the literature had been made, and did not conform to the parameters required. The format of answering each question "yes" or "no" and then giving a confidence rating was not followed, the questions in general were not sufficiently specific to the task, and the participants were not given a clear idea of the task before completing the questionnaire. Because of these major flaws, it was felt inappropriate to include this study in the main body of the thesis.

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