

INVESTIGATIONS OF
BECK'S COGNITIVE THERAPY
FOR DEPRESSION

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Happiness exists as it is perceived. It is the mind that maketh well or ill. The elements of pleasure and pain are everywhere. The degree of happiness that any circumstances or objects can confer on us depends on the mental disposition with which we approach them.

Thomas Love Peacock,

Nightmare Abbey,

1818

INVESTIGATIONS OF BECK'S COGNITIVE THERAPY FOR DEPRESSIONABSTRACT

Beck's cognitive model of depression suggests that negative thinking can play an important role in the development and maintenance of clinical depression. It follows from this that interventions which reduce the frequency or intensity of depressing thoughts will also reduce depression. This prediction forms the basis of cognitive-behavioural therapy (CBT) for depression, as developed by Beck and his colleagues.

The cognitive model of depression, and cognitive therapy, are described. The development of a questionnaire (the Cognitions Questionnaire - CQ) is then presented, designed to assess various dimensions of depressive thinking in relation to positive, negative and neutral hypothetical events. Relationships between scores on the questionnaire and level of depression in psychiatric and community samples are examined, and possible indices of continuing cognitive vulnerability to depression following an episode are explored.

As an alternative to the traditional outcome trial, a within-subject experimental design is proposed, designed to test the central prediction of the cognitive model outlined above by examining the immediate effects on depressive thinking and on depression of specified cognitive therapy interventions. A series of experiments is presented, which demonstrated that in patients low in endogeneity, a brief, standardised distraction procedure reliably reduced the frequency of depressing thoughts, compared to a control procedure. As would be predicted from the cognitive model of depression, this was accompanied by significant reductions in depres-

sion. A study using nondepressed student subjects showed that these effects could not be attributed to the direct impact of the two procedures on depressed mood. Similar results were not found in depressed patients high in endogeneity. The nature of this difference in responsiveness to distraction is explored, and its implications for the theory and practice of CBT for depression are discussed.

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INVESTIGATIONS OF
BECK'S COGNITIVE THERAPY
FOR DEPRESSION

CHAPTER 1COGNITIVE THERAPY FOR DEPRESSION : WHAT IS IT?

OVERVIEW

In this chapter I shall present Beck's cognitive model of depression (Beck 1967, 1976), describe the characteristics and core strategies of cognitive-behavioural therapy (CBT) of depression (Beck, Rush, Shaw and Emery, 1979), and illustrate the treatment in action with a case example. It is not my intention at this point to discuss at any length related ideas or evidence from cognitive or clinical psychology, or to provide a critical evaluation of the model or of CBT. Rather I intend to introduce the conceptual and practical background against which the experimental studies I shall describe were carried out.

THE COGNITIVE MODEL OF DEPRESSION

Beck's cognitive therapy is a psychological treatment for emotional disorders, based on "an underlying theoretical rationale that an individual's affect and behaviour are largely determined by the way in which he structures the world" (Beck et al., 1979, p.3). Clearly this central proposition is not in itself a new idea. As Beck and his colleagues point out, its origins may be

traced back to Stoic philosophers such as Epictetus, who wrote: "Men are disturbed not by things, but by the views which they take of them" (cited by Beck et al., 1979, p.8). Marcus Aurelius made a similar point, adding a therapeutic element: "If you are pained by any external thing, it is not this thing that disturbs you, but your own judgement about it. And it is in your power to wipe out this judgement now" (cited by Bedrosian and Beck, 1980). What is new about Beck's approach is the development of a complex, structured and systematic treatment approach, designed to achieve changes in affect and behaviour through the active modification of immediate interpretations of experience, and of the fundamental beliefs on which these are based.

I shall discuss Beck's cognitive model specifically in relation to depression. This was the area in which it was first developed, and within which it has so far been most extensively researched. This should not however be taken to mean that it is relevant only to depression, or indeed only to emotional disorders of clinical intensity. As the quotations above imply, it may usefully be viewed as a general model of human functioning, describing the regulation of affect and behaviour in terms of a thinking organism in active interaction with its environment, and giving primacy to the processing of immediate experience as influenced by enduring cognitive structures formed in response to previous events.

Beck himself originally trained as a psychoanalyst (Beck, 1976, p.29), and the development of the cognitive model of depression grew out of his dissatisfaction with and failure to find empirical

support for analytical models, together with his growing interest, as both scientist and clinician, in the contents of conscious experience and their influence on feeling and on behaviour (Beck, 1976, pp. 30-31). Contemporary conceptualisations of depression "predominantly utilised a motivational-affective model ... The cognitive processes as such have received little attention ... The relative lack of emphasis on the thought-processes in depression may be a reflection of ... the widely held view that depression is an affective disorder, pure and simple, and that any impairment of thinking is the result of the affective disturbance" (Beck, 1963). Beck, in contrast, proposed that depressive thinking might play a crucial role in the development and maintenance of the disorder.

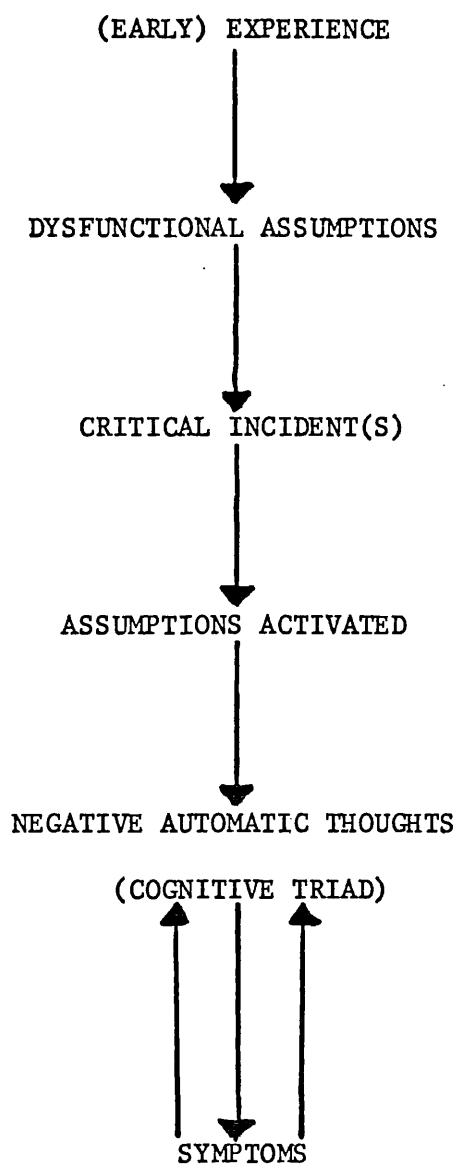
An early study of session content and between-session records of patients receiving psychotherapy (Beck, 1963, 1967) showed systematic, idiosyncratic distortions of experience, unrelated to actual circumstances, in those who were diagnosed depressed. Specifically, these patients were preoccupied with thoughts of loss, deprivation, self-derogation, self-commands and injunctions, overestimations of the magnitude of current difficulties, and escapist or suicidal wishes. While other cognitive distortions were present in patients falling into different diagnostic categories (for example, unrealistic self-enhancement in mania, and overestimation of threat in anxiety), these particular misinterpretations were peculiar to depression, and were viewed by Beck as evidence of a consistent negative bias in processing. The content of depressive thinking was subsequently codified in terms

of a "cognitive triad" (Beck, 1967), comprising negative views of the self ("I'm no good", "I'm useless", "I'm inadequate"), of current experience ("Nothing I do turns out right", "It's all too difficult") and of the future ("There's no hope", "I will never get better", "It will always be this way").

A further study suggested that this bias might originate in early experience (Beck, 1967). A comparison of 100 severely depressed patients with 100 nondepressed controls showed that among the depressed a significantly higher proportion (27% as opposed to 12%) had lost one or both parents before the age of sixteen. (This is reminiscent of the finding of Brown and Harris (1978) that loss of mother before the age of eleven constituted a vulnerability factor for depression in women.) Beck suggested that, through early traumatic experiences, depressed patients might develop certain characteristic cognitive-affective patterns which, once activated, would produce disproportionate reactions of deprivation and despair (what these experiences might be in the 73% of depressed patients not reporting parental loss was not explored).

The model derived from these early findings has now been extensively described (e.g. Beck, 1963, 1964, 1967, 1976; Beck et al., 1979; Burns, 1980; Emery, 1981, 1984; Kovacs and Beck, 1978), and is illustrated schematically in Figure 1.1. The model proposes that experience (usually but not necessarily early experience) leads to the formation of rules or beliefs ("assumptions" or "schemata"), "relatively enduring components of

Figure 1.1 The cognitive model of depression



(BEHAVIOURAL, MOTIVATIONAL, AFFECTIVE, COGNITIVE, SOMATIC)

the cognitive organisation" (Beck, 1964) which are subsequently used to organise perceptions, set goals, adapt to the environment and guide behaviour. That some means of coding experience and organising behaviour is necessary to normal functioning has long been recognised (e.g. Hayek, 1952; Bruner, Goodnow and Austin, 1956). However, a subsection of assumptions will be dysfunctional in that, in relation to specific categories of environmental influence, they can act to precipitate emotional disorder. That is, "they persist in a latent state like an explosive charge ready to be detonated by an appropriate set of conditions" (Beck, 1967). Such assumptions, often culturally based, concern issues such as how one ought to behave, what is necessary to happiness, what one must do or be in order to consider oneself a worthwhile person, and what standards one sets for one's own or others' behaviour. Some examples are given in Figure 1.2. They are dysfunctional in that: 1) they do not reflect the realities of human experience; 2) they are rigid, absolute, overgeneralised and extreme, taking no account of variations in circumstances; 3) they prevent rather than facilitating goal-attainment (as where unrealistically high standards produce anxiety which inhibits performance; 4) violation of them is associated with extreme and excessive emotions, e.g. depression and despair rather than sadness or regret; and 5) they are relatively impervious to modification by ordinary experience. This is in part because, although the individual acts as if they were true, they may well be unformulated and hence largely unconscious. Depending on previous experience, "each person has a unique set of personal rules" (Beck et al., 1979, p.244), which

Figure 1.2 Examples of dysfunctional assumptions

Achievement

I should be upset if I make a mistake

If I do not do as well as other people, it means I am an inferior human being

My life is wasted unless I am a success

Acceptance

My value as a person depends greatly on what others think of me

If others dislike you, you cannot be happy

I am nothing if a person I love does not love me

Control

I should always have complete control over my feelings

Turning to someone else for advice or help is an admission of weakness

A person should be able to control what happens to him

will be active in situations directly related to the individual's particular vulnerabilities.

Beck, Emery and Greenberg (1985) have grouped assumptions in terms of three major areas of concern: achievement, acceptance and control. In a given situation, any of these might be operative. For example, a person might avoid relationships because they feared being unable to meet the other's standards (achievement), because they feared rejection (acceptance), or because they feared their life might be taken over (control). In another recent development, Beck, Epstein and Harrison (1983) have identified superordinate modes of functioning (more akin to "personality variables") which they suggest may influence the nature of precipitating events, the pattern of symptomatology, and treatment responsiveness. Two specific dimensions have been identified, "sociotropy" or social dependence, focussing on interpersonal relations, and "autonomy", focussing on independence, freedom of choice and the integrity of the person (see Figure 1.2). These should be reflected in cross-situational consistency of behaviour, though they are not regarded as fixed or inflexible, or indeed as mutually exclusive. Preliminary psychometric work on a questionnaire measure assessing beliefs associated with the two dimensions has already been carried out (Beck, In press). Their relationship to different categories of environmental stressor, pattern of symptoms and response to treatment remains to be investigated.

In itself, the existence of dysfunctional assumptions will not account for the development of emotional disorder of clinical

intensity. Rather, an interactional model is proposed. Problems arise when the person encounters a critical incident (or series of incidents) which relates directly to his or her system of beliefs and reflects, however marginally, the circumstances under which these were first established (Kovacs and Beck, 1978). Thus, for example, the belief that your worth as a person depends on success could lead to depression in the face of a major failure or series of failures; the belief that being loved is crucial to happiness could lead to depression following rejection; and the equation of personal worth with work could precipitate depression in an individual made redundant or unemployed. In the face of events of this kind, the assumptions (hitherto silent) are activated, leading to an upsurge of cognitions termed by Beck "negative automatic thoughts" - "negative" in that they are associated with unpleasant emotions, "automatic" in that they arise "without any antecedent reflection or reasoning" (Beck, 1963).

Unlike assumptions, which may be viewed as generalised beliefs, often unspecified and operating to influence affect and behaviour in a variety of situations, automatic thoughts are specific, discrete mental events occurring in response to specific external or internal stimuli (Beck, 1963). As depression develops, more "rational" thoughts are "crowded out" by the increasing frequency and intensity of depressive cognitions, this process being facilitated by increasingly pervasive depressed mood (Beck, 1964).

Negative automatic thoughts are assigned certain formal characteristics (Beck, 1963; Beck, 1976). They are described as involuntary or autonomous, plausible (that is, their validity is accepted without question, the more so when the accompanying emotion is strong), habitual, and extensive in that, unlike thoughts relating to specific phobias, for example, they occur in response to a wide range of situations. These characteristics may account to a large extent for the difficulty of treating depression by psychological means: because the thoughts are habitual, they may be difficult to identify; because they are automatic and involuntary, they are difficult to control and will tend to recur; because they are plausible, they will be difficult to challenge; and because they are extensive, they will influence negatively the patient's response to therapist and therapy alike.

As to process, negative automatic thoughts are seen as the product of certain logical errors in processing, through which interpretations of the past, the future and ongoing experience are distorted. In sum, these amount to a systematic bias against the self (Beck, 1963). Individually, they represent a quantitative rather than qualitative difference from the errors in reasoning found in normal (nondepressed) individuals. All men are irrational, but some men are more irrational than others. Thus although the content of the thoughts is specific to depression, the processes by which that content is arrived at (some of which are illustrated in Figure 1.3) are common to other emotional disorders, and indeed to "normal" distress (Beck, 1976, pp.3-4).

Figure 1.3 Logical errors in thinking

<u>ERROR</u>	<u>PROCESS</u>	<u>EXAMPLE</u>
Overgeneralisation	Drawing a general conclusion on the basis of a single instance	A typing error - nothing I do turns out right
Selective abstraction	Perceptual bias; attending only to negative aspects of experience	I didn't have a moment's pleasure today
Dichotomous thinking	Thinking in polarised extremes, either/or thinking	If I can't do it perfectly, there's no point in doing it at all
Personalisation	Accepting excessive responsibility	It's all my fault

Returning to the model illustrated in Figure 1.1, negative automatic thoughts are related to the full range of depressive symptomatology. Thus behavioural symptoms such as lowered activity levels, withdrawal and avoidance, and motivational symptoms such as loss of interest and of the desire to engage in any activity, will be associated with expectation of negative outcomes (e.g. "I can't do it", or "What's the point? I won't get anything out of it"). Affective symptoms also relate to specific cognitions, differing in content according to the nature of perceived impact on the personal domain. For example, sadness will be associated with thoughts of loss (e.g. "Everything I ever valued has gone"), anxiety with thoughts of risk or danger (c.f. Beck, Laude and Bohnert, 1974; Beck and Rush, 1978; Butler and Mathews, 1983; Hibbert, 1984), guilt and self-disgust with the idea that the individual has fallen below prescribed standards of behaviour (e.g. "I ought to be over this by now. I'm pathetic"). Cognitive symptoms too may be precipitated or intensified by negative thoughts. For example, ruminations about current problems will hamper concentration and memory, leading to further distressing thoughts (e.g. "I must be going senile", "I've got a brain tumour"). Somatic symptoms may also be intensified by negative interpretations of their significance, as when worries about the effects of not sleeping make sleep yet more difficult, or when loss of sexual desire is seen to indicate the imminent breakdown of a previously satisfactory relationship, rather than recognised as a symptom of depression. Finally, suicidal behaviour will reflect the conviction that the present

situation is intolerable, and that nothing can be done to alter or escape it.

It should be noted that at this point in Figure 1.1 the arrows go in both directions. That is, not only do thoughts influence other symptoms, but these in turn will reciprocally influence thinking. The individual becomes caught in a vicious circle where depressing thoughts lead to an intensification of depressive affect, and this in turn increases the frequency and plausibility of the depressing thoughts. This "continuous interaction between cognition and affect" (Beck, 1963) is readily recognised by depressed patients, and has received some support from experimental work both on the influence of induced mood on cognitive functioning (e.g. Bower, 1981), and on the cognitive concomitants of different levels of clinical depression in individuals experiencing diurnal variation (Clark and Teasdale, 1982). In relation to the no doubt complex interactions between thinking, behaviour and affect, Beck's model should not be taken to imply that negative cognitions cause depression, as Beck himself has recently been at pains to emphasise (Beck, 1984). Depression may be viewed as the final common pathway for a range of biological, developmental, social and psychological predisposing and precipitating variables (Beck, In press). Cognitive factors do not cause depression. Rather they have some temporal priority in its development, and they can act to trigger, enhance or maintain other symptoms. For this reason, they form an ideal point for intervention (Beck, 1983).

COGNITIVE THERAPY FOR DEPRESSION

Within the context of the cognitive model, the therapist's prime task is to teach the patient to identify and challenge first the automatic thoughts occurring within specific problem-situations, and then the assumptions on which they are based. The immediate goal is symptom-relief. In the longer term the aim is to use the same approach to solve life-problems (such as situational or relationship difficulties which may or may not be directly associated with the depression), and to prevent, or at least attenuate, future episodes. For a detailed description of the practice of CBT for depression, see Beck et al.(1979).

Cognitive therapy has certain specific characteristics (Beck, 1970; Beck et al., 1985; Derubeis, Hollon, Evans and Bemis, 1982) which are summarised below. It is:

1. based on a coherent cognitive model of emotional disorder

That is, it is not simply a collection of disparate techniques, loosely cobbled together and mechanically applied, but a conceptual framework for understanding human behaviour. This aids generalisation in that it provides the patient with a means of analysing and dealing with problems that occur between therapy sessions and after therapy has terminated;

2. based on a sound collaborative therapeutic relationship

General therapeutic qualities such as empathy, warmth and genuineness are strongly emphasised. The patient is explicitly identified as an equal partner in a team approach to problem-

solving, so that trust, openness and active participation are facilitated. This is encouraged by the therapist both through a system of frequent reciprocal feedback, and by making the various therapy strategies and their rationales clear and explicit. There is no reliance on mystique or mystery;

3. brief, time-limited Traditionally, a maximum of twenty one-hour sessions are offered. Patients are informed from the outset that the therapist will be available for only a limited period. Thus they are encouraged to acquire the skills necessary to help themselves, independent of professional support;

4. structured and directive The therapist does not function as a tabula rasa on which the patient may project his or her fantasies, nor simply as a source of support. He or she is actively engaged in structuring sessions towards the achievement of agreed goals, questioning the patient's patterns of thought, and teaching new ways of thinking and new behavioural skills. At the same time, this is a collaborative, rather than prescriptive, process;

5. problem-oriented and focussed on the present As in behaviour therapy, problems are concretely and specifically defined. Relatively little time is spent exploring the deep past. The focus is on factors currently maintaining difficulties, and not on their origins;

6. reliant on inductive method Patients are taught to view their thoughts and beliefs not as facts, but as hypotheses whose validity may be tested by reviewing evidence already available and by careful observation of the outcome of behavioural experiments;

7. educational Generally speaking, change is assumed to occur not so much through moments of blinding insight as through the gradual acquisition of specific depression-management skills. As with any skill, learning is promoted by repeated practice. So every therapy session is followed by homework assignments, through which patients carry new ideas and new behaviours into their everyday environments.

As a total treatment package, CBT includes a complex interweaving of cognitive and behavioural strategies. Three main cognitive components may be identified: distraction, modification of negative automatic thoughts, and modification of underlying assumptions. Distraction, or diversion (Beck et al., 1979, pp.171-173), involves teaching the patient to direct attention away from distressing preoccupations by focussing either on alternative, pleasanter internal stimuli or on the immediate environment. It is designed to elevate mood by reducing the frequency of negative automatic thoughts and is generally used early in treatment at a stage where the individual is too severely depressed, or too unskilled, readily to generate rational alternatives to distorted, depressive thinking, or to engage in constructive problem-solving.

In contrast to this primarily palliative strategy, CBT's core cognitive component involves teaching the patient to resolve problems (including dealing with the current episode of depression) by following certain specified steps, illustrated in Figure 1.4. These may be applied to a wide range of problems, and

Figure 1.4 Cognitive problem-solving

1. IDENTIFY UNPLEASANT EMOTION

2. IDENTIFY SITUATION IN WHICH IT OCCURS

3. IDENTIFY ASSOCIATED NEGATIVE AUTOMATIC THOUGHTS

4. FIND RATIONAL ALTERNATIVE - REVIEW EXISTING EVIDENCE
 - SEARCH FOR OTHER PERSPECTIVES
 - IDENTIFY LOGICAL ERRORS

5. TEST OUT IN ACTION (BEHAVIOURAL EXPERIMENT)

6. EVALUATE OUTCOME OF EXPERIMENT - CONFIRMATION OF NEW PERSPECTIVE?
 - FURTHER CHANGE NEEDED?

will form a major part of therapy sessions, and of homework assignments. The patient is taught to identify the onset of unpleasant emotions, the situations in which they occur, and the negative automatic thoughts associated with them. Thus a habitual and perhaps poorly discriminated process is brought into conscious awareness. Gradually the patient will learn to challenge the thoughts, for example by reviewing evidence already available, searching for alternative perspectives (e.g. "How would you have viewed this situation before you got depressed?"), and identifying and correcting logical errors (e.g. "Am I thinking in black and white terms with no shades of grey?", or "Am I assuming I know what other people think?"). The next step is to set up a behavioural experiment which allows the validity of the new interpretation to be tested in action. Finally, the outcome of the experiment is evaluated to determine whether the new perspective does indeed fit the facts, or whether further changes need to be made. A similar process will later be used to undermine dysfunctional assumptions, except that the goal will be the formulation of more moderate and helpful guiding principles (for example, "It's nice to do things well, but I'm only human so I should expect to make mistakes sometimes, and I can learn from them", rather than "I have to be perfect all the time"), and a greater emphasis is likely to be laid on the ways in which such assumptions frustrate the achievement of desirable goals.

CASE STUDY

Let me illustrate the course of treatment by relating it to the case of a woman patient seen as part of a trial of CBT in general practice.

Background

Mrs T. was woman of 50, married to a kindly but dependent man, currently off work with an alcohol-related disease. They lived in a cramped, damp and dark council flat, together with her granddaughter and the granddaughter's little girl, who had no home of their own at the time. Mrs T. was also off work so that she could look after her husband. Her usual job was on a factory assembly line. She had seven previous referrals to psychiatric hospital, five of them for depression, and had attempted suicide on two occasions. At the time of referral, she had been more or less severely depressed for about 2 1/2 years, despite antidepressant medication from her general practitioner and extensive social worker support. The overall pattern of treatment is illustrated in Figure 1.5.

Session 1

As is usual in cognitive therapy, the prime focus in the first session was the specification of current problems, and a brief explanation of the cognitive model of depression. Some of the problems identified were primarily situational (e.g. financial difficulties), some appeared to be more plainly aspects of the depression itself (e.g. an agitated restlessness), and some seemed

Figure 1.5 G.T. : Course of treatment

<u>#</u>	<u>BDI</u>	<u>PROBLEM/STRATEGY</u>	<u>HOMEWORK</u>
1.	29	Identify current problems → Problem list Target thought: I'm not doing anything	Distraction "Coping with Depression" Monitor activities
2.	26	Loss of pleasure → Teach P & M Target thought: I'm not enjoying anything	Monitor activities, plus P & M
3.	18	Inactivity → Teach planning ahead Target thought: I can't get going	Plan each day in advance Monitor activities, plus P & M
4.	18	Morning panic → Teach identifying negative thoughts. Answer in session and make action plan	Monitor negative thoughts Use action plan for morning panics
5.	17	Worrying thoughts → Teach rational responding	Monitor and answer negative thoughts. Set up behavioural experiments and evaluate outcome
6-12.	69	Current events, setbacks, fears of future → Extend application of skills, prepare for future, construct "First Aid Kit"	Rehearse application application of cognitive problem- problem-solving skills

to be a mixture of the two. For example, she was genuinely burdened with extra family responsibilities, because of her husband's illness, but her belief that she was not coping with them was incorrect. Similarly, her reported loss of pleasurable activities appeared to relate partly to lack of funds, partly to social isolation resulting from a recent move, and partly to generalised loss of motivation and interest. The cognitive model was explained first didactically, then by engaging Mrs T. in an experiment designed to demonstrate the link between thinking and affect. After a short period focussing on the problems she had listed, she described her feelings - "terrible". She was then asked to focus her attention on the view from the window and to describe in as much detail as possible what she could see. After some minutes of increasing absorption, she reported feeling "much better; I've forgotten all about it". As this exercise had proved effective, practising dealing with fruitless worries by using distraction became her first homework assignment. In addition, she was to read "Coping with Depression" (Beck and Greenberg, 1974), a booklet describing the cognitive approach, and to record her activities hour by hour. The latter was intended to test out the thought "I'm not doing anything".

Session 2

The evidence from this assignment was that she was in fact doing a good deal. She still reported however that she was not enjoying anything. The focus of Session 2 was to challenge this thought by examining in detail what she had in fact been doing, and rating

out of ten the pleasure (P) and mastery (M) which she had gained from each activity. Again, the evidence disconfirmed the thought, showing that there were a range of activities from which she in fact derived satisfaction. Rating pleasure and mastery became the next homework assignment.

Session 3

In the third session, periods of inactivity were still something of a problem. So Mrs T. was taught how to plan each day in advance, hour by hour, the aim being to find a pattern of activity which would maximise pleasure and mastery. The target thought was "I can't get started", and the hypothesis was that planning time would increase her chances of engaging in activities. As her comment at the beginning of the following session was "for the first time there were no doing nothings", that remained a continued homework assignment until Session 6, after which activity level, loss of pleasure and interest were no longer a problem.

Session 4

Up to Session 4, the main focus had been on lifting depressed mood by increasing engagement in rewarding activities and by directing attention towards positive aspects of experience (pleasure and mastery). This use of primarily behavioural strategies within CBT has been lucidly described by Rush, Khatami and Beck (1975). While some cognitive methods had been used (the interventions were presented within the framework of a cognitive rationale, and tasks were set up as tests of the validity of negative cognitions),

depressive thinking as such had not formed an explicit focus of treatment. From this point onwards, however, Mrs T. was gradually taught to use the cognitive problem-solving skills outlined in Figure 1.4, and to apply them to an increasing range of situations. She had now returned to work, and the main target in Session 4 was her feelings of panic on waking. These were dealt with, as a teaching example, as shown in Figure 1.6. That is, we worked together to identify the emotions, the situation, and the negative automatic thoughts. These thoughts were then challenged, using the evidence currently available, and a specific action plan was agreed which would allow Mrs T. to test out the validity of the solution we had devised. In the event, the results were good, so that became her continued strategy for dealing with early morning anxiety. A further homework assignment, encouraging generalisation from this specific example, was to monitor problem situations, emotions and thoughts as they occurred.

Sessions 5-12

From this point onwards, sessions moved from twice to once a week. Each session was primarily devoted to identifying specific difficulties and using the cognitive problem-solving skills to tackle them. This was also the major homework assignment over the remaining weeks, and was applied to a variety of different problems, including her husband's being caught shoplifting, a daughter's psychotic episode, encounters with the social services, dealing with setbacks, and fears about ending treatment. By the end of this time she was no longer depressed. Towards the end of

Figure 1.6 G.T. : Cognitive problem-solving

- | | | |
|----|---|--|
| 1. | EMOTIONS | Panic, dread |
| 2. | SITUATION | Getting ready to go to work |
| 3. | NEGATIVE AUTOMATIC
THOUGHTS | It's too far. I'll never get there.
It's such a long day. I won't be
able to manage |
| 4. | RATIONAL ALTERNATIVE | It's not that far - I walk that far
for pleasure. In fact, I always
<u>do</u> manage, so there's no reason
why I shouldn't today. Once I get
to work and see my mates, I'll be
fine - I always am |
| 5. | ACTION PLAN
(BEHAVIOURAL EXPERIMENT) | Use these answers when thoughts come
up, then distract yourself. Walk
along slowly and take notice of
what you see |
| 6. | EVALUATE OUTCOME | Felt much better - no panic.
Continue |

treatment a written "first aid kit" was constructed, based on what she personally had found useful in therapy. This she would be able to refer to in case of future difficulties. Specific plans were also made for dealing with predictable problems, for example her husband's continued ill health and the possibility of his death.

Follow-up

Once well, Mrs T. was eager to leave therapy, so the assumptions that might have made her vulnerable to depression were not dealt with at that point. However, two years later, another series of situational and family difficulties led to severe depression and she asked for further help. Over eight sessions, a core assumption was identified and successfully challenged. It was that if anyone, in particular family, came to her for help, their problems were her problems, and she must take them on herself one hundred per cent. This assumption could be seen to date from her mother's reliance on her as confidant when her father left the family during Mrs T.'s childhood. Challenging the assumption led to the formulation of a new and more moderate rule: "It is good to help people, but taking 100% responsibility for sorting out their lives helps noone. They don't learn to look after themselves, and I get overburdened and end up depressed and no good to them at all". This new belief she then began to put into practice. At the end of the sessions, although the situation that had given rise to her distress remained essentially unchanged, Mrs T. was no longer depressed.

DISCUSSION

Essentially, Beck's cognitive model of depression proposes that negative cognitions can play a central role in the development and maintenance of the disorder. It specifies in some detail both the content (cognitive triad) and the process (logical errors) of negative thinking, delineates its relationship with the full range of depressive symptomatology, and describes the cognitive structures (dysfunctional assumptions) that are assumed to underlie it. In addition, the development of CBT has contributed significantly to the clinical psychologist's armamentarium for dealing with an area of psychological distress which, although increasingly the focus of theoretical speculations (e.g. Costello, 1972; Ferster, 1973; Lazarus, 1968; Lewinsohn and Graf, 1973; Lewinsohn, Weinstein and Shaw, 1969; Seligman, 1975; Skinner, 1953), was until relatively recently marked by a paucity of well-developed, sophisticated practical applications. Thus, the contributions of Beck and his colleagues, both to our understanding of emotional disorder, and to our handling of it, have undoubtedly been considerable. However, if the cognitive model of depression is to be satisfactorily validated, certain questions and issues will need to be resolved. Those which will be addressed in the work reported here are outlined below.

1. Depression and cognition

Are negative cognitions of the type postulated by Beck indeed present in depression? Further, can a depressive cognitive style

be identified, characteristic of individuals vulnerable to depression, and measurably present even when they are not actively depressed? These issues will be addressed in Chapter 2, which describes the development of a questionnaire measure designed to assess various dimensions of depressive responding in relation to negative, positive and neutral hypothetical situations. The relationships between scoring on the questionnaire and levels of depression in psychiatric and community samples will be explored, and possible indices of psychological vulnerability to further depression following an episode of the disorder will be examined.

2. The efficacy of CBT for depression

Beck's cognitive therapy for depression specifically aims to reduce negative thinking and to undermine depressogenic assumptions, thus alleviating current depression and preventing (or at least attenuating) future episodes. Chapter 3 will review evidence currently available on the immediate and long-term efficacy of CBT. Does it indeed alleviate and/or prevent clinical depression? Does it reduce depressive thinking? If so, can we with confidence identify the therapy procedures responsible for such changes? In particular, can recovery from depression during CBT be unequivocally attributed to those elements of the treatment package specifically designed to modify negative thinking, rather than to other behavioural or nonspecific elements? The clinical efficacy of CBT will be compared with that of other treatments of depression, based on different rationales and targeting different aspects of the state, and the usefulness of the traditional

outcome trial as a means of identifying specific procedures responsible for change will be questioned. An alternative research strategy, using a within-subject design to evaluate the immediate effects on depressive thinking and on depression of specified psychological interventions, will be proposed.

3. Experimental modification of depressive thinking

Is it possible, by experimentally modifying the frequency or intensity of depressive thinking, to produce immediate changes in other aspects of depression (specifically, mood and psychomotor speed), as would be predicted from the cognitive model of depression? Such an empirical demonstration of a functional link between thinking and affect would both support Beck's cognitive model of depression, and suggest the therapeutic usefulness of attempting directly to modify depressive thinking. Chapters 4, 5 and 6 describe a series of experiments designed to address these issues by examining the immediate effects on depression of a brief, standardised distraction procedure designed to reduce the frequency of depressing thoughts.

4. Heterogeneity of depression

Are the effects of reducing the frequency of depressing thoughts similar in all clinically depressed individuals, or are there differences in responsiveness to the experimental modification of negative cognitions? Chapter 7 examines the relationship between endogeneity, as defined by score on the Newcastle Diagnosis Scale (Carney, Roth and Garside, 1965), and responsiveness to

distraction in depressed patients.

5. The picture to date, and future directions

In Chapter 8, main findings will be summarised, and certain issues arising from the studies reported below will be addressed. In particular, I should like to discuss in more detail the degree to which irrational thinking can be seen as in any way abnormal, the nature of the relationship between cognition and affect, the therapeutic usefulness and limitations of absorbing activity, the relative applicability of Beck's cognitive model to different subtypes of depression, and some possible future directions for research.

CHAPTER 2

THE COGNITIONS QUESTIONNAIRE: SPECIFIC THINKING ERRORS IN DEPRESSION

The recent development of cognitive models of depression described in Chapter 1 has led to increasing interest in the measurement of depressive cognitive style. There is plentiful evidence, both clinical and empirical, of distorted, negative thinking during depressive episodes (e.g. Wilkinson and Blackburn, 1981). A number of diagnostic instruments (e.g. Research Diagnostic Criteria (RDC), Spitzer, Endicott and Robins, 1978; the Present State Examination (PSE), Wing and Sturt, 1978) and scales measuring severity of depression (e.g. the Montgomery and Åsberg Depression Scale (MADS), Åsberg and Montgomery, 1979; the Hamilton Rating Scale for Depression (HRS), Hamilton, 1960) developed quite independently of cognitive conceptualisations, include items assessing negative thinking as a symptom of the disorder. In addition, the high risk of relapse in those previously depressed might indicate some enduring cognitive style characteristic of people predisposed to depression. However, empirical evidence for a lasting tendency to interpret events in a negative way, either

*Based on Fennell, M.J.V. and Campbell, E.A. (1984) The Cognitions Questionnaire: Specific thinking errors in depression. British Journal of Clinical Psychology, 23, 81-92. (A copy of this paper will be found at Appendix I.)

before depression has developed or as a consequence of an episode, is at best inconsistent.

Metalsky, Abramson, Seligman, Semmel and Peterson (1982) in a prospective investigation of the revised learned helplessness model of depression (Abramson, Seligman and Teasdale, 1978), found that in students a combination of internal, global attributions for failure and low mid-term grades (one month after the attributional assessment) resulted in depressed mood. Neither attributional style nor low grades alone were sufficient to produce depressed mood. Working within the same model, Golin, Sweeney and Schaeffer (1980), using a cross-lagged panel correlational design, showed that stable and global attributions for negative events and unstable attributions for positive events predicted depression one month later. The major problem with both these studies is their use of mildly depressed student groups. Cutrona (1983) found that scores on 6 negative items from the Attributional Style Questionnaire (ASQ) (Seligman, Abramson, Semmel and von Baeyer, 1979), given during the third trimester of pregnancy, predicted postnatal depression in those who were not originally depressed, and predicted speed of recovery in those who became depressed immediately after the birth of their babies. Again, however, the level of depression investigated was low, and only a small proportion of women (3-5%) reported an episode diagnosable by RDC at any assessment point.

In a group of 60 depressed inpatients, Reda, Carpiniello,

Secchiaroli and Blanco (1985) examined the persistence of dysfunctional assumptions using a modified version of the Dysfunctional Attitude Scale (DAS) (Weissman and Beck, 1978). While belief in most items declined with recovery, belief in a certain proportion remained unchanged. Eaves and Rush (1984), studying a sample of 31 depressed female patients, found that scores on the Automatic Thoughts Questionnaire (ATQ) (Hollon and Kendall, 1980) declined with recovery and were no different on remission from those of normal controls. In contrast, however, elevated scores on the DAS and on response to negative items in the ASQ (Seligman et al., 1979) persisted. Thus dysfunctional depressive beliefs and a lasting tendency to attribute negative outcomes to internal, global, stable causes were identified as possible long-term cognitive characteristics. Both of these clinical studies seem promising. However, a major difficulty with each is the relatively brief period between remission and reassessment. These apparently enduring cognitive characteristics could simply be the "time-limited residuals of an episode of depression" (Eaves and Rush, 1984).

Four investigations have failed to support the concept of cognitive vulnerability. Lewinsohn, Steinmetz, Larson and Franklin (1981), using a large community sample and a variety of assessments including a measure of depressive beliefs, found no significant cognitive predictors or sequelae of depression. Wilkinson and Blackburn (1981) found no differences between recovered depressed patients and normal controls. Both groups

scored significantly lower on a range of cognitive measures than acutely depressed patients. Hamilton and Abramson (1983) showed that while acutely depressed patients scored significantly higher on the DAS and on the ASQ than nondepressed psychiatric patients or normal controls, after recovery (on average 17 days later) there was no significant difference between these groups. Silverman, Silverman and Eardley (1984) found that scores on the DAS declined with recovery in 32 out of 35 patients with major depressive disorder to a level indistinguishable from that of the normal subjects assessed by Weissman and Beck (1978). In summary, enduring cognitive vulnerability to depression, if indeed it exists, has not yet been consistently demonstrated.

These inconsistent findings may in part result from the nature of the measures used. Some, for example the ASQ (Seligman et al., 1979), have been designed to assess only one aspect of depressive thinking. No consideration is given within the attributional model to the individual's response to the consequences of events rather than their causes. Yet the importance of this aspect of depressive thinking has been demonstrated (Hammen and Cochran, 1981). Other measures provide global assessments of the quantity or frequency of depressive thinking, e.g. the ATQ (Hollon and Kendall, 1980), the Cognitive Response Test (CRT) (Watkins and Rush, 1983), and the measure of depressive distortion devised by Krantz and Hammen (1979). These do not however isolate specific dimensions of thinking such as misattribution or overgeneralisation. Indeed, Krantz and Hammen (1979) reported that independent judges were unable to distinguish reliably

between Beck's various logical errors (Beck et al., 1979, pp.14-15) as exemplified in their questionnaire.

Thus measures currently available assess either single dimensions of depressive thinking or a global tendency to interpret events in a distorted, negative way. No existing assessment instrument combines the two functions: the specification of particular thinking errors and a global assessment of cognitive style. Yet cognitive vulnerability might be manifest only in particular dimensions of distortion (e.g. overgeneralisation), or in response to particular types of event (e.g. losses). To test this hypothesis, a questionnaire was designed - the Cognitions Questionnaire (CQ) - which would provide a total score for depressive distortion and also allow the identification of a number of specific cognitive distortions in response to negative, positive and neutral events.

The selection of response dimensions was guided by the revised learned helplessness model (Abramson et al., 1978), which sees depression as a response to negative events viewed as highly aversive, attributed to internal, global and stable causes, and perceived to be uncontrollable. The dimensions chosen for the CQ resemble those identified by the attributional model with one crucial difference: apart from attribution, the identified dimensions were applied not to the causes of the hypothetical situations described, but rather to their consequences.

Five dimensions of response were chosen: emotional impact (not in itself a cognitive distortion), attribution of causality, generalisation across time (implications for the future), generalisation across situations (how far events were seen as typical), and perceived uncontrollability (what could be done about the situation). On each dimension, high scores were expected to be associated with depression.

1. Emotional impact reflected the felt aversiveness of negative events and pleasantness of positive events. Some evidence is available both for heightened sensitivity to unpleasant experiences (Lewinsohn, Lobitz and Wilson, 1973; Schless, Schwartz, Goetz and Mendels, 1974), and for reduced sensitivity to pleasant experiences (Lewinsohn and Graf, 1973; Lewinsohn and MacPhillamy, 1974) in depressed individuals. Scoring on this dimension was as follows: (a) negatively interpreted events High scores reflect an extreme emotional response, or the absence of a response where some degree of upset would be regarded as normal. Low scores represent moderate or slight responses; (b) positively interpreted events High scores reflect absent or attenuated emotional responses, and low scores moderate or extreme responses; (c) neutral events were hypothesised to constitute ambiguous stimuli, to which depressed subjects would respond as if they were negative, and nondepressed subjects as if they were positive or neutral. On the dimension of emotional impact, high scores reflect more or less intense negative responses, and low scores pleasure or no particular reaction.

2. Attribution of causality A number of studies have found a

relationship between depression and the individual's tendency to attribute negative outcomes to the self, and positive outcomes to external factors (e.g. Klein, Fencil-Morse and Seligman, 1976; Rizley, 1978; Kuiper, 1978; Janoff-Bulman, 1979). Misattribution of negative outcomes relates to Beck's "personalisation" error, the acceptance of excessive responsibility for unpleasant events (Beck et al., 1979, p.14). Thus: (a) negatively interpreted events High scorers blame unpleasant events on their own qualities or behaviour. Low scorers place the blame on other people or on circumstances; (b) positively interpreted events High scorers attribute pleasant events to other people or to circumstances. Low scorers attribute them to their own qualities or behaviour.

3. Generalisation across time (future) The expectation that negative outcomes will extend without relief into the future (hopelessness) is a core feature of depression, and one element of Beck's "negative cognitive triad" (Beck et al., 1979, pp.11-12). Scoring was as follows: (a) negatively interpreted events High scorers see unpleasant events extending into the future and likely to recur. Low scorers see them as short-lived and unlikely to recur; (b) positively interpreted events High scorers view pleasant events as short-lived and unlikely to recur. For low scorers the reverse is true.

4. Generalisation across situations ("generalisation") Generalisation of hopelessness from specific negative life events had been identified as a key element in the development of depression by Brown and Harris (1978). Overgeneralisation has

also been identified by Beck as a logical error commonly occurring in depression (Beck et al., 1979, p.14), and is another element of the cognitive triad, the distorted negative view of the world. Thus: (a) negatively interpreted events High scorers see unpleasant events as typical of their lives as a whole. Low scorers view them as isolated exceptions; (b) positively interpreted events For these the reverse is true.

5. Perceived uncontrollability This dimension reflects the extent to which the individual believes that constructive action may be taken to alter a negative situation or to perpetuate or repeat a positive one. High scorers report avoiding taking action of any kind, believing that nothing they do will influence the situation. Low scorers plan active coping strategies.

Aims of the study

These may be summarised as follows: (1) to devise a questionnaire to assess cognitive style in relation to different levels of severity of depression; (2) to determine the relative contributions to total CQ score of the five response dimensions described above; (3) to establish the relative potency of differently valenced hypothetical events (negative, positive and neutral) as stimuli for depressive cognitions; and (4) to examine the persistence of negative thinking after recovery from an episode of clinical depression.

Hypotheses

A. CQ scores and depression (1) the degree of overall cognitive distortion (total CQ score) would be positively related to

severity of depression; (2) depression would be associated with higher scores for each type of hypothetical event (negative, positive and neutral), and the association would be strongest for negative events (i.e. those events most likely in real life to precipitate depression); and (3) depression would be associated with higher scores on all five response dimensions when these were considered separately;

B. CQ scores and cognitive vulnerability (1) recovered depressed subjects would on average score lower on the CQ than currently depressed subjects, but higher than subjects who had never been depressed; and (2) this difference would be most evident in relation to negative events, this again being the type of event (loss, deprivation, failure, disappointment) most likely in real life to precipitate depression.

METHOD

Composition of the questionnaire

Eight brief scenarios were composed by a group of psychologists. These related to work (three scenarios), family (one), social relationships (two), finance (one) and the experience of depression itself. The scenarios were given to 10 nondepressed independent judges to code as negative (unpleasant), positive (pleasant) or neutral (neither one nor the other). Nondepressed individuals were expected to code neutral scenarios as either neutral or positive. Agreement with predetermined coding was good: 100% for the two positive scenarios and the two neutral

scenarios, and a mean of 82.5% for the four negative scenarios. None of the latter was rated as positive. The lowest agreement was for the scenario describing depression (early waking followed by ruminations), which was rated negative by seven judges and neutral by three.

Each scenario was followed by five fixed-choice questions designed to assess the five response dimensions. Four alternatives were provided for each question. Of these, the most depressed alternative scored two, the next most depressed scored one, and the remaining two alternatives (judged to be nondepressed) scored zero. Thus the higher the total CQ score, the more extreme the emotional response, and the greater the degree of depressive distortion.

The questionnaire was given to six independent judges to score. There was high agreement between the authors' scoring system and the judges' categorisation of responses as depressive or not depressive. For the 160 individual items in the questionnaire, agreement between the independent judges and the authors ranged from 86% to 94% (mean = 91%).

Respondents were told to imagine themselves in each situation as vividly as possible. They were then instructed to choose, for each response dimension, the alternative which best described what they thought their reaction would be if they were actually faced with that situation. A copy of the questionnaire will be found at Appendix II.

Respondents

There were two main groups of respondents: a sample of psychiatric patients from the wards and Outpatient Department of a single psychiatric hospital (recruited over a 6 month period from July 1980 to January 1981), and a community sample. The composition of the sample is shown in Table 2.1.

All respondents completed the CQ and the Beck Depression Inventory (BDI) (Beck, Ward, Mendelson, Hock and Erbaugh, 1961). A cut off of 10 on the BDI was chosen for the nondepressed group. Thus marginally depressed individuals scoring 11-13, below the normally accepted lower boundary of mild clinical depression (14), were included in the mildly depressed group. This would provide a more conservative test of the hypotheses than including these individuals in the nondepressed group. The psychiatric sample, which included 42 men, also gave information on age and education. They answered both questionnaires as part of normal outpatient assessment or, on the wards, in response to a request to take part in a study of people's reactions to certain situations. The community sample (all women) gave information on age. They completed the questionnaires as part of two separate and unrelated studies.

Table 2.1

<u>A Psychiatric Sample</u>			
<u>Diagnostic criterion</u>	<u>Severity criterion</u>	<u>N</u>	
		<u>Female</u>	<u>Male</u>
1. <u>Currently depressed</u> Currently meeting Research Diagnostic Criteria for Major Depressive Disorder (Spitzer, Endicott and Robins, 1978)	Beck Depression Inventory (BDI) score \geq 11	29	15
2. <u>Past depressed</u> Previously meeting RDC for Major Depressive Disorder, but now recovered	BDI score \leq 10	12	3
3. <u>Other diagnosis depressed</u> Not meeting RDC for Major Depressive Disorder, i.e. main diagnosis anxiety disorder, phobic disorder, etc.	BDI score \geq 11 (i.e. significant mood disturbance in the absence of a primary diagnosis of depression)	25	11
4. <u>Other diagnosis non-depressed</u> Not meeting RDC for Major Depressive Disorder	BDI score \leq 10	12	12
<u>B. Community Sample</u>			
1. <u>Currently depressed</u>	BDI score \geq 11	<u>Female</u> 19	
2. <u>Past depressed</u> Previously meeting criteria for Neurotic Depression (ID level \geq 5) as defined by the Present State Examination (PSE) and CATEGO-ID programme (Wing and Sturt, 1978)	BDI score \leq 10	19	
3. <u>Nondepressed</u> No known previous episode depression	BDI score \leq 10	86	

RESULTS

General sample characteristics and total CQ scores

Age There was no correlation between CQ total score and age. There was, however, a small but significant correlation between age and BDI score ($r(241)=0.20$, $p<.001$). This was an artifact of sampling procedures: the community sample, which contained most of the nondepressed individuals, was composed entirely of young women (mean age 29), whereas the psychiatric sample, which contained over two-thirds of all the currently depressed individuals, was on average older (mean age 42). Within the community sample, age correlated neither with BDI score ($r(122)=0.10$, N.S.) nor with total CQ score ($r(122)=-0.01$, N.S.). Similarly, within the psychiatric sample, there was no correlation between age and BDI score ($r(117)=-0.02$, N.S.), nor between age and total CQ score ($r(117)=0.02$, N.S.).

Gender There was no difference between men and women on total CQ score ($t(241)=0.37$, N.S.). Within the psychiatric sample, there were no significant differences between men and women on BDI score ($t(117)=1.02$, N.S.) or total CQ score ($t(117)=1.94$, N.S.).

Education No information on educational status was available for the community sample. For the psychiatric sample, four categories of educational experience were used: secondary school only; apprenticeship/job training; clerical/commercial training; and further education, including university. Information on educational status was missing for three people. Neither BDI score ($F(3,112)=0.64$, N.S.) nor CQ total score ($F(3,112)=0.31$, N.S.) was related to educational status in the psychiatric sample.

Hypothesis A1: Depression and overall level of cognitive distortion

Depression level in the whole sample, as measured by the BDI, correlated positively with total score on the CQ ($r(241)=0.61$, $p<.001$). The first hypothesis, that overall degree of distortion would be positively related to depression, was therefore supported.

This was confirmed by a comparison of total CQ scores of the various diagnostic groups (Table 2.2). The depressed psychiatric group (Group A1 in Table 2.1) scored significantly higher than the non-depressed psychiatric group (Group A4) ($t(66)=4.96$, $p<.001$), who scored the same as the nondepressed community group (Group B3). Thus the cognitive style assessed by the CQ did not characterise all psychiatric patients regardless of diagnosis, but was specific to those with depressed mood. Comparing the psychiatric and community samples, there were no significant differences on the CQ between the two currently depressed groups, between the two past depressed groups, or between the two nondepressed groups. The two samples were therefore combined in the remaining analyses.

Hypothesis A2: Depression and type of event

The second prediction was that depression would be associated with high scores for each type of hypothetical event (negative, positive and neutral), and that the differences in scoring between

Table 2.2 CQ and BDI mean scores by diagnostic group

Diagnostic group	CQ score		BDI score		N
	mean	sd	mean	sd	
Depressed psychiatric	27.93	11.1	25.07	9.43	44
Other diagnosis depressed	24.61	9.6	20.28	7.76	36
Past depressed psychiatric	16.20	7.4	5.2	2.98	15
Non-depressed psychiatric	15.96	5.3	5.17	3.4	24
Depressed community	23.95	6.7	17.63	5.54	19
Past depressed community	18.26	5.6	6.42	3.32	19
Non depressed community	15.46	6.5	3.28	3.01	86

different levels of depression would be clearest in relation to negative situations. The sample was divided into four groups according to score on the BDI: nondepressed ($BDI \leq 10$); mildly depressed ($BDI 11-19$); moderately depressed ($BDI 20-25$); and severely depressed ($BDI \geq 26$). Table 2.3 shows the mean scores for each level of severity of depression in relation to each type of event.

A series of one-way analyses of variance showed the expected relationship between depression level and mean score for each type of event: negative events ($F(2,239)=52.68, p<.001$); positive events ($F(2,239)=19.07, p<.001$); neutral events ($F(2,239)=11.49, p<.001$). Post hoc Newman-Keuls tests confirmed that negative events discriminated consistently between different levels of severity of depression. For positive and neutral events, the comparisons between nondepressed and mildly depressed and between moderately and severely depressed groups failed to reach significance. The inability of neutral events to discriminate sensitively between different levels of depression reflects the restricted range of scores obtained in response to both events (on one, 76% of respondents scored 0).

Hypothesis A3: Depression and response dimensions

For this and subsequent analyses, the sample was divided into three groups: "current depressed" (everyone scoring 11 or more on the BDI); "never depressed" (everyone scoring 10 or less on the BDI and not known to have previously suffered any depressive episode); and "past depressed" (everyone currently scoring 10 or

Table 2.3 Mean score for each event type in relation to severity of depression

Event type	Non-depressed (n=144)	Mild (n=47)	Moderate (n=23)	Severe (n=29)
Negative				
Mean	10.92	13.81	17.52	22.10
S.D.	(4.45)	(5.32)	(3.76)	(5.41)
Positive				
Mean	2.94	4.04	5.65	6.31
S.D.	(2.28)	(2.64)	(2.90)	(3.30)
Neutral				
Mean	2.36	3.13	4.22	4.45
S.D.	(1.48)	(2.53)	(2.75)	(3.22)

———— Nonsignificant differences $p < .05$

- - - - Nonsignificant differences $p < .01$

less on the BDI following recovery from an episode of clinical depression).

Hypothesis A3 predicted that the depressed group would score more highly than the nondepressed on all five response dimensions. Mean scores are presented in Table 2.4. A series of one-way analyses of variance showed significant differences between the groups on all five response dimensions: emotional impact ($F(2,240)=4.15$, $p<.02$); attribution ($F(2,240)=21.34$, $p<.001$); future ($F(2,240)=31.94$, $p<.001$); generalisation ($F(2,240)=40.96$, $p<.001$); and control ($F(2,240)=6.69$, $p<.001$). Post hoc Newman-Keuls tests showed that the currently depressed group scored significantly higher than the never depressed group on each response dimension except emotional impact. From the F values, generalisation can be seen to be the most powerful discriminator between the groups. This was also the dimension that correlated most highly with the BDI ($r(241)=0.63$, $p<.001$). Taking each question separately, generalisation correlated more highly with the BDI than any other dimension in 7 out of 8 cases.

Hypothesis B1: Vulnerability and overall CQ score

This hypothesis predicted that past depressed individuals would on average have lower total scores than currently depressed individuals, but higher total scores than individuals who had never been depressed. Results are presented in Table 2.5. One-way analysis of variance revealed highly significant differences between the three groups ($F(2,240)=46.31$, $p<.001$). Post hoc

Table 2.4 Mean score for each response dimension in current, past and never depressed groups

Response dimension	Current depressed (n=100)	Past depressed (n=34)	Never depressed (n=109)
Emotional impact			
Mean	5.27	4.91	4.35
S.D.	(2.53)	(1.93)	(2.23)
Attribution			
Mean	6.50	4.91	4.38
S.D.	(2.52)	(2.25)	(2.28)
Future			
Mean	4.81	2.44	2.49
S.D.	(2.85)	(1.42)	(1.77)
Generalisation			
Mean	5.33	2.88	2.25
S.D.	(2.97)	(2.20)	(2.11)
Control			
Mean	3.55	2.29	2.48
S.D.	(2.67)	(2.14)	(2.13)

———— Nonsignificant differences $p < .05$

- - - - Nonsignificant differences $p < .01$

Table 2.5 Mean total CQ score and mean score for each event-type in relation to current, past and never depressed groups

	Currently depressed (n=100)	Past depressed (n=34)	Never depressed (n=109)
Total CQ Score			
Mean	25.94	17.35	15.57
S.D.	(9.90)	(6.46)	(6.25)
Negative events			
Mean	17.09	11.88	10.58
S.D.	(6.09)	(4.44)	(4.41)
Positive events			
Mean	5.07	3.09	2.88
S.D.	(3.04)	(2.39)	(2.26)
Neutral events			
Mean	3.37	2.29	2.37
S.D.	(2.82)	(1.43)	(1.50)

———— Nonsignificant differences $p < .05$

Newman-Keuls tests showed the differences to lie between the currently depressed and the other two groups ($p < .01$). There was no significant difference between past and never depressed.

Hypothesis B2: Vulnerability and event type

This hypothesis predicted that response to negative events would most sensitively reflect cognitive vulnerability. Results are presented in Table 2.5. Three one-way analyses of variance revealed highly significant differences between the three groups for each type of event: negative events ($F(2,240)=43.06, p < .001$); positive events ($F(2,240)=19.65, p < .001$); and neutral events ($F(2,240)=19.98, p < .001$). However, post hoc Newman-Keuls tests showed these differences to lie between the currently depressed and the other two groups. There were no significant differences between the past and the never depressed groups. The hypothesis is therefore not supported.

Other findings

In these areas no specific hypotheses had been generated as to direction of effects.

Vulnerability and response dimension The results of the post hoc comparison between the past and never depressed groups will be found in Table 2.4. As with situation-type, significant differences revealed by a one-way analysis of variance were accounted for by differences between the currently depressed group and the other two groups. There were no significant differences between past and never depressed groups on any dimension.

Depression, vulnerability and the interaction between event-type and response dimension To examine the possibility of a

relationship between event-type and response dimension, a series of one-way analyses of variance were carried out comparing currently depressed with past and never depressed groups. Each dimension was considered in relation to each event-type, i.e. emotional impact for negative, positive and neutral events, attribution for negative, positive and neutral events, and so on. Post hoc Newman-Keuls tests were used to examine the nature of differences between the groups revealed by the overall analysis.

The analyses demonstrated that for negative events, all dimensions except emotional impact discriminated well between the currently depressed and the other two groups. For positive and neutral events, only future and generalisation effectively distinguished between the currently depressed and the other two groups. Only one category of response discriminated between those who had previously been depressed and those who had not: generalisation from negative situations. On this dimension the past depressed, as predicted, had significantly higher mean scores than the never depressed group ($p < .05$). Thus people who had recovered from a previous episode of depression were more likely to see unpleasant events as typical of their lives than those who had never been depressed. Generalisation from negative events also correlated most highly with BDI scores ($r(241) = 0.62$, $p < .001$) and with total CQ score ($r(241) = 0.68$, $p < .001$).

The persistence of cognitive distortions after recovery

The analyses reported above have separately examined event types,

response dimensions, and the relationship between event-type and response dimension. Only one difference emerged between the past and the never depressed: generalisation from negative events. However, it may be that the past depressed group are characterised not by their responses to individual dimensions, events, or some combination of the two, but by a particular overall pattern of scores. In order to examine this possibility, a discriminant function analysis was carried out to see which items from the CQ best discriminated between the past depressed and the never depressed groups.

A function composed of nine items (including three from the question about the experience of depression itself) discriminated between the groups. Using these nine items, 32% of the past depressed group were found to have a significantly different pattern of response from the never depressed group ($X^2=17.83$, $p<.001$). This difference was partly accounted for by responses to the question about the experience of depression itself. Some past depressed individuals may have a very specific vulnerability to experiences which might be interpreted as the beginning of a new episode of depression, rather than some more general cognitive vulnerability. To examine this possibility, the question relating to the experience of depression was removed and the discriminant function analysis repeated. The past depressed group were not then significantly different from the never depressed group.

DISCUSSION

The major aim of the study was to devise a measure of cognitive style which could discriminate between different levels of severity of depression and identify specific residual errors in thinking after recovery from an episode of depression. The results may be summarised as follows: 1) a strong positive association was found between degree of depression and overall level of cognitive distortion; 2) negative events discriminated more sensitively between different levels of depression than positive or neutral events (this could be because there were 4 negative events and only 2 positive and 2 neutral events); 3) there were significant differences between currently depressed and never depressed groups on all response dimensions except emotional impact. Generalisation was most consistently sensitive to differences in depression level; 4) two possible markers emerged of residual cognitive vulnerability following an episode of depression: generalisation from negative events, and responses to the question describing the experience of depression itself. It is perhaps worth bearing in mind that these results are based on a predominantly female sample, and all the nondepressed group were women.

The observed association between depressed mood and overall cognitive distortion as measured by CQ total score is in accord with the findings of previous investigators who have used other measures (e.g. Wilkinson and Blackburn, 1981). However, the CQ

differs from other measures in that, as well as providing a total score, it assesses a range of specific dimensions of response relating to the consequences of events.

Two findings stood out from the examination of the response dimensions. First, score on emotional impact discriminated less sensitively between the currently depressed and the never depressed than any other dimension. Response on this dimension may reflect a primary affective response to events (c.f. Rachman, 1981; Zajonc, 1980), rather than being a by-product of cognitive distortion. The reported upset or pleasure was relatively constant in the sample, regardless of level of depression. Perhaps what distinguishes the depressed from the nondepressed is not how they immediately feel about what happens, but rather the interpretations they subsequently place upon events. Where these interpretations are distorted in a negative direction, clinical depression will result. This finding is congruent with Teasdale's (1983b) suggestion that dysphoria is a normal consequence of serious loss events, and that what determines whether or not clinical depression will develop is the type of cognitions that become available once such dysphoria is present.

Secondly, in contrast to the relatively poor discriminatory power of emotional impact, there was a strong and consistent association between depression and generalisation across situations. In addition, generalisation from negative events was the only response which distinguished those who had recovered from an episode of depression from those who had never been depressed.

This finding should however be treated with caution. It may genuinely reflect a highly specific error in thinking which characterises people who have previously suffered an episode of depression. On the other hand, given the number of analyses performed on the data, it is possible that it is simply a chance finding.

The results from the discriminant function analyses suggest that a subgroup within the past depressed group have a pattern of scores on the CQ significantly different both from the rest of the past depressed and from the never depressed. The question contributing the greatest number of items to the significant discriminant function was that relating to the experience of depression itself. Given that this pattern of scores appears in only a minority of the past depressed, this finding cannot be attributed simply to prior experience of depression per se. Rather it would appear that some individuals who have previously been clinically depressed may retain a specific vulnerability in the shape of a tendency to interpret normal dysphoria as the onset of a new episode. While it is unlikely that this vulnerability would be useful in predicting initial onset, it could have considerable therapeutic implications for the prevention of relapse. As well as teaching patients how to manage the symptoms of depression, it may be important to help them to respond nondepressively to "normal" low mood or other possible first signs of depression. Patients should be encouraged to recognise that these do not necessarily signal the onset of a full-blown depression, and that

to react as if they did may increase the probability that such an episode will indeed develop.

There is, however, a difficulty in interpreting this finding, that is, the observation that the past depressed tended to be more depressed (mean BDI score = 5.9) than the never depressed (mean BDI score = 3.5). While no-one in either group met diagnostic or severity criteria for clinical depression, it is possible that this difference in BDI score (indicating a low level of residual symptomatology in some of the past depressed) could in itself affect scoring on the CQ, in particular on Item H which reflects response to current depression. Indeed, examination of responses to Item H showed that past depressed individuals who scored ≥ 5 on the BDI tended to score higher on this item (mean score = 2.43) than those who scored < 5 on the BDI (mean score = 1.46). This difference was not significant ($t(32)=1.49, p>.1$). However, we should not ignore the possibility that the differences identified by the discriminant function analysis, rather than indicating continued cognitive vulnerability to depression, might predominantly reflect incomplete recovery from an episode. Simons, Murphy, Levine and Wetzel (1984), in a one-year follow-up of patients receiving CBT and/or pharmacotherapy, concluded on the basis of their findings that "sustained improvement appears most likely in patients who have become virtually symptom free [BDI scores 0-3] as compared to patients whose termination BDI scores reflect residual symptoms at the end of treatment [BDI scores 7-9]". Thus residual symptomatology might in itself predict relapse, without the need to postulate any mediating cognitive mechanism.

It remains to be determined whether, in a larger sample of past depressed individuals, distorted, depressive patterns of thinking of the kind identified here predict future depression independent of score on the BDI. A minimum interval between recovery and administration of the questionnaire should be specified. In addition, information about variables such as number of previous episodes of depression, duration of time depressed and contextual factors such as precipitating and maintaining negative life events would be valuable in that they might permit more sensitive discrimination between those who will remain vulnerable to future depressions and those who will never experience another episode.

Given the difficulty of obtaining consistent evidence of an enduring depressive cognitive style, it seems more than likely that the factors involved in cognitive vulnerability to depression (assuming that it indeed exists) are relatively inaccessible in the nondepressed state. Beck, as described in Chapter 1, suggests that they consist of latent organising structures, activated by specific events relevant to the individual. A questionnaire measure like the CQ assumes that the presentation of potential activating stimuli (hypothetical events) will be adequate to arouse the cognitive distortions characteristic of depression, even where the individual is not currently depressed. This assumption may be incorrect. Some existing evidence suggests that responses to different stimuli will vary even in currently depressed individuals (e.g. Cutrona, 1983; Miller, Klee and Norman, 1982). Such variation may be even greater in people who

have been, but are no longer, depressed. In contrast to questionnaire measures, direct experience might be used to assess vulnerability to depression. For example, the presentation of mildly depressing "real life" stimuli (such as failure on an experimental task presented as reflecting overall ability, apparent social rejection, or a mood induction procedure) might more accurately assess how the individual would respond to the type of events that would be likely to precipitate clinical depression. One would hypothesise that people who had previously experienced clinical depression would show more intense depressed mood and more distorted depressive thinking in response to such stimuli than people who had not. Such differences would not necessarily demonstrate the existence of rules or assumptions of the kind postulated by Beck. They might simply reflect differences in the kind of cognitions - for example, self-evaluations, or memories of personal experiences (including previous depression) - that become available once the person experiences depressed mood (Bower, 1981; Teasdale, 1983b and c).

Additionally, we should not perhaps assume that vulnerability to depression, or the pattern of thinking present when actually depressed, are necessarily identical in every case. Some people may indeed become sensitized by early experience to subsequent loss events, as hypothesised by Beck (1967). Others may be vulnerable to depression for primarily biological reasons. A further group may first become depressed in the context of severe negative life events or of a chronically stressful environment

(Brown and Harris, 1978), rather than primarily because of some internal predisposition. A paper by Hammen (1978), examining life stress, distorted thinking and depression in student subjects, supports this possibility. She found that "among the depressed, those who were depressed with low life stress distorted more than those who were depressed with high life stress". The two groups did not differ in level of depression as measured by the BDI. Hammen suggested two possible explanations for this finding. Firstly, the sample might have comprised two separate groups, the one experiencing depression in the context of high life stress, the other depressed in response to their own habitual cognitive style, relatively independently of life stress. Alternatively, students who had recently experienced high life stress might not as yet have developed measurable patterns of cognitive distortion (c.f. Davis, 1979). A further alternative is that the BDI failed to distinguish between acute situational depressed mood, directly related to circumstances, and depression as a more comprehensive syndrome. Feather and Barber (1983), in a study of depression and unemployment, found quite different patterns of attribution associated with depressed mood directly related to unemployment as measured by a Visual Analogue Scale, and more global depression as measured by the BDI. Whereas the former was associated with the perceived importance of having a job and with external attributions for unemployment, the latter was associated with patterns of attribution more traditionally seen as characteristic of depression, that is, internal attributions for unemployment, perceived helplessness to improve the situation, and low self-esteem.

It is possible that people who originally become depressed in the context of severe life stress will, in some cases, subsequently develop lasting pessimistic, self-derogatory and helpless patterns of thinking which will render them vulnerable to future episodes, even after the precipitating stressor has long since disappeared. This might be particularly likely where life stresses were chronic or repetitive, and where depression persisted over time or recurred repeatedly, that is, where the individual has accumulated real life experiences consistent with a depressive perspective ("Things will never go right", "My life is a total mess", "I'll never get back to normal"). Such individual differences in the relative importance of cognitive and environmental factors might account, for instance, for the curious findings of Hamilton and Abramson (1983) that only 30% (n=6) of their acutely depressed patients showed self-derogatory attributions, that only 50% (n=10) had "deviant" scores on the DAS (i.e. scores higher than those attained by any nondepressed subject), and that of the 10 DAS "deviants" 7 returned to normal scoring levels following recovery, but 3 did not. Since no detailed information on the history or context of the current depression is given in the paper, it is impossible to identify factors associated with an absence of abnormal scores on the ASQ, with abnormally high scores on the DAS or with a failure to return to normal on this measure as depression abated. It seems clear, however, that if our understanding of vulnerability to depression is to be increased, we should consider not only the intrapsychic factors usually taken

into account (for example, in the present study), but also the influence of environmental events and of previous experience of depression.

Leaving aside the issue of cognitive vulnerability, results on the CQ confirm and extend previous work demonstrating the association between negative thinking and depression. Unfortunately, however, these data (while in general highly consistent) provide only correlational evidence of the link between thinking and mood. Given the demonstrated effect of depression on thinking (e.g. Bower, 1981; Clark and Teasdale, 1982), the existence of such a correlation might equally well indicate that thinking maintains depression, that depression maintains thinking, or that a reciprocal relationship exists between the two (c.f. Teasdale, 1983b,c). That is, the work cited may do little more than demonstrate, with varying degrees of sophistication, the existence of negative distorted cognitions as one aspect of the constellation of symptoms customarily labelled depression, no different in function or role from motivational, behavioural, affective or somatic aspects of the disorder. Such purely correlational evidence cannot unequivocally support or refute Beck's contention that depressive thinking can have an important role to play in the development and maintenance of clinical depression. In order to assess this hypothesis, it is necessary to manipulate depressive thinking and to examine resultant changes in depression. This cognitive-behavioural therapy (CBT) for depression is designed to do. Evidence currently available from outcome trials of CBT and of other psychological treatment for

depression will be discussed in Chapter 3.

CHAPTER 3

ASSESSING THE COGNITIVE MODEL OF DEPRESSION:

OUTCOME TRIALS OF COGNITIVE THERAPY

Besides primarily correlational data demonstrating the existence of negative, distorted thinking in depression, another potential source of support for Beck's cognitive model of the disorder is evidence relating to the therapeutic efficacy of the cognitive-behavioural treatment package (CBT) (Beck et al., 1979). This is based on the central hypothesis that reducing the potency of depressive thinking and modifying the fundamental dysfunctional assumptions on which it is based will, in the short-term, lead to an alleviation of depression and, in the longer term, reduce the probability of its recurrence.

Over recent years, early studies with subclinical populations (e.g. Taylor and Marshall, 1977; Shaw, 1977) and single case series (e.g. Rush, Khatami and Beck, 1975) have been followed by a growing body of full-scale comparative outcome trials evaluating the immediate and long-term effects of CBT. These have consistently shown CBT to produce significant reductions in depression, and to be at least as effective in overcoming a presenting episode as tricyclic antidepressant medication. In

addition, they provide some encouraging evidence that CBT may be more effective than medication at preventing relapse. It is not my intention to provide a fully comprehensive review of all relevant studies and issues, since this has been ably and extensively done elsewhere (e.g. Blaney, 1977; Kovacs, 1980; Latimer and Sweet, 1984; Miller and Berman, 1983; Teasdale, 1985; Vallis, 1984; Weissman, 1979; Williams, 1984). The main findings will, however, be summarised below.

IMMEDIATE EFFECTS OF CBT

Evidence for the immediate (post-treatment) effectiveness of CBT for depression now seems increasingly solid. Six major clinical trials have been carried out, using carefully selected, diagnostically homogeneous patient samples. The subjects of the studies reported below were moderately-to-severely depressed ambulatory patients (usually scoring ≥ 20 on the Beck Depression Inventory (BDI) (Beck et al., 1961), and ≥ 14 on the Hamilton Rating Scale for Depression (HRS)(Hamilton, 1960)) with definite, nonpsychotic, nonbipolar major depressive disorder defined according to the criteria of Feighner, Robins, Guze, Woodruff, Winokur and Muñoz (1972), or according to the Research Diagnostic Criteria (RDC) of Spitzer, Endicott and Robins (1978).

Rush, Beck, Kovacs and Hollon (1977) randomly allocated 41 depressed patients to receive either CBT or antidepressant medication (imipramine hydrochloride). Thirty-two patients

completed treatment. At post-treatment, both groups showed significant improvements in depression. CBT, however, was significantly superior to drug treatment, both in terms of attrition rate (28% of pharmacotherapy patients and only 5% of CBT patients dropped out of treatment), and on post-treatment level of depression, particularly as measured by the BDI. This study has been faulted on a number of grounds. For example: 1) the effects of pharmacotherapy may have been underestimated, since patients were withdrawn from drug treatment before the post-treatment assessment; 2) plasma levels of the drug were not assessed, and its poorer performance may thus have been due to poor compliance; 3) the main effects were strongest on self-reported depression (the BDI), and observer-ratings of depression (for example, the HRS) were not carried out by blind assessors; 4) patients included were on the whole self-referred, well-educated and fee-paying, and thus may not have been representative of people typically seen in general clinical practice; and, 5) factors other than the specific effects of modifying cognitions may have accounted for the success of CBT, in particular the enthusiasm of therapists working at the Centre where the therapy had originated and was currently under development. Nonetheless, this study was the first to demonstrate the effectiveness of CBT in a sizeable clinical sample, and its importance should not be underestimated. In addition, many of these criticisms have been met in subsequent trials.

Blackburn, Bishop, Glen, Whalley and Christie (1981) compared CBT, antidepressant medication (drug of choice), and a combination of both in two patient samples: hospital outpatients, and general

practice patients from a predominantly working-class area of Edinburgh. In hospital patients, the combination treatment produced a higher percentage change in depression (as measured by the BDI and the HRS) than either CBT or pharmacotherapy, these on average being about equally effective. In the general practice groups, however, CBT was clearly superior to pharmacotherapy (both in post-treatment outcome and in drop-out rate), and no advantage was gained by combining the two. Again, this study is open to certain criticisms. In particular, the extraordinarily poor performance of the drug group in general practice has been noted (Goldberg, 1982). As blood plasma drug levels were not assessed, it is impossible to say how far this reflects inadequate prescribing, or how far it was due to adequate prescribing but inadequate compliance. Blackburn et al. suggest that drug therapy may have appeared singularly inappropriate to the patients who took part in the study, whose level of adverse life circumstances was high. Additional points are that observer ratings of depression were not carried out by assessors blind to treatment allocation, and that interpretation of the results is confounded by a possible therapist effect, since patients were not randomly allocated to the two cognitive therapists. One saw most of the hospital outpatients, and the other saw most of the patients in general practice. Finally, initial differences in severity of depression between different treatment groups necessitated a highly complex method of analysis. Nonetheless, the extension of research to a British NHS patient population was a valuable advance.

Teasdale, Fennell, Hibbert and Amies (1984) compared CBT in addition to whatever treatment would usually be received with treatment-as-usual (TAU) alone. Thirty-four patients, referred by their general practitioners, were randomly allocated to the two treatment groups and to one of two therapists in the CBT group. At post-treatment, CBT patients were significantly less depressed than TAU patients on the BDI and on two observer-ratings of depression, the HRS and the Montgomery and Åsberg Depression Scale (MADS)(Åsberg and Montgomery, 1979). These were administered by an independent psychiatrist blind to treatment allocation. By three-month follow-up there were no significant differences between the two patient groups on any measure of depression, mainly because of continued improvement in the TAU group. Thus it appeared that CBT accelerated recovery from an episode of major depression. It is not possible to determine whether this was a product of specific thought-change procedures, or whether it was simply a result of the considerably greater therapist attention received by patients allocated to CBT.

Hollon, Evans and DeRubeis (1983) compared CBT, pharmacotherapy (including weekly supportive contact), and a combination of the two in a sample of depressed patients attending a community mental health centre in a predominantly working class area of Minneapolis. Blood plasma levels of imipramine hydrochloride were monitored to ensure drug compliance. In 64 patients who completed 12 weeks of treatment, all three treatment conditions produced significant reductions in depression. There were no significant

differences between treatments either on the the BDI or on the HRS, though combined treatment tended to do better than either treatment alone on both measures.

Murphy, Simons, Wetzel and Lustman (1984) carried out a somewhat similar comparison. Seventy depressed patients from a blue-collar area of St Louis were randomly allocated to 12 weeks of CBT alone, pharmacotherapy alone (nortriptyline hydrochloride), CBT plus an active placebo, or CBT plus nortriptyline. Medication was not tapered off until after post-treatment assessment, and blood plasma drug levels were monitored during the trial. Post-treatment results showed significant improvement in all treatment groups, both on the BDI and on the HRS. There were no significant differences between the different treatments, though a somewhat higher proportion of patients were well ($BDI < 10$) in the combination group (78%) than in any of the other treatment groups (CBT 53%; pharmacotherapy 56%; CBT + placebo, 65%). Improvement was broadly maintained in all groups at one month follow-up, by which time medication had been tapered off.

Finally, Beck, Hollon, Young, Bedrosian and Budenz (1985) have recently reported results from a study comparing CBT alone and CBT plus tricyclic antidepressant medication (amitriptyline hydrochloride). This was carried out at the Centre for Cognitive Therapy in Philadelphia with a patient sample very similar demographically to those treated by Rush et al. (1977). Allocation to treatment group was random. Blood plasma drug

levels were not monitored, though the fact that 7 out of 11 patients allocated to the combination treatment were on less than maximum doses of amitriptyline because of "strong nuisance side effects" suggests compliance. No drug only treatment group was included. At post-treatment, both groups showed significant improvements in depression on the BDI and on the HRS. There were no significant differences between them on either measure.

Taken together, these studies, despite their individual weaknesses, support the clinical usefulness of CBT as an effective psychological treatment for depression. It would appear that CBT reliably reduced depressive symptomatology to a level comparable to tricyclic antidepressant medication, and that little was gained by administering the two treatments in tandem. Given the complexity of CBT, however, its high consumption of therapist time both in training and in treatment, and hence its expensiveness, we may be entitled to question whether its widespread use in general clinical practice is justifiable. In this context, evidence of its ability to prevent further episodes of depression is of crucial importance.

LONG-TERM EFFECTS OF CBT

Four reports have been published concerning the power of CBT to prevent relapse in depressed patients, compared to drug treatment, and to date the evidence is encouraging.

Kovacs, Rush, Beck and Hollon (1981) reported follow-up of

patients who completed treatment with CBT or with pharmacotherapy in the study carried out by Rush et al. (1977). On average, treatment gains were maintained by both patient groups over a one-year follow-up period. On the BDI, CBT patients were still significantly less depressed one year after termination of treatment than patients who had received antidepressant medication. A nonsignificant trend in the same direction was evident on the HRS. Pharmacotherapy patients were about twice as likely as CBT patients to relapse during the year (i.e. to revert to a significant level of depressive symptomatology or to require further psychiatric or psychological treatment), but this difference was not significant. In all, 35% of pharmacotherapy patients and 17% of CBT patients remained chronically depressed through the follow-up year, and 76% of pharmacotherapy patients and 50% of CBT patients re-entered treatment (though apparently not necessarily overtly for help with depression). These high rates of continued symptomatology led Kovacs et al. to conclude that: "for a distinct portion of patients, cognitive therapy or pharmacotherapy on a short-term basis may offer temporary symptomatic relief but not prevent relapse or recurrence". Fortunately, subsequent studies have proved less pessimistic.

Hollon et al. (1983) reported rates of relapse over a 6 month follow-up period in patients who initially responded to treatment in their comparison of CBT, pharmacotherapy and a combination of the two. Relapse was defined as a score of 16 or more on the BDI for 2 consecutive weeks, or as re-entry to treatment for

depression. Hollon and his colleagues found that a significantly higher proportion of patients relapsed following pharmacotherapy alone (67%), than following CBT alone (25%), or following the combination treatment (18%).

Evidence of a significant prophylactic effect of CBT was also found by Simons, Murphy, Levine and Wetzel (1984), who reported rates of relapse over a one year follow-up period in patients who had recovered in the comparison between CBT, pharmacotherapy, CBT + placebo, and CBT + drug carried out by Murphy et al. (1984). Twenty-eight out of 44 responders remained well during the follow-up year, and 16 relapsed, i.e. they scored ≥ 16 on the BDI at one of 3 follow-up assessments ($n=5$), or they re-entered treatment for depression ($n=11$). As Simons and her colleagues point out, differences between treatments in the latter group may reflect differences in help-seeking behaviour, rather than differences in rate of recurrence of depression. When the 4 treatment groups were collapsed according to whether they had received medication or not, those who had received medication were significantly more likely to relapse than those who had not (52% as opposed to 19%). Conversely, patients who had received CBT were significantly less likely to relapse than those who had not (28% as opposed to 66%).

Finally, Beck et al. (1985) reported no significant differences at 6 or 12 month follow-up assessments between patients who initially received CBT alone and those who received it in combination with pharmacotherapy. Both groups maintained original improvements on the BDI and on the HRS. The proportion of patients in complete

remission (BDI<10) favoured CBT alone at 6 months follow-up (62% as opposed to 40% of combination patients), and favoured the combination group at 12 months follow-up (82% as opposed to 58% of CBT patients). On the other hand, a higher proportion of combination patients (91%) than CBT patients (71%) returned to cognitive therapy during the follow-up year, and CBT patients on average received significantly fewer extra therapy sessions than combination patients. This suggests somewhat better outcome for patients who did not receive drugs, since they maintained a level of depression comparable to those who did, while requiring less additional therapy input. It is unfortunate that no drugs only group was included.

In conclusion, while CBT does not by any means entirely prevent relapse, the overall picture of its efficacy in comparison to drug treatment is a hopeful one, in particular when the results of research carried out independent of its source (the Centre for Cognitive Therapy in Philadelphia) are taken into account. How it compares in the longer term with other structured psychological treatments, for example, the Interpersonal Psychotherapy currently under assessment in a multicentre comparative outcome trial funded by the American NIMH (Elkin, Parloff, Hadley and Autry, 1985) remains to be seen.

SHORTCOMINGS OF THE TRADITIONAL OUTCOME TRIAL

Despite this promising evidence of immediate and long-term success

with clinically depressed patients, the major question of how CBT achieves its effects remains as yet unanswered. A significant problem in this regard is the complexity of the therapy package. As will be clear from Chapter 1, cognitive therapy contains not only procedures specifically designed to modify the frequency or intensity of depressing thoughts and beliefs, but also a powerful behavioural component. This includes not only symptom-relief techniques such as activity-scheduling and graded task assignment, but also the regular setting up of behavioural experiments, for example as homework assignments, and the freedom to work on establishing and rehearsing new behaviours (such as study skills or social skills), provided that this is done within the framework of the cognitive model. In addition, the therapy is endowed with strong structural and interpersonal elements (not least, the emphasis on forming a warm, collaborative therapeutic relationship) which are by no means specific to it. Given this complexity, we cannot be sure whether the success of CBT derives from the active modification of depressive cognitions, from other specific treatment components, from general therapy characteristics, or indeed from the very fact that its range allows a multifaceted attack on a variety of different aspects of depression (Blaney, 1979). The picture is further complicated by the possible influence over 2 to 3 months of treatment of "noise" factors such as spontaneous remission or the impact of positive and negative life events. Thus existing treatment outcome trials can tell us that CBT works, but not how it works. Equally, evidence of its clinical effectiveness provides only limited support for the cognitive model of depression.

The difficulty of identifying procedures within CBT responsible for change, and problems in testing related hypotheses about the influence of thinking on affect, have been highlighted by recent research developments.

1. Specific effects of CBT on depressive cognitions

Evidence for any specific effect of CBT on depressive cognitions is at best inconsistent. Rush, Kovacs, Beck, Weissenburger and Hollon (1981) analysed patterns of change in depressive symptomatology in patients who took part in the study reported by Rush et al. (1977). They found that in CBT patients, changes in hopelessness, view of the self and mood preceded changes in motivational and vegetative symptoms. No consistent pattern of change was evident in patients who received pharmacotherapy. Rush, Beck, Kovacs, Weissenburger and Hollon (1982), using data from the same study, showed greater reductions in hopelessness and more generalised improvements in self-concept to occur with CBT than with pharmacotherapy. CBT and pharmacotherapy patients were equally depressed on the BDI and the HRS at the time in therapy when greatest reductions in hopelessness occurred in the CBT group, so differences cannot be attributed to different rates of recovery. Rush et al. suggest that the significant improvements in negative view of the self and the future in pharmacotherapy patients may have been "secondary consequences of a restored biochemical equilibrium within the central nervous system". This point touches on a central difficulty in assessing the specific

impact of CBT on thinking, i.e. the known reciprocal relationship between cognition and mood. This means that reductions in depression, whether brought about by psychological or pharmacological means, will almost certainly produce corresponding reductions in the level of depressive thinking, even where this was not the main target of treatment. For this reason, the failure of other investigators to demonstrate cognitive changes specific to CBT is not surprising.

Blackburn and Bishop (1983), for example, found that in all treatment groups included in their comparative trial (Blackburn et al., 1981), changes in cognition mirrored changes in mood and in severity of depression. They suggest that: "one must assume a feedback between cognition and mood in a two-way process. It appears that in a circular system involving mood, cognitions and biochemical changes, at whatever point one enters the system, that is whatever the medium of intervention is, all these functions will change to the same degree depending on the efficacy of the intervention". Consistent with this, Simons, Garfield and Murphy (1984) found cognitive change to be as great in patients improving with antidepressant medication as in patients improving with CBT. They conclude that their findings suggest "that cognitive change is part of clinical improvement. They appear, however, to refute the assumption that cognitive therapy has unique power to effect these cognitive changes". Finally, Rabin, Kaslow and Rehm (1984) examined data arising from a large-scale comparison of cognitive and behavioural self-control treatments for depression. Patterns of change in depressive symptomatology (including cognitive

symptoms) were assessed using the short form of the BDI. There were no differences between cognitive and behavioural treatments on this measure, either during or after treatment.

2. Effectiveness of other psychological treatments of depression

An increasing body of work now demonstrates (with greater or lesser sophistication and control) the therapeutic impact on clinical depression of a variety of psychological treatments, based on alternative theoretical rationales and targetting different aspects of the state of depression. Examples include interpersonal psychotherapy (Weissman, Prusoff, Dimascio, Neu, Goklaney and Klerman, 1979; Weissman, Klerman, Prusoff, Sholomskas and Padian, 1981), marital therapy (Friedman, 1975; McLean, Ogston and Grauer, 1973), social skills training (Bellack, Hersen and Himmelhoch, 1983; Hersen, Bellack, Himmelhoch and Thase, 1984; Sanchez, Lewinsohn and Larson, 1980; Wells, Hersen, Bellack and Himmelhoch, 1979), and self-control treatment for depression (Rehm, 1977; Fuchs and Rehm, 1977; Kornblith, Rehm, O'Hara and Lamparski, 1983; Rehm, Fuchs, Roth, Kornblith and Romano, 1979; Rehm, Kornblith, O'Hara, Lamparski, Romano and Volkin, 1981).

Outcome trials where cognitive treatments have been compared with structured, goal-oriented therapies of this kind, rather than with drugs or with traditional insight-oriented psychotherapy, are as yet relatively few and far between. Those which have been carried out, however, have failed to demonstrate unequivocal superiority for purely cognitive interventions (c.f. Rabin et al.(1984),

referred to above). A study carried out by Zeiss, Lewinsohn and Muñoz (1979), for example, compared three treatment packages, each delivered in a group therapy format. These were designed respectively to increase frequency of engagement in mood-related pleasant activities, to build assertiveness, positive social impact and social interaction, and to modify depressive cognitions. Impact on depression (as measured by the Minnesota Multiphasic Personality Inventory Depression Scale - the MMPI-D) and on a variety of written and observational measures of target behaviours was assessed. Results indicated that all three treatments produced statistically significant improvements in depression, compared to a delayed treatment control condition (though the authors noted that, on average, patients did not score in the normal range on the MMPI-D at the end of treatment). There were no differences between the three treatments in the extent to which they alleviated depression, nor in the extent to which they produced change in specific target behaviours. None produced changes in these variables greater than those found in the delayed treatment control group. Zeiss et al. conclude that all of the treatments had nonspecific effects, that improvements in mood could not be attributed to any specific change in target behaviours, and that patients did not improve differentially according to the type of treatment they received.

Findings such as these have led some workers to suggest that "the specific content of the skill training offered to depressed clients may be less important than has been previously assumed" (Zeiss et al., 1979, p.437), and to seek other aspects of

psychological treatments which might account for their therapeutic effectiveness. Zeiss et al., for example, suggest the following as necessary core components for any successful psychological treatment of depression: 1) an elaborate, well-planned rationale encouraging the belief that the patient can control his or her own depression; 2) training in skills of significance to the patient and congruent with the rationale, which can be used effectively in daily life; 3) emphasis on the independent use of these skills by the patient, and enough structure to facilitate such use; and 4) encouragement to the patient to attribute improvements in mood to his or her own efforts, rather than to the therapist's skill. Rehm (1982) and Kornblith, Rehm, O'Hara and Lamparski (1983) have identified similar features common to successful treatment programmes for depression, and have in addition picked out common procedural elements such as self-monitoring records, activity-scheduling, problem-solving techniques and self-reinforcement procedures.

3. The search for patient and treatment variables relating to successful outcome in CBT

There is a marked lack of consistent evidence relating to general variables such as history of depression, previous treatment experience, duration of current episode, personality dimensions and the like as factors predicting success or failure with CBT (Steinmetz, Lewinsohn and Antonuccio, 1983). Recent work has attempted to examine more specific patient and treatment variables which might facilitate or impede response to CBT, and to identify

more precisely the nature of change occurring in patients who receive it.

MacKnight, Nelson, Hayes and Jarrett (1984) assessed the effectiveness of combined social skills training and cognitive therapy in a small number of depressed women meeting Research Diagnostic Criteria for Major or Minor Depressive Disorder and scoring ≥ 70 on the MMPI-D and ≥ 18 on the Lubin Depression Adjective Checklist. Three subjects were assessed to have only social skills deficits, three to have only problems with irrational cognitions, and three to have a combination of both. Assessment was made using a mixture of questionnaire and observational measures of target behaviours. Each subject received four sessions of social skills training, and four sessions of cognitive therapy, randomly ordered. Measures of depression, social skills and irrational cognitions were administered before each treatment session, with the intention of assessing the effects of the previous session. Differential treatment effectiveness was assessed on the basis of the frequency with which each treatment demonstrated superiority at individual assessment points, combining frequencies for the three subjects in each target group. In addition, pre-to-post treatment differences were assessed using analysis of variance, though the authors acknowledge the difficulties of employing such analysis with a very small number of subjects who had not been randomly assigned to target groups. Results were summarised as follows: "For subjects having difficulties in social skills, social skills training produced better results for both depression and social

skills deficits, but not for irrational cognitions. For subjects with irrational cognitions, the cognitive treatment produced better results for both depression and irrational cognitions but not for social skills deficits. For subjects who were experiencing difficulties in both areas, there were no significant differential treatment effects with regards to the subjects' depression. On cognitive measures, however, the cognitive treatment was more effective than social skills training. On the social skills measures, social skills training was more effective than the cognitive treatment". At post-treatment, only one subject was diagnosed as still meeting RDC for Major Depressive Disorder, and no subject scored in the depressed range on the MMPI-D. At one year follow-up, one subject in the group with irrational cognitions could not be located. Seven out of the remaining 8 subjects were nondepressed, and none showed irrational cognitions or social skills deficits. This study very promisingly indicates the variations in thinking and in behaviour that may lurk beneath the apparent homogeneity of a traditional medical diagnosis, and provides preliminary evidence to support the often-repeated contention that treatment effectiveness could be markedly improved by careful consideration of the exact nature of presenting problems. The results should be treated with some caution, however, given the very small number of subjects, the rather complicated analysis, and the lack of any no treatment or attention control group. In addition, the fact that these 9 subjects were drawn from an initial pool of no less than 45 women who met the study's criteria for diagnosis and severity of

depression, must call into question the ease with which such clearly defined and mutually exclusive categories of target behaviour are to be found in clinical practice.

A second study (Simons, Lustman, Wetzel and Murphy, 1985) examined a number of variables that might predict response to treatment in the patients who took part in the trial of CBT and tricyclic antidepressant medication carried out by Murphy et al.(1984). Because of missing data in combined treatment groups, only patients who received CBT alone or pharmacotherapy alone were investigated. Variables assessed included history of depression, previous treatment experience, initial severity of depression on the BDI, initial levels of negative automatic thoughts and dysfunctional assumptions, and score on Rosenbaum's (1980a) Self-Control Schedule, a measure of "learned resourcefulness" which assesses a person's repertoire of cognitive strategies, problem-solving capacities, ability to delay gratification and expectations of self-efficacy. Score on the scale has been shown to predict, for example, ability to cope with seasickness (Rosenbaum and Rolnick, 1983), to succeed on a weight-reduction programme (Smith, 1979), and to tolerate pain (Rosenbaum, 1980b). Simons et al. used regression analysis to show that, in each treatment group, score on the SCS accounted for more variance in post-treatment outcome than any other variable, with the exception of pre-treatment BDI score. On this measure of depression, relatively high pre-treatment scores predicted similarly high scores post-treatment. Score on the SCS predicted outcome significantly for CBT patients (a high score being related to

successful outcome in this group), but not for pharmacotherapy patients (in whom low scores tended to predict successful outcome). Both treatment groups were then split at their combined median score on the SCS, and a 2 x 2 (treatment x SCS score) analysis of variance carried out on post-treatment BDI scores, taking initial differences in severity into account. The analysis showed a significant interaction between treatment and score on the SCS. Post hoc analysis demonstrated that, with CBT, high scorers did significantly better than low scorers. In contrast, with pharmacotherapy, low scorers did significantly better than high scorers. There were no significant differences between high scorers receiving CBT and low scorers receiving pharmacotherapy, nor between low scorers receiving CBT and high scorers receiving pharmacotherapy.

Simons and her colleagues suggest two possible explanations for these findings: 1) that in patients high in learned resourcefulness, CBT can capitalise on an existing repertoire of cognitive and behavioural self-control skills, whereas in low resourcefulness patients it must provide basic training in such skills; and 2) that the SCS measures, at least in part, the extent to which a person already endorses a cognitive explanatory framework for emotional distress, and actually uses rational responding as a means of coping with unpleasant or unhelpful feelings. Thus patients high in learned resourcefulness will ab initio be working in congruence with the model presented by the therapist, whereas patients low in learned resourcefulness may

have some difficulty accepting an active self-help rationale based on the idea that feelings and behaviour are mediated by thoughts, interpretations and underlying belief systems. By the same token, low learned resourcefulness patients scores on the SCS may reflect a view that feelings and behaviour are externally determined and essentially beyond one's control, which would be more readily congruent with a medical model of depression and with pharmacological treatment. This work clearly needs replication, as the authors acknowledge, but in the meantime provides valuable preliminary data on the type of patient variables which might be expected to facilitate response to CBT for depression.

A third study, examining the nature of change in treatment, and patient characteristics related to rapidity of response to CBT, has also put forward the suggestion that a match between patients' conceptualisation of depression and the model proposed by treatment may be an important factor in determining both short- and long-term responses to therapy.

Fennell and Teasdale (1985) conducted a detailed examination of individual differences in response to treatment of patients who took part in the outcome trial of CBT in general practice carried by Teasdale et al. (1984). Since this has not been published elsewhere, results will be presented in some detail. Fennell and Teasdale noted first that, within two weeks of initiating treatment, marked differences emerged between CBT and control patients, CBT leading to a comparatively rapid decrease in depression as measured by the BDI. This difference was

maintained, and indeed increased, throughout the active treatment phase. Secondly, within the CBT group, there were considerable individual differences in the rapidity with which patients responded to treatment. By session 4, 8 CBT patients showed a fall in BDI score of 50% or more from pre-treatment levels. Furthermore, change in depression by this point predicted post-treatment scores on the BDI, the HRS and the MADS. On the BDI, all 8 rapid responders to CBT were well at post-treatment (score < 10). In contrast, only one slow responder was well at this point, 5 were still mildly depressed (BDI score 10-14), and three remained severely depressed (BDI score > 30) despite extensive therapy input. A significant difference between rapid and slow responders persisted on the BDI and on the HRS up to 12 months follow-up.

In the interests of identifying predictive markers that might distinguish between rapid and slow responders, and of elucidating possible mechanisms of change operating within CBT, Fennell and Teasdale then investigated in some detail the relationship between changes in self-reported depression occurring over the first two weeks of therapy (during which treatment sessions were held twice-weekly), and the content of treatment sessions and homework assignments over this period. Examination of standardised written records employed during the trial to summarise the content of sessions and of between-session assignments showed that, in rapid responders, maximum reductions in BDI score occurred between sessions 2 and 4. This was a point in therapy at which patients

had been provided with a) a conceptual framework (the cognitive model) within which to understand their experience of depression, and b) the opportunity to test out the model empirically by means of independent homework assignments, for example, use of distraction, activity-scheduling, and monitoring and challenging negative automatic thoughts. Both of these components (the model, and an opportunity to test it in action) were necessary for marked change to occur. In addition, there was a direct relationship between the extent to which CBT patients were assessed by independent raters to have endorsed the cognitive model of depression, the degree to which they were judged to have responded positively to homework assignments between sessions 2 and 3, and the decrease in BDI score which occurred between pre-treatment assessment and before session 4.

The introduction of the cognitive model and its validation in practice could be taken to convey the following messages: 1) depression may be understood in terms of negative thinking, this being demonstrable through self-observation; 2) it is a normal and commonly occurring state, and not a sign of personal inadequacy; and 3) as empirically demonstrated, it can be controlled by the use of logical and clearly specified therapy strategies. Fennell and Teasdale hypothesised that the patients on whom these messages would have a particular impact would be those for whom they were particularly relevant, that is, those patients who before therapy could see no readily understandable explanation for their depression, who interpreted it as a sign of characterological inadequacy, and who believed that they could do nothing to

alleviate it and, as a consequence, found it a highly aversive and distressing experience - in a word, those who were most depressed about being depressed (Teasdale, 1985). To test this prediction, Fennell and Teasdale examined pre-treatment scores on the final item of the CQ (see Appendix II), which assesses depressive responding to aspects of the experience of depression itself (early waking, lethargy, ruminations, dread of the day). High scorers on this item are intensely upset by this experience, blame themselves for it, see it as the start of another endless spell of depression, believe they never feel any different, and cannot decide what to do to remedy the way they feel. It was predicted that patients who before treatment scored relatively high on this item would respond more positively to the cognitive conceptualisation of depression than patients who initially scored relatively low. This was indeed the case. There was a significant positive correlation between score on the item and judges' ratings of positiveness of response to the cognitive model as presented to patients in the booklet "Coping with Depression" (Beck and Greenberg, 1974) ($r(11)=0.61$, $p<.05$). (Data were missing for 4 patients.)

Thus, as predicted, those patients who were initially most depressed about depression responded most positively to the cognitive model of depression and to the messages implicit in early sessions of CBT, and demonstrated most marked improvement, not only immediately, but also in the longer term. These findings, like those of the previous two studies cited, suggest

that outcome with cognitive treatment may be a function of a "match" between patient and treatment, the best response occurring in people for whom the cognitive model of depression is most relevant. Such a speedy and complete response to CBT would be particularly likely where patients were prevented from using a well-established repertoire of coping skills by depression (i.e. patients high in learned resourcefulness), and relatively unlikely in those who had never possessed such skills and would require additional training in them (i.e. those low in learned resourcefulness). However, as Fennell and Teasdale pointed out, "The analysis presented necessarily constitutes a post hoc attempt to understand marked variation in response to treatment. Hence our conclusions should be regarded as tentative; their main purpose is the generation of hypotheses for further investigation, rather than a statement of final truth".

THE NEED FOR EXPERIMENTAL MANIPULATIONS OF DEPRESSIVE THINKING

Let me recapitulate: 1) clinical outcome trials have provided increasingly solid evidence to support the short- and long-term effectiveness of CBT for depression; 2) unfortunately this has not in itself increased our understanding of how the therapy works, nor given more than limited validation to its theoretical underpinnings, mainly because of the considerable complexity of the treatment package; 3) recent research into CBT and other structured, goal-oriented psychological treatments for depression

has encouraged the identification of therapy characteristics, pre-treatment patient variables, and relationships between the two which may facilitate or hinder successful outcome with CBT. In particular, the last two studies cited both indicate the importance of a match between patients' understanding of their condition and the conceptualisation of depression offered by the therapy they are offered. These findings, while intriguing and clearly worth further investigation, do not however address the central theoretical and therapeutic issues of interest here. That is, they do not with any clarity answer the following question: Does modifying the frequency or intensity of depressing thoughts also modify depression? An answer to this question is crucial, both to the validation of Beck's cognitive model of depression, and to the successful identification of active therapy components within the CBT package.

The inadequacy of traditional outcome research as a vehicle for addressing this central question has led to the development of an alternative research strategy (Teasdale and Fennell, 1983). This involves using a within-subject design to evaluate the immediate effects on negative thinking and on clinical depression of brief, clearly specified psychological interventions. The goals of this research strategy are twofold: 1) to identify active therapy components, as a prelude to refining the overall CBT package so as to implement these components as effectively and efficiently as possible; and 2) to examine the validity of the cognitive model's core assumption that negative thinking is central to the

maintenance of clinical depression.

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Such a design has a number of advantages: 1) it allows interventions employed to be clearly described, and thus readily replicable; 2) it encourages accuracy of measurement of treatment effects, in particular because there need be no gap between assessment and intervention; 3) it overcomes difficulties arising from natural variations in depression, since both treatments can be administered to subjects within a relatively brief period; 4) it can deal with patient heterogeneity, since patients serve as their own controls; 5) it overcomes the difficulty of extrapolating from analogue to clinical samples; and 6) discrete therapy components can be presented, and their effects observed, in isolation from any overall therapy context, thus avoiding expectations of treatment gain, the influence of the treatment's long-term "delivery system", and the like.

On the other hand: 1) the strategy rests on the assumption that it is possible to generalise from short-term changes brought about by brief, standardised experimental procedures to longer term changes occurring over a course of treatment as a whole. While, with careful specification of the components to be tested, this appears reasonable within the framework of CBT, the assumption could nonetheless be wrong. For this reason, ingredients of CBT apparently active within the experimental context would require subsequent validation as part of a broader treatment programme; 2) initial levels may constrain the range of movement available, either for improvement (in mildly depressed or nondepressed

subjects) or for deterioration (in moderately or severely depressed subjects); 3) initial levels could vary considerably from one subject to another, and this variation should ideally be taken into account statistically; 4) measures used repeatedly may be open to influence by time-related processes (for example, practice effects), and these could interact with and confound interpretation of treatment effects; and 5) performance in one condition could influence performance in the other (Poulton, 1974). For this reason, significant interactions between treatment and order of presentation of treatment procedures should be tested for.

The predicted functional link between thinking and affect might be demonstrated in two ways. The first would be to increase depressive thinking and observe the effects of this on depression. Velten's mood induction procedure has sometimes been taken as an example of this strategy, apparently providing evidence in support of the cognitive model of depression (e.g. Velten, 1968). However, as Clark (1983) has pointed out, the mood induction includes instructions to subjects to try to feel the mood suggested by the statements, which may therefore act as nothing more than a description of the state towards which they are aiming. How they actually achieve that state might have relatively little to do with reading the statements as such. More directly relevant here is an experiment carried out by Teasdale and Bancroft (1977). They examined the effects on depressed mood and on corrugator electromyographic activity of brief periods of thinking happy or

unhappy thoughts. Five mildly-to-moderately depressed female patients, recruited from a psychiatric day hospital, took part in the experiment. As predicted, mood was significantly more depressed, and corrugator EMG higher, after thinking unhappy thoughts than after thinking happy thoughts in all 5 subjects.

Teasdale and Bancroft thus successfully demonstrated that when depressive thinking was experimentally increased, mood and psychophysiological measures of depression changed accordingly. The major problem with this, however, is that while such experiments show that depression can be increased by increasing negative thinking, they provide no conclusive evidence that it is normally maintained by this means. It is necessary, in order to examine this issue, to reduce the frequency or intensity of spontaneously occurring depressing thoughts (as indeed CBT claims to do), and to examine the effects of this procedure on other aspects of the state of depression. This the experiments reported in chapters 4 to 7 attempted to do.

CHAPTER 4IMMEDIATE EFFECTS OF DISTRACTION ON THINKING AND AFFECT IN
DEPRESSED PATIENTS : STUDY I

To recapitulate, Beck's cognitive model of depression proposes that negative thinking can play an important role in the development and maintenance of clinical depression. The model predicts that interventions which successfully reduce the frequency or intensity of negative thinking will lead to corresponding reductions in depression. This prediction forms the basis for cognitive-behavioural therapy (CBT) of depression, as developed by Beck and his colleagues. While there is increasing evidence to support the effectiveness of CBT with clinically depressed patients, the major question of how the therapy achieves its effects remains unanswered. Given the complexity of the cognitive-behavioural treatment package, this is not a question that traditional long-term outcome research can readily answer. For the same reason, the apparent success of CBT for depression provides only limited support for the validity of the cognitive model of depression.

*Based on: Fennell, M.J.V. and Teasdale, J.D. (1984) Effects of distraction on thinking and affect in depressed patients. British Journal of Clinical Psychology, 23, 65-66. (A copy of this paper will be found at Appendix III.)

In order to test the prediction that reducing negative thinking reduces depression, and to evaluate the specific effectiveness of thought-change components of CBT, Teasdale and Fennell (1983) have proposed an alternative research strategy capable of marrying clinical relevance with an experimental precision and control not normally associated with long-term outcome trials. This involves using a within-subject design to investigate the immediate effects of specific, clearly defined interventions on clinically depressed subjects. The series of studies described in this chapter, and in the three chapters that follow, used the proposed design to examine empirically the immediate effects on negative thinking and on depression of a specific cognitive therapy component (distraction) designed to reduce the frequency of depressing thoughts. Four previous studies (three of which form a series directly preceding the work reported here) have used this approach, two designed to examine the effects of reducing the frequency of depressing thoughts (Teasdale and Rezin, 1978a and b), and two intended to evaluate CBT techniques aimed at reducing the power or intensity of negative thinking (Blackburn and Bonham, 1980; Teasdale and Fennell, 1982). In addition, one study (Rötzer, 1978) has used a between-subject design to evaluate the immediate effects of another cognitive technique (coverant control) on depressed mood and on self-image.

CBT contains a number of core treatment strategies. These are outlined in Figure 4.1 (roughly in order of use), together with the depressive behaviours with which they are designed to deal. Choice of strategy within treatment depends on a number of

Figure 4.1MAJOR CBT STRATEGIES

- | | |
|---------------------------------|---|
| 1. <u>COGNITIVE</u> | <ul style="list-style-type: none"> *DISTRACTION *COUNTING THOUGHTS <p>Directed towards:</p> <ul style="list-style-type: none"> Ruminations Intense unpleasant emotions |
| 2. <u>BEHAVIOURAL</u> | <ul style="list-style-type: none"> ACTIVITY SCHEDULING GRADED TASK ASSIGNMENT <p>Directed towards:</p> <ul style="list-style-type: none"> Loss of interest/pleasure Lowered activity levels Loss of normal routine Procrastination Practical problems |
| 3. <u>COGNITIVE-BEHAVIOURAL</u> | <ul style="list-style-type: none"> *MONITORING NEGATIVE AUTOMATIC THOUGHTS *CHALLENGING NEGATIVE AUTOMATIC THOUGHTS BEHAVIOURAL EXPERIMENTS LEARNING NEW BEHAVIOURS/SKILLS <p>Directed towards:</p> <ul style="list-style-type: none"> Symptom relief Unpleasant emotions Life problems (psychological or situational) |
| 4. <u>PREVENTION</u> | <ul style="list-style-type: none"> IDENTIFYING AND CHALLENGING ASSUMPTIONS REVISION OF 1, 2 AND 3 USE OF SETBACKS <p>Directed towards:</p> <ul style="list-style-type: none"> Faulty/unhelpful ground rules Reinforcement of existing skills Dealing with relapse Preparing for future stressors |

* Cognitive strategies

considerations, including the severity of the patient's depression, what problems are currently most distressing to the patient and most open to change, and the patient's familiarity with and experience of CBT. Three elements of the programme may be identified as primarily designed to produce immediate changes in the frequency or intensity of depressive thinking: counting thoughts, distraction, and identifying and challenging negative automatic cognitions. (Modifying assumptions is also clearly a cognitive strategy, but it involves altering the generalised, underlying cognitive structures (ground rules) which form the basis for negative automatic thoughts, rather than the thoughts themselves). I shall discuss counting thoughts and challenging negative automatic thoughts first because, although relevant research has been carried out on the latter, neither forms the main focus of the work reported here.

Counting thoughts (Burns, 1980, pp.64-66) is designed to promote distance from depressive thinking. It involves teaching the patient to note distressing thoughts ("Ah, there's one!") and to put them on one side. This might be compared to standing at the side of road conducting a traffic survey, rather than standing in the middle of the road being run over by every car that passes. The immediate effects of counting thoughts have not been systematically evaluated. However, the technique reputedly takes some time to produce benefits and, in the short-term, may lead to an actual or apparent increase in negative cognitions, together with a temporary worsening in mood. For this reason, it was

considered an unsuitable target for the brief experimental investigations planned.

Identifying and challenging negative automatic thoughts, through verbal reasoning and through behavioural experimentation, constitutes the main cognitive strategy employed in CBT. This process has been described and illustrated in Chapter 1, and will not be further elaborated here. Three experimental studies have investigated the effects on depression of interventions designed to challenge the validity of negative automatic thoughts.

Rötzer (1978) assessed within-session changes in depressed mood and in self-image over the first two sessions of a covert control treatment for depression. Sixteen severely depressed, hospitalised patients were randomly allocated to receive training in covert control, or to an attention control treatment. This equated for variables such as therapist time and repeated assessment, and took self-exploration as its therapeutic goal. In the first covert control session, concrete examples of positive personal qualities were elicited from patients. In the second session, repeated rehearsal of these examples was modeled by the therapist and practised by the patients. Patients gave themselves tangible and verbal reinforcement, and received verbal and nonverbal reinforcement from the therapist. No significant changes in depressed mood occurred in either treatment group in session 1. Thus increased accessibility to evidence of positive personal qualities did not in itself alter depression. Changes in self-image were not assessed, so it is impossible to say whether

view of the self was changed by the exercise or not. Over session 2 depressed mood decreased significantly in the experimental group ($p < .01$), but not in the control group. Equally, self-image improved significantly in the experimental group ($p < .01$), and not in the control group.

The study demonstrated the effects of a cognitive technique both on thinking (self-image) and on mood. Unfortunately, the number of subjects was small, and no direct short-term measure of depression other than self-reported depressed mood was reported. The inclusion of a control group somewhat reduces the risk that the effects observed resulted from therapeutic nonspecifics. Nonetheless, improvements in mood and self-image could simply be correlated changes in aspects of the state of depression resulting from a high level of self- and therapist-reinforcement, rather than indicating a primary cognitive change. In addition, covert control is not a technique central to Beck's CBT, and involves increasing the availability of positive self-statements, rather than directly challenging and undermining negative automatic thoughts.

Blackburn and Bonham (1980) investigated the effects on depressed mood and on physiological measures of depression of three experimental conditions: thinking a happy thought (control condition); "distancing" from an unhappy thought (a brief version of re-evaluation of negative cognitions as practised in CBT); and "involvement" in an unhappy thought (absorption in vivid mental

images and associated feelings). All thoughts were elicited from the subjects. Five depressed patients, all meeting RDC (Spitzer et al., 1978) for primary depressive illness and scoring 14 or more on the BDI, received 10 minutes' training in each technique. The experiment itself consisted of thirty 30-second trials (10 per thought), interspersed with 25-second rest periods, during which mood-ratings were taken. Thoughts were presented in random order. On depressed mood, there were significant differences between the three conditions for all 5 subjects ($p < .01$ in all cases). Mood ratings were lowest after thinking happy thoughts, highest after involvement in unhappy thoughts, and between the two after distancing from unhappy thoughts. In all cases, distanced thoughts received lower depression ratings than they had received when originally elicited, before distancing. There were significant differences for 4 out of 5 subjects on corrugator EMG, happy and distanced thoughts evoking lower activity than involved unhappy thoughts. Heart rate discriminated significantly between conditions for 3 out of 5 subjects, happy and distanced thoughts being associated with lower heart rate than involved unhappy thoughts.

These results seem very promising, particularly given the small number of subjects and the brevity of the interventions. Blackburn and Bonham acknowledge, however, the possible influence of demand effects and of the differential credibility of the two procedures for dealing with negative thoughts (though the results on corrugator EMG and on heart rate make this less likely). In addition, there was no direct evidence of cognitive change, such

as degree of belief in the unhappy thoughts before and after distancing or involvement. Nonetheless, the results do suggest that the way in which a negative thought is dealt with will affect the extent to which it leads to disturbed emotions.

Teasdale and Fennell (1982) examined the immediate effects on belief in depressing thoughts and on depression of a longer period (approximately 30 minutes) of therapist-directed thought-modification. This was compared with a similar period of exploration, information-gathering and empathy. Five moderately-to-severely depressed female patients, meeting RDC (Spitzer et al., 1978) for unipolar, nonpsychotic Major Depressive Disorder and scoring 20 or more on the BDI (mean score = 31.5), took part in the study. All five had been depressed for at least one year, had previously failed to respond to anti-depressant medication, and (with one exception) had been hospitalised for depression. All had received at least 12 sessions of CBT. For each patient, a thought was identified which was depressive in content, contained distortions, was commensurate with reported affect, and was judged to be central to the patient's depression, and currently affecting immediate mood. Before and after each treatment procedure, belief in the selected thought and immediate depressed mood were rated on Visual Analogue Scales (VASs), and speech rate was measured by asking subjects to count from 1 to 10 in their own time. (All these measures, and the two experimental procedures, were routinely part of CBT sessions). For each patient, thought-change produced greater reductions in belief (mean = 61 VAS

points) than thought-exploration (mean = 0). Equally, thought-change produced greater decreases in self-rated depression (mean = 38 VAS points) than thought-exploration (mean = 3 points). On speech rate, however, only 3 out of 5 subjects showed changes in the predicted direction.

This study appeared promising, in that (apart from speech rate) the results were consistent with the prediction from the cognitive model of depression that reducing the intensity of depressing thoughts will alleviate depression. In addition, it appeared to support the clinical usefulness of active thought-change. There were however limitations to the study. Firstly, the number of patients included was small (this is also true the two other studies reported above). Secondly, consistent effects on depression were confined to a self-report measure of mood (as indeed they were in Rützer's study). Thirdly, the experimental procedures were not presented independently of an active therapeutic context. It is possible that during the course of previous CBT sessions the patients had learned to expect improvement from the active modification of depressing thoughts, and not from exploration, information-gathering or empathy. In the absence of physiological or behavioural confirmation of self-reported change, the possibility remains that results were influenced by expectation. Finally, the procedures used, though closely based on the CBT treatment manual (Beck et al., 1979) and readily discriminable by independent judges, were not in any way standardised, and might therefore be difficult to replicate.

The three studies reported above were intended to modify the intensity of negative thoughts, i.e. their reflection in score on an instrument measuring self-image, their depressingness, or the extent to which they were believed. Distraction, in contrast, which forms the main subject-matter for this thesis, is designed to alleviate depression by reducing the frequency of depressing thoughts. Distraction, rather than the modification of negative automatic thoughts through verbal reasoning, was chosen for investigation here because it is relatively uncomplicated, because the content of interventions could be reasonably easily standardised, and because clinical experience suggested (as the research reported below may not) that, given an adequately powerful distraction stimulus, marked immediate effects on depression could be confidently predicted following very brief interventions.

Distraction (or diversion) (Beck et al., 1979, pp. 171-2) involves teaching the patient to direct attention away from distressing ruminations, either towards the external environment, or towards more pleasant or neutral internal stimuli (memories, fantasies, mental exercises). It may be used in three main ways. First, it can be used to demonstrate the cognitive model of depression, and to provide experiential evidence of the functional link between thinking and mood (as described in the case of Mrs T.). Secondly, it can be presented as a coping skill for reducing high frequency depressing thoughts and associated affect. Thirdly, it may be used to achieve a lift in mood sufficient to prompt rational

thinking. Engagement in a pleasant and absorbing activity, for example, may be used to facilitate rational responding to depressing or hopeless thoughts which are initially so powerfully believed, and accompanied by such intense affect, that access is not available to more realistic alternative interpretations. The second use (distraction as a means of alleviating immediate depressed mood by reducing the frequency of depressing thoughts) is the subject of the current investigation.

Two studies have used a within-subject design to examine the effects on depression of reducing the frequency of depressing thoughts, and form a prelude to the work reported here. Teasdale and Rezin (1978b) examined the immediate effects of thought-stopping. Eight psychiatric day-patients completed the study. They varied in diagnosis, but all complained of depressed mood. Thought-stopping was presented as a coping skill, and patients received 4 training sessions during which they applied the techniques for increasing periods of time. These were followed by two experimental sessions. Half of each of these was spent in thought-stopping, and half in a control condition, "mind-wandering". Order of presentation of the two interventions was systematically varied. At intervals during each intervention, a bell sounded. Subjects were asked to report, when they heard the bell, whether what they had been thinking immediately beforehand was depressing or not. Depressed mood was rated before, after and at intervals during each intervention. The Profile of Mood States (POMS) (McNair and Lorr, 1964) was administered before and after each intervention, and corrugator supercillii EMG was measured

throughout. Even though subjects reported active use of thought-stopping, there were no significant differences between the experimental and control conditions in reported frequency of depressing thoughts, or on any measure of depression. Whether this reflects particular intransigence on the part of depressing thoughts, or the overall inefficacy of thought-stopping as a therapeutic procedure (Mahoney and Arnkoff, 1978) is not clear.

Teasdale and Rezin (1978a) used a standardised distraction exercise (repeating aloud sequences of letters presented at varying rates over headphones) to reduce the frequency of depressing thoughts. Subjects were selected for this study according to the presence of depressive symptomatology, and not by any formal diagnostic procedures. In two young female patients attending psychiatric day-hospital, high rates of presentation of letters significantly reduced the frequency of depressing thoughts, and this was accompanied by significant decreases in depressed mood. Similar results were not however consistently obtained with a larger (n=13) sample of severely depressed day- and inpatients. Some evidence for experimental control of depressing thoughts was found in some subjects during the first of two experimental sessions; no evidence for such control was present in the second session. Consistent with this, there was no clear evidence of significant reductions in depressed mood. Some evidence of experimental control of a measure of psychomotor speed (writing-speed) was found in those subjects who did demonstrate a reduction in the frequency of depressing thoughts. Teasdale and

Rezin concluded that predicted effects on depression were not observed because in the majority of patients the reduction in negative thought-frequency was inadequate, and too briefly maintained (individual trials of distraction were only 16 seconds in duration). They recognised, however, the alternative possibility that for most patients, depressing cognitions do not in fact cause depressed mood. In particular they noted that the extent to which negative thoughts were controlled by distraction appeared to be related to the nature of a patient's depression. That is, there was a significant negative correlation between the degree to which a high rate of presentation of distraction stimuli reduced the frequency of depressing thoughts, and score on the Newcastle Diagnosis Scale (NDS) (Carney, Roth and Garside, 1965), a measure of endogeneity. A high score on this measure represents an endogenous clinical picture. Teasdale and Rezin found that the lower a patient's score on the NDS (i.e. the less endogenous their presentation), the more likely it was that distraction would effectively block out their depressing thoughts.

The present study was intended to extend this line of research. It used a somewhat larger sample of diagnostically homogeneous depressed patients, and a more powerful distraction procedure, to investigate the immediate effects on depression of experimentally reducing the frequency of depressing thoughts. Given the results of Teasdale and Rezin (1978a and b), a major consideration in pursuing this line of work was the selection of an experimental procedure powerful enough to reduce the frequency of depressing thoughts in depressed patients with a high degree of reliability.

Such a procedure should be brief, standardised, absorbing (i.e. requiring a high level of information-processing), not apparently a task on which subjects might see themselves to fail (with consequent negative self-evaluations), and, preferably, closely allied to clinical practice, i.e. based on procedures actually used in CBT. The type of distraction exercise described in Chapter 1 in relation to Mrs T. appeared to be a likely candidate.

The area of clinical psychology in which the effects of distraction have been most extensively studied is the control of experimentally induced and (to a much lesser degree) natural pain. Since the early 1960's, a large number of studies have been carried out, mostly using female student subjects, to assess the effects on a number of measures, both psychological (pain tolerance, pain threshold, subjective discomfort and subjective distress) and physiological (muscle tension, respiration and heart rate) of experimental pain induction procedures, in particular (indeed, almost exclusively) the cold stressor test. Experiments with induced pain have been used to assess subjects' ability to increase pain tolerance and pain threshold, and to reduce subjective discomfort and distress, through the use of a variety of different coping strategies. These have included: relabelling sensations (for example, imagining a hot day and interpreting the cold water as pleasantly cool) (Barber and Haan, 1962; Blitz and Dinnerstein, 1971; Jaremko, 1978; Scott and Leonard, 1978; Thelen and Fry, 1981); imagining the hand to be numb (Barber and Haan, 1962; Farthing, Venturino and Brown, 1984; Johnson, 1974; Spanos,

McNeil, Gwynn and Stam, 1984); brief relaxation (Grimm and Kanfer, 1976; Hackett and Horan, 1980; Johnson, 1974; Mills and Farrow, 1981; Stevens and Heide, 1977; Varni, 1981); and self-management instructions or rational self-talk (Avia and Kanfer, 1980; Beers and Karoly, 1979; Girodo and Wood, 1979; Jaremko, 1978; Rosenbaum, 1980b; Spanos, Kennedy and Gwynn, 1984; Worthington and Shumate, 1981). A variety of techniques involving redirection of attention have been assessed, including: mental exercises such as counting down from 1000 in 3's (Beers and Karoly, 1979), picturing numbers on a board (Horan, Layng and Pursell, 1976), and memorising a list of words (Farthing et al., 1984); positive memories and fantasies (Avia and Kanfer, 1980; Chaves and Barber, 1974; Grimm and Kanfer, 1976; Horan and Dellinger, 1974; Rosenbaum, 1980b; Scott and Barber, 1977; Worthington and Feldman, 1981; Worthington and Shumate, 1981); and concentrating on a series of slides (Kanfer and Goldfoot, 1966; Kanfer and Seidner, 1973; McCaul and Haugtvedt, 1982).

This last procedure appeared particularly promising, since it approximated closely to the distraction technique used by Mrs T. (Chapter 1 above) and often recommended to depressed patients (Beck et al., 1979, p.171; Emery, 1981, p.101). Clinical experience suggested that an external distraction stimulus of this kind would more effectively sustain attention and thus reduce the frequency of depressing thoughts than internal distraction stimuli (such as memories, fantasies or mental exercises), because the latter could be more easily disrupted, and indeed wholly blocked out by the high frequency of depressing thoughts and

intense dysphoria that one would anticipate with moderate or severe levels of clinical depression. A visual distraction procedure was therefore selected (concentrating on a series of slides), based on clinical practice, and similar to the most effective procedures used by Kanfer and Goldfoot (1966) and by Kanfer and Seidner (1973), in that subjects would be asked to describe the slides aloud, and that the rate of presentation of the slides would be under their control.

The study had two major aims: 1) to test the theoretical prediction from Beck's cognitive model of depression that reducing the frequency of depressing thoughts would reduce depression; and 2) to examine the effectiveness of distraction as a specific component of CBT. It was predicted that: 1) distraction would reduce the frequency of negative cognitions, compared to a control procedure; and 2) consistent with the cognitive model of depression, this would be accompanied by greater reductions in depression during distraction than during the control condition. In addition, the sensitivity to short-term change of a number of measures of depression was explored.

METHOD

Overview

A within-subject design was used. For each subject, 5 minutes concentrating on a series of slides was compared with a similar period sitting in a relaxed manner focussing attention on a

rectangle of white light projected on the wall. The effects of the two procedures on frequency of depressing thoughts and on various measures of depression were assessed.

Subjects

Sixteen moderately-to-severely depressed patients (11 female), meeting RDC for nonpsychotic, unipolar Major Depressive Disorder (Spitzer et al., 1978), and scoring 20 or more on the BDI on the day of testing (mean=30.25, range=20-43), were asked to take part in a study of "the way people react to certain experiences when depressed". Patients were recruited from two psychiatric hospitals over a 10-month period from March, 1981 to January, 1982. Information for making diagnoses was obtained initially from medical and nursing staff in regular contact with patients, and confirmed by interview with patients themselves. A standard checklist was used, based on the RDC. This is shown in Figure 4.2. Where information was ambiguous or lacking, patients were not asked to take part in the study.

So that changes in depression could be attributed to the specific effects of the procedures compared, rather than to expectation of therapeutic gain, no subject was familiar with the theory or practice of CBT, and no indication of possible therapeutic benefit was given. Mean age was 40.80 (range 22-59). Ten subjects were inpatients, two were day-patients and four were outpatients. Ten were currently receiving anti-depressant medication. None had received ECT during the current episode of depression (mean duration = 10.25 months, range 2-60 months). Before the experiment, the Newcastle Diagnosis Scale (NDS) (Carney et al.,

Figure 4.2PSYCHIATRIC SCREENING RECORD SHEET

Name Sex M/F Date

Age OP/IP/DP Medication
(type and dosage)I. RESEARCH DIAGNOSTIC CRITERIA - PRIMARY MAJOR DEPRESSIVE DISORDER

- A. Depression as main problem (not preceded or accompanied by any other psychiatric disorder. May be reactive to events)
- B. Unipolar, nonpsychotic (no previous manic episodes; not hallucinated or deluded)
- C. Duration = 2 weeks
- D. Depressed mood
- E. At least 5 out of the following 8 symptoms (at some point during the current episode, even if not now):
1. Excessive guilt/self-reproach
 2. Thoughts of death or suicide, suicidal behaviour
 3. Sleep disturbance (↑ or ↓)
 4. Loss of energy/fatigability
 5. Appetite disturbance/weight disturbance (↑ or ↓)
(1 kg per week for several weeks, or 9 kg in 1 year when not dieting)
 6. Slowed thinking/poor concentration
 7. Loss of interest/pleasure (including loss of libido)
 8. Psychomotor agitation/retardation
- F. No previous history of schizophrenia, mania, antisocial personality
- G. No current diagnosis of panic disorder, anxiety disorder, alcoholism, drug abuse, mental retardation, organic brain disorder

II. SEVERITY

- A. BDI score \geq 20

1965), an interview-based measure of endogeneity, was administered to each subject (median score = 3, range 0-7). The scale was not however scored by the experimenter until after each subject had completed the experiment. (A copy of the NDS will be found at Appendix IV.)

Measures

Frequency of depressing thoughts was measured during the course of each intervention, and the various measures of depression were administered before and after each intervention, i.e. on 4 separate occasions. Copies of the measures will be found at Appendix V.

Frequency of depressing thoughts At 26-second intervals during each intervention, a tone sounded (10 in all). Subjects reported whether the thought they were thinking when they heard each tone was depressing ("Yes") or not ("No"). Depressing was defined as "the kind of thought that would make anyone feel depressed if they had it". "Not depressing" included pleasant and neutral thoughts, and the absence of identifiable thoughts. Examples of each type of thought were given by the experimenter and elicited from the subject. On three randomly chosen occasions, subjects reported aloud what they actually were thinking. Where necessary, the exact nature of particular thoughts was clarified by the experimenter immediately after each intervention (e.g. "Thinking about my father"; "Can you tell me what was depressing about that thought?"; "My father's gone into hospital and he's very ill"). To check the validity of subjects' categorisations, thoughts reported aloud were transcribed verbatim and presented in random

order to three independent judges, blind to experimental condition, who rated each thought on a 7-point scale ranging from -3 (extremely depressing) to +3 (extremely happy). "Depressing" was defined to the judges in the same way as to the patients.

Depressed mood was measured using a 10 cm line Visual Analogue Scale (VAS) (Zealley and Aitken, 1969), labelled "Not at all depressed" at the left-hand end and "As depressed as you possibly could be" at the right-hand end. Subjects indicated how depressed they felt at the moment of rating ("right now") by making a cross at a point on the line. The score was the distance in mm of the cross from the left-hand end.

Speech rate Subjects were asked to count from 1 to 10 "in their own time". On each occasion, two counts were taken. These were tape-recorded, and played back via a noise-gate through a Grass 7-D Polygraph to produce a visual "speech-print" from which total time to count from 1 to 10 could be measured. This measure has been shown to be sensitive to short-term changes in depression in some patients (Teasdale, Fogarty and Williams, 1980), and to experimentally manipulated elation-depression (Teasdale and Taylor, 1981; Teasdale, Taylor and Fogarty, 1980). In the present study, the mean of the two counts taken on each occasion was the measure.

Writing-speed Subjects were asked to write down numbers from 100 downwards - 100, 99, 98, 97, 96 and so on - "in their own time". They were stopped by the experimenter after one minute. The number of numbers written in this time was the measure. This measure has been shown to be responsive to experimental manipulations of mood (Hale and Strickland, 1976; Johnson, 1937;

Velten, 1968), and to discriminate mildly depressed from nondepressed student volunteers (Berndt and Berndt, 1980). In addition, Teasdale and Rezin (1978a) found some evidence of effects on this measure in those subjects who demonstrated experimental control of depressing thoughts.

Incentive ratings Subjects were asked to rate on a 0 to 10 scale how much they would like to engage "right now, if you had the chance" in 12 potentially pleasant activities. A rating of 0 corresponded to "do not want to at all", and rating of 10 to "want to very, very much". This measure was designed to assess the loss of interest and incentive commonly observed as a central feature of depression. In previous studies (Teasdale, Spencer and Clark, 1982), scoring on the scale was shown to be sensitive to experimentally manipulated mood, the largest effects being observable on social and effortful activities. For this reason, in the present study, effects of the two interventions were examined on activities high in social contact and in effort ("Go to a party", "Go out for a meal with a group of new and interesting people", and "Go to a concert of your favourite music with a group of friends"). This measure had not previously been used with clinically depressed subjects.

Word association latency Subjects were presented by the experimenter with four words, and asked to give the first word that came to mind in response to each word. The stimulus words were taken from Fisher and Marrow (1934), and on each occasion of measurement included one example of each of four mood-related categories: pleasant (birds, life, music, happy); unpleasant

(sorrow, fear, accident, hate); neutral (paper, wood, shoes, snow); and ambiguous (sex, love, school, parent). Stimulus and response words were audiotaped, and latency of response measured. This measure has been shown to be responsive to induced elation-depression, longer latencies accompanying depressed mood (Fisher and Marrow, 1934; Velten, 1968).

Procedure

The experimental procedure is illustrated in Figure 4.3, and a copy of the experimental instructions (which were standardised) will be found at Appendix V. The experiment took about 1 hour in all. Subjects first practised all the measures. When they were familiar with these, the two interventions were described and modeled by the experimenter. In the Distraction Condition, subjects were asked to concentrate as fully as possible on a series of slides projected from a Kodak Carousel S projector on to a blank wall to give a display 110 x 75 cm, 1.5 m from where the subject sat in a comfortable chair. The slides depicted a variety of outdoor scenes (e.g. mountain, coastal and agricultural landscapes, a market scene, an aerial view of a town with a large river running through it). To help them to concentrate on the slides, subjects were asked to describe what they saw in each out loud in as much detail as possible. These commentaries were audiotaped and later transcribed. Subjects were told not to worry if they found concentration difficult; the procedure was not a test of any kind, they would not be required to remember what they had seen, and no deep significance would be read into what they said. Presentation of the slides was under subjects' control, and they were told to move to a new one whenever they wished. Median

Figure 4.3STUDY I - EXPERIMENTAL PROCEDURE1. REHEARSAL

Measures: Depressed mood (VAS)
 Speech rate
 Writing speed
 Incentive ratings
 Word association latency

Distraction and control procedures

Thought-tapping

2. EXPERIMENT

Measures



Distraction or control procedure

plus thought-tapping



Measures

-

5 minute break

-

Measures



Distraction or control procedure

plus thought-tapping



Measures

-

Post-experimental questionnaire

De-briefing

number of slides viewed was 5 (range 3-18). In the Control condition, subjects were asked to sit quietly in a relaxed way, and to look at a rectangle of white light (110 x 120 cm) projected on the wall. They were told not to worry if they found their minds wandering, but to let their thoughts go where they would.

After the interventions had been demonstrated, the experiment proper began. Measures of depressed mood, speech rate, writing speed, incentive and word association latency were administered, in that order. The instructions for the first intervention were then briefly repeated, and that intervention then took place. Each intervention lasted 5 minutes. Each subject experienced both interventions, and the order of presentation was determined randomly and balanced as far as possible. Seven subjects received distraction first, and 9 subjects received the control condition first. At the end of the first intervention, the measures were readministered in the same order, and subjects rated how involved they had been in the intervention using a scale from 0 ("not at all involved") to 10 ("completely involved"). This was followed by a 5 minute break, during which subjects were left alone. The procedure was then repeated, using the other intervention. Finally, subjects were asked the three questions of the post-experimental enquiry described below, debriefed, and thanked.

Post-experimental enquiry

At the end of the experiment, subjects were asked three questions to determine the extent to which experimental demand might have influenced their responses. The questions were: 1) What do you

think the experiment was about? 2) What do you think I expected to happen? and 3) Do you think I expected you to feel better after looking at the slides than after looking at the white light? Subjects' replies were transcribed and given to 3 independent judges to rate according to how far each answer indicated that the subject had guessed the purpose of the experiment. A 5-point scale was used, ranging from 0 ("did not guess at all") to 4 ("guessed completely"). In the event, only one subject was consistently judged (from her response to Question 3) to have guessed the purpose of the experiment. This subject was included in the analysis, since her removal did not affect the pattern of results.

RESULTS

Overview

When all 16 subjects were taken together, distraction did not effectively reduce the frequency of depressing thoughts. When, however, 11 subjects scoring ≤ 3 on the NDS were considered alone, the frequency of depressing thoughts was significantly lower during distraction than during the control procedure. Consistent with prediction, self-report and psychomotor measures of depression showed greater reductions during distraction than during the control condition in these subjects.

Effects of distraction on frequency of depressing thoughts

In order to convert the judges' ratings of the thoughts sampled and transcribed during each intervention to a form comparable to the categorisation used by patients, negative scores on the 7-

point scale (-3 to -1) were taken to indicate a "depressing" categorisation, and all other scores (0 to +3) a "nondepressing" categorisation. On this basis, there was complete agreement between the patient and all three judges for 82% of thoughts sampled. There was agreement between the patient and 2 out of 3 judges (majority verdict) for a further 14%. Patients' categorisations therefore appeared to have a satisfactory degree of external validity. Mean judges' rating for thoughts categorised by patients as depressing was -1.32. Mean rating for thoughts categorised as not depressing was +0.24. Thus non-depressing thoughts, on average, were judged to be neutral, rather than actively happy. Indeed, 28 nondepressing thoughts (54%) were rated 0 ("neither depressing nor happy") by all 3 judges. Only 7 nondepressing thoughts (13%) received a mean rating of >1 ("slightly happy"), and none received a mean rating as high as 2 ("moderately happy").

In order to assess the effectiveness of the distraction procedure, the frequencies of depressing thoughts in the two conditions were compared. Taking the sample as a whole, the difference in frequency of depressing thoughts between the two conditions, although in the predicted direction, was not significant. Since Teasdale and Rezin (1978a) had shown distraction to be most effective in subjects with low endogeneity scores on the NDS, the 11 patients scoring at or below the median (3) were examined separately (see Table 4.1 and Figure 4.4 for median frequencies of depressing thoughts in both conditions). In these patients, the

Table 4.1 Study I : Median frequency of depressing thoughts during distraction and during the control condition, and mean scores on measures of depression before and after each intervention, low (NDS score \leq 3) and high (NDS score \geq 3) endogenous patients

	<u>Low endogenous patients</u> ^a (NDS score \leq 3)		<u>High endogenous patients</u> ^b (NDS score \geq 3)	
	<u>Distraction</u>	<u>Control</u>	<u>Distraction</u>	<u>Control</u>
Frequency of depressing thoughts	2.00	7.00	4.00	3.00
Depressed mood	Pre 59.09 Post 53.23	Pre 39.95 Post 71.50	Pre 54.40 Post 48.60	Pre 58.40 Post 44.40
Speech rate (secs)	7.60 32.45	7.12 34.00	11.61 35.60	12.62 37.40
Writing speed	1.21 1.70	2.54 30.36	2.47 33.80	4.13 37.20
Incentive ratings	1.30 1.90	1.86 2.25	2.07 1.46	2.23 4.22
Word association latency (secs)				

Notes a n = 11 for each median or mean

b n = 5 for each median or mean

frequency of depressing thoughts was significantly lower during distraction (median=2) than during the control condition (median=7) ($p < .04$, sign test). (Nonparametric statistics were used for this comparison because one low endogenous subject reported more depressing thoughts during distraction than during the control condition in so extreme a fashion as to distort the normal distribution of scores.) During distraction, 100% of depressing thoughts reported aloud were judged by independent raters to concern the experiment itself (e.g. "I can't do this"), whereas during the control condition 67% were judged to concern patients' circumstances outside the experimental situation (e.g. "I've let my family down"). Depressing thoughts about subjects' own situations were rated as significantly more depressing (mean rating=-1.74) than depressing thoughts related to the experiment (mean rating=-0.83) ($t(10)=5.88$, $p < .0002$). Thus, it appeared that distraction successfully blocked out thoughts about depressing current concerns. Consistent with this, involvement was rated significantly higher in the distraction condition (mean=5.82) than in the control condition (mean=2.73) ($F(1,9)=13.29$, $p < .01$). There was no significant main effect on rated involvement for order of presentation ($F(1,9)=1.27$, N.S.), and no significant intervention x order interaction ($F(1,9)=3.47$, N.S.). In addition, frequency of depressing thoughts during distraction was significantly related to the amount of detail used to describe the slides. A word-count taken from the audiotaped transcripts of patients' commentaries on the slides revealed a significant negative correlation between frequency of depressing thoughts and overall number of words ($r(10)=-0.73$, $p < .02$). That is, the more detailed

the descriptions of the slides, the lower the frequency of depressing thoughts.

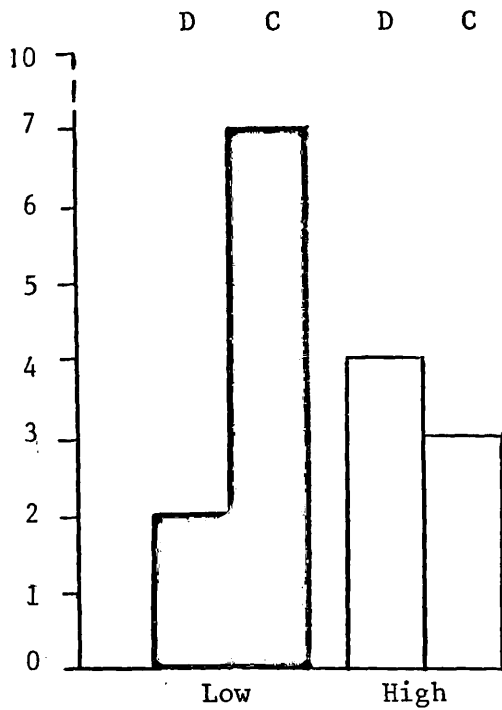
Effects of distraction on measures of depression

Since distraction was effective only in subjects low in endogeneity, the results reported below relate only to these subjects. Multivariate analysis of variance, with order of presentation as a between-subject factor, was used to compare change scores in the two conditions on all five measures of depression. Table 4.1 shows mean scores on these measures before and after distraction and the control condition for both low and high endogenous patients. Results from patients receiving distraction first and from those receiving the control condition first are combined. (Means for each order group separately, and summary tables for univariate analyses of variance, are presented in Appendix VI.)

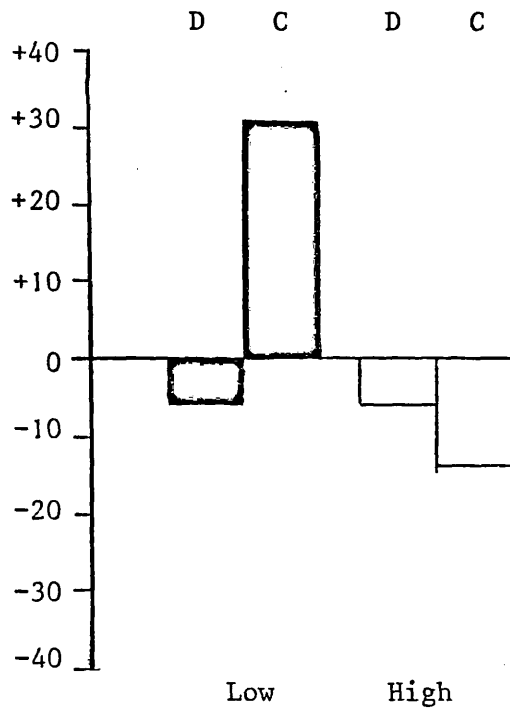
The analysis revealed significant overall differences between the two conditions ($F(5,5)=3.79$, $p<.05$, 1-tailed). There was no significant main effect for order ($F(5,5)=1.38$, $p>.3$), and no significant intervention x order interaction ($F(5,5)=2.92$, $p>.1$). Three measures (self-reported mood, speech rate and writing speed) showed significant differences between the two conditions as predicted. Mean change scores on these measures over each intervention are illustrated in Figure 4.4.

Depressed mood Univariate analysis of variance of change scores showed significant differences between the two conditions, as predicted by the cognitive model of depression ($F(1,9)=11.88$,

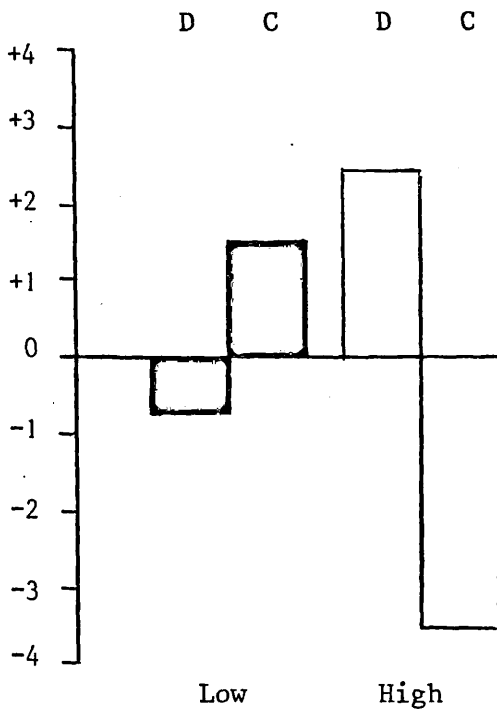
Figure 4.4 Study I : Median frequency of depressing thoughts during distraction(D) and the control (C), and mean change scores on depressed mood, speech rate and writing speed over both interventions, low (NDS score ≤ 3) vs high (NDS score > 3) endogenous patients



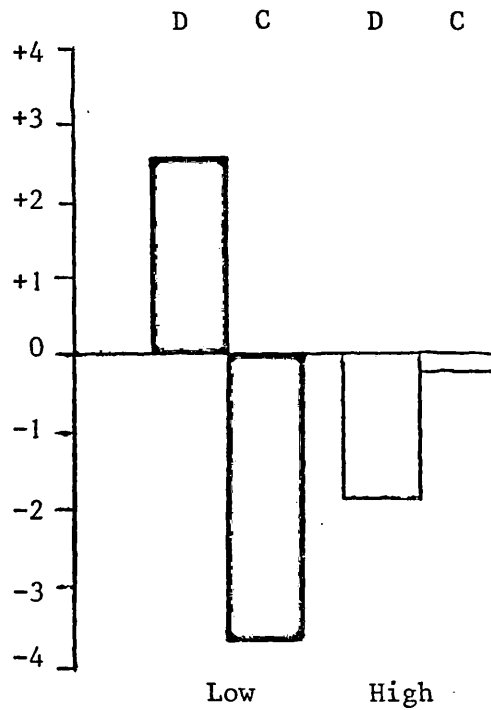
Frequency of depressing thoughts



Depressed mood (VAS)



Speech rate (time taken to count from 1 to 10 in secs)



Writing speed (no. of nos written in 1 min.)

$p < .004$). Ten out of 11 patients showed greater reductions in depressed mood during distraction than during the control conditions. The reduction in depressed mood during distraction, while in the predicted direction, was not in itself significant (dependent $t(10) = 0.91$, N.S.). In contrast, large and consistent increases in depressed mood were found in the control condition (dependent $t(10) = 4.87$, $p < .001$). Frequency of depressing thoughts correlated significantly with post-intervention mood in both conditions (Distraction: $r(10) = 0.66$, $p < .05$; Control: $r(10) = 0.84$, $p < .002$), but not with pre-intervention mood in either. Frequency of depressing thoughts also correlated significantly with change in mood in both conditions (Distraction: $r(10) = -0.53$, $p < .05$; Control: $r(10) = 0.53$, $p < .05$).

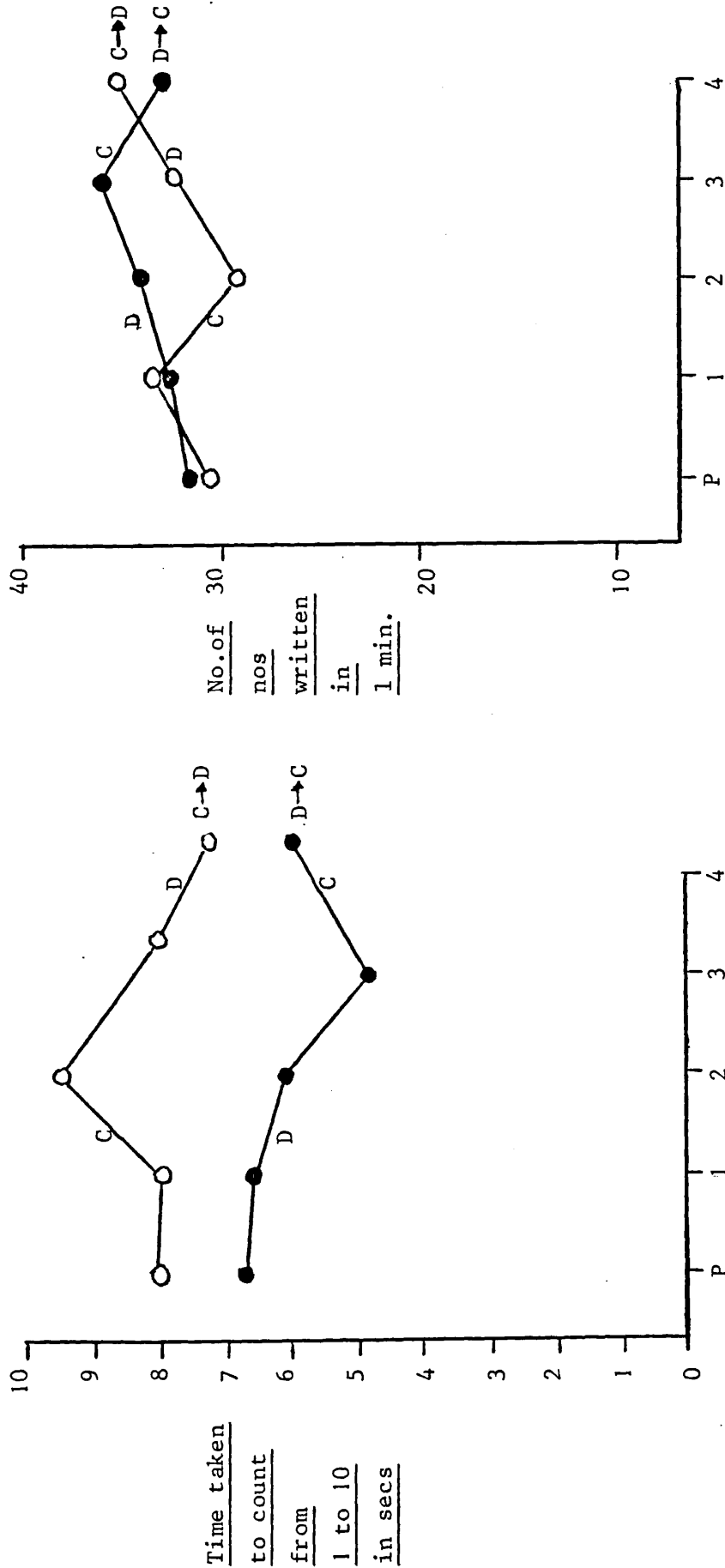
Speech rate Consistent with prediction, changes in the time taken to count from 1 to 10 were significantly different in the two conditions ($F(1,9) = 6.14$, $p < .02$). Figure 4.5(a) shows that there was no consistent practice effect on this measure either in patients who received distraction first or in those who received the control condition first.

Writing speed Equally, there was a significant difference in change in writing-speed between the two conditions, as predicted ($F(1,9) = 6.81$, $p < .01$). Again, Figure 4.5(b) shows that there was no consistent practice effect in either order group.

Incentive ratings There was no significant difference between conditions in change in incentive to engage in social activities high in effort ($F(1,9) = 1.35$, $p > .2$).

Word association latency The difference between conditions in change in word association latency was also nonsignificant

Figure 4.5 Study I : Mean speech rate and writing speed at successive assessment points (practice (P); before (1) and after (2) the first intervention; before (3) and after (4) the second intervention), for low endogenous patients receiving distraction first (D→C) and receiving the control condition first (C→D)



(a) Speech rate

(b) Writing speed

($\underline{F}(1,9)=0.10$, $\underline{p}>.7$).

DISCUSSION

A brief, standardised, visual distraction procedure successfully reduced the frequency of depressing thoughts in moderately-to-severely depressed patients scoring low on a measure of endogeneity, the Newcastle Diagnosis Scale. In these patients, self-reported mood and two simple measures of psychomotor speed showed significant differences between the two experimental conditions, as predicted. Similar results were not evident in patients scoring >3 on the NDS, that is, those relatively high in endogeneity.

Given responses to the post-experimental enquiry, it is unlikely that the findings in relation to low endogenous patients are a reflection of experimental demand. The results for these patients are consistent with Beck's cognitive model of depression, and support the clinical usefulness of distraction as an emergency measure for the alleviation of depressed mood in this group. From examination of thought-content, it appeared that distraction effectively prevented major depressing concerns from occupying the central focus of low endogenous patients' attention. It should be recalled that these patients were moderately-to-severely depressed, had been so on average for approaching a year, and mostly required day- or full-time hospitalisation at the time of the study. Thus the depressed mood modified by this brief

intervention was no trivial or transitory state.

The study usefully demonstrates the sensitivity to short-term changes of two psychomotor measures of depression, speech rate and writing speed. Thus effects were not confined to the VAS measuring self-reported depressed mood. Incentive ratings and word association latency, however, did not reflect mood and psychomotor changes. A number of different factors might account for this. Both measures were administered late in the assessment sequence, when the effects of the interventions might already have been declining. Additionally, both were relatively lengthy and complex, compared to the other measures, and they may have required a degree of mental effort that overrode transient mood-change, allowing baseline depression-levels to emerge. On the incentive ratings, a floor effect was at least partially responsible for the results, in that a number of subjects scored 0 throughout on some items. It appeared that this measure, originally devised for a student population experiencing induced low mood, was unable to respond sensitively to a moderate-to-severe level of clinical depression, perhaps because the latter was associated with a considerably higher level of disability (social withdrawal, energy loss, lowered activity levels). The major problem with word association latency, on the other hand, was a very high degree of variability between responses, both between subjects and (more markedly) between individual words at specific assessment points. Neither of these measures was used in later experiments.

The results were promising in that they met the original aims of the study to test the prediction that reducing the frequency of depressing thoughts would also reduce depression, to examine the effectiveness of a specific CBT component, and to explore the sensitivity to short-term change of a number of measures of depression. Clearly, however, generalisation from such a small group of subjects could be done only with caution, and replication was called for. In particular, there were certain difficulties in interpreting the results:

1. Once patients scoring >3 on the NDS were withdrawn from the analysis, order of presentation was no longer balanced. Only three low endogenous subjects out of 11 received distraction first. It could be, therefore, that the control procedure led, for one reason or another, to an increase in depressed mood which then gradually dissipated, producing a spurious effect of distraction. While no order effects were evident in the analysis, and indeed the means presented in Appendix VI show very similar results in the two order groups, this sizeable discrepancy in numbers between those receiving distraction first and those receiving the control condition first calls for replication with balanced order groups;
2. The number of high endogenous patients was too small to allow any satisfactory exploration of the exact nature of differences in responsiveness to the two procedures between these and the low endogenous patients, or to examine in any detail the reasons for failure to respond to distraction;

3. Given that the rate of presentation of the slides was under subjects' control, whereas the white light was not, the effects of distraction on mood might conceivably have been the result of an opportunity to exert mastery over the environment;

4. During distraction, subjects were required to describe the slides aloud, whereas there was no such requirement during the control condition. The measures, in particular speech rate, could have been affected by this difference in vocalisation;

5. Unexpectedly, the average increase in depressed mood during the control procedure was greater than the average decrease during distraction. That is, the supposedly neutral control condition embarrassingly appeared to be the more powerful of the two interventions. This could have been because the high information-processing demands of the general experimental context reduced any additional benefit from the specific distraction procedure. Alternatively, it could have resulted from the fact that nondepressing thoughts experienced during distraction were not as happy as depressing thoughts experienced during the control condition were depressing. Twenty-one nondepressing thoughts were reported aloud during distraction. These received a mean judges' rating of +0.35. Ten thoughts (48%) were rated 0 by all three judges, three (13%) received mean ratings of +1 or more, and none received mean ratings as high as +2. During the control condition, 21 depressing thoughts were reported aloud. Mean judges' rating for these was -1.57. Sixteen thoughts (76%) received a mean rating of -1 or more, and 9 (43%) received a mean rating of -2 or more. Thus the affective intensity of the

depressing thoughts reported aloud during the control condition was considerably greater than that of the nondepressing thoughts reported aloud during distraction;

6. The two procedures might have differed inherently in such a way as to exert a direct effect on mood, rather than operating through their effects on frequency of depressing thoughts. For example, viewing the slides might have been a pleasant (and thus mood-elevating) experience, compared to looking at the white light.

These issues were addressed in two further concurrent studies of distraction. The first (described in chapter 5) was a modified replication of the experiment reported here, using a larger sample of depressed patients. The second (described in chapter 6) investigated the effects of distraction in a nondepressed student population, and explored the direct effects of the two procedures on mood.

CHAPTER 5IMMEDIATE EFFECTS OF DISTRACTION ON THINKING AND AFFECT IN
DEPRESSED PATIENTS : STUDY II

The study reported in Chapter 4 (Study I) showed that, in depressed patients scoring ≤ 3 on the Newcastle Diagnosis Scale, a measure of endogeneity, distraction significantly reduced the frequency of depressing thoughts, compared to a control procedure. Comparison of change scores on measures of depression showed that, as would be predicted from Beck's cognitive model of depression, these subjects showed significantly greater decreases in depressed mood and increases in psychomotor speed (as measured by speech rate and writing speed) over distraction than over the control procedure. Similar effects were not evident in patients scoring > 3 on the NDS (that is, those relatively high in endogeneity).

These results supported the theoretical prediction that reducing the frequency of depressing thoughts will reduce depression, at least in patients relatively low in endogeneity, and suggested that for such patients distraction might be an effective component of CBT. Additionally, they offered confirmatory evidence for the finding of Teasdale and Rezin (1978a) that the extent to which distraction reduced the frequency of depressing thoughts was related to level of endogeneity. Problems in interpreting the results have already been described. Specifically, these were:

- 1) a sizeable imbalance in the order of presentation of the two

interventions; 2) a very small sample of high endogenous patients; 3) a response to the control procedure which, compared to the response to distraction, was unexpectedly large; and 4) the availability of alternative explanations for the results, in particular differences in mastery and vocalisation, and the possibility that the two procedures exerted a direct effect on mood, rather than operating through their impact on frequency of depressing thoughts. These issues, apart from the last (direct mood-effects), were addressed in the study reported here.

This study had three main aims: 1) to examine the replicability of the finding that distraction was effective in reducing depressive thinking and alleviating depression in patients low in endogeneity; 2) by modifying the experimental procedure, to exclude order of presentation, mastery and vocalisation as possible explanations for any differences found between the two conditions; and 3) to examine further the relative responsiveness to distraction of patients high and low in endogeneity. It was predicted that in low endogenous patients: 1) distraction would significantly reduce the frequency of depressing thoughts in comparison to the control procedure; and 2) in accordance with the cognitive model of depression, subjects would report feeling less depressed and show faster speech rate and writing speed after distraction than after the control procedure. No specific hypotheses were formed in relation to high endogenous patients. This was because Study I did not provide sufficient data to predict with any degree of confidence whether they would fail to

show any response whatever to the two procedures, whether they would respond in the opposite direction from low endogenous patients, or whether they would respond in the same way, but to a lesser extent.

METHOD

Overview

As in Study I, a within-subject design was used in which, for each patient, five minutes concentrating on a series of slides was compared with five minutes sitting quietly looking at a rectangle of white light projected on the wall. The effects of these two procedures on frequency of depressing thoughts, depressed mood, speech rate and writing speed were assessed.

Summary of modifications to the experimental design

The design of the study was broadly similar to that of Study I. However, in order to overcome the difficulties described above, certain changes were made to the experimental procedure, as described below. The revised procedure is illustrated in Figure 5.1; modifications to the original are indicated by asterisks.

1. In order to reduce any possibility of demand effects:
 - a) the experiment was introduced to patients as "a study of stress and perception, that is, the way people see things about them at times when they are having difficulties or under stress". Depression as such was not mentioned, and the experiment was explicitly presented as having no connection whatever with treatment. As before, none of the patients was familiar with the

theory or practice of CBT, and no expectation of therapeutic benefit was given;

b) the instructions for the control condition were strengthened, so as to introduce an element of counter-demand and to suggest that this was intended to be, if anything, a relaxing procedure. Subjects were not merely asked to sit in a relaxed way, to look at the white light, and to allow their thoughts to wander as they might. Rather they were requested to "sit as comfortably as possible, to let themselves relax as far as they possibly could, and to keep their attention focussed on the white light";

c) during each intervention, subjects were asked to report what exactly they were thinking at the moment when they heard the tones, rather than whether what they were thinking was depressing or not. The thoughts were categorised as depressing or not only at the end of the experiment. Thus, again, depression was not specifically mentioned;

d) in addition to depressed mood, happiness, energy and anxiety were rated at each measurement point on 10 cm VASs. This again was intended to reduce the extent to which depression appeared to be the main focus of interest;

e) any subject judged to have guessed the purpose of the experiment was excluded from the analysis.

2. To counter the possibility of alternative explanations for results in the predicted direction:

a) order of presentation of the two experimental procedures

was random and balanced, and the number of subjects who received distraction first in each endogeneity group was the same as the number of subjects who received the control condition first. As a further check, main effects of order and interactions between order, treatment and endogeneity were tested;

b) to exclude mastery as an influence, rate of presentation of the slides was under the experimenter's control, and not the subjects';

c) to exclude differences in vocalisation as a contributory factor, subjects were not asked to describe the slides aloud.

3. To exclude the possibility that the effects of distraction were attenuated by the high information-processing demands of the experimental context, 5 minute breaks, during which subjects were left alone, were introduced before both interventions, not simply between intervention I and intervention II.

4. To reduce the possibility of experimenter bias, the NDS was both administered and scored after the experiment. In addition, the interviews were audiotaped and re-rated by an independent psychiatrist.

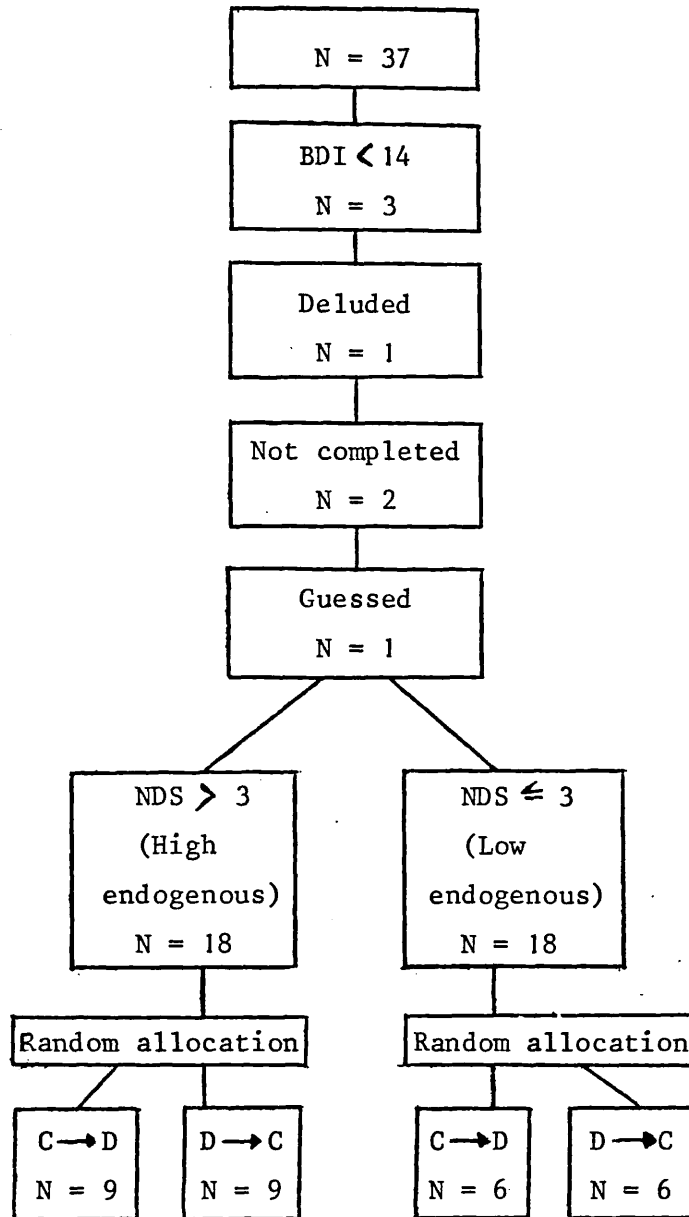
The possibility that the two procedures exerted a direct impact on mood was addressed in a separate study using nondepressed student subjects, which will be reported in Chapter 6.

Subjects

Thirty-seven depressed patients (7 male) were recruited from 6 psychiatric hospitals over an 11-month period between November

1983 and October 1984 (see Figure 5.2). They were all selected according to the following criteria: a) age 18-60 (mean 42.6, range 21-59); b) fulfilling Research Diagnostic Criteria for unipolar Primary Major Depressive Disorder (Spitzer et al., 1978); and c) Beck Depression Inventory (BDI) score ≥ 14 on the day of testing (mean 29.04, range 17-57) (Beck et al., 1961). Three subjects were excluded because they scored less than 14 on the BDI on the day of testing, two failed to complete the experiment, one was excluded because administration of the NDS revealed her to be deluded, and one because she was judged by independent raters to have guessed the purpose of the experiment. The thirty patients remaining were divided into two groups according to level of endogeneity as measured by the NDS (see Appendix IV for a copy of the scale). On the basis of the results of Study I, those scoring 4 or more ($n=18$) were categorised as high endogenous, and those scoring 3 or less ($n=12$) as low endogenous. Mean NDS score for the high endogenous group was 5.61 (range 4 to 9). Given the scale's possible maximum score of 12, these patients were thus relatively, rather than extremely, endogenous. Mean NDS score for the low endogenous group was 1.83 (range 0 to 3). Both groups on average scored in the severe range on the BDI (mean scores 30.28 and 27.17 respectively), and they did not differ significantly from one another on this measure ($t(28)=0.96$, $p>.3$). Seventeen patients were inpatients, 3 were daypatients and 10 were outpatients. Twenty-four were receiving antidepressant medication (mostly tricyclics) at the time of the study. None had received ECT during the current episode of depression (mean duration 8.25

Figure 5.2 Study II : Depressed patients, selection and allocation to experimental groups, with mean BDI score and mean NDS score for each group



Mean NDS score	5.55	5.67	1.67	2.00
Mean BDI score	31.44	29.11	26.67	27.67

months, range 0.5 to 30 months). There were no significant differences between high and low endogenous groups on any demographic or clinical characteristics, other than the NDS. (A fuller description of the NDS, and discussion of items on the scale which appeared to differentiate between the two groups will be found in Chapter 7.)

Measures

As in Study I, frequency of depressing thoughts was measured during both interventions, and depressed mood, speech rate and writing speed were assessed before and after each intervention (that is, on four separate occasions). (Copies of the measures will be found in Appendix VII.) All the measures in the main analysis were shown in Study I to discriminate significantly between distraction and the control procedure in low endogenous patients. Only the measurement of frequency of depressing thoughts will be described in any detail, since the three measures of depression were administered exactly as described in Study I.

Frequency of depressing thoughts During each intervention, subjects heard ten tones. The first sounded one minute after the start of the intervention, and the remainder were at random intervals of between 23 and 31 seconds thereafter. In Study I, the tones were at regular 26 second intervals. Random intervals were introduced in the present study to avoid the possibility that subjects would learn to predict when the next tone might sound and would order their thoughts accordingly. At each tone, subjects reported out loud what they were thinking at that moment, rather than simply saying whether what they were thinking was depressing or not, as in Study I. They were given examples of possible

thought-content (e.g. the experiment itself, what they might be doing later that day, or nothing at all), and asked to state their thoughts briefly word-for-word, rather than describing the subject-matter in general terms (for example, "There are some sheep in the corner on the left-hand side", not "Thinking about the slide"). Thoughts reported aloud were recorded verbatim, and at the end of the experiment patients were asked to categorise each of their thoughts as depressing or not depressing. As in Study I, "depressing" was defined as "the kind of thought that would make anyone feel depressed if they had it". The thoughts were rated by three independent judges (blind to patients' categorisations, experimental condition and endogeneity scores) on a 7-point scale ranging from -3 (extremely depressing) to +3 (extremely happy), exactly as described in Study I.

Depressed mood was measured using a 10 cm line Visual Analogue Scale (VAS). (VAS ratings for happiness, energy and anxiety, which were introduced to reduce possible demand effects, will not be reported here. For mean scores on these measures before and after each intervention, and for summary tables of analyses of covariance carried out on post-intervention scores, with pre-intervention scores as the covariate, and with order of presentation as a between-subject factor, see Appendix IX).

Speech rate Subjects were asked to count out loud from 1 to 10 "in their own time". On each occasion two counts were tape-recorded. The mean of the two counts was the measure.

Writing speed The number of numbers from 100 downwards written in one minute was the measure.

Post-experimental enquiry At the end of the experiment, subjects were asked three questions: 1) What do you think the experiment was about? 2) What do you think I expected to happen? and 3) Do you think I expected you to feel different after looking at the slides than after looking at the white light, and if so, how? Questions 1 and 2 were identical to those used in Study I. Question 3 substituted "feel different" for "feel better" in the interests of reducing possible yea-saying. Replies were given to three independent judges to assess whether or not subjects had guessed the purpose of the experiment. This simple yes/no categorisation was substituted for the more complicated 5-point rating scale used previously, because in Study I nearly all responses to the questionnaire were rated either 0 ("did not guess at all") or 4 ("guessed completely") by all three judges. In the present study, only one subject was judged to have correctly guessed the purpose of the experiment. This subject was excluded from the analysis.

Newcastle Diagnosis Scale (NDS) The NDS was scored on the basis of a semi-standardised interview conducted by the experimenter and lasting approximately 30 minutes. (A copy of the questionnaire and of the questions which formed the basis for the interview will be found at Appendix IV.) Patients were initially categorised as high (score > 3) or low (score ≤ 3) endogenous by the experimenter. To reduce experimenter bias, all interviews (except two where permission was refused by subjects) were audiotaped and rescored by an independent psychiatrist blind to the ratings given by the experimenter. Agreement on categorisation as high or low endogenous in the 35 patients included in the experiment who were

rated by both raters, and in a further 7 pilot patients (i.e. 42 patients in all) was reached without discussion for 35 patients (83%). Agreement on categorisation was reached after discussion on a further 5 patients (12%). Two patients (5%) were referred to an independent third party for a final decision.

Procedure

The experimental instructions were standardised, and a copy will be found at Appendix VII. The experiment took one hour and a half. This was longer than the 1 hour taken in Study I, because of the inclusion of the NDS interview. In Study I this was carried out before patients took part in the experiment itself.

As in Study I, subjects first familiarised themselves with the various measures and with the two interventions. In the Distraction condition, subjects were asked to concentrate as far as possible on a series of slides projected from a Hanimex La Ronde carousel projector on to a blank wall. The slides were identical to those used in Study I. Their rate of presentation was the same for each subject, and was under the control of the experimenter, not the subject, as had been the case in Study I. Each was presented for about 30 seconds (timing was arranged so that changing slides did not coincide with the tones). To help them concentrate on the slides, subjects were asked to describe each one to themselves silently (not out loud, as had been the case in the previous experiment) in as much detail as possible. This was modeled by the experimenter, and practised by the subjects. Subjects were assured that viewing the slides was not a

test of any kind, that they would not be required to recall what they had seen, and that they should not worry if they found concentration difficult, but simply do the best they could. In the Control condition, subjects were asked to sit as comfortably as possible, to relax as far as possible, and to keep their attention on a rectangle of white light (110 x 75 cm) projected on the wall. Order of presentation of the two interventions (each of which lasted 5 minutes) was random and balanced in each endogeneity group.

After this, subjects were left alone for five minutes "to settle down before beginning the experiment itself". This was to provide an opportunity to return to baseline state after the high information-processing demands of the practice period. The first intervention then took place, preceded and followed by the measures of depressed mood, speech rate and writing speed, in that order. Subjects also rated on a 0 to 10 scale how involved they felt they had been in the intervention. There was then a five minute break, during which subjects were left alone. This pause again provided an opportunity to return to baseline after the first intervention, as well as permitting a minimal estimation of the duration of the effects of the two interventions (given that half the subjects received distraction first, and half received the control procedure first). The second intervention then took place, preceded and followed by the various measures of depression, and followed by the rating of involvement and by the post-experimental questionnaire. Subjects then categorised their thoughts as depressing or not. Finally, the NDS was administered

and patients were categorised as high or low endogenous by the experimenter.

RESULTS

Overview

As predicted, distraction significantly reduced the frequency of depressing thoughts in low endogenous patients. Consistent with the cognitive model of depression, low endogenous patients reported feeling significantly less depressed and showed significantly faster writing speed, and somewhat faster speech rate, after distraction than after the control condition. No such effects were found in patients high in endogeneity.

Validity of categorisation of thoughts

In order to convert judges' ratings of thoughts sampled to a form comparable to the categorisation used by patients, negative scores on the 7-point scale (-3 to -1) were taken to indicate a "depressing" categorisation, and all other scores (0 to +3) a "non-depressing" categorisation. On this basis, there was complete agreement between the patient and all 3 judges for 86% of thoughts. There was agreement between the patient and two out of three judges (majority verdict) for a further 9% of thoughts. Thus, patients' ratings had a satisfactory degree of external validity. The judges' mean rating for thoughts categorised by patients as depressing was -1.53. Mean rating for thoughts categorised by patients as not depressing was +0.16. Thus (as in Study I) non-depressing thoughts were on average neutral rather

than actively positive. Indeed, 69% of nondepressing thoughts reported aloud were rated 0 (neither depressing nor happy) by all three judges. Only 5% of thoughts received mean ratings of +1 (slightly happy) or more, and only three thoughts in all received a mean rating as high as +2 (moderately happy).

Effects of distraction on low endogenous patients

The study's first aim was to examine the replicability of the effects of distraction and of the control procedure in low endogenous patients, as observed in Study I. Low endogenous patients were therefore first examined alone.

Effect of distraction on frequency of depressing thoughts

The effect of distraction on frequency of depressing thoughts was examined using analysis of variance, with order of presentation of the two interventions as a between-subject factor. Mean frequencies of depressing thoughts during both interventions for the two order groups combined are shown in Table 5.1. (Mean frequencies for each group separately, and the summary table for the analysis, will be found in Appendix VIII.) As predicted, mean frequency of depressing thoughts was significantly lower during distraction than during the control procedure ($F(1,10)=31.36$, $p=.0002$). This difference was present in all 12 low endogenous patients, except one who reported no depressing thoughts in either condition. For this patient the white light functioned as effectively as a distractor as did the slides. All 10 thoughts she reported aloud during the control condition were descriptions of or comments on the procedure itself (for example, "There's a dark ring round the outside of the square", and "I'm trying to keep

Table 5.1 Study II : Mean frequency of depressing thoughts during distraction and during the control condition, and mean scores on measures of depression before and after each intervention

	<u>Low endogenous patients</u> ^a				<u>High endogenous patients</u> ^b			
	(NDS score = 3)				(NDS score 3)			
	<u>Distraction</u>	<u>Control</u>	<u>Distraction</u>	<u>Control</u>	<u>Distraction</u>	<u>Control</u>	<u>Distraction</u>	<u>Control</u>
Frequency of depressing thoughts	0.92	5.58	2.78	4.39				
	<u>Pre</u>	<u>Post</u>	<u>Pre</u>	<u>Post</u>	<u>Pre</u>	<u>Post</u>	<u>Pre</u>	<u>Post</u>
Depressed mood (VAS)	56.25	36.83	45.33	57.67	50.11	60.39	50.28	64.44
Speech rate (secs)	7.43	7.24	8.10	8.28	5.97	5.91	5.91	6.05
Writing speed	36.83	38.50	37.25	36.83	38.72	41.11	41.17	41.44

Notes

a n = 12 for each mean

b n = 18 for each mean

concentrating. I suppose it gets easier as you go along, you get used to it"). Correspondingly, this patient reported high levels of involvement (9/10) for both conditions. During distraction, only four subjects reported more than one depressing thought. During the control condition, in contrast, only four reported less than five depressing thoughts. There was no significant main effect for order, though subjects receiving distraction first tended to report more depressing thoughts in both conditions than subjects receiving the control condition first ($F(1,10)=3.97$, $p<.08$). Equally, there was no significant interaction between order and treatment ($F(1,10)=0.64$, $p>.4$).

There was a significant negative correlation between frequency of depressing thoughts and involvement in the control condition ($r(10) = -0.66$, $p = .02$), but not in the distraction condition, probably because the maximum number of depressing thoughts reported was only 3 out of a possible 10, and most patients (8 out of 12) reported only 0 or 1 depressing thoughts (that is, the range was very restricted). On average, reported involvement was significantly higher for distraction (mean = 6.17) than for the control condition (mean = 4.58) (dependent $t(11) = 2.50$, $p < .03$).

As in Study I, a major effect of distraction was to exclude depressing thoughts related to the subjects' actual circumstances outside the experimental situation. During distraction, 91% of depressing thoughts were judged by independent raters to be directly related to the experiment itself. During the control condition, in contrast, 66% of depressing thoughts were judged to

concern the patients' life situation outside the experiment. Excluding the one patient who reported no depressing thoughts in either condition, depressing thoughts related to external current concerns were rated by independent judges to be significantly more depressing than those related to the experiment (mean ratings - 1.83 vs. -1.04, $t(10)=5.70$, $p<.001$).

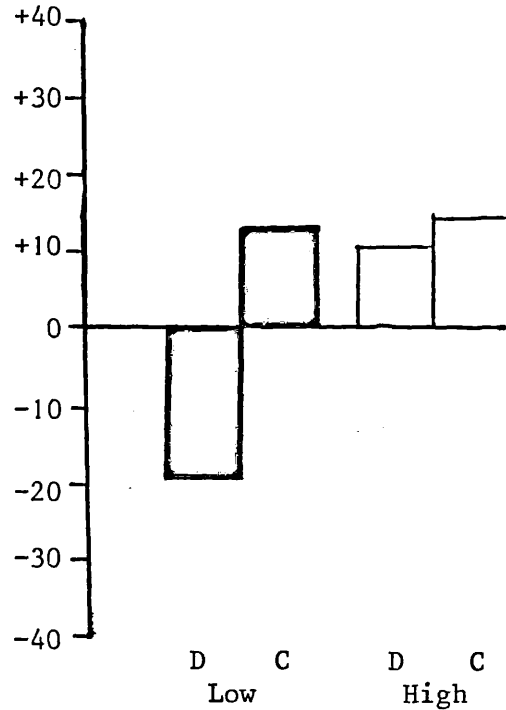
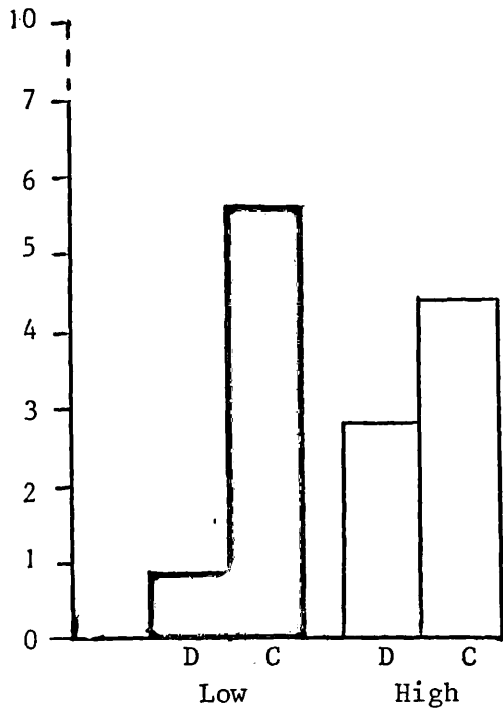
Effects of interventions on measures of depression

Post-intervention scores on depressed mood, speech rate and writing speed were analysed in a series of analyses of covariance with pre-intervention scores as the covariates, and with order of presentation of the two interventions as a between-subject factor. Table 5.1 shows mean scores on each measure before and after the two procedures, with the two order groups combined. (Mean scores for each group separately, and summary tables for the analyses, will be found in Appendix VIII.) Mean change scores over each intervention are illustrated in Figure 5.3.

Depressed mood As predicted, low endogenous patients were on average significantly less depressed after distraction than after the control condition ($F(1,9)=11.19$, $p<.01$). There was no significant main effect for order ($F(1,9)=0.93$, $p>.3$), and no significant interaction between order and treatment ($F(1,9)=0.65$, $p>.4$).

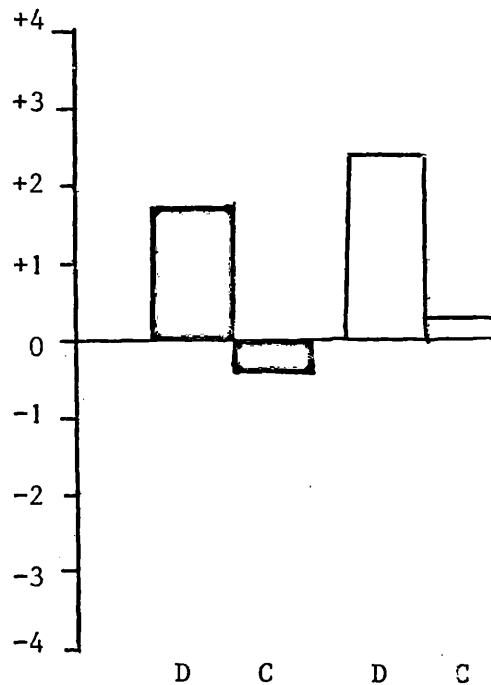
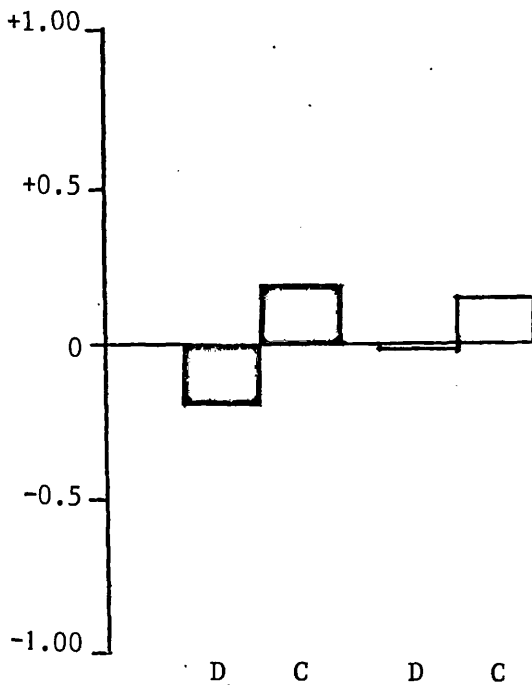
An examination of within-intervention change scores showed a greater reduction in depressed mood during distraction than during the control condition in all twelve patients. The reduction in depressed mood during distraction was in itself significant (mean

Figure 5.3 Study II : Mean frequency of depressing thoughts during : distraction (D) and the control condition (C), and mean change scores on measures of depression over both interventions, low (NDS: score ≤ 3) and high (NDS score $\rightarrow 3$) endogenous patients



a) Frequency of depressing thoughts

b) Depressed mood (VAS)



c) Speech rate (time taken count from 1 to 10)

d) Writing speed (no. of nos written in 1 min.)

reduction=19.42, dependent $t(11)=3.73$, $p<.004$). The increase in depressed mood during the control condition was not (mean increase=12.34, dependent $t(11)=1.38$, $p>.1$). This is in contrast to Study I, where the control procedure led to larger changes in mood than the distraction procedure, and suggests that the effects of distraction were, as intended, enhanced by the introduction of the five minute gap before each intervention. This was despite the fact that the depressing thoughts reported aloud during the control condition were, as in Study I, rated to be more depressing on average (mean rating=-1.35) than the nondepressing thoughts reported aloud during distraction were rated to be happy (mean rating=+0.37). During distraction, only 26% of nondepressing thoughts were given a mean rating of at least +1 (slightly happy), and only 3 thoughts (3%) were given a mean rating of at least +2 (moderately happy). In contrast, during the control condition, 78% of depressing thoughts were given a mean rating of at least -1 (slightly depressing), and 34% were given a mean rating of at least -2 (moderately depressing).

In order to assess whether the effects of distraction on depressed mood persisted beyond immediate engagement in the interventions, the change in depressed mood from before the first intervention to before the second (that is, including 5 minutes after the first intervention during which patients were left alone) was compared between those receiving distraction first and those receiving the

control first. There was no difference between the two groups before the first intervention ($t(10)=0.58$, $p>.5$). The difference between change scores for the two groups was however significant (mean change for those receiving distraction first = -10.83 ; mean change for those receiving the control condition first = $+11.00$; $t(10)=2.30$, $p<.05$). Thus the difference in the effects of the two procedures was still evident 5 minutes after they had stopped.

Speech rate Mean time taken to count from 1 to 10 was marginally smaller after distraction than after the control condition. The difference, although in the predicted direction, was not significant ($F(1,9) = 1.52$, $p > .2$). There was no significant main effect for order ($F(1,9)=0.00$, $p>.9$), and no significant interaction between order and treatment ($F(1,9)=0.82$, $p>.3$).

Writing speed As predicted, the number of numbers written in one minute was significantly greater following distraction than following the control procedure ($F(1,9)=5.66$, $p<.05$). There was no significant main effect for order ($F(1,9)=0.69$, $p>.4$), and no significant interaction between order and treatment ($F(1,9)=0.89$, $p>.3$).

Low versus high endogenous patients

The study's second aim was to explore further the relative responsiveness to distraction of patients low and high in endogeneity. It was predicted on the basis of results from Teasdale and Rezin (1978a) and from Study I that sensitivity to distraction would be reduced, if not absent, in high endogenous patients. Mean frequency of depressing thoughts and mean scores on each measure of depression before and after both interventions

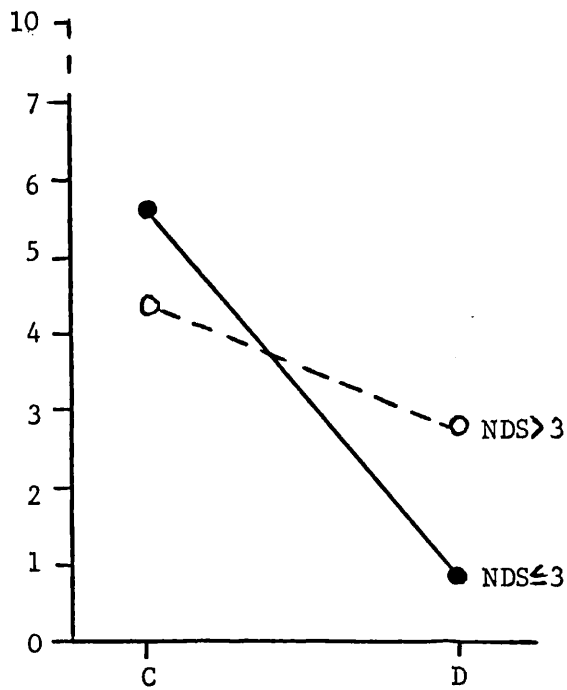
for the two order groups combined are shown in Table 5.1. Change scores are illustrated in Figure 5.3, and interactions in Figure 5.4. (Mean scores for each order of presentation separately, and the summary tables for the analyses, will be found in Appendix VIII.)

Effect of distraction on frequency of depressing thoughts

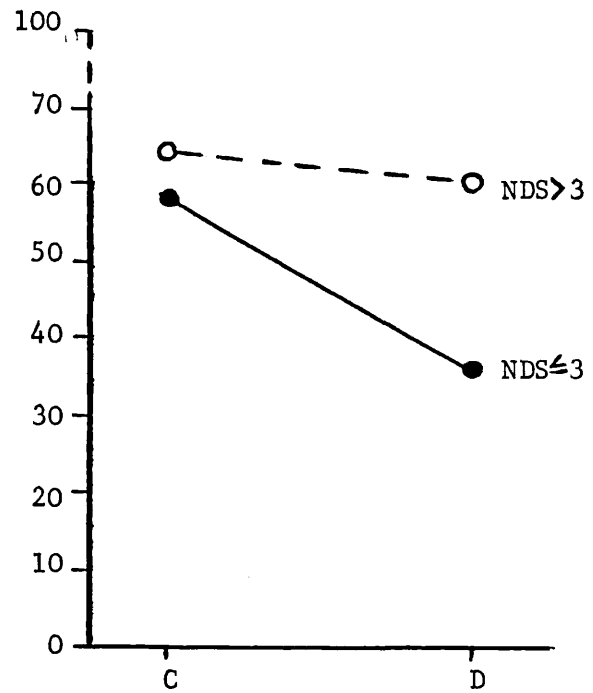
The effects of distraction on frequency of depressing thoughts were assessed using analysis of variance, with endogeneity and order of presentation of the two interventions as between-subject factors. Differences between individual cells were assessed using post hoc Tukey tests.

There was a significant main effect for treatment, both endogeneity groups reporting a lower mean frequency of depressing thoughts during distraction than during the control condition ($F(1,26)=35.55$, $p<.0001$). There was no significant main effect for endogeneity ($F(1,26)=0.15$, $p>.6$). A significant interaction between treatment and endogeneity ($F(1,26)=8.42$, $p<.008$) showed differences between the two conditions to be considerably more marked in low than in high endogenous patients (see Figure 5.4 a). Indeed, post hoc Tukey tests showed that in the latter, there was no significant difference in frequency of depressing thoughts between distraction and the control procedure. There was no significant main effect for order ($F(1,26)=1.10$, $p>.3$), and there were no significant interactions between order and treatment ($F(1,26)=2.34$, $p>.1$), order and endogeneity ($F(1,26)=0.52$, $p>.4$), or between order, treatment and endogeneity ($F(1,26)=0.07$, $p>.7$).

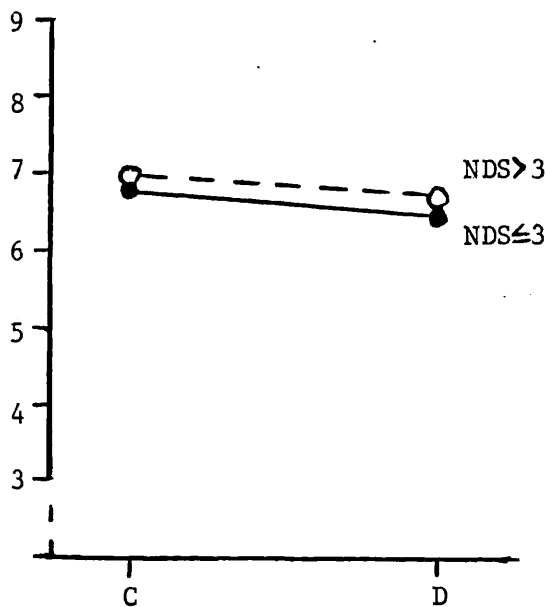
Figure 5.4 Study II : Mean frequency of depressing thoughts and adjusted mean post-intervention scores on measures of depression for low (NDS score ≤ 3) and high (NDS score > 3) endogenous patients, distraction (D) vs. the control condition (C)



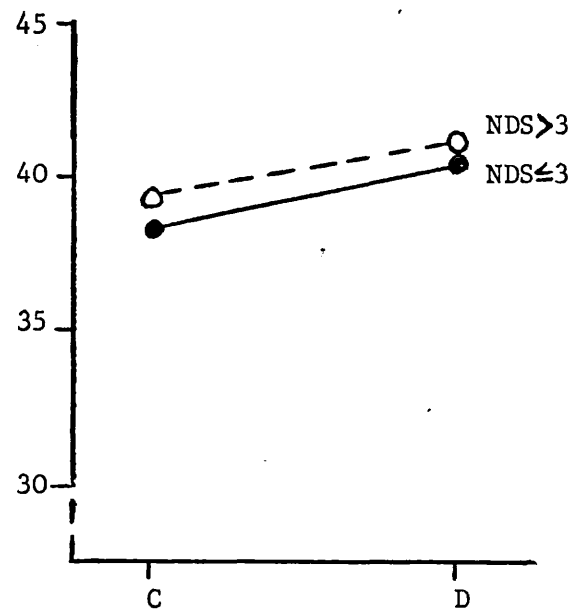
a) Frequency of depressing thoughts



b) Depressed mood (VAS)



c) Speech rate (time taken to count from 1 to 10)



d) Writing speed (no. of nos written in 1 min.)

Effects of distraction on measures of depression

The effects of distraction on depressed mood, speech rate and writing-speed were assessed in a series of analyses of covariance on post-intervention scores, with pre-intervention scores as the covariates, and with endogeneity and order of presentation of the two interventions as between-subject factors. Post hoc Tukey tests were used to assess differences between individual cells.

Depressed mood The analysis showed a significant main effect for treatment ($F(1,25)=6.42$, $p<.02$), both groups being on average less depressed after distraction than after the control condition. The main effect for endogeneity just failed to reach significance ($F(1,25)=4.19$, $p>.05$). High endogenous patients tended to be more depressed on average after both interventions than low endogenous patients. The interaction between endogeneity and treatment was not significant ($F(1,25)=2.30$, $p>.1$). However, Figure 5.4b shows clearly that, as predicted, responsiveness to distraction was greater among low than among high endogenous patients. Post hoc Tukey tests showed that there were no significant differences between distraction and the control condition among high endogenous patients, or between high and low endogenous patients following the control condition. The difference between the two groups following distraction was significant ($p<.05$). Thus the main effects of both treatment and endogeneity were primarily carried by the different response to distraction of the two groups. There was no significant main effect for order ($F(1,25)=1.45$, $p>.2$), and there were no significant interactions between order and treatment ($F(1,25)=1.54$, $p>.2$), order and endogeneity ($F(1,25)=0.06$, $p>.8$), or order, treatment and

endogeneity ($F(1,25)=0.00$, $p>.9$).

Inspection of the pattern of change over the two conditions revealed a further difference: whereas low endogenous patients on average showed a decrease in depressed mood over distraction and an increase over the control condition (see above), high endogenous patients on average showed similar increases over both interventions (mean increase over distraction = 10.28; mean increase over the control condition = 14.16) (Table 5.1). High endogenous patients thus responded to the control condition in a similar manner to low endogenous patients. Their response to distraction, however, was in the reverse direction. That is, they became more, not less, depressed while viewing the slides. This was despite the fact that their mean frequency of depressing thoughts was somewhat lower during distraction than during the control condition.

Speech rate There was no significant main effect on speech rate for endogeneity ($F(1,25)=0.42$, $p>.5$), and a marginal main effect for treatment ($F(1,25)=3.38$, $p<.08$). The latter reflects the fact that both groups tended to count from 1 to 10 more slowly after the control condition than after distraction (see Figure 5.4c). The interaction between endogeneity and treatment was not significant ($F(1,25)=0.72$, $p>.4$). There was no significant main effect for order ($F(1,25)=0.24$, $p>.6$), and there were no significant interactions between order and treatment ($F(1,25)=0.27$, $p>.6$), order and endogeneity ($F(1,25)=0.36$, $p>.5$), or between order, treatment and endogeneity ($F(1,25)=0.69$, $p>.4$).

Figure 5.5 Study II : Mean speech rate at successive assessment points (practice (P); before (1) and after (2) the first intervention; before (3) and after (4) the second intervention), for low (NDS score ≤ 3) and high (NDS score > 3) endogenous patients, distraction first (D→C) and control first (C→D) presented separately

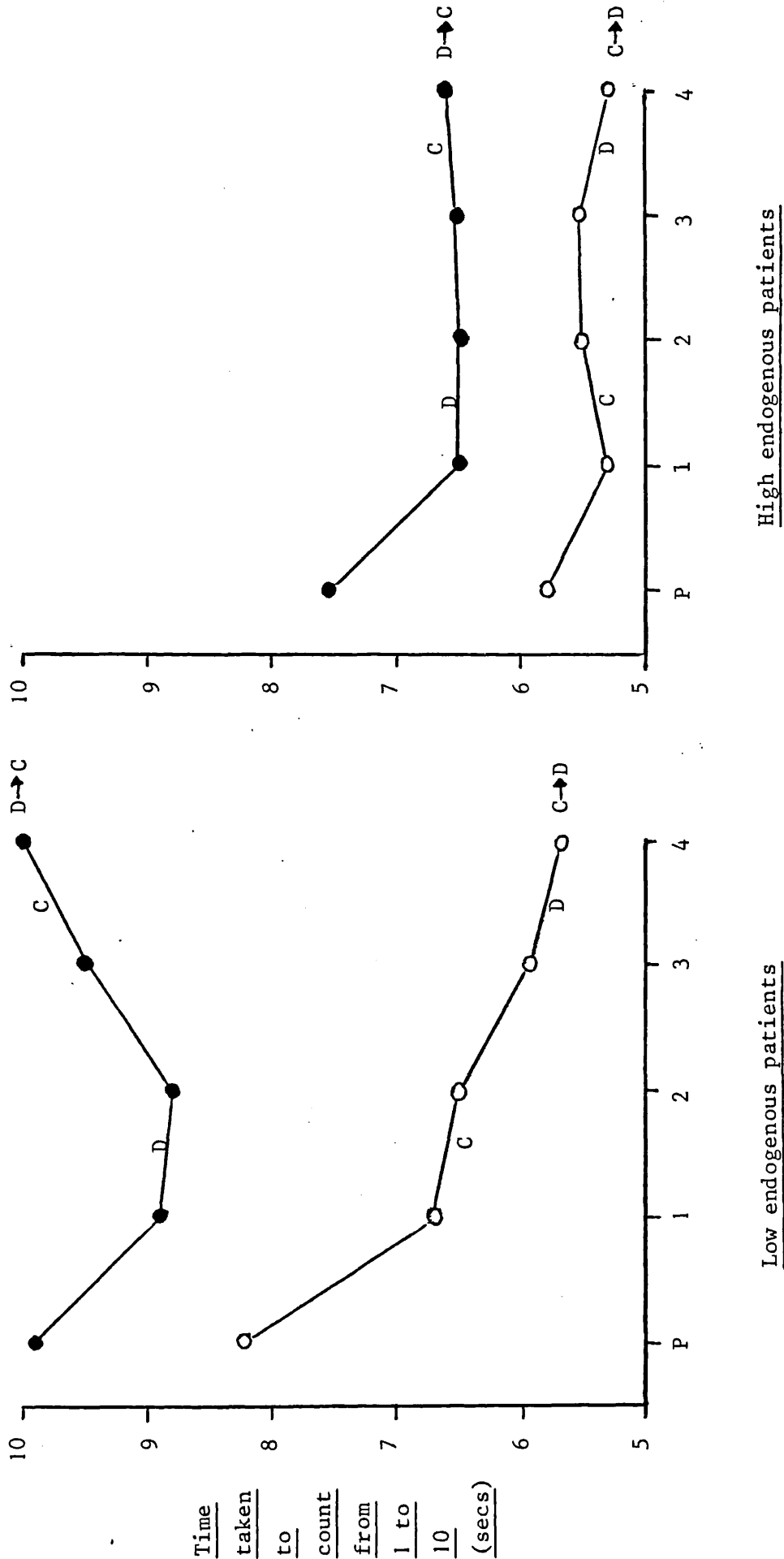


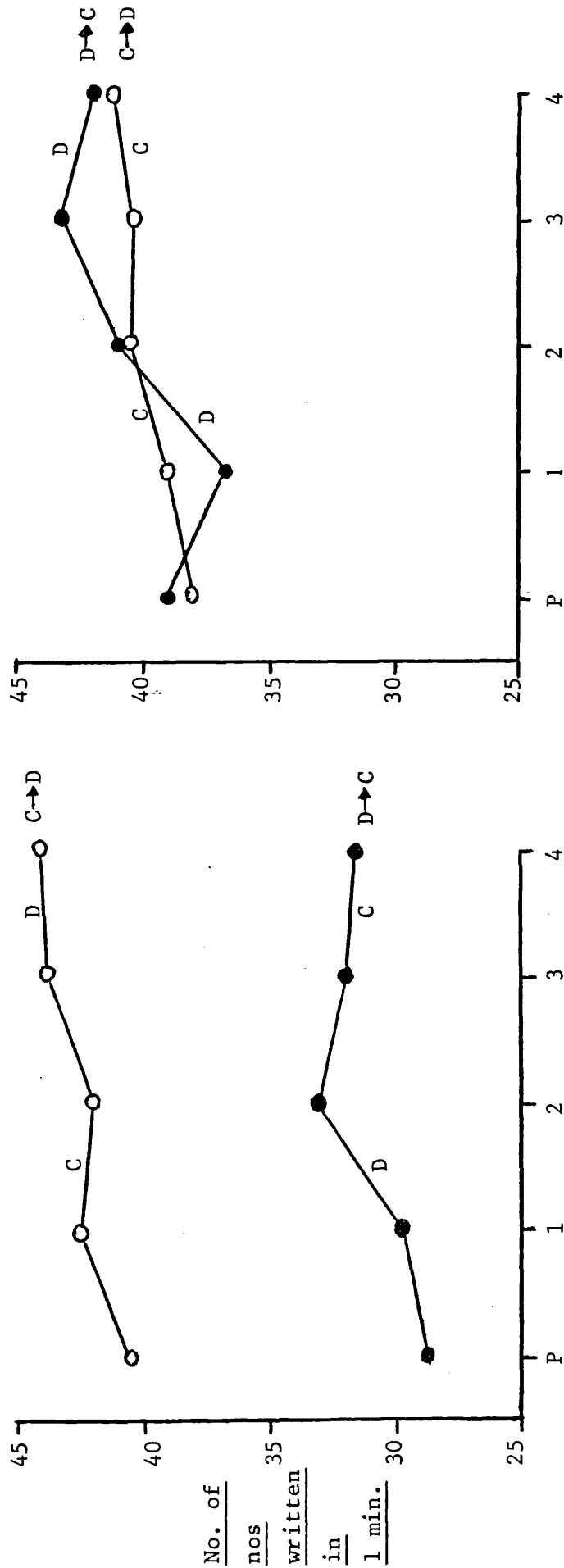
Figure 5.5 shows no consistent evidence of practice effects, except perhaps in the low endogenous patients who received the control condition first.

Writing speed There were no significant main effects on writing speed for treatment ($F(1,25)=2.86$, $p>.1$), or for endogeneity ($F(1,25)=0.50$, $p>.4$), and the interaction between treatment and endogeneity was not significant ($F(1,25)=1.31$, $p>.2$). The marginal treatment effect reflects the fact that both endogeneity groups tended to write down fewer numbers after the control condition than after distraction (see Figure 5.4d). There was no significant main effect for order ($F(1,25)=1.12$, $p>.3$), and there were no significant interactions between order and treatment ($F(1,25)=0.26$, $p>.6$), order and endogeneity ($F(1,25)=0.50$, $p>.4$), or order, treatment and endogeneity ($F(1,25)=0.06$, $p>.8$). Figure 5.6 shows no consistent evidence of practice effects, except perhaps in the high endogenous patients who received the control condition first.

DISCUSSION

In clinically depressed patients low in endogeneity, distraction significantly reduced the frequency of depressing thoughts compared to a control procedure. As would be predicted from the cognitive model of depression, these patients felt significantly less depressed, and showed significantly faster writing speed after distraction than after the control condition. Results on speech rate, while in the predicted direction, were not significant. In high endogenous patients, distraction did not

Figure 5.6 Study II : mean writing speed at successive assessment points (practice (P); before (1) and after (2) the first intervention; before (3) and after (4) the second intervention), for low (NDS score ≤ 3) and high (NDS score > 3) endogenous patients, distraction first (D \rightarrow C) and control condition first (C \rightarrow D) presented separately



Low endogenous patients

High endogenous patients

consistently reduce the frequency of depressing thoughts compared to the control procedure, and there were no significant differences between post-distraction and post-control scores on any measure.

The lack of significant difference between the two conditions on speech rate in low endogenous subjects could have been the product of a number of different factors. On the one hand, it could be that the subjects varied in the degree to which they were sensitive to this measure, for example because of variation in the extent to which psychomotor retardation formed an aspect of their individual symptomatology. Although all were selected using the same criteria, the RDC requires the presence of only 5 out of a possible 8 symptoms for a diagnosis of Major Depressive Disorder, and offers retardation and agitation as alternatives to each other. Thus the presence of psychomotor slowing was not a necessary condition for entry to the study. Teasdale, Fogarty and Williams (1980) have noted patient heterogeneity of this kind as a possible explanation for the fact that only some of the patients they investigated demonstrated covariation between speech pause time (which correlates highly with total time taken to count from 1 to 10) and self-reported depressed mood. However, if variability in overall levels of psychomotor retardation were responsible for the results, the significant differences found on writing-speed would not have emerged. A second possibility was that the distraction procedure employed in Study I was more absorbing (and thus more comprehensive in its effects) than the

modified version used in Study II. That is, subjects in Study I could turn to a new stimulus whenever their attention flagged, and the requirement to describe the slides aloud might in addition have facilitated attentional focussing. If this were the case, however, lower ratings of involvement would be expected for the distraction procedure used in Study II than for that used in Study I. In fact, distraction in Study II was rated on average as marginally more involving (mean rating = 6.17) than distraction in Study I (mean rating = 5.82). In addition, the frequency of depressing thoughts during distraction was lower in Study II than in Study I. This was not due to an overall difference in level of depressing thoughts in the two samples of low endogenous patients, since a similar difference was not present in the control condition. Thus a difference in the extent to which the two distraction procedures succeeded in holding subjects' attention is unlikely to explain the results on speech rate. A third possibility is that the higher level of activity required by distraction in Study I (where subjects both described the slides aloud, and manipulated the controls of the slide projector) produced a higher level of physical activation, which was reflected in speech rate. It has been noted elsewhere (Teasdale et al., 1980; Teasdale and Fennell, 1982) that measures such as counting-time may be influenced by factors affecting activation other than depressed mood. If this were so, however, a similar loss of difference between distraction and the control procedure should be evident on writing speed. In fact, this was not the case. The most likely explanation, therefore, is that the requirement to vocalise in Study I exerted a specific effect on

speech rate, and that removal of this requirement resulted in a loss of the significant difference between the two conditions on this measure.

Examination of thought-content in low endogenous patients suggested that a major effect of distraction was to reduce the frequency of thoughts reflecting preoccupation with depressing current concerns outside the experimental situation (differences in thought-content between high and low endogenous patients will be discussed in more detail in Chapter 7.) During the control procedure, in contrast, the absence of any stimulus sufficiently complex or novel as to require intensive processing allowed the emergence of a considerable number of depressing thoughts related to patients' current life circumstances. Many depressing thoughts related to patients' life circumstances revealed a high degree of negative self-evaluation and of hopelessness, e.g. "It's all my fault things have gone wrong", "I can't do anything", "I feel useless", "What's it all for? I can't see the point", and "I don't think I'm ever going to go home". Such powerfully depressing thoughts were successfully offset during distraction by thoughts whose hedonic tone was predominantly neutral (91% of nondepressing thoughts were simply descriptions of some aspect of the experimental situation). Thus, in order to lift depressed mood in low endogenous patients, it was sufficient to direct attention away from central depressing concerns to the immediate environment. The introduction of happy thoughts of an intensity equal to that of the depressing thoughts was not necessary,

although presumably this would be likely to result in a greater alleviation of depressed mood.

A main concern of the present study was to improve methodologically on Study I. This was intended to increase confidence in the conclusion that, for depressed patients low in endogeneity, short-term reductions in the frequency of depressing thoughts will lead to corresponding reductions in depression. The modifications to the experimental procedure which were intended to achieve this aim have been described above. As far as the results of these modifications are concerned, the marked effect of distraction on thinking and mood in low endogenous patients cannot be accounted for by experimental demand, since none of the subjects included in the analysis was judged to have guessed the purpose of the experiment. Equally, it cannot be explained by order of presentation of the two interventions, since this was random and balanced. In addition, no significant main effects for order, or interactions between order, treatment and endogeneity emerged. Similarly, mastery cannot be used to explain the results, since the slides were not under subjects' control. Vocalisation equally will not account for differences between the two conditions (with the possible exception of a specific effect on speech rate), since there was no requirement to describe the slides aloud. Despite these improvements, however, the possibility that the two procedures might have direct differential effects on mood, rather than operating through their impact on frequency of depressing thoughts, had not been examined. Unless this possibility were excluded, the results could not be taken

unequivocally to support Beck's cognitive model of depression. For this reason, a third study was carried out, using a similar design to examine the effects of distraction on thinking and affect in nondepressed student subjects. This study is reported in Chapter 6.

CHAPTER 6IMMEDIATE EFFECTS OF DISTRACTION ON THINKING AND AFFECT IN
NONDEPRESSED STUDENT SUBJECTS : STUDY III

Study II essentially replicated the findings of Study I. It demonstrated that, in depressed patients low in endogeneity, a brief period of distraction significantly reduced the frequency of depressing thoughts, compared to a control procedure. Consistent with Beck's cognitive model of depression, low endogenous patients were less depressed and showed significantly faster writing speed and somewhat faster speech rate after distraction than after the control procedure. Similar effects were not present in patients high in endogeneity. In addition, Study II excluded order of presentation, mastery and vocalisation as potential alternative explanations for the differential effects of the two experimental procedures. It did not however address the possibility that the effects of distraction and of the control procedure on measures of depression might have resulted from their exerting a direct influence on mood, rather than from a primary impact on frequency of depressing thoughts. That is, the distraction procedure might have been inherently more mood-elevating than the control procedure, for example, because it included pleasanter or more interesting stimuli. If this were the case, the differences between the two conditions in frequency of depressing thoughts

would be simply a correlate of mood-change, rather than a necessary precursor to it. In order to resolve this question, it was necessary to compare the effects of distraction and of the control procedure on a sample of subjects who were experiencing depressing thoughts with their effects on a similar sample who were not. The study reported in this chapter investigated the effects of the distraction procedure employed in Study I on a sample of nondepressed student subjects. It was assumed that, although none of the students was clinically depressed, some of them would nonetheless be preoccupied with depressing concerns (for example, academic difficulties, boyfriend or family troubles).

The study had two main aims: 1) to investigate whether the changes in thinking, mood and psychomotor speed observed in low endogenous patients would also be present in subjects who were not clinically depressed, but who were experiencing depressing thoughts (i.e. a normal population); and 2) to investigate the possibility that such changes might be due not to the effects of distraction and of the control procedure on frequency of depressing thoughts, but rather to the direct impact on mood of some quality inherent in the two procedures, in particular their relative pleasantness. If the latter were the case, then similar changes should be observable in all subjects, whether they reported depressing thoughts or not. That is, both those reporting depressing thoughts and those reporting none should on average feel less depressed and be faster on measures of

psychomotor speed after distraction than after the control procedure. If, on the other hand, distraction depends for its effects on a reduction in the naturally occurring frequency of depressing thoughts, then changes in depression should be present only in subjects who reported such thoughts.

It was predicted that in subjects reporting depressing thoughts: 1) frequency of such thoughts would be lower during distraction than during the control procedure; and 2) as would be predicted from the cognitive model of depression, these subjects would report feeling less depressed and show faster speech rate and writing speed after distraction than after the control. That is, they should respond in the same way as low endogenous patients, albeit probably to a lesser extent, since a lower frequency of depressing thoughts would be expected in subjects with a low level of depression (c.f. Hollon and Kendall, 1978). In subjects who did not report any depressing thoughts during the course of the experiment, no marked effects of either procedure on mood or on psychomotor speed were predicted.

METHOD

Overview

The experimental procedure was almost identical to that employed in Study I. For each subject, the effects on depressing thoughts, depressed mood, speech rate and writing speed of five minutes concentrating on a series of slides were compared with those of five minutes sitting in a relaxed way and focussing attention on a

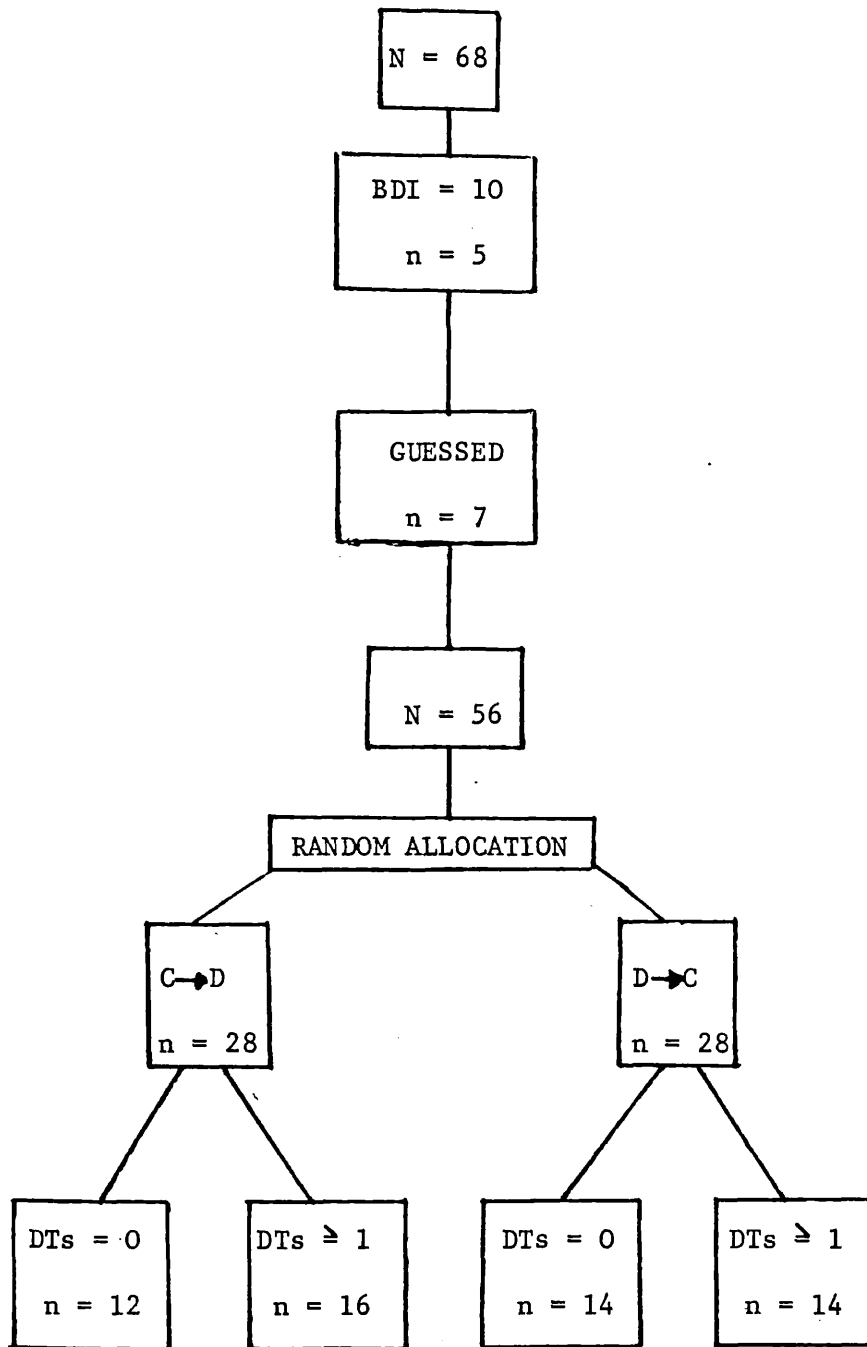
rectangle of white light projected on the wall.

As in Study I, subjects were asked to describe the slides aloud, and the rate of presentation of the slides was under their control. However, some modifications to the original experimental procedure were made, similar to those reported in Study II. These were: 1) no direct mention of depression when the experiment was introduced; 2) strengthened instructions for the control procedure, so as to introduce an element of counter-demand; 3) measurement of happiness, energy and anxiety in addition to depression; 4) exclusion of any subject judged by independent raters to have guessed the purpose of the experiment; 5) order of presentation as far as possible random and balanced, and results analysed for possible effects of order; 6) five-minute breaks before both interventions; and 7) signals to report thoughts aloud at random rather than regular intervals.

Subjects

Sixty-eight nondepressed female students (mean age 20.49 years) were recruited over a 5-month period from November 1983 to April 1984 from a local Polytechnic and from a School of Occupational Therapy. They were asked to take part in a study of "stress and perception". "Nondepressed" was defined as a score of 9 or less on the Beck Depression Inventory (BDI) (Beck et al., 1961) on the day of testing (subject selection and allocation to experimental groups are illustrated in Figure 6.1). All subjects were volunteers, and they were paid a small sum of money for participating in the experiment. Five subjects were excluded from

Figure 6.1 Study III : Nondepressed student subjects, selection and allocation to experimental groups, with mean BDI score for each group



Mean BDI score

3.67

3.69

3.36

4.43

the analysis because they scored 10 or more on the BDI (that is, they could be considered to be verging on clinical depression). Seven more were excluded because they were rated by independent judges to have guessed the purpose of the experiment. Of the remaining 56 subjects, half received distraction first, and half the control procedure. Of those receiving distraction first, 14 reported depressing thoughts in one condition or the other, and 14 did not. Of those receiving the control procedure first, 16 reported depressing thoughts in one condition or the other, and 12 did not.

Order of presentation of the experimental interventions was random and balanced, with the single constraint that level of scoring on the BDI should remain more or less equal in each order group. It was not possible a priori to equate number of subjects or BDI score in the groups defined according to presence or absence of depressing thoughts, since these emerged only in the course of the experiment. In the event, mean BDI score for the whole sample was 3.79, and there was no significant difference on the BDI between the four groups of subjects, that is, those reporting depressing thoughts and those reporting none who received each order of presentation of the two interventions ($F(3,52) = 0.36$, N.S.)(see Figure 6.1 for mean BDI scores).

Measures

As in Studies I and II, frequency of depressing thoughts was measured during both interventions and depressed mood, speech rate and writing speed were assessed before and after each intervention (that is, on four separate occasions). Copies of the measures

will be found at Appendix X.

Frequency of depressing thoughts Ten tones sounded at random intervals during each intervention. As in Study I, subjects reported when each tone sounded whether what they were thinking at that moment was depressing ("Yes") or not ("No"). "Depressing" was defined as "the kind of thought that might make anyone feel depressed if they had it". What subjects actually were thinking was reported aloud verbatim on three randomly chosen occasions. These thoughts were transcribed and rated by independent judges on a 7-point scale ranging from -3 (extremely depressing) to +3 (extremely happy). "Depressing" was defined to the judges in the same way as to the subjects.

Depressed mood was measured using a 10 cm Visual Analogue Scale (VAS).

Speech rate Subjects counted out loud from 1 to 10 "in their own time". On each occasion, the mean of two tape-recorded counts was the measure.

Writing speed The number of numbers from 100 downwards written in one minute was the measure.

Happiness was measured in addition to depression, using a VAS labelled "Not at all happy" at the left hand end and "As happy as you possibly could be" at the right hand end. At each assessment point, subjects made a cross on the line to indicate how happy they felt "right now". Happiness was measured in addition to depression because it was hypothesised that in nondepressed subjects it would be more sensitive to change than depression. (Anxiety and energy were also measured in order to dilute the

focus on depression and happiness. Findings on these will not be reported in the main body of the chapter. A summary of results, mean scores before and after each intervention separately presented for those receiving distraction first and for those receiving the control condition first, summary tables for related analyses of covariance, and figures illustrating change scores over the two interventions and interactions between treatment and presence or absence of depressing thoughts will be found at Appendix XII.)

Pleasantness ratings Subjects rated both procedures for pleasantness on a 7-point scale ranging from -3 (extremely unpleasant) through 0 (neither pleasant nor unpleasant) to +3 (extremely pleasant).

Post-experimental enquiry As in Studies I and II, subjects were asked three post-experimental questions: 1) What do you think the experiment was about? 2) What do you think I expected to happen? and 3) Do you think I expected you to feel different after looking at the slides than after relaxing with the white light, and if so, how? As in Study II, answers were rated by independent judges according to whether subjects had guessed the purpose of the experiment or not. As has already been mentioned, seven subjects were judged to have correctly guessed the purpose of the experiment and were excluded from the analysis.

Procedure

A copy of the experimental instructions, which were standardised, will be found at Appendix X. The experiment took one hour. It was almost identical in design to Study I (differences, similar to those introduced in Study II, have already been described, and

some are marked with an asterisk in Figure 6.2).

Subjects first practised the various measures, and familiarised themselves with the two experimental procedures. In the Distraction condition (which was modeled by the experimenter), they were asked to concentrate as far as possible on a series of slides projected on the wall. To aid concentration, they were asked to describe each slide out loud in as much detail as possible. Rate of presentation of the slides was under subjects' own control. They were assured that viewing the slides was not a test, that they would not be required to recall what they had seen, and that nothing deep would be read into what they said. The same slides as in Study I and Study II were used, and in the same order. However, as they were under subjects' control, not all subjects saw the same number of slides (mean number of slides viewed = 4.87, range 2-10). In the Control condition, subjects were asked to sit as comfortably as possible, to relax as far as possible, and to keep their attention focussed on a rectangle of white light projected on the wall. Order of presentation of the two interventions (each of which lasted 5 minutes) was random and balanced. Each subject received both interventions.

After the practice period, subjects were left alone for five minutes "to settle down before beginning the experiment itself". The first intervention was then presented, preceded and followed by the measures of depressed mood, happiness, speech rate and writing speed in that order, and followed by ratings of

involvement (as described in Studies I and II) and of perceived pleasantness of the intervention. After a further five minute gap, the second intervention was given, preceded and followed by the same measures. Finally, the post-experimental questionnaire was given, and subjects were debriefed and thanked.

RESULTS

Overview

As predicted, frequency of depressing thoughts in subjects who reported such thoughts was significantly lower during distraction than during the control procedure. Consistent with the cognitive model of depression, these subjects were significantly less depressed and showed significantly faster speech rate and writing speed after distraction than after the control condition. Similar effects were not present in subjects who reported no depressing thoughts. Both groups rated viewing the slides as pleasanter than focussing on the white light. Thus, the rated pleasantness of the two interventions was independent of their effects on mood. In summary, the study demonstrated that in nondepressed student subjects reporting depressing thoughts, the two procedures produced effects similar to those observed in low endogenous patients, and that these effects could not be accounted for by the relative pleasantness of the two interventions.

Validity of categorisation of thoughts

To convert judges' ratings of thoughts to a form comparable to the categorisation used by subjects, negative scores on the 7-point

scale (-3 to -1) were taken to indicate a depressing categorisation, and neutral (0) and positive scores (+1 to +3) a nondepressing categorisation. On this basis, there was agreement between the subject and all three independent judges for 94% of thoughts reported aloud. Mean judges' rating for thoughts classified by subjects as depressing was -1.45. Mean judges' rating for thoughts classified by subjects as not depressing was +0.22. Thus, as with depressed patients, thoughts reported as not depressing were on average neutral, rather than actively happy. Indeed, 61% of nondepressing thoughts were rated 0 by all three judges (neither depressing nor happy). Only 8% of thoughts received a mean rating of more than +1 (slightly happy), and only one thought received a mean rating of more than +2 (moderately happy).

Subjects reporting depressing thoughts

The study's first aim was to examine the prediction that nondepressed subjects experiencing depressing thoughts would respond to distraction and to the control procedure in a manner similar to the low endogenous patients who took part in Studies I and II. That is, the frequency of depressing thoughts in these subjects would be lower during distraction than during the control procedure, and, consistent with the cognitive model of depression, they would feel less depressed and show faster speech rate and writing speed after distraction than after the control condition. Subjects reporting one or more depressing thoughts in either

condition were therefore first considered alone.

Frequency of depressing thoughts

Frequency of depressing thoughts in the two conditions was compared using a split-plot analysis of variance with order of presentation as a between subject factor. Mean frequencies during each intervention for those receiving distraction first and for those receiving the control condition first combined are presented in Table 6.1. (Means for the two order groups separately, and a summary table for the analysis of variance, are presented in Appendix XI.)

In those subjects who reported depressing thoughts, the frequency of such thoughts was, as predicted, significantly lower during distraction (mean = 0.67) than during the control condition (mean = 2.13) ($F(1,28) = 17.16, p < .001$). There was no significant main effect for order ($F(1,28) = 0.14, N.S.$), and no significant interaction between order and treatment ($F(1,28) = 1.09, N.S.$). Two subjects reported equal numbers of depressing thoughts in both conditions. Of the twenty-eight remaining, 25 reported fewer depressing thoughts during distraction than during the control condition (this is significant by the sign test, $p < .001$). Nineteen subjects reported no depressing thoughts at all during distraction; only two reported none during the control condition. Thus, as predicted, distraction significantly reduced the frequency of depressing thoughts in subjects who reported experiencing such thoughts during the course of the experiment.

On average, rated involvement in distraction (mean=7.13) was

Table 6.1 Study III : Student subjects - Mean frequency of depressing thoughts during distraction and during the control condition, and mean scores on measures of depression and happiness before and after each intervention

	<u>Subjects with</u>		<u>Subjects with no</u>					
	<u>depressing thoughts</u> ^a		<u>depressing thoughts</u> ^b					
	<u>Distraction</u>	<u>Control</u>	<u>Distraction</u>	<u>Control</u>				
	<u>Pre</u>	<u>Post</u>	<u>Pre</u>	<u>Post</u>	<u>Pre</u>	<u>Post</u>	<u>Pre</u>	<u>Post</u>
Frequency of depressing thoughts	0.67	2.13	0	0				
Depressed mood	29.67	25.77	30.37	41.50	12.42	16.19	18.38	16.50
Happiness	58.67	61.97	57.04	55.40	67.39	65.27	67.12	65.04
Speech rate (secs)	5.51	5.20	5.79	5.74	5.39	5.15	5.39	5.13
Writing speed (no. of nos written in 1 min.)	52.23	55.41	53.33	52.70	50.42	52.31	50.88	51.50

Notes

a n = 30 for each mean

b n = 26 for each mean

significantly higher than rated involvement in the control procedure (mean=4.43) ($t(29)=5.39$, $p<.0001$). The correlation between involvement and frequency of depressing thoughts, however, was not significant either for distraction ($r(28)=0.09$, N.S.) or for the control condition ($r(28)=0.01$, N.S.), perhaps because of the relatively restricted range of frequency of depressing thoughts (0-5) in both conditions (compared, for example, to a range of 0-10 in the low endogenous patients who took part in Study II).

As with the low endogenous patients who took part in Studies I and II, a major function of distraction was to block out preoccupation with depressing current concerns. During distraction, 100% of depressing thoughts (and 99% of nondepressing thoughts) reported out loud concerned the experiment. During the control condition, in contrast, 83% of depressing thoughts concerned the subjects' current life circumstances outside the experimental situation. (A higher proportion of nondepressing thoughts (41%) was also concerned with subjects' circumstances outside the experimental context). Thoughts related to the subjects' own circumstances were on average rated by independent judges as significantly more depressing than thoughts relating to the experiment (mean rating = -1.64 as opposed to -1.02)($t(17)=3.25$, $p<.01$). (This excludes twelve subjects whose depressing thoughts were not reported aloud verbatim, but simply indicated by stating "Yes" when the tone sounded.) Examples of depressing and nondepressing thoughts related to the experiment and to subjects' personal circumstances,

together with mean judges' ratings, are given in Figure 6.3.

Effects of the two interventions on measures of depression and happiness

Post-intervention scores on measures of depressed mood, happiness, speech rate and writing speed were examined using analysis of covariance with pre-intervention scores as the covariates, and with order of presentation of the two interventions as a between subject factor. Table 6.1 shows mean scores before and after both interventions on each measure for those who received distraction first and for those who received the control condition first combined, since the effects of the two interventions did not depend on which was experienced first. (Means for the two order groups separately, and summary tables for the analyses of covariance, will be found at Appendix XI.)

Depressed mood As predicted, subjects reporting depressing thoughts were significantly less depressed after distraction than after the control condition ($F(1,27)=12.55, p<.002$). There was also a significant main effect for order of presentation of the two interventions ($F(1,27)=5.52, p<.03$), subjects who received distraction first being more depressed on average after both interventions than subjects who received the control condition first. (The means presented at Appendix XI show that subjects reporting depressing thoughts who received distraction first were in fact more depressed at every measurement point than subjects who received the control condition first.) There was, however, no significant interaction between order and treatment ($F(1,27)=0.26, p>.6$). Thus the effects of distraction and of the control procedure on depressed mood did not depend on which was

Figure 6.3 Study III : Examples of depressing and non-depressing thoughts related to the experiment itself and to Ss' own situations external to the experiment, together with mean judges' ratings on a 7-point scale from -3 (extremely depressing) to +3 (extremely happy)

Mean judges' rating

Thoughts related to the experiment

Depressing

<u>Distraction</u>	How useless I am at description	-1.67
	Thinking, oohh! How boring, I hate that sort of place (referring to slide)	-1.33
<u>Control</u>	Imagining there's space all around me, and just being stuck out there, suspended in the middle of nowhere, isolated, floating, alone	-1.33
	Thinking how depressing this room is	-1.67

Nondepressing

<u>Distraction</u>	Thinking about my holiday in Greece - it's very like a train ride we had (slide)	+1.33
	Very large city, very flat as well (referring to slide)	0
<u>Control</u>	I was thinking of the sound the waves make, listening to the noise of the tape-recorder	+0.67
	Thinking about all the squiggles, like amoeba, on the white light	0

Cont'd/...

Figure 6.3 Cont'd/...

<u>Thoughts related to the subjects' own situations</u>		<u>Mean judges' rating</u>
<u>Depressing</u>		
<u>Distraction</u>	None	
<u>Control</u>	My exam revision. Such a lot to do by Friday. I won't get it all done	-1.33
	My fiance is diagnosed as having cancer	-3.00
<u>Nondepressing</u>		
<u>Distraction</u>	Whether I should move house or not	+1.67
<u>Control</u>	When shall I eat the gammon?	0
	What a good disco it was last night	+2.33

experienced first.

As in Study I, the reduction in depressed mood which occurred during distraction was not in itself significant (mean reduction=3.90; $t(29)=1.75$, $p<.1$). The increase in depressed mood which occurred during the control condition, on the other hand, was (mean increase=11.13; $t(29)=3.05$, $p<.02$).

There was a significant positive correlation between mood-change and frequency of depressing thoughts during the control condition ($r(28)=0.48$, $p<.02$), but not during distraction ($r(28)=0.19$, N.S.), probably because nearly two thirds of the subjects ($n=19$) reported no depressing thoughts in this condition.

Happiness The significant main treatment effect on depressed mood was not accompanied by comparable differences in happiness between the two conditions, although subjects tended on average to be happier after distraction than after the control condition ($F(1,27)=3.28$, $p<.09$). There was a significant main effect for order of presentation ($F(1,27)=7.15$, $p=.01$), subjects who received distraction first being less happy after both interventions than subjects who received the control condition first. (Again, the figures presented at Appendix XI show that subjects receiving distraction first were less happy at every measurement point than subjects who received the control condition first.) The interaction between order and treatment was not, however, significant ($F(1,27)=0.36$, $p>.5$).

Speech rate was on average significantly faster after

distraction than after the control condition ($F(1,27)=4.62$, $p<.05$). There was a significant main effect for order ($F(1,27)=5.93$, $p=.02$), subjects who received distraction first being faster after both interventions than subjects who received the control condition first (as indeed they were at all measurement points - see Appendix XI). The interaction between order and treatment was not, however, significant ($F(1,27)=0.02$, $p>.9$).

Writing speed was also significantly faster after distraction than after the control condition ($F(1,27)=9.39$, $p<.005$). There was also a significant main effect for order ($F(1,27)=5.38$, $p<.03$), subjects who received distraction first being slower after both interventions than subjects who received the control condition first. The interaction between order and treatment did not reach significance ($F(1,27)=4.03$, $p<.06$). This trend towards significance reflects the fact that differences between distraction and the control condition, while in the same direction in both order groups, were somewhat larger for those receiving the control condition first.

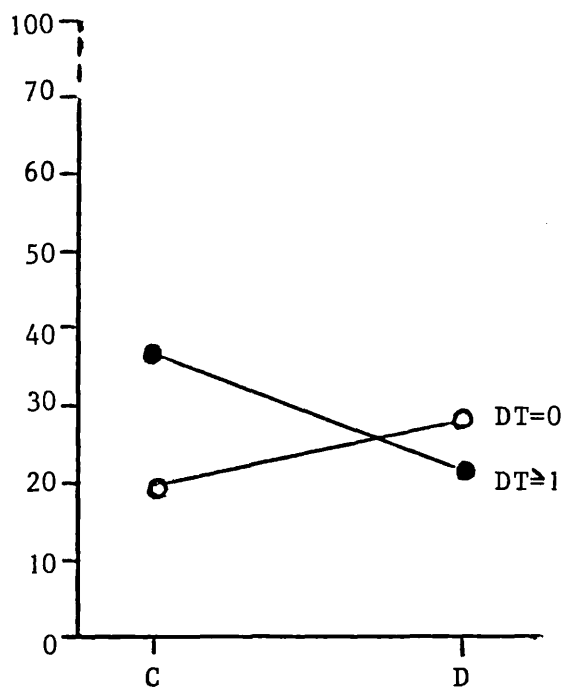
Comparison between subjects reporting one or more depressing thoughts and subjects reporting none

In student subjects reporting depressing thoughts, the frequency of such thoughts was, as predicted, significantly lower during distraction than during the control condition. These subjects, consistent with prediction, were significantly less depressed and showed significantly faster speech rate and writing speed after

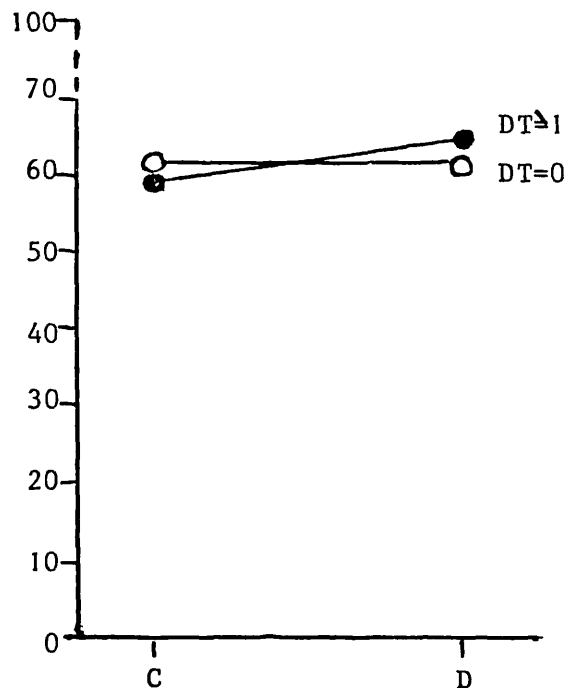
distraction than after the control condition. To examine the possibility that direct impact on mood (rather than influence on frequency of depressing thoughts) was responsible for these effects, post-intervention scores on measures of depression and of happiness were compared for subjects who reported depressing thoughts and for subjects who reported none. Scores were examined using analysis of covariance with pre-intervention scores as the covariates, and with order of presentation and presence or absence of depressing thoughts as between-subject factors. Mean scores on each measure before and after both interventions are presented in Table 6.1. Scores for those receiving distraction first and for those receiving the control condition first are combined, since no significant interactions were found on any measure between order of presentation and treatment, order and presence or absence of depressing thoughts, or order, treatment and presence or absence of depressing thoughts. (Mean scores for the two order groups separately, and summary tables for the analyses of covariance, are presented in Appendix XI.)

On the assumption that only subjects reporting depressing thoughts would demonstrate the mood and psychomotor changes reported above, a significant interaction was predicted between treatment and presence or absence of depressing thoughts on each measure. If the relative pleasantness of the two interventions was responsible for their effects, on the other hand, significant main treatment effects would be predicted, to which both groups should contribute equally. The results are illustrated in Figure 6.4, which gives

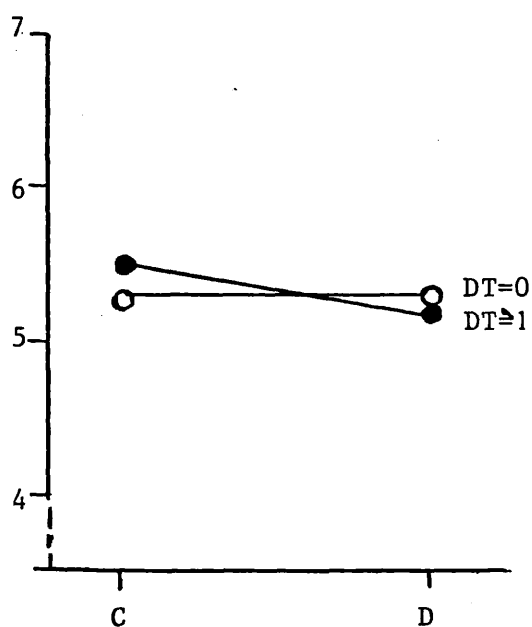
Figure 6.4 Study III : Adjusted mean post-intervention scores on measures of depression and happiness for student subjects reporting depressing thoughts ($DT \geq 1$) and for those reporting none ($DT=0$), distraction (D) vs. the control condition (C)



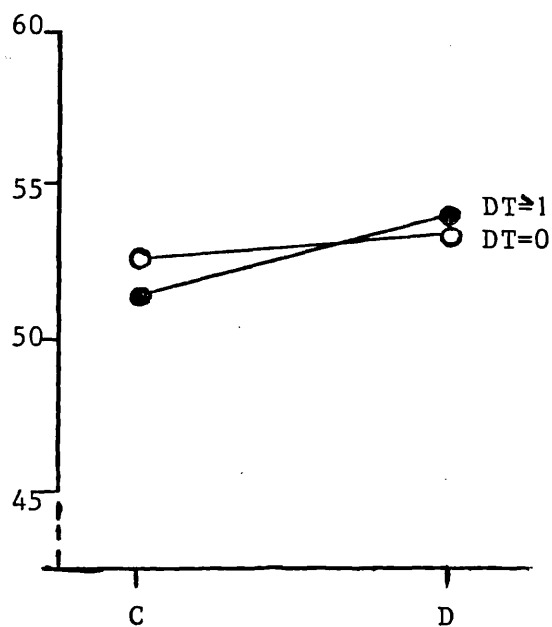
a) Depressed mood (VAS)



b) Happiness (VAS)



c) Speech rate (counting time in secs)



d) Writing speed (no. of nos written in 1 min.)

mean post-intervention scores adjusted to take account of pre-intervention levels on each measure. Post hoc Tukey tests were used to test the differences between individual cells. Mean change scores over the two interventions for those reporting depressing thoughts and for those reporting none are shown in Figure 6.5.

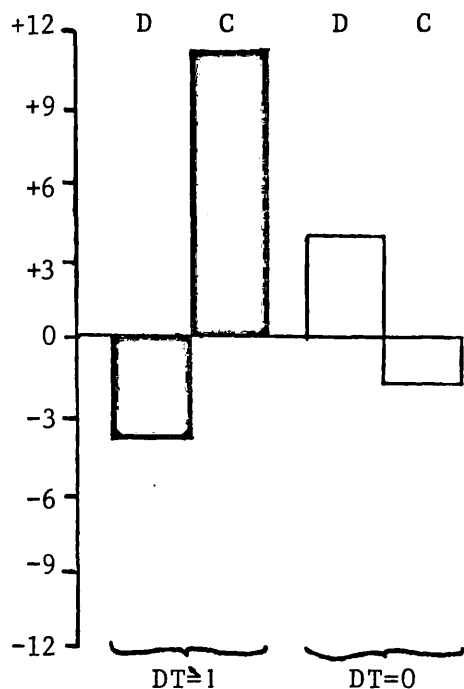
Content of thoughts

The effects of the two interventions on frequency and content of thoughts in subjects reporting depressing thoughts have already been described. Subjects in the comparison group were of course selected because they reported no depressing thoughts in either condition. As with low endogenous patients, however, and with nondepressed students reporting depressing thoughts, distraction effectively reduced preoccupation with current concerns external to the experimental situation. During distraction, 99% of thoughts (all but one) were judged by independent raters to concern the experiment. During the control condition, in contrast, 38% were judged to concern subjects' own situations, external to the experiment.

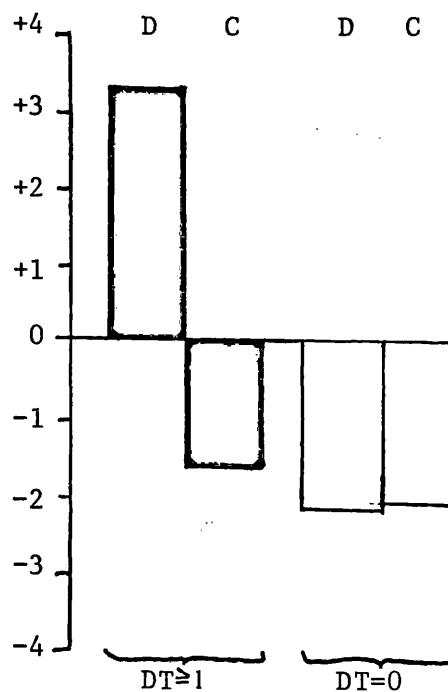
Effects of the two interventions on measures of depression and happiness

Depressed mood There were significant main effects on depressed mood both for treatment ($F(1,51)=6.46, p<.02$), and for presence or absence of depressing thoughts ($F(1,51)=6.06, p<.02$). Subjects who reported no depressing thoughts were less depressed on average at every measurement point than subjects who reported depressing thoughts. In addition, there was, as predicted, a significant

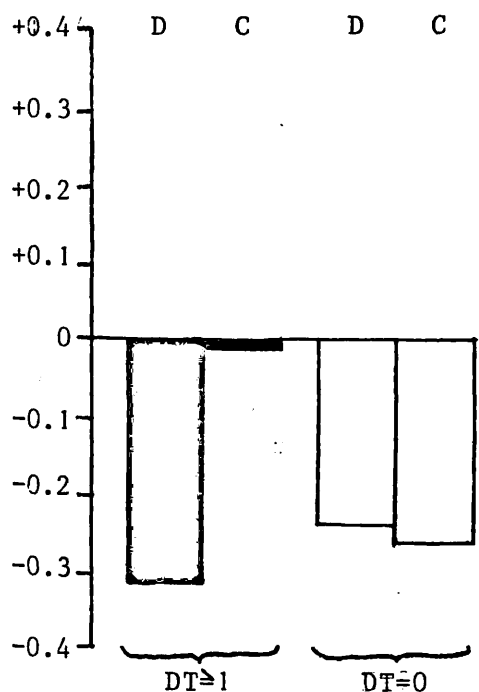
Figure 6.5 Study III: Nondepressed student subjects - Mean change on measures of depression and happiness, Distraction (D) vs. the Control (C), and subjects reporting depressing thoughts ($DT \geq 1$) vs. subjects reporting none ($DT=0$)



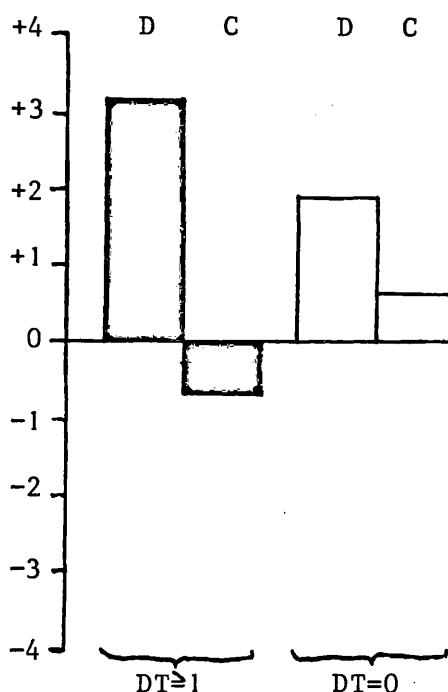
a) Depressed mood (VAS)



b) Happiness (VAS)



c) Speech rate (time to count from 1 to 10)



d) Writing speed (no. of nos written in 1 min.)

interaction between treatment and presence or absence of depressing thoughts ($F(1,51)=10.88$, $p<.002$) (see Figure 6.4a). Post hoc Tukey tests showed that both main effects were carried by this interaction. That is, subjects reporting depressing thoughts were (as has already been reported) significantly less depressed after distraction than after the control procedure ($p<.01$ by the Tukey test). There was no such difference in subjects who reported no depressing thoughts who, once pre-intervention levels were taken into account, were if anything somewhat more depressed after distraction than after the control condition (see Figure 6.4a). After distraction, there was no significant difference in depressed mood between subjects reporting depressing thoughts and those reporting none. After the control condition, on the other hand, subjects reporting depressing thoughts were significantly more depressed than subjects reporting none ($p<.01$). There was a significant main effect for order of presentation of the two interventions ($F(1,51)=4.85$, $p<.04$), subjects who received distraction first being more depressed after both interventions than subjects who received the control condition first. There were, however, no significant interactions between order and treatment ($F(1,51)=1.82$, $p>.1$), order and presence or absence of depressing thoughts ($F(1,51)=0.80$, $p>.3$) or order, treatment and presence or absence of depressing thoughts ($F(1,51)=0.28$, $p>.6$). Thus the effects of the interventions were not dependent on which was experienced first.

Examination of scores at the practice point (i.e. before either

intervention had been experienced) showed that, for those receiving distraction first, whether depressing thoughts were reported during the course of the experiment or not depended on initial level of depressed mood. This was not the case among subjects who received the control condition first. In the latter group, mean practice score on depressed mood was almost identical for those who subsequently reported depressing thoughts (mean=14.94) and for those who did not (mean=13.92) ($t(26)=0.18$, $p>.8$). In subjects receiving distraction first, however, mean practice score for those who subsequently reported depressing thoughts (29.93) was considerably higher than mean practice score for those who did not (7.71), which in turn was lower than the scores of either group of subjects who received the control condition first. (A similar, but much less marked difference is evident in BDI score for the four groups, shown in Figure 6.1.) This suggests that in subjects who, through random allocation, received distraction first, only those experiencing relatively intense depressed mood subsequently reported depressing thoughts. Subjects with a lower initial level of depressed mood were, as it were, protected by their initial experience of distraction. In subjects who by random allocation received the control condition first, on the other hand, initial level of depressed mood did not apparently affect whether depressing thoughts were subsequently reported or not.

To summarise, in subjects reporting depressing thoughts, distraction reduced depressed mood to a level comparable to that of subjects reporting no depressing thoughts at all. In contrast,

the control condition failed to produce any increase in depressed mood in subjects who did not report any depressing thoughts. These subjects were equally depressed after distraction and after the control condition, and indeed showed on average a very slight increase in depressed mood over distraction, and decrease over the control condition, in direct contrast to subjects reporting depressing thoughts (see Figure 6.5a). These findings do not support the contention that some quality inherent in the two procedures was in itself responsible for the effects observed in subjects reporting depressing thoughts.

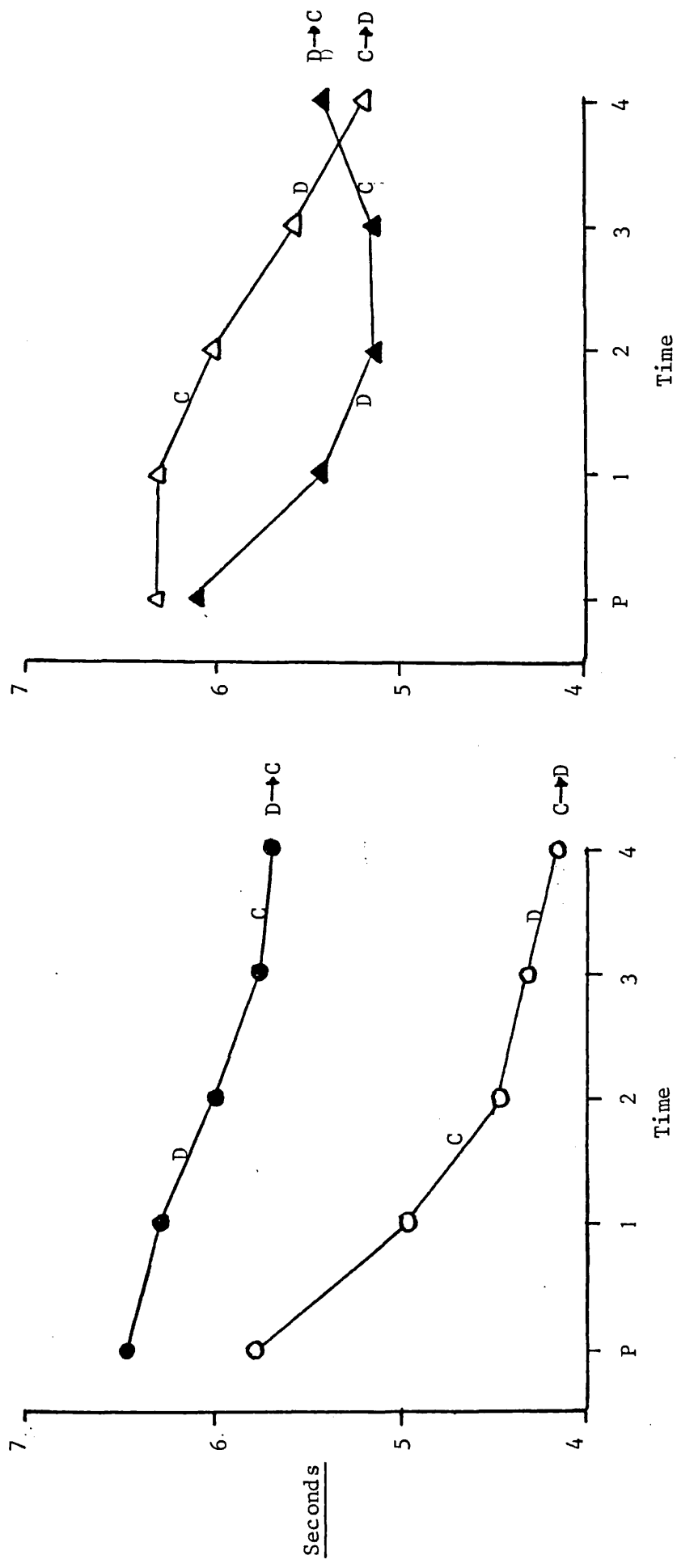
Happiness There were no significant main effects on happiness for treatment ($F(1,51)=2.37$, $p>.1$) or for presence or absence of depressing thoughts ($F(1,51)=0.11$, $p>.7$). Equally, the interaction between treatment and presence or absence of depressing thoughts was not significant ($F(1,51)=1.91$, $p>.1$). In those reporting depressing thoughts (as has already been reported) scores were in the predicted direction (i.e. they were somewhat happier after distraction than after the control condition), but not significantly so. In subjects reporting no depressing thoughts, post-intervention scores were almost identical (see Figure 6.4b). These subjects on average showed minimal decreases in happiness over both interventions (see Figure 6.5b). There was a significant main effect for order of presentation ($F(1,51)=6.67$, $p<.02$), those who received distraction first being less happy after both interventions on average than those who received the control condition first. There were, however, no significant interactions between order and treatment ($F(1,51)=0.87$, $p>.3$),

order and presence or absence of depressing thoughts ($F(1,51)=0.94, p>.3$), or between order, treatment and presence or absence of depressing thoughts ($F(1,51)=0.00, p>.9$). Again, these results provide no support for a direct mood-elevation effect of distraction.

Speech rate There was no significant main effect on speech rate for treatment ($F(1,51)=3.56, p<.07$), or for presence or absence of depressing thoughts ($F(1,51)=0.54, p>.4$). As predicted, there was a significant interaction between thoughts and treatment ($F(1,51)=4.55, p<.04$) (see Figure 6.4c). None of the individual comparison within this interaction were significant by post hoc Tukey test. Subjects reporting no depressing thoughts showed similar increases in speech rate over both interventions (see Figure 6.5c). There was a significant main effect for order ($F(1,51)=5.34, p<.03$), with those who received distraction first counting more slowly after both interventions than those who received the control condition first. There were, however, no significant interactions between order and treatment ($F(1,51)=0.04, p>.8$), order and thoughts ($F(1,51)=0.41, p>.5$), or between order, treatment and thoughts ($F(1,51)=0.00, p>.9$).

Figure 6.6a shows a clear practice effect in subjects reporting no depressing thoughts. Figure 6.6b demonstrates how this interacted with the effects of the two interventions in subjects who did report depressing thoughts. The effects of distraction might be expected to enhance practice effects in subjects reporting depressing thoughts, leading to greater increases in speech rate during distraction in these subjects than in subjects reporting no

Figure 6.6 Study III : Mean speech rate at successive assessment points (practice (P); before (1) and after (2) the first intervention; before (3) and after (4) the second intervention), for subjects reporting depressing thoughts and for those reporting none, distraction first (D→C) and control first (C→D) presented separately



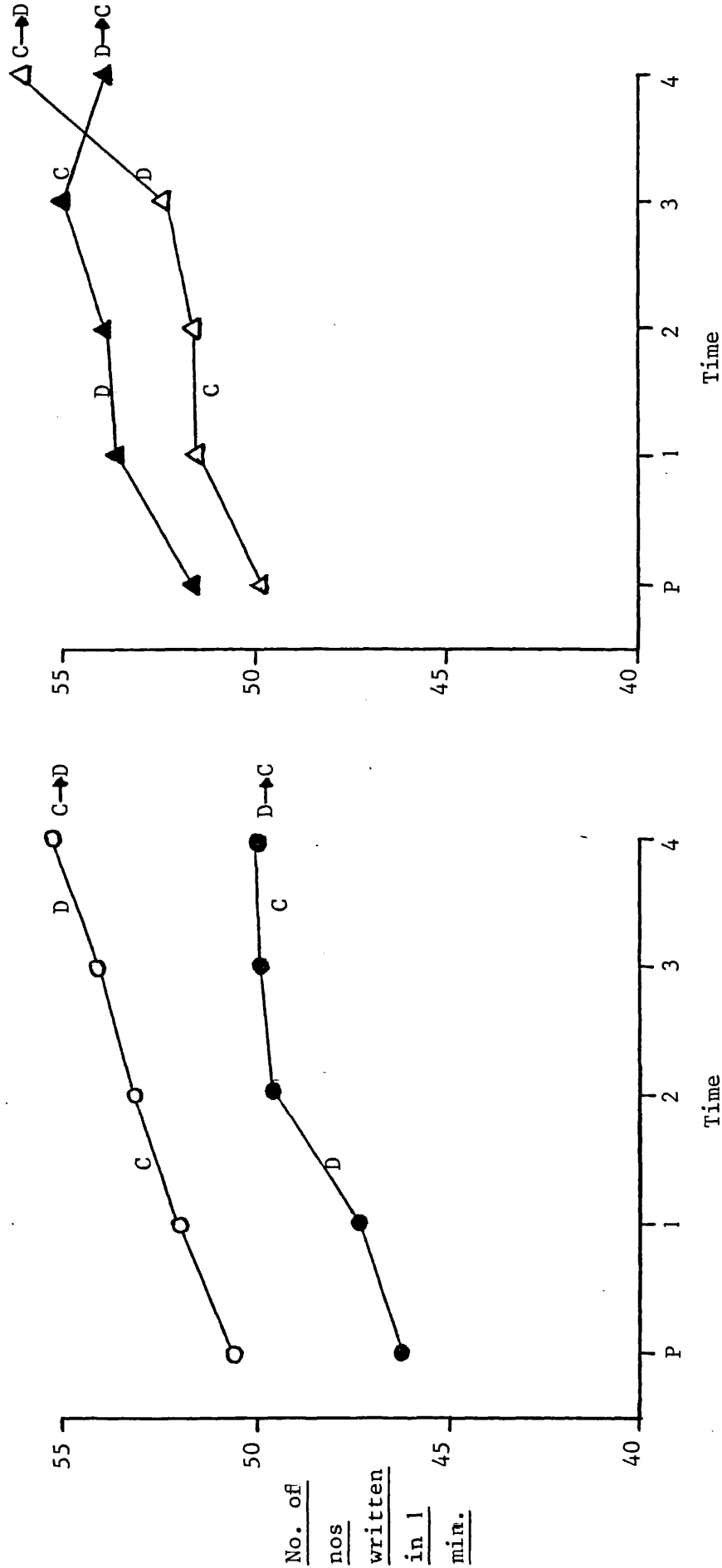
a) Subjects reporting no depressing thoughts

b) Subjects reporting depressing thoughts

depressing thoughts. This was the case when distraction was experienced second (mean change score in subjects reporting depressing thoughts = -0.37 secs; mean change score on subjects reporting no depressing thoughts = -0.17 secs), but not when distraction was experienced first (mean change in subjects reporting depressing thoughts=-0.28 secs; mean change in subjects reporting no depressing thoughts = -0.29 secs). Conversely, the effects of the control procedure might be expected to produce a reduced practice effect in subjects reporting depressing thoughts, compared to those reporting none. This was indeed the case, both when the control condition was experienced first (mean change for subjects reporting depressing thoughts = -0.31 secs; mean change for subjects reporting no depressing thoughts = -0.49 secs), and when it was experienced second (mean change for subjects reporting depressing thoughts = +0.24 secs; mean change for subjects reporting none = -0.06). None of these differences between subjects reporting depressing thoughts and subjects reporting none was significant by post hoc t-test ($p > .2$) in all cases).

Writing speed There was a significant main treatment effect on writing speed ($F(1,51)=8.37$, $p < .01$), both groups being faster after distraction than after the control condition. This difference was somewhat greater in subjects who reported depressing thoughts (see Figure 6.4d), but the interaction between treatment and thoughts was not significant ($F(1,51)=1.17$, $p > .2$). Figure 6.5d shows mean change scores over the two interventions for both groups of subjects. There was no significant main effect for presence or absence of depressing thoughts ($F(1,51)=0.44$,

Figure 6.7 Study III : Mean writing speed at successive assessment points (practice (P); before (1) and after (2) the first intervention; before (3) and after (4) the second intervention), for subjects reporting depressing thoughts and for subjects reporting none, distraction first (D→C) and control first (C→D) presented separately



a) Subjects reporting no depressing thoughts

b) Subjects reporting depressing thoughts

$p > .5$). Equally, there was no significant main effect for order ($F(1,51)=2.63$, $p > .1$), and no significant interactions between order and treatment ($F(1,51)=1.37$, $p > .2$), order and thoughts ($F(1,51)=3.25$, $p < .08$), or between order, treatment and thoughts ($F(1,51)=1.96$, $p > .1$).

Figure 6.7a shows a clear practice effect in subjects who reported depressing thoughts. Figure 6.7b demonstrates how this interacted with the effects of the two interventions in those reporting depressing thoughts. As with speech rate, distraction might be expected to enhance practice effects, leading to greater increases in writing speed during distraction in these subjects than in subjects reporting no depressing thoughts. This was the case when distraction was experienced second (mean change for subjects reporting depressing thoughts = +3.69; mean change for subjects reporting none = +0.17), but not when distraction was experienced first (mean change for subjects reporting depressing thoughts = +0.29; mean change for subjects reporting none = +2.50). Conversely, the control procedure might be expected to reduce practice effects in those reporting depressing thoughts, compared to those reporting none. This was the case, both when the control condition was experienced first (mean change for subjects reporting depressing thoughts = +0.25; mean change for subjects reporting none = +0.17) and when it was experienced second (mean change for subjects reporting depressing thoughts = -1.07; mean change for subjects reporting none = +0.14). Again, none of these differences between subjects reporting depressing thoughts and those reporting none was significant by post hoc t-test ($p > .04$ in

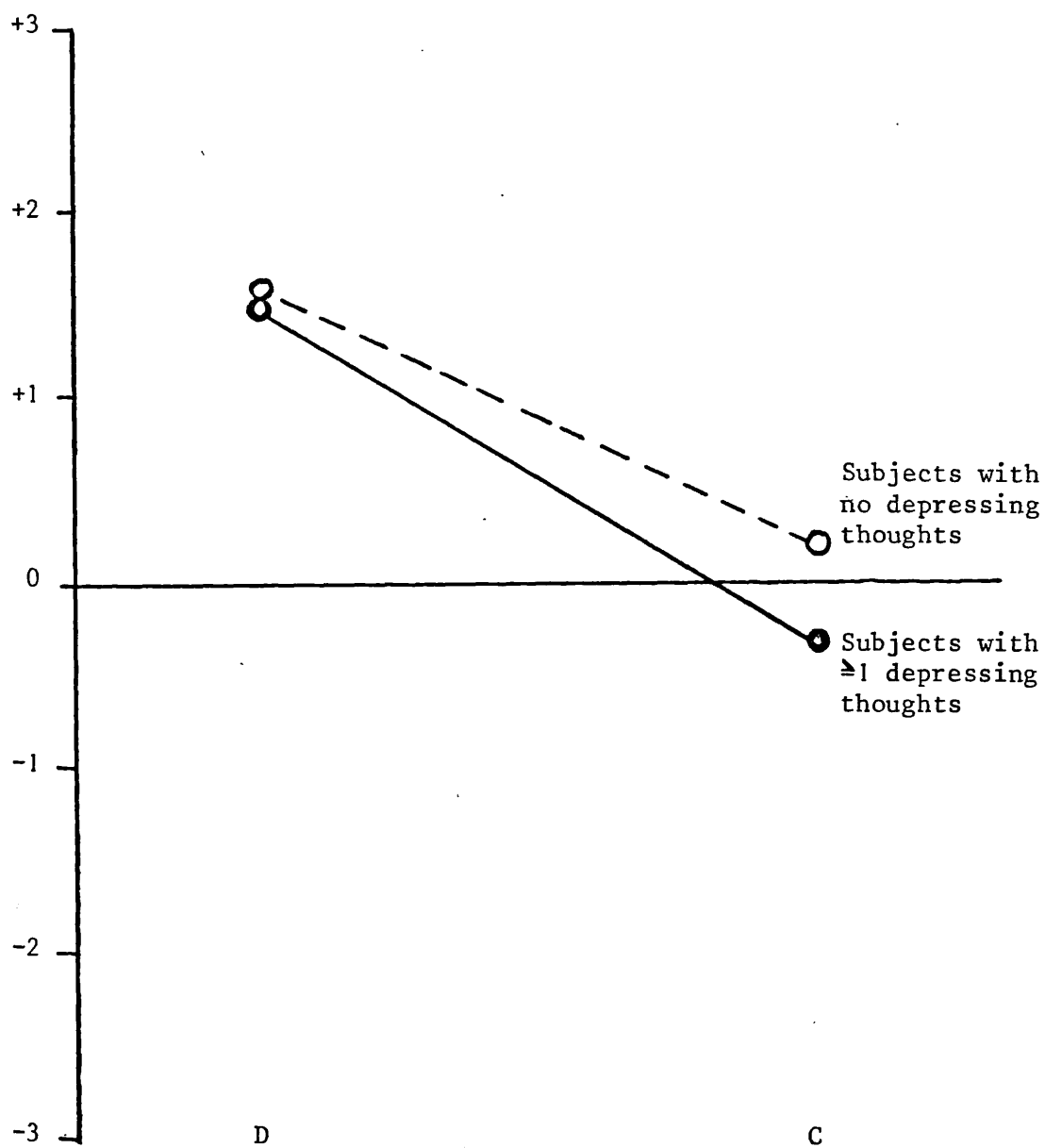
all cases).

Pleasantness ratings The pleasantness ratings given to the two interventions were analysed using split-plot analysis of variance with presence or absence of depressing thoughts as a between subject factor. Results are illustrated in Figure 6.8. There was a significant main effect for treatment ($F(1,51)=60.27, p<.001$). Both groups consistently rated viewing the slides as pleasanter than focussing on the white light. Mean ratings for distraction were +1.50 for subjects reporting depressing thoughts, and +1.54 for subjects reporting none. Mean ratings for the control condition were -0.33 and +0.19 for the two groups respectively (these ratings are neutral rather than actively negative, and would be unlikely to account for the significant increase in depressed mood experienced by subjects reporting depressing thoughts). There was no significant main effect for presence or absence of depressing thoughts ($F(1,54)=2.31, N.S.$), and no significant interaction between treatment and thoughts ($F(1,54)=1.38, N.S.$). Thus the relative pleasantness of the two interventions was the same, regardless of whether subjects experienced depressing thoughts or not, and cannot be called upon to explain differences in response to distraction between those who reported depressing thoughts and those who did not.

Comparison between low endogenous depressed patients and nondepressed student subjects reporting depressing thoughts

Mean frequency of depressing thoughts during distraction and

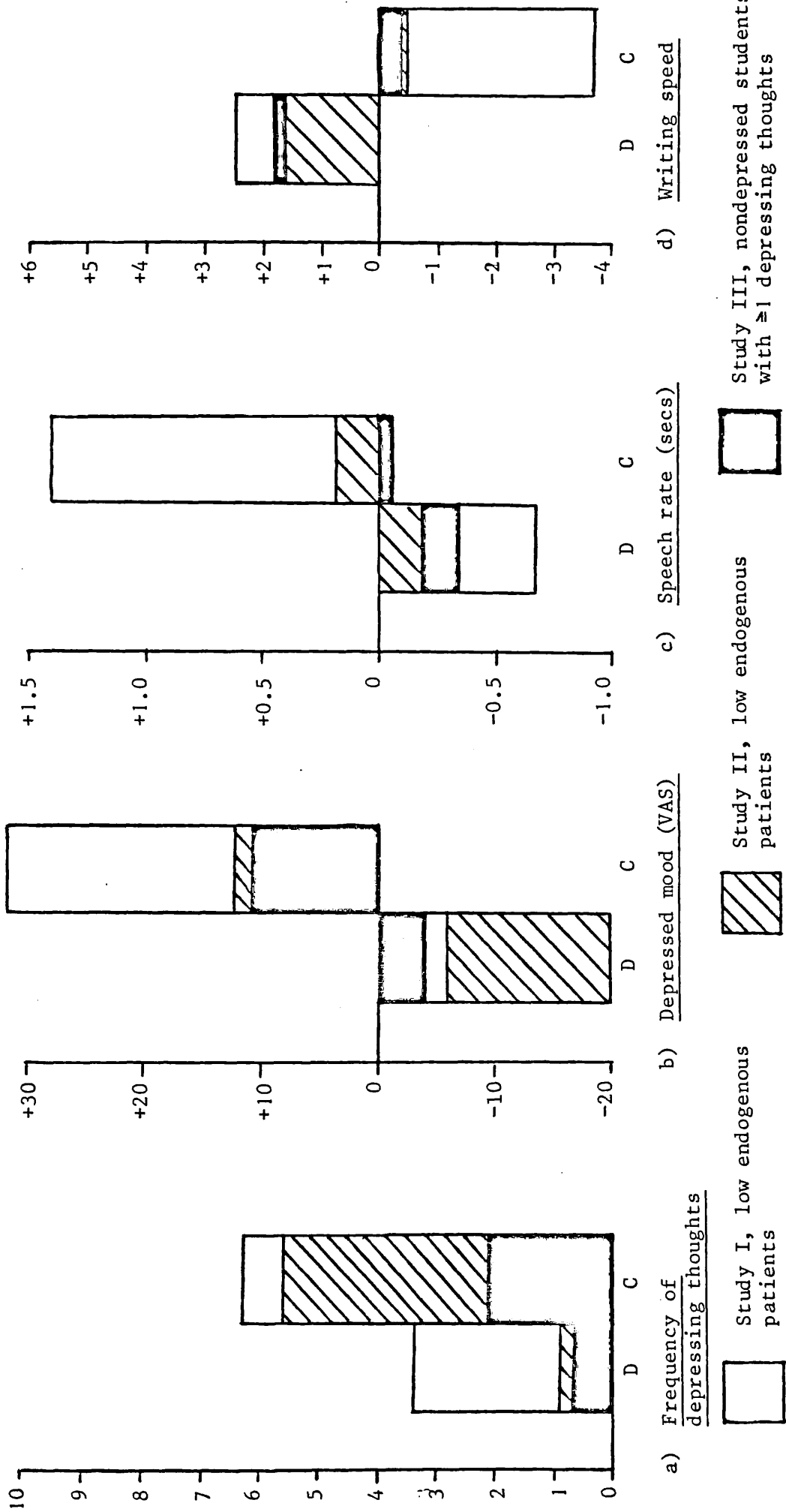
Figure 6.8 Study III : Nondepressed student subjects with and without depressing thoughts - mean pleasantness ratings for distraction (D) and for the control condition (C)



during the control condition, and mean change scores over the two interventions on measures of depressed mood, speech rate and writing speed are illustrated in Figure 6.9 for the low endogenous depressed patients who took part in Studies I and II, and for the nondepressed student subjects in the present study who reported one or more depressing thoughts during the course of the experiment. The close similarity in pattern of response to the two interventions of these three groups is clearly evident. Specific comparisons were made between student subjects reporting depressing thoughts and the low endogenous patients from Study II on frequency of depressing thoughts during the two interventions, the extent to which distraction reduced the frequency of thoughts related to subjects' own circumstances outside the experiment, the depressingness ratings assigned both to thoughts related to the experiment and to thoughts related to subjects' situations by independent judges, and scores on the VAS measuring depressed mood after the two interventions. (Summary tables for analyses of variance will be found at Appendix XI.)

Frequency of depressing thoughts was compared using a split-plot analysis of variance with status as patient or student as a between-subject factor. Results are illustrated in Figure 6.10a. There were significant main effects for status ($F(1,40)=14.95$, $p<.002$), and for treatment ($F(1,40)=58.65$, $p<.002$). The interaction between treatment and status was also significant ($F(1,40)=30.49$, $p<.002$). The significant differences between distraction and the control condition in both groups of subjects have already been described. The significant status effect, on the other hand, was entirely accounted for by differences between

Figure 6.9 Mean frequency of depressing thoughts, and mean change scores on depressed mood, speech rate and writing speed, distraction (D) vs. the control (C), for low endogenous patients taking part in Studies I and II, and for nondepressed student subjects reporting ≥ 1 depressing thoughts in Study III



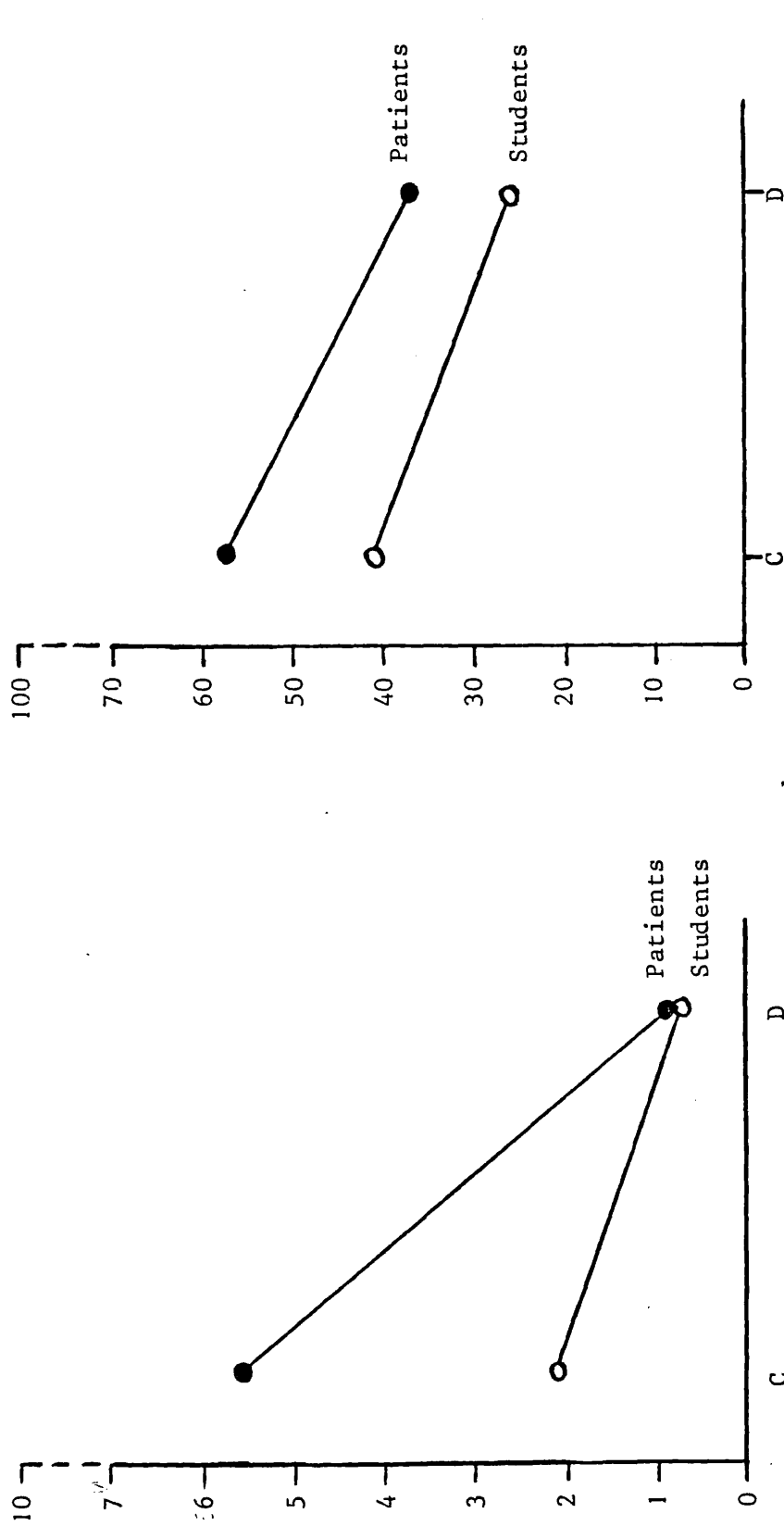
patients and students during the control condition ($p < .01$ by post hoc Tukey test). During distraction, there was no significant difference between patients and students by this test in frequency of depressing thoughts.

Reduction in frequency of thoughts related to subjects' own circumstances The percentage of thoughts judged to be related to subjects' situations outside the experimental context which occurred in the two experimental conditions was compared for depressed patients and for student subjects reporting depressing thoughts, combining depressing and nondepressing thoughts. During distraction, only 1% of thoughts reported aloud by each group were judged to concern their own situations. During the control condition, 53% of thoughts reported by patients and 65% of thoughts reported by students were judged to relate to their own circumstances. Thus the two groups did not differ significantly in the extent to which distraction reduced the frequency of depressing thoughts relating to their own situations outside the experimental context ($\chi = 0.33$, $p > .5$).

Judges' ratings of depressing thoughts Depressing thoughts elicited from low endogenous depressed patients were on average rated by independent judges as no more depressing than depressing thoughts elicited from nondepressed student subjects. This was true both for thoughts related to the experiment ($t(13) = 0.03$, N.S.) and for thoughts related to subjects' own situations ($t(21) = 0.80$, N.S.).

Depressed mood Differences in depressed mood after the two interventions were assessed using split-plot analysis of variance

Figure 6.10 Study III : Mean frequency of depressing thoughts and mean post-intervention scores on depressed mood, distraction (D) vs. the control condition (C), for low endogenous patients taking part in Study II and nondepressed student subjects reporting one or more depressing thoughts in Study III



a) Frequency of depressing thoughts

b) Post-intervention depressed mood (VAS)

with subjects' status as patients or as nondepressed students as a between subject factor. Results are illustrated in Figure 6.10b. As would be expected from the independent comparisons already reported, there was a significant main effect for treatment ($F(1,40)=22.96$, $p<.002$), both groups being less depressed after distraction than after the control condition. Patients were more depressed after both interventions than students, but not significantly so ($F(1,40)=3.67$, N.S.). Equally, there was no significant interaction between treatment and status ($F(1,40)=0.41$, N.S.). As can be seen from Figure 6.10b, the difference between the two conditions was almost identical in the two subject groups.

DISCUSSION

The first aim of Study III was to determine whether, in nondepressed student subjects reporting depressing thoughts, distraction and the control procedure would produce effects similar to those obtained in the low endogenous patients examined in the previous two experiments. The results reported above indicate that this was indeed the case. As predicted, distraction significantly reduced the frequency of depressing thoughts, compared to the control procedure. Consistent with Beck's cognitive model of depression, student subjects reporting depressing thoughts were significantly less depressed, and showed significantly faster speech rate and writing speed after distraction than after the control procedure. In both low

endogenous patients and student subjects, distraction appeared to function by reducing the frequency of thoughts concerning the subjects' own circumstances outside the experimental context, which were rated by independent judges to be more depressing than thoughts associated with the experiment in both groups.

In contrast to depressed patients, the content of self-related depressing thoughts reported aloud by students rarely revealed any marked degree of hopelessness or self-devaluation. Topics referred to included worries about work (in particular, impending examinations), serious current illness of close relatives or friends, recent bereavement, breakdown in relationships with boyfriends, parents' divorce, and empathy for the problems of close friends. Many depressing thoughts were simply brief descriptive accounts of current negative life events of this kind, and did not appear to reflect a distorted cognitive style (c.f. Hammen, 1978).

The study's second aim was primarily methodological, that is, to exclude qualities inherent in the two interventions (in particular, their relative pleasantness) as a potential explanation for their effects. Two pieces of data have a bearing on this issue. Firstly, it was clear from the comparison on measures of depression and happiness between subjects reporting depressing thoughts and subjects reporting none that the predicted effects of the two interventions were confined to those who reported depressing thoughts (see Figure 6.4). Mean scores after distraction and after the control condition were almost identical

on every measure in subjects who reported no depressing thoughts.

Despite this, the interactions between treatment and presence or absence of depressing thoughts were not significant for happiness or for writing speed. In the case of happiness, this probably reflects the measure's relative insensitivity to the two interventions, compared to depressed mood, given the lack of a significant difference between distraction and the control in subjects reporting depressing thoughts. The prime effect on mood of reducing the frequency of depressing thoughts was to reduce depression, rather than to enhance positive affect. Given the neutral ratings assigned to the majority of nondepressing thoughts by the three independent judges, this is not perhaps surprising. In the case of writing speed, a different factor appeared to be operating, judging by subjects' spontaneous comments. A number remarked that they had (correctly) interpreted the measure as a test of speed, and had deliberately attempted to write more numbers on each occasion. This fine spirit of competition may have reduced differences between the two subject groups. (No similar remarks were made about speech rate, and indeed there were frequent queries as to the purpose of the measure.)

The second strand of evidence relating to mechanism was the rated pleasantness of the two interventions. Analysis showed clearly that this was independent of the presence or absence of depressing thoughts, and hence of the interventions' effects on mood. Both subject groups (as might be expected) found viewing the slides

pleasanter than focussing on the white light. The latter, however, was rated as a neutral rather than aversive experience, and will not therefore readily account for the significant increase in depressed mood reported by subjects with depressing thoughts. Ten subjects reporting no depressing thoughts (40%) gave the control procedure positive ratings (+1 or +2) on the pleasantness scale, and a number remarked that they found it relaxing, and described how calm, sleepy and peaceful it made them feel. The contrast between this and the effects of the control on subjects reporting depressing thoughts is neatly captured by the following two quotations (one from a subject reporting depressing thoughts, and one from a subject reporting none), which were elicited in the course of the post-experimental enquiry: 1) "The slides reminded me of my holidays. The white light made me think about my current situation"; and 2) "Looking at the white light was like looking at a flame - just blank, nothing very much, very relaxing".

Taken together, the comparison on measures of depression between subjects reporting depressing thoughts and subjects reporting none, and the independence of pleasantness ratings for the two interventions from presence or absence of depressing thoughts, effectively exclude direct impact on mood as a plausible explanation for the predicted effects of the two procedures. In subjects reporting no depressing thoughts, viewing the slides had no positive effects on mood or on psychomotor speed, compared to the control procedure. Thus the slides did not appear to be inherently mood-elevating, independent of their distracting

effect. Assuming that it is legitimate to generalise from nondepressed student subjects to clinically depressed patients (the close similarity in pattern of response illustrated in Figure 6.9 suggests that it is), the effects of distraction on depression in low endogenous patients observed in Studies I and II can be most parsimoniously attributed to its success in reducing the frequency of depressing thoughts. This finding is entirely consistent with Beck's contention that negative thinking can play a crucial role in the maintenance of clinical depression. Whether this assertion applies equally well to all depressed patients will be investigated in some detail in Chapter 7.

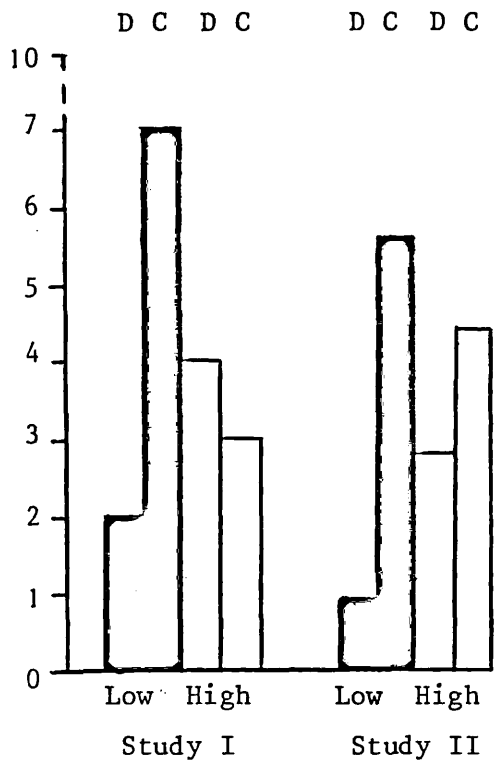
CHAPTER 7DISTRACTION AND ENDOGENEITY:THE ROLE OF NEGATIVE THINKING IN MAJOR DEPRESSIVE DISORDER

The purpose of this chapter is to examine in greater detail a consistent finding from the research reported in previous chapters, that is, the marked relationship between response to distraction and endogeneity as measured by the Newcastle Diagnosis Scale (NDS) (Carney et al., 1965). This relationship has now been empirically demonstrated in three separate experimental studies: Teasdale and Rezin (1978a), Study I (reported in Chapter 4) and Study II (reported in Chapter 5). Studies I and II examined the effects of distraction in moderately-to-severely depressed patients with a Research Diagnosis Criteria diagnosis of nonpsychotic, unipolar Major Depressive Disorder (Spitzer et al., 1978). They demonstrated that, in patients who scored ≤ 3 on the NDS (i.e. those who were relatively low in endogeneity), a brief, standardised, visual distraction procedure significantly reduced the frequency of depressing thoughts, compared to a control condition. As would be predicted from Beck's cognitive model of depression, this difference in frequency of depressing thoughts was accompanied in both studies by differences between the two experimental conditions in depressed mood, speech rate and writing

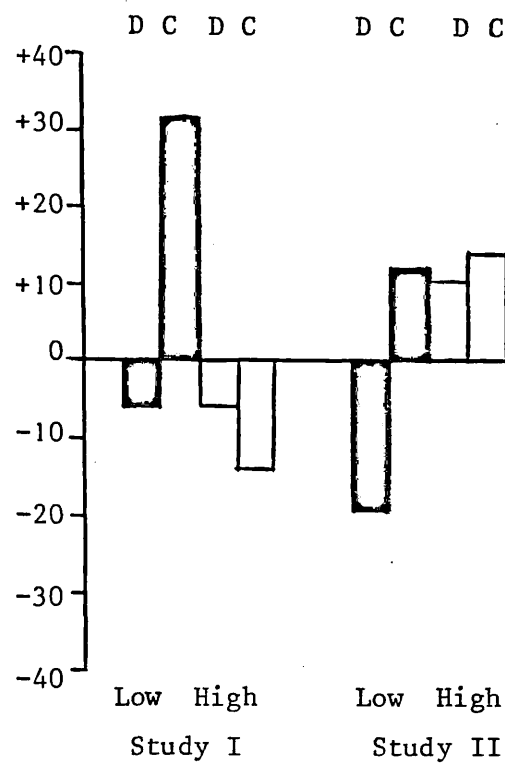
speed. Similar responses to distraction were not evident in patients scoring >3 on the NDS (i.e. those relatively high in endogeneity). Frequency of depressing thoughts during distraction and during the control procedure, and mean change scores on measures of depression over the two conditions, are illustrated in Figure 7.1 for the high and low endogenous patients who took part in Studies I and II.

Thus, in low endogenous patients, distraction was capable of successfully reducing the frequency of depressing thoughts in comparison to a control procedure. Further, where this was achieved, corresponding changes occurred on instruments measuring other aspects of the state of depression. These findings are unlikely to be pure artefacts of the experimental procedure, since Study II excluded experimental demand, order of presentation of the two interventions, mastery and vocalisation as potential explanations for the results obtained. Equally, it seems clear from the results of Study III that the changes observed in mood and in psychomotor speed depend on the successful manipulation of frequency of depressing thoughts. These findings support the central prediction of Beck's cognitive model of depression that negative thinking can play an important role in the maintenance of clinical depression, at least in depressed patients low in endogeneity. They also, however, beg the question as to whether the cognitive model will apply equally well to all patients meeting criteria for Major Depressive Disorder, or only to those who are, in conventional psychiatric terms, "neurotically" or "reactively" depressed. The role of negative thinking in high

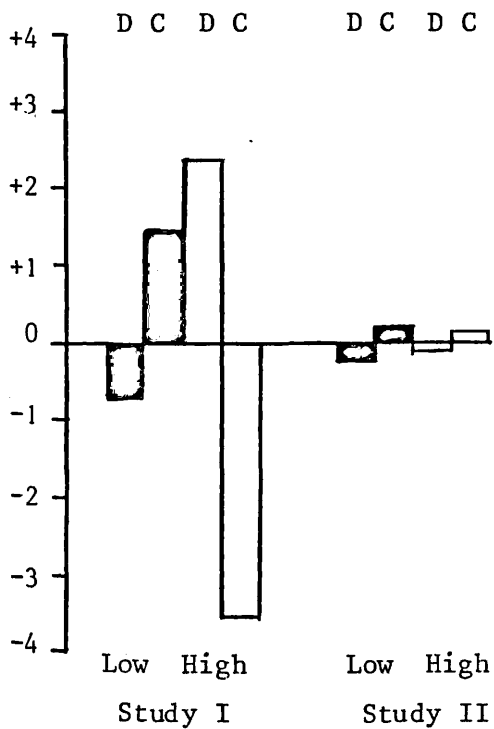
Figure 7.1 Median (Study I) and mean (Study II) frequencies of depressing thoughts during distraction (D) and the control (C), and mean change scores on measures of depression over both interventions, low (NDS score \leq 3) vs. high (NDS score $>$ 3) endogenous patients from Study I and Study II



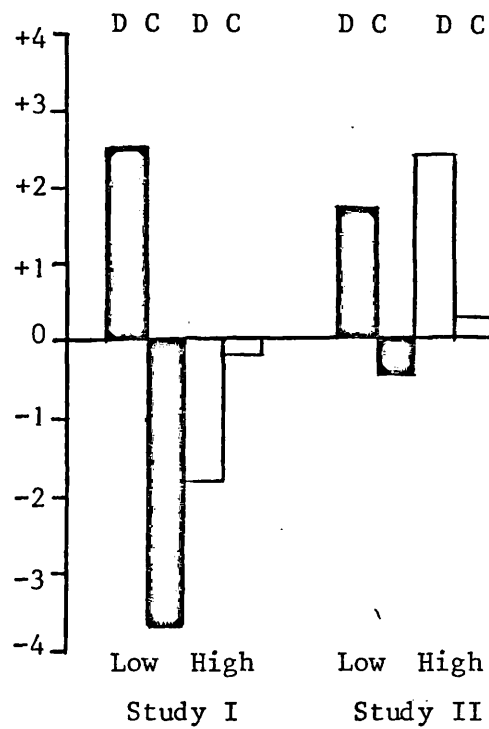
a) Frequency of depressing thoughts



b) Depressed mood (VAS)



c) Speech rate (time taken to count from 1 to 10 in secs)



d) Writing speed (no. of nos written in 1 minute)

endogenous patients might be quite different from its role in low endogenous patients. Since this is an issue with important theoretical and clinical implications, the present chapter will further examine differences between the low and high endogenous patients who took part in Study II. This study was selected for further analysis: 1) because it employed a larger number of high endogenous patients ($n=18$) than Study I ($n=5$); and 2) because categorisation of patients as high or low endogenous was done on the basis of agreement between the experimenter and an independent psychiatrist (in Study I categorisation was carried out by the experimenter alone).

Depressing thoughts of the kind postulated by Beck to play a part in the maintenance of clinical depression were certainly present in depressed patients scoring high on the NDS. Indeed, in Study II, there was no overall significant difference in frequency of depressing thoughts between high and low endogenous patients ($F(1,26)=0.15$, $p>.6$). Yet the effects of distraction on depression that would be predicted from Beck's cognitive model failed to appear in high endogenous patients. A number of factors might account for this phenomenon. Firstly, the two patient groups (low and high endogenous) might differ on some variable other than NDS score (for example, severity of depression), and this difference might account both for differing levels of endogeneity and for differences in response to distraction. To examine this possibility, the two groups were compared on social and demographic factors, clinical characteristics and severity of

depression. In addition, scoring patterns on individual items of the NDS were examined. Secondly, it could be that distraction simply failed to control the emergence of depressing thoughts in high endogenous patients. To explore this possibility, the frequency and content of depressing thoughts reported aloud during distraction and during the control condition by both patient groups were investigated in greater detail. Thirdly, it could be that distraction did successfully reduce the frequency of depressing thoughts in high endogenous patients, but that this was not reliably accompanied by corresponding changes in other aspects of depression, in particular, depressed mood. Such a dysjunction between thinking and mood would have interesting implications for the cognitive model of depression, and was examined in a more detailed investigation of the effects of distraction on depressed mood in the two patient groups.

MEASURING ENDOGENEITY : THE NEWCASTLE DIAGNOSIS SCALE

A copy of the Newcastle Diagnosis Scale, and a copy of the standardised questions which formed the basis of the assessment interview, will be found at Appendix IV. The NDS consists of 10 weighted items. Some assess depressive symptomatology (weight loss; depressive psychomotor activity; anxiety (negatively weighted); nihilistic delusions; attribution of blame to others (also negatively weighted); guilt; distinct quality of mood). Some examine the context of the current episode (presence or absence of previous episodes; adequate premorbid personality; no adequate psychogenesis (absence of psychological stress or difficulty

continuing to operate after the onset of symptoms, and thus maintaining the depression)). Item scores are summed to give a total endogeneity score (range -2 to +12). On the basis of an apparently bimodal distribution of scores in a sample of more than 100 consecutive inpatient admissions, Carney et al. (1965) suggested that a score of 6 or more on the scale corresponded to a diagnosis of endogenous depression, and a score of 5 or less to a diagnosis of neurotic depression. Later workers have found acceptable interrater agreement on all items and on diagnostic categories (Davidson, Strickland, Turnbull, Belyea and Miller, 1984), and have shown the scale to compare adequately with other measures of endogeneity (Davidson, Lipper, Zung, Strickland, Krishnan and Mahorney, 1984). The same workers failed to replicate the bimodal distribution of scores found by Carney et al. (1965), and Davidson, Strickland et al. (1984) suggest the scale might be used dimensionally rather than categorically.

To recapitulate, in Study II the NDS was scored by the experimenter after the experiment had been completed by each patient on the basis of a semi-standardised interview lasting about 30 minutes. Patients were then categorised as high (NDS score > 3 , $n=18$) or low (NDS score ≤ 3 , $n=12$) endogenous. A cut-off of 3 had been shown in Study I to discriminate between those who responded as predicted to distraction (i.e. the low scorers) and those who did not (i.e. the high scorers). This was therefore used in preference to the cut-off of 5 advocated by Carney et al. (1965).

In order to reduce experimenter bias, all NDS interviews (except two where subjects refused permission) were audiotaped and scored by an independent psychiatrist blind to the ratings given by the experimenter. Audiotapes were available for 28 patients included in the study, for 7 patients tested but not included (e.g. because they guessed the purpose of the experiment, or because they were insufficiently depressed on the BDI on the day of testing), and for 7 pilot patients (i.e. 42 patients in all). Agreement on categorisation as high or low endogenous was reached without discussion for 35 patients (83%). Agreement on categorisation was reached after discussion for a further 5 patients (12%). Two patients (5%) were referred to an independent third party for a final decision. Among the 28 patients included in the experiment whose interviews were rated by both the experimenter and the independent psychiatrist, agreement was reached without discussion for 90% of individual item decisions (254/280 decisions). Agreement was reached on a further 6% (16 decisions) after discussion. Only 10 decisions out of a total of 280 (10 items per patient for 28 patients) were referred to a third party for final decision (2%). Agreement without discussion on individual items of the 10-item scale varied between 71% (adequate personality) and 100% (anxiety), the mean agreement per item being 91%. These levels of agreement are comparable to those found by Davidson, Strickland et al. (1984).

RESULTS : COMPARISON BETWEEN PATIENTS LOW AND HIGH IN ENDOGENEITY

1. Social, demographic and clinical characteristicsa. Social and demographic factors

Details of patients' age, sex, marital status, education and current employment are shown in Table 7.1. There were no significant differences between the two groups, except that significantly more high than low endogenous patients had received university education or professional training.

b. Clinical characteristics

Patient status (inpatient, daypatient or outpatient), whether or not patients were currently receiving antidepressant medication, presence or absence of previous episodes of depression, duration of major depression and duration of overall mood disturbance are shown in Table 7.2. There were no significant differences between the two groups on any of these variables. Two thirds of patients were receiving full- or day-time care, half had been depressed at least once before, and 80% were currently receiving anti-depressant medication (tricyclics in 18 out of 23 cases).

c. Severity of depression

This was assessed using data from the RDC diagnostic checklist, from the BDI (Beck et al., 1961) which was completed on the day of testing, and from the Visual Analogue Scale (VAS) measuring depressed mood which was administered at the beginning of the

Table 7.1 Social and demographic characteristics of low and high endogenous patients taking part in Study II

	<u>Low endogenous patients</u> (NDS score ≤ 3) (n = 12)	<u>High endogenous patients</u> (NDS score > 3) (n = 18)	<u>p</u>
Mean age	46.25	40.17	N.S.
Sex (no. of males)	4	3	N.S.
Marital status:			
Married	7	11	N.S.
Single	3	3	
Separated/ divorced	1	2	
Widowed	1	2	
Education:			
2ndary school only	8	4	$<.05$
University/ professional training	4	14	
Currently employed	4	10	N.S.

Table 7.2 Clinical characteristics of low and high endogenous patients taking part in Study II

	<u>Low endogenous patients</u>	<u>High endogenous patients</u>	<u>P</u>
	(NDS score \leq 3)	(NDS score $>$ 3)	
	(n = 12)	(n = 18)	
Patient status:			
Inpatient/ daypatient	8	12	N.S.
Outpatient	4	6	
Currently receiving antidepressant medication			
	8	16	N.S.
Previous episodes=1			
	5	12	N.S.
Duration (median no. of months):			
Major Depressive Disorder	5.5(range 2-30)	2.5(range 1-36)	N.S.
Overall mood-disturbance	14 (range 2-72)	17 (range 1-192)	N.S.

experimental session, before subjects had experienced either intervention (practice VAS). Results are shown in Table 7.3.

There were no significant differences between the two groups on RDC symptomatology, either on mean number of symptoms reported out of the 8 available for a diagnosis of Major Depressive Disorder, or on the number of patients reporting biological symptoms (sleep and appetite/weight disturbance). This was partly due to the restricted range of scoring available (a minimum of 5 out of 8 symptoms are required for a diagnosis of Major Depressive Disorder), and partly to a ceiling effect: only 4 low endogenous patients and 2 high endogenous patients reported fewer than 7 out of 8 symptoms. All patients in both groups reported loss of interest and pleasure, loss of energy and poor concentration or slowed thinking. There was no difference between the two groups on total BDI score, nor on any individual item of the BDI, with the exception of item 10, which assesses crying behaviour. On this item, high endogenous patients scored significantly higher than low endogenous patients. Eleven out of 18 high endogenous patients, and only one low endogenous patient, scored the maximum possible (3) on this item ("I used to be able to cry, but now I can't cry, even though I want to"). Finally, there was no difference between the two groups on the practice VAS. Thus there was no evidence that high endogenous patients were generally more severely depressed than low endogenous patients (although high endogenous patients did score marginally higher than low endogenous patients on several of the items shown in Table 7.3).

Table 7.3 Severity of depression in low and high endogenous patients taking part in Study II

	<u>Low endogenous patients</u>	<u>High endogenous patients</u>	<u>p</u>
	(NDS score ≤ 3)	(NDS score > 3)	
	(n = 12)	(n = 18)	
<u>RDC</u>			
Mean no. of symptoms reported out of 8	6.83 (range 5-8)	7.22 (range 5-8)	N.S.
No. of patients reporting biological symptoms:			
Sleep	10	17	N.S.
Appetite/weight	8	15	N.S.
Both	7	14	N.S.
<u>BDI</u>			
Mean total score	27.17	30.28	N.S.
Mean score on Item 10 (crying behaviour)	1.00	2.28	$< .001$
<u>Depressed mood (VAS)</u>			
Mean practice score	45.42	50.11	N.S.

d. Scoring on the NDS

Mean score on the NDS for the low endogenous group was 1.83 (range 0 to 3). (Sireling, Freeling, Paykel and Rao (IP) found 65% of a hospital outpatient sample to fall within this range.) Mean score for the high endogenous group was 5.61 (range 4 to 9). Given a possible maximum score of 12, these patients were thus on average relatively rather than extremely endogenous. As would be expected, given that they were selected on this basis, the difference on NDS total score between the two groups was highly significant ($t(28)=7.91$, $p<.00001$). However, not all 9 items used (subjects scoring on the item measuring nihilistic delusions were not included in the study) contributed equally to this overall difference. The number of patients scoring on each item in the high and low endogenous groups was compared using the χ^2 test of significance, and results are shown in Table 7.4.

The two groups did not differ on number of previous episodes of depression, nor on items assessing symptom severity (i.e. weight loss, depressive psychomotor activity, anxiety, or guilt). The number of patients without an identifiable maintaining stressor tended to be greater among high endogenous patients, but not significantly so. Stressors included bereavement, marital and family difficulties, serious illness of spouse, financial difficulties, job loss, failure to adapt to a recent move, breakdown of relationships, work demands and chronic illness or pain. On the other hand, a significantly greater number of high endogenous patients described adequate previous personalities

Table 7.4 Number of low and high endogenous patients taking part in Study II who scored on each item of the Newcastle Diagnostic Scale

	<u>Low endogenous patients</u> (NDS score \leq 3) (n = 12)	<u>High endogenous patients</u> (NDS score $>$ 3) (n = 18)	<u>χ^2</u>	<u>p</u>
1. Adequate personality	4 (33%)	14 (78%)	4.43	$<.05$
2. No adequate maintaining stressor	0 (0%)	6 (33%)	3.13	$<.10$
3. Weight loss	5 (42%)	14 (78%)	2.64	$>.10$
4. Previous episode	5 (42%)	12 (67%)	0.96	$>.30$
5. Depressive psychomotor activity	6 (50%)	13 (72%)	0.72	$>.30$
6. Anxiety	12 (100%)	13 (72%)	2.25	$>.10$
7. Nihilistic delusions	0	0		
8. Blame others	11 (92%)	5 (28%)	9.38	$<.01$
9. Guilt	10 (83%)	14 (78%)	0.09	$>.90$
10. Distinct quality	4 (33%)	15 (83%)	5.75	$<.02$

(i.e. no history of neurotic breakdown, no disabling neurotic symptoms or social maladjustment), did not blame others for their predicament, and reported distinct quality of mood (i.e. they felt that the current mood disturbance was different in quality from depression normally experienced in reaction to problems). The most common qualitative differences reported were helplessness (giving up, feeling unable to cope) and hopelessness about the prospects of recovery from depression.

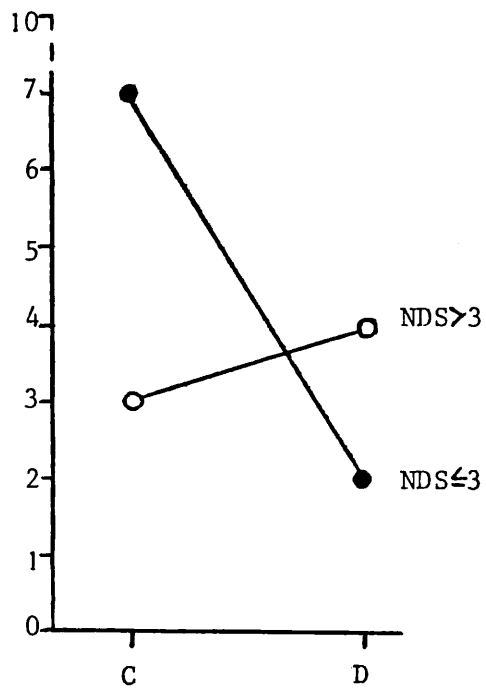
2. Pattern of response to distraction

a. Frequency of depressing thoughts

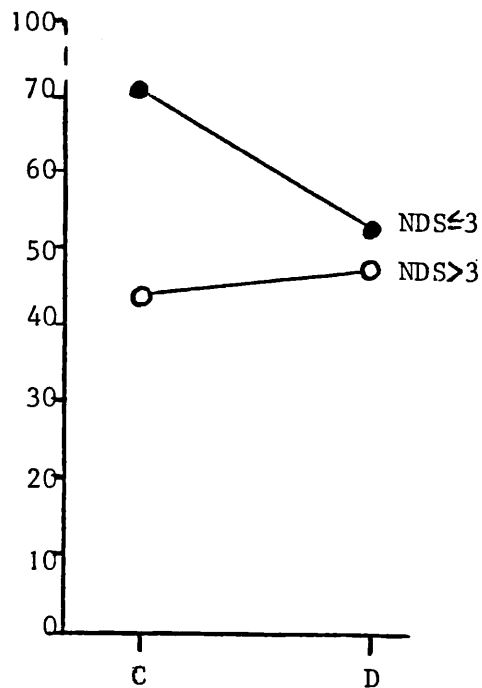
Frequency of depressing thoughts during distraction and during the control condition for high and low endogenous patients in Studies I and II is illustrated in Figure 7.2.

In Study II, as reported in Chapter 5, analysis of variance with presence or absence of depressing thoughts as a between subject factor showed the effects of distraction to be considerably more marked in low than in high endogenous patients. By post hoc Tukey test, low endogenous patients reported significantly fewer depressing thoughts during distraction than during the control procedure. By the same test, high endogenous patients did not. Eleven out of 12 low endogenous patients (92%) reported fewer depressing thoughts during distraction than during the control procedure (the other reported no depressing thoughts in either condition). In contrast, only 11 out of 18 high endogenous

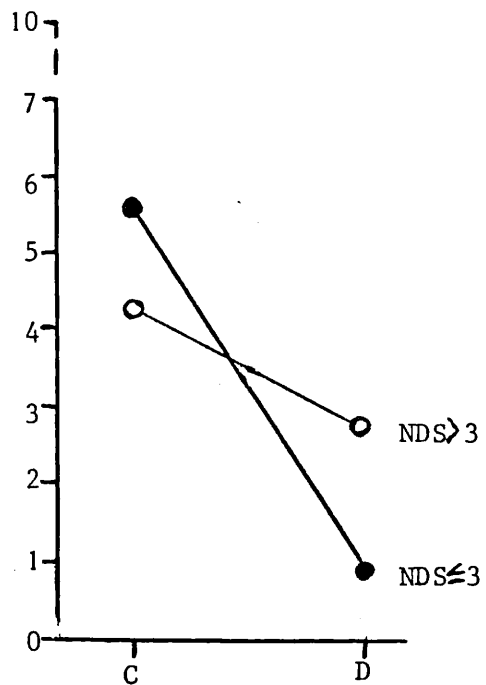
Figure 7.2 Frequency of depressing thoughts during distraction (D) and during the control condition (C), and mean post-intervention scores on depressed mood, high (NDS score >3) vs. low (NDS score ≤3) endogenous patients from Study I and Study II



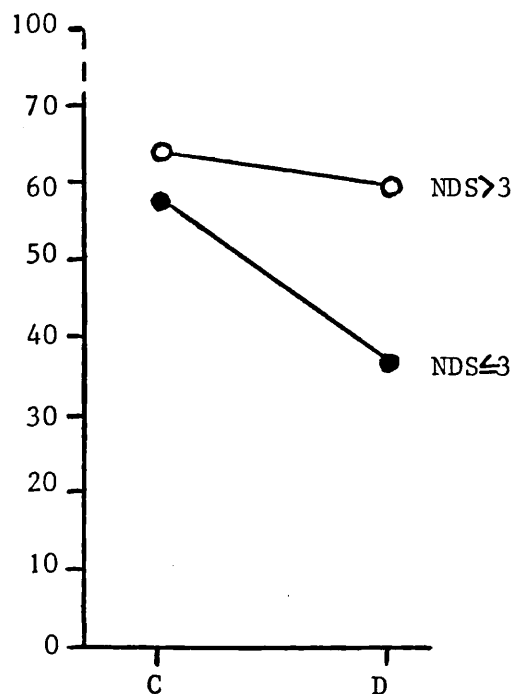
a) Frequency of depressing thoughts (median), Study I



b) Depressed mood (VAS), Study I



c) Frequency of depressing thoughts (mean), Study II



d) Depressed mood (VAS), Study II

patients (61%) reported fewer depressing thoughts during distraction than during the control. Of the remainder, 4 reported equal numbers of depressing thoughts (0, 0, 6 and 10) in both conditions, and 3 reported more depressing thoughts during distraction than during the control. In addition, there was a significant negative correlation between NDS score and the extent to which distraction reduced the frequency of depressing thoughts ($r(28)=-0.36$, $p=.05$). The higher a subject's score on the NDS, the smaller the difference in frequency of depressing thoughts between the two conditions.

These results might be taken to suggest that distraction simply failed to exert control over the frequency of depressing thoughts in high endogenous patients. Consideration of these patients alone, however, indicates that this was not the case. The difference in frequency of depressing thoughts between distraction and the control condition in high endogenous patients was in its own right significant, both when number of subjects responding as the cognitive model would predict was examined ($p<.03$ by the sign test), and when number of depressing thoughts in the two conditions was taken into account (dependent $t(17)=2.38$, $p<.03$). Thus while overall the difference in frequency of depressing thoughts between distraction and the control condition was less marked and less reliable among high than among low endogenous patients, it could not be said that distraction simply failed to control depressive thinking in the former group.

b. Content of depressing thoughts

Categorisation of thought-content In each study, thoughts reported aloud were transcribed verbatim and given to three independent judges to categorise according to whether they related directly to the experiment, or to the subjects' own situations outside the experimental context. Examples of both types of thought, elicited from patients taking part in Study II, will be found in Figure 7.3, together with mean judges' ratings on the 7-point scale from -3 (extremely depressing) to +3 (extremely happy).

Thoughts concerning the experiment included descriptions of the slides or of the white light, comments on any aspect of the experimental procedure, descriptions of immediate feelings or state of mind (e.g. "My mind is wandering", or "I feel bored"), comments on performance at the experimental task (e.g. "Am I doing this right?"), and associations or personal memories obviously stimulated by the experiment itself (e.g. "Boats. That reminds me of my holidays"). Thoughts concerning subjects' own situations outside the experiment included any description of or comment on the person's present life circumstances (including the current episode of depression), which was not overtly stimulated by the slides, the white light, or any other aspect of the experimental situation (e.g. "Thinking about going to the dentist tomorrow", but not "Looking at those curtains made me think of decorating the boys' room. So much to do. I don't know where to start"). Using this categorisation, agreement between all three judges on the

Figure 7.3 Study II : Examples of depressing and nondepressing thoughts related to the experiment itself and to Ss' own situations outside the experiment, together with mean judges' ratings on a 7-point scale from -3 (extremely depressing) to +3 (extremely happy)

	<u>Mean judges' ratings</u>
<u>Thoughts related to the experiment</u>	
<u>Depressing</u>	
<u>Distraction</u>	-1.33
I can't cope with this, I'm getting it wrong	
The Seine, looks like. Remember when I last saw the Seine, young and happy. I don't feel like that now	-2.00
<u>Control</u>	-1.33
Oblong, a coffin, the shape of the light	
When are the pictures going to start? I expected something more. It's irritating. It's like my illness, always expecting help and never getting it	-2.33
<u>Nondepressing</u>	
<u>Distraction</u>	0
What kind of - whether it's reeds, or barley	
Thinking how marvellous Nature is - gives us everything to eat	+2.33
<u>Control</u>	+1.00
I feel so comfortable and very relaxed	
Wondering what the marks were at the bottom of the screen	0

Thoughts related to subjects' situations

Depressing

Distraction

I wish there was some sort of future to the situation I'm in -
so difficult to imagine one

-2.00

Don't want to slip back. Coming off my tablets at the moment,
I hope I don't slip back when I stop

-1.33

Control

Can't relax, can't sleep, just simply thinking about problems,
no end to it

-3.00

How do I get out of this hospital? And if I do, where do I go?

-2.00

Nondepressing

Distraction

Got to do the best I can to get myself into some sort of pattern

+0.33

Control

I hope my stepdaughter doesn't forget to take the dog for a
walk

0

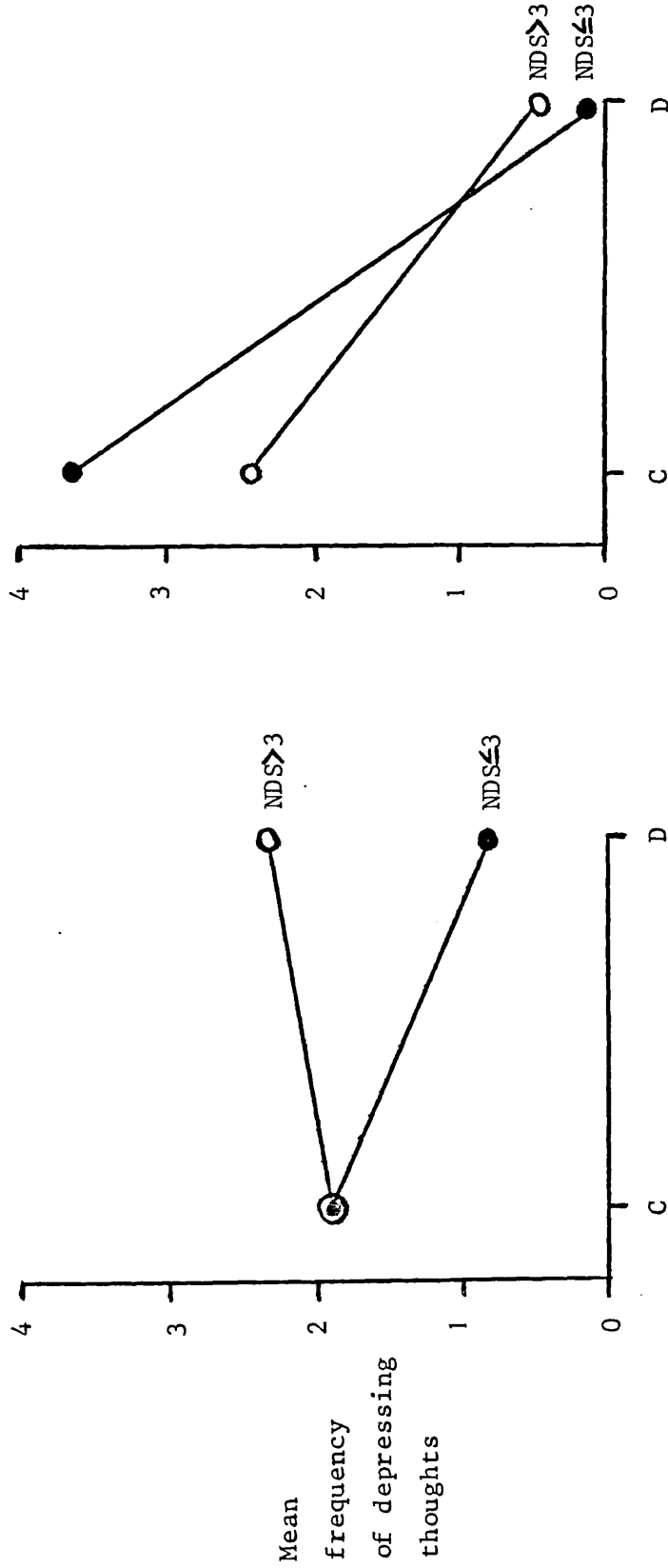
Preparing for weekend leave - we're flying to Jersey on Friday

+1.00

content of categorisable thoughts was in each case extremely high (94% in Study I, 97% in Study II, and 95% in Study III).

In order to examine further the impact of distraction on high and low endogenous patients in Study II, differences between the two groups in content of depressing thoughts were compared during the two experimental conditions. The comparison is illustrated in Figure 7.4. It can be seen from this that distraction reduced the frequency of depressing thoughts related to subjects' own circumstances in both patient groups (mean reduction in low endogenous patients = 3.59; mean reduction in high endogenous patients = 2.00). In high endogenous patients, as in low endogenous patients, depressing thoughts related to the experiment were rated by independent judges to be significantly less depressing (mean rating = -1.15) than depressing thoughts related to the subjects' own circumstances (mean rating = -1.70) ($t(15)=4.57$, $p<.001$). (Two high endogenous patients reported no depressing thoughts in either condition). In low endogenous patients, distraction also reduced the frequency of depressing thoughts related to the experiment itself (mean reduction =1.09). In high endogenous patients, however, the mean frequency of depressing thoughts related to the experiment actually increased slightly during distraction (mean increase = 0.39). The difference in frequency of depressing thoughts relating to the experiment reported during distraction between high and low endogenous patients was in itself significant ($t(28)=2.05$, $p<.05$). None of the other differences between the two groups approached significance ($p>.2$ in all cases).

Figure 7.4 Mean number of depressing thoughts relating to the experiment and to subjects' own situations outside it, distraction (D) vs. the control condition (C), and high (NDS > 3) vs. low (NDS ≤ 3) endogenous patients taking part in Study II



Thoughts relating to subjects' own situations outside the experiment

Thoughts relating to the experiment

c. Effects of distraction on depressed mood

Mean post-intervention scores on the VAS measuring depressed mood for high and low endogenous patients who took part in Studies I and II are illustrated in Figure 7.2.

All 12 low endogenous patients in Study II showed a greater reduction in depressed mood during distraction than during the control procedure. A similar pattern of change in depressed mood was present in only 8 out of 18 high endogenous patients (44%). Mood and thought covaried as would be predicted by the cognitive model of depression only in 6 of these high endogenous patients (one reported equal numbers of depressing thoughts in both conditions, and one reported more depressing thoughts during distraction than during the control). Eleven high endogenous patients reported fewer depressing thoughts during distraction than during the control condition. Of these, only 6 (55%) responded as would be predicted from the cognitive model of depression with greater reductions in depressed mood during distraction than during the control. On average, high endogenous patients showed similar increases in depressed mood over both interventions (10.28 VAS points during distraction, and 14.16 VAS points during the control condition). Equally, while low endogenous patients on average became more depressed over the two five-minute intervals when they were left alone (mean increases = 5.33 and 6.00 VAS points), high endogenous patients tended to become less depressed during these intervals (mean decreases =

0.44 and 9.44).

The apparent dysjunction between thoughts and mood-change in high endogenous patients was confirmed by correlating frequency of depressing thoughts and change in mood in each experimental condition for the two groups of patients. In low endogenous patients, the correlation between number of depressing thoughts (out of 10) and change in mood during distraction was not significant ($\underline{r}(10)=0.17$, N.S.), mainly because the range of thought-frequencies was extremely restricted (8 out of 12 low endogenous patients reported no depressing thoughts during distraction). In the control condition, however, when the range of thought-frequencies was greater (0 to 10), there was a significant positive correlation between number of depressing thoughts and increase in depressed mood ($\underline{r}(10)=0.77$, $\underline{p}<.002$). Among high endogenous patients, in contrast, there was no significant correlation between number of depressing thoughts and change in depressed mood either during distraction ($\underline{r}(16)=0.08$, N.S.) or during the control condition ($\underline{r}(16)=0.21$, N.S.), even though the range of frequencies of depressing thoughts was extensive (0 to 10) in both.

This finding was corroborated by matching the two patient groups as far as possible according to the difference in frequency of depressing thoughts between the two conditions. Extreme scorers (i.e. low endogenous patients with very large differences in frequency of depressing thoughts between the two conditions, and high endogenous patients with no differences or with more

depressing thoughts during distraction than during the control condition) were eliminated from both groups, leaving 9 subjects in each. Mean difference in frequency of depressing thoughts between distraction and the control condition was approximately 3.50 for each of these reduced groups. A pattern of correlations similar to that of the two groups as a whole appeared in these matched subsamples. Thus, the correlation between frequency of depressing thoughts and change in depressed mood was not significant in low endogenous patients during distraction ($r(7)=0.37$, N.S.), but was significant during the control condition ($r(7)=0.76$, $p<.02$). In high endogenous patients, there was no significant correlation between thought-frequency and mood-change either during distraction ($r(7)=0.28$, N.S.) or during the control condition ($r(7)=0.02$, N.S.). Thus in low endogenous patients there appeared to be a direct relationship between the extent of depressive thinking and change in depressed mood, whereas in high endogenous patients no such relationship emerged.

DISCUSSION

This chapter has examined in greater detail differences between the high and low endogenous patients who took part in Study II. Findings may be summarised as follows:

1. There were no significant social or demographic differences between high and low endogenous patients, except that high endogenous patients were significantly more likely to have

received a university education or professional training. It is difficult to see how this could have influenced the results. More highly educated people might conceivably have been more likely to question and grasp the purpose of the experiment, but since no patients who identified the aim of the study were included in the analysis, this could not have influenced outcome;

2. There were no significant differences between the two groups in broad clinical characteristics, or in overall severity of depression. The lack of any difference in the frequency with which biological symptoms (sleep and appetite disturbance) were reported by the two groups is consistent with other research. Nelson and Charney (1981), for example, in an extensive review of studies examining patterns of depressive symptomatology, conclude that these symptoms are frequently present in both endogenous and nonendogenous depressive syndromes, and question their utility in distinguishing autonomous from nonautonomous depression. Alternatively, differences between the two groups could have been obscured by the fact that many patients were currently receiving antidepressant medication. This is unlikely, however, since the RDC checklist was used to assess the presence of symptoms at any point during the current episode, and thus allowed inclusion in the study of patients who were no longer experiencing biological symptoms, but had done so before entry into hospital or before starting to take antidepressant medication.

The only marked difference between the two groups was a significantly higher mean score in high endogenous patients on the BDI item assessing crying behaviour. While this is entirely

consistent with the loss of normal reactivity often considered a defining characteristic of endogenous depression (see, for example, the DSM III diagnosis of melancholia, and the RDC criteria for endogenous depression), a significant difference on only one out of 21 BDI items could of course have arisen purely by chance;

3. On the NDS, the two groups did not differ in number reporting previous episodes. Consistent with the results on measures of severity reported above, they also did not differ on items reflecting core depressive symptomatology (weight loss, agitation/retardation, anxiety or guilt). High endogenous patients were somewhat less likely than low endogenous patients to report depression continuing in the absence of current environmental stressors. They were significantly more likely to describe an adequate previous personality (i.e. an absence of long-term coping deficits or breakdown), to attribute blame to themselves or to nothing rather than to others, and to report a distinct quality of mood, recognisably different from what they would normally experience in reaction to problems (i.e. from what might be termed "reactive" depression). Low endogenous patients, on the other hand, tended to be experiencing depression in a context of identifiable current life difficulties. Most reported a history of failing to cope successfully with such difficulties, laid the blame for their condition (rightly or wrongly) on other people, and described their current mood as no different in quality from what they would normally experience in reaction to problems. This picture corresponds well to "situational"

depression as described by Zeiss and Jones (1983), who cite tentative evidence to support the suitability of behavioural and comparable psychological treatments for these patients;

4. Distraction reduced the frequency of depressing thoughts in comparison to a control procedure in both low and high endogenous patients, though the reduction in the high endogenous groups was overall less marked and consistent. Thus it could not be said that distraction simply failed to control frequency of depressing thoughts in high endogenous patients;

5. In both groups, distraction markedly reduced the frequency of depressing thoughts relating to patients' own circumstances outside the experimental situation. In low endogenous patients, it also reduced the frequency of depressing thoughts related to the experiment itself. In high endogenous patients, in contrast, the frequency of such thoughts marginally increased during distraction. Thus distraction blocked out both preoccupation with depressing current concerns and depressive interpretations of current experience (the experiment itself) in low endogenous patients, whereas in high endogenous patients it only blocked out depressing current concerns, allowing depressive interpretations of current experience to continue unchecked;

6. In low endogenous patients, a lower frequency of depressing thoughts during distraction was accompanied in every case by greater reductions in depressed mood during distraction than during the control procedure. This was not the case in high endogenous patients. Equally, there was no significant correlation between thought-frequency and mood-change in either condition for high endogenous patients. Thus, it appeared that

a direct relationship between thinking and mood was present in low, but not in high endogenous patients.

Clearly it would be unwise to form definite conclusions on the basis of findings from one relatively small-scale study comparing low with high endogenous patients. The results reported here need independent confirmation, and should form the basis for hypothesis-driven replication. Nonetheless, taking them at face value, they do present intriguing pointers towards understanding the nature of endogenous and nonendogenous depression, and in particular towards defining the useful limits of a cognitive model of the disorder, and identifying more clearly the kind of patients most likely to benefit from CBT. These issues, together with possible directions for future research, will be discussed in full in Chapter 8. In the meantime, a number of points should be made.

Firstly, a reasonable body of evidence is now accumulating to support the idea that level of endogeneity may act to mediate the effects of distraction on patients with Major Depressive Disorder. In addition to the three studies reported here (Teasdale and Rezin (1978a), Study I and Study II), some degree of independent corroboration is offered by an unpublished study (Davies, 1982), reported by Williams (1984) in a recent review of issues pertaining to CBT. Davies compared the effects on depressed mood of a self-focussed task (thinking and writing about oneself), an externally focussed task (letter-cancellation), and a control condition (doing nothing). Twenty mildly-to-moderately depressed

patients, categorised as endogenous (n=8) or neurotic (n=12) by Research Diagnostic Criteria, each received all three conditions, presented in random order. Both doing nothing and self-focus resulted in increases in depressed mood (11 and 23 points respectively on a 100 point scale for the total sample). Letter-cancellation, on the other hand, resulted in a marked decrease in depressed mood (45 points on the 100 point scale for the total sample). In addition, there was some indication that this difference between conditions was greater for neurotic than for endogenous patients. In the neurotic group, letter-cancellation was significantly more effective at alleviating depressed mood than either self-focus ($p < .01$) or the control condition ($p < .01$). In the endogenous group, these differences (while in the same direction) were not significant. In addition, a higher proportion of neurotic than endogenous patients responded to letter-cancellation with a reduction in depressed mood (83% as opposed to 50%). On the other hand, there were no significant differences between the changes in mood in the neurotic and endogenous groups in any condition. These somewhat ambiguous results may reflect the use of Research Diagnostic Criteria to diagnose endogeneity. These criteria include only one of the NDS variables which discriminated between high and low endogenous patients in Study II (distinct quality of mood), and this variable is not necessary for a diagnosis of endogenous depression. Other items included in the RDC diagnosis either are not assessed by the NDS (diurnal variation, lack of reactivity to environmental stimuli), or failed to distinguish between high and low endogenous patients (loss of interest and pleasure, guilt, sleep disturbance, weight loss,

appetite disturbance, psychomotor agitation or retardation).

It would seem from the results reported in this chapter that the difference in responsiveness to distraction between high and low endogenous patients was not simply a reflection of differing levels of severity of depression. Rather it would appear that the context of the current episode (previous personality, presence or absence of maintaining stressors), the way it was interpreted (blaming others, self or nothing), and the nature of the experience (distinct quality of mood, as opposed to an intensification of "normal" depression) determined membership of high and low endogenous groups in this sample. These variables, as they presented in the high endogenous group, correspond closely to classic endogenous depression as described, for example, by Nelson and Charney (1981). Such depression is traditionally assumed to be associated primarily with a biochemical dysfunction, and to require physical treatment.

The results reported here suggest the presence of a clear relationship in low endogenous patients between extent of depressive thinking and immediate mood. This is entirely consistent with Beck's propositions on the maintaining role of negative thinking in clinical depression. In contrast, the apparent lack of any such relationship between cognition and affect in high endogenous patients may indicate that, in these patients, depressive thinking is present primarily as a symptom of the disorder, and has no major functional role in its development or maintenance. In low endogenous patients, the reduction in

preoccupation with depressing current concerns was associated with a corresponding reduction in depressed mood, and with a lowered frequency of negative interpretations of immediate experience (depressing thoughts related to the experiment itself). Conversely, the control condition allowed full rein to depressing ruminations about patients' current circumstances. Comments elicited from subjects during and after the control condition reflect an uncomfortable awareness of this process: "I don't like this very much. It's letting me think about what I don't want to think about"; "I'm starting to lose myself in my own thoughts. Nothing to take your mind off your own thoughts. Depressing thoughts tend to surface when there's nothing there. My thoughts are turning inward"; "I couldn't really concentrate on it. Everything seemed to be coming into my head all the time"; and "I couldn't escape my own thoughts".

In high endogenous patients, on the other hand, reducing preoccupation with depressing current concerns was not associated during distraction with any corresponding reduction in depressed mood - indeed, depressed mood on average increased during distraction in high endogenous patients. One might hypothesise that it was this continued high level of depression which produced the relatively high frequency of depressing thoughts related to the experiment in high endogenous patients, i.e. which allowed negative interpretations of current experience to continue unabated, even though depressing thoughts about subjects' own circumstances were blocked out. The two verbatim commentaries

below (taken from a low endogenous patient and a high endogenous patient in Study I) both refer to the same slide (a picture of an elderly lady leading a mule down an isolated mountain road). They illustrate very clearly this difference in the processing of immediate experience.

1. "She's, she's obviously taking it somewhere. P'raps, p'raps she sells things in a market. And, and the goods she's selling are on the back of the mule, and she's taking it to market. Erm - now then, I've just noticed there's a white line down the middle of the road. So it's not in a remote part of the country like I imagined it to be. So it must be a fairly modern place if there's a white line down the middle of the road. Also I think she's walking on the side of the road that foreigners do. You know, they do it the opposite way to we do." (Low endogenous patient)

2. "It's a lady leading a donkey on top of a hill. And the donkey's got so much on it, poor thing. You know, I wouldn't like to be a donkey. I don't think I could cope with all that. Erm - the lady's not very happy. Poor donkey, it feels as if it's being dragged." (High endogenous patient)

This difference in itself may tell us something useful about the marked failure of a small number of CBT patients to respond to therapy (Fennell and Teasdale, 1985). Cognitive therapy assumes that the modification of depressive thinking will lead to changes in affect and behaviour, which in turn will feed back into further changes in thinking. Where mood is not functionally linked with thought in this way (as appeared to be the case in the high endogenous patients who took part in Study II), this therapeutic process would be repeatedly short-circuited by continued intense dysphoria, which would bias in a negative direction perceptions of

current experience, including the experience of therapy itself. The therapeutic implications of the findings reported here will be more extensively discussed in Chapter 8.

Finally, it should be pointed out that a difference between low and high endogenous patients in the role played by negative thoughts would not necessarily be reflected in scores on questionnaire measures of depressive thinking, since it would reside in the function, not the form or quantity, of negative cognitions. Consistent with this, Eaves and Rush (1984) have reported no differences between endogenous and nonendogenous depressed patients, as defined by Research Diagnostic Criteria (Spitzer et al., 1978), on the Dysfunctional Attitudes Scale (DAS)(Weissman and Beck, 1978), the Attributional Style Questionnaire (ASQ)(Seligman et al., 1979), or the Automatic Thoughts Questionnaire (ATQ)(Hollon and Kendall, 1980). In both groups, scores on these measures decreased with remission. Similarly, Giles and Rush (1982) reported no differences on the DAS between endogenous and nonendogenous depressed patients, and found a significant correlation between DAS scores and severity of depression as measured by the BDI only in nonendogenous patients. These data point clearly to the importance of not only assessing the content and magnitude of depressive thinking, but also empirically investigating its functional relationship with other aspects of depression, including affect and behaviour, and with the environment (Arnkoff, 1980; Fennell, 1977).

CHAPTER 8SUMMARY OF MAJOR FINDINGS AND
IMPLICATIONS FOR THE THEORY AND PRACTICE OF
COGNITIVE THERAPY FOR DEPRESSION

In this final chapter, I should like briefly to summarise the main findings of the studies reported above, and to elaborate some of the issues, both theoretical and clinical, that seem to me to be of importance. Specifically, I shall discuss: 1) the extent to which distorted, "irrational" thinking can be regarded as in any way abnormal; 2) the nature of the link between thinking and affect in depression, and in particular evidence suggesting a reciprocal relationship between the two; 3) the therapeutic usefulness of directing attention away from depressive ruminations, either through brief periods of distraction or through more extended programmes of engagement in absorbing activity; 4) the limitations of distraction as a means of overcoming depression, the process of change over the treatment period as a whole, and ways of maintaining improvement once therapy has terminated; 5) the possible irrelevance of cognitive theory and therapy to depressed patients high in endogeneity; and 6) possible directions for future research. I should add one major caveat: many of the ideas expressed here are largely speculative, and should be accepted as such.

SUMMARY OF MAJOR FINDINGS

1. A positive relation was demonstrated between depression as measured by the BDI and scores on the Cognitions Questionnaire, with respect both to total score and to specific dimensions of depressive thinking. The relationship was present in both psychiatric and community samples, and in relation to positive, negative and neutral hypothetical events. More tentatively, results in the group of subjects who had previously been depressed suggested two possible cognitive vulnerability factors, overgeneralisation from negative events and a tendency to respond depressively to the experience of depression itself. These results in particular will need careful replication, as indicated in Chapter 2.

2. In depressed patients low in endogeneity as measured by the Newcastle Diagnosis Scale, a brief, standardised visual distraction procedure significantly reduced the frequency of depresssing thoughts, compared to a control condition. As would be predicted from Beck's cognitive model of depression, this was reliably accompanied by corresponding changes in depressed mood and (somewhat less consistently) in psychomotor speed.

3. These findings could not be attributed to experimental demand, order of presentation of the two interventions, mastery or vocalisation.

4. Results with nondepressed student subjects did not support the alternative hypothesis that distraction achieved its effects through direct mood-elevation rather than through reduction in the frequency of depressing thoughts. That is, it did not appear to function simply as a mood-related pleasant activity. In subjects who reported no depressing thoughts, neither intervention was effective in altering depressed mood, happiness, or psychomotor speed. The possibility remains that some third factor was responsible for changes both in frequency of depressing thoughts and in mood. It is difficult, however, to imagine what such a factor might be. It is unfortunate that (purely for reasons of availability) only female subjects took part in this experiment, since there is some evidence of sex differences in cognitive processes, at least in induced depressed mood (Clark and Teasdale, 1985). However, the responses of female subjects are perhaps of particular interest in relation to depression, given its considerably higher rate of occurrence in women than in men (c.f. Weissman and Paykel, 1974). Nonetheless, future work should ideally include subjects of both sexes.

5. Results similar to those found in low endogenous patients were not present in patients high in endogeneity. In this group, distraction did not consistently control the frequency of depressing thoughts and, even when it did, such reductions were not necessarily accompanied by reductions in depressed mood. It appeared that the clear functional relationship between thinking and mood found in low endogenous patients was not reliably present in patients high in endogeneity.

LACK OF LOGIC AS A PART OF NORMAL FUNCTIONING

Results on the Cognitions Questionnaire demonstrated the predicted relationship between distorted, depressive thinking and depression in both psychiatric and community samples. What scores on questionnaires of this kind may obscure, however, is the extent to which biased perceptions and inaccurate interpretations of incoming information are a normal part of human functioning. It is clear from the work of experimental cognitive and social psychologists that the processes of distortion identified by Beck in relation to psychopathology are in fact by no means specific to emotional disorder. Indeed, the idea of perception and cognition as active, organising, constructive processes operating to varying degrees in accordance with existing conceptual frameworks, rather than with "objective" reality, has a lengthy and respectable history (e.g. Bartlett, 1932; Bruner, 1959; Gibson, 1966; Haber and Hershenson, 1973; Hayek, 1952; Neisser, 1967, 1976), and has received increasing attention with the development of information-processing technology (e.g. Lindsay and Norman, 1972; Anderson, 1976, 1980). Workers such as Tversky and Kahneman (1974) and Nisbett and Ross (1980) have examined in some detail the influence of "knowledge structures" (akin to assumptions), "judgemental heuristics" such as availability, representativeness and salience, and more specific inferential errors such as inadequate appreciation of covariation, distortions of attribution, ignorance of base rates and regression phenomena, and confirmatory biases in theory-testing (c.f. Wason, 1968). Recent research and

discussion papers have attempted to use this extensive body of theory and of empirical data to produce more sophisticated models of cognitive functioning in emotional disorder, and in particular the genesis and maintenance of depression (e.g. Arieti and Bemporad, 1980; Arnkoff, 1980; Bower, 1981; Hollon and Kriss, 1984; Ingram, 1984; Turk and Salovey, 1985).

Given the well-attested normality of inaccurate perception and reasoning, one may feel entitled to ask whether the cognitive processes postulated by Beck to be crucial to the development of clinical depression differ in any way from what most of the people are doing most of the time (Rachman, 1983). As Hollon and Kriss (1984) have expressed it, "cognitive factors ... including the operations of knowledge structures and heuristic processes, even those leading to biased inferences, may well operate in normal, as well as in psychopathological populations. For years, clinical researchers have focussed on the aberrant cognitive processes of psychopathological groups such as depressives and anxiety disordered individuals. The extensive research by cognitive and social psychologists ... highlights the extremely important fact that all individuals may be said to engage in aberrant styles of cognitive processing". While no formal answer exists to the question of why in some individuals these normal inaccuracies of interpretation spill over into flagrant pathology, it seems probable that the solution will lie not so much in the processes involved as in their content, the extent to which they are unhelpful or indeed destructive to the individual, and the degree

to which their operation is associated with extremes of painful affect. As Hollon and Kriss continue: "what may cause clinical groups a problem is the interaction of certain potentially universal heuristics with problematical "schemata" (e.g. schemata containing excessively negative information or excessively fearful stimuli) producing problematical cognitive products (e.g. negative and self-critical statements, phobic or paranoid thoughts). Nonclinical groups, on the other hand, are less likely to experience problematical cognitive products because they base their heuristic processing on more neutral or positive schemata". Nisbett and Ross (1980) graphically describe the cost to the individual of this harmful interaction between structure and process:

"the judgements and inferences that are of the greatest personal importance to the individual may be the ones that can be least touched by ... normative considerations ... The more vivid the data that people confront, and the more affect-laden or personally relevant the issues with which they deal, the less likely ... the higher-order inferential routes ... will be used in the evaluation of evidence. This is true to such an extent that people may have different standards of rationality, indeed even different standards of sanity, for inferences that touch deeply on the self than for those pertaining to other matters ... Inferences about matters that touch deeply upon the self have a unique status. They seem to call upon cognitive structures that are less normative and more primitive than those that figure in less personal inferences. Moreover, such structures cannot readily be superseded by more logical ones. When other people point out to the individual that his inferences or feelings are distorted and erroneous, he may accept this intellectually but scarcely be affected by it emotionally. That is, he may recognise his error, and realise that he would not have made a similar judgement about anyone else, but still remain trapped by his feelings, and by the primitive inferential processes underlying them" (pp. 288-289).

The implications of this for the possibility of fundamental long-term change of the kind supposed by the cognitive model to be necessary to prevent relapse into depression will be discussed below.

COGNITION AND MOOD: A RECIPROCAL RELATIONSHIP?

The influence of mood on thinking

The results of the three experiments reported in Chapters 4, 5 and 6 support the central prediction from the cognitive model of depression that modifying the frequency or intensity of negative thinking will also modify depression, at least in low endogenous patients. While theoretically this provides valuable corroboration for the fundamental hypothesis underlying the development of CBT, the findings should not be taken to indicate a one-way relationship between thinking and affect. The contrary proposition (that the influence of affect on cognition is primary) has recently been put forward with some energy by Zajonc (1980) and by Rachman (1981, 1983). Zajonc argued that "affective judgements may be fairly independent of and precede in time the sorts of perceptual and cognitive operations commonly assumed to be the basis of these affective judgements". This being the case, cognitive interpretations may be little more than post hoc rationalisations. Rachman pursued this line of argument in two lively discussion papers, in particular drawing out its clinical implications. He suggested that more attention should be devoted to developing direct means of altering affective state (c.f. also

Wright and Mischel, 1982) so as to increase the interdependence of cognition and affect and to facilitate the use of each to modify the other, emphasised the importance of performance-based change procedures and the difficulty of controlling the "dense and unruly flow of thinking", and proposed that findings from experimental psychology should be used to guide the development of treatment programmes. This last suggestion one can only endorse.

These three papers, while thought-provoking, appear in the reading to be at least partly based on faulty assumptions that Beck's model proposes: a) that depression is caused by negative thinking; and b) that traffic on the road between thinking and emotion is strictly one-way. As has already been stated in Chapter 1, Beck (1983) explicitly denies a causal role for negative thinking, and has from the beginning (Beck, 1963) assumed a reciprocal relation between thinking and mood. Certainly, there is now plentiful evidence to support the association between both clinical depression and induced depressed mood and deficits in a variety of aspects of cognitive functioning. These include: lowered expectancy of successful performance (Lobitz and Post, 1979; Loeb, Beck and Diggory, 1971; Wright and Mischel, 1982); poor retrospective evaluation of performance (Demonbreun and Craighead, 1977; Lobitz and Post, 1979; Loeb, Beck and Diggory, 1971; Wener and Rehm, 1975; Wright and Mischel, 1982); decrements in perception of positive behaviours (Roth and Rehm, 1980); deficits in interpersonal problem-solving (Mitchell and Madigan, 1984); negative global self-evaluations (Wright and Mischel, 1982); loss

of future perspective (Dilling and Rabin, 1967); imperviousness to positive feedback, readiness to accept negative feedback and sensitivity to low rates of positive reinforcement (Roth and Rehm, 1980; Wener and Rehm, 1975; Wright and Mischel, 1982); low rates of self-reward (Lobitz and Post, 1979); facilitated recall of negative self-referent information (Davis, 1979; Davis and Unruh, 1981; Kuiper and Derry, 1982); increased facility for recognising unpleasant material (Dunbar and Lishman, 1984); and decreased probability and speed of recall of positive experiences and stimulus words and/or increased probability and speed of recall of negative experiences and stimulus words (Bower, 1981; Breslow, Kocsis and Belkin, 1981; Clark and Teasdale, 1982, 1983; Lloyd and Lishman, 1975; Madigan and Bollenbach, 1982; Teasdale and Fogarty, 1979; Teasdale and Russell, 1983; Teasdale and Taylor, 1980; Teasdale, Taylor and Fogarty, 1980).

The influence of mood on thinking thus appears to have been incontestably demonstrated, and indeed knowledge of this phenomenon is not restricted to the scientific community, as the following quotation, taken from a recent popular novel, readily illustrates:

"Thinking about my life that night I saw it as a desolate range of mountains in which each pinnacle of failure led on to an even higher peak. My mind only seemed capable of selecting horrible memories from the past so that I vividly recalled every moment of humiliation and frustration that I'd endured from early childhood up to the present. With the distortion that depression induces I had the impression that my experience had been one of unbroken pain". (Blackwood, 1981)

The vicious circle

Data of the kind reported above, together with evidence of the influence of thinking on affect, have been used to extend our understanding of the development and maintenance of clinical depression, and in particular to explicate the vicious circle of reciprocal negative thinking and emotion originally postulated by Beck (1963). Wright and Mischel (1982), for example, in an experimental study of the effects of induced mood in nondepressed students, noted how a combination of depressed mood and apparent failure led to subjects setting higher standards for performance on a matching task, standards which in fact exceeded expected level of performance and thus set the scene for future failure and perpetuation of negative self-evaluations and of depression. This is reminiscent of Rehm's (1977) self-control model of depression, which proposes unrealistically high standards of performance as one element of self-regulation resulting in self-evaluation and self-reinforcement deficits, and thus contributing to the development of clinical depression.

The importance of recognising the complex interplay of feeling, thinking and behaviour in human functioning has been emphasised by a number of workers (e.g. Greenberg and Safran, 1984; Meichenbaum and Butler, 1979). Within depression-treatment research, the idea of a self-perpetuating reciprocal feedback loop between cognition and affect has been extensively developed in a series of papers by Teasdale (Teasdale, 1983b and c, 1985), which draw together information from social and experimental cognitive research.

Teasdale suggests that the development of clinical depression as an extension of the dysphoria normally associated with loss events will depend on the operation of a number of factors, for example: continued occurrence of acute environmental stressors or chronic life difficulties of the kind identified by Brown and Harris (1978); the nature of the support available to the individual, especially the availability of a close and confiding relationship with one's spouse (Brown and Harris, 1978); the nature of the cognitions that become accessible once the individual is depressed (which will be determined largely by the strength of associations built up by past experience between concepts and depressed mood - Bower, 1981; Teasdale, 1983a); and previous knowledge and experience of depression, including the availability of a conceptual framework for understanding it (c.f. Fennell and Teasdale, 1985) and knowledge of depression-management strategies. This conceptualisation of depression represents an important advance, not least because it attempts to integrate the working of a range of different factors (mood, current thinking, past experience, environmental and interpersonal variables) which might influence the course of depression and determine whether mild "normal" mood-disturbances dissipate or worsen, and whether clinical depression once it has developed "spontaneously" remits or becomes a chronic, longstanding disorder.

Additionally, Teasdale's model has important implications for what will constitute valid goals for treatment in different individuals. Where lack of understanding of the nature of

depression and poor depression-management skills were the primary maintaining factors, an acceptable concept of depression and experience of the practical efficacy of therapeutic techniques derived from it might provide a pivotal experience sufficient in itself to promote recovery (Fennell and Teasdale, 1985), especially if negative life events associated with onset were no longer operating, and if the individual was equipped with a range of skills for dealing with life (Simons et al, 1985). Where, in contrast, depression was associated primarily with genuine continuing environmental stressors, as was apparently the case with many of the patients included in Study II, problem-solving directed towards resolving these would also be necessary, though it might be facilitated by the use of symptom-relief strategies such as distraction or activity-scheduling. In some cases, this would primarily involve reactivation of existing coping skills; in others, such skills would have to be taught. (Interventions of this kind are readily carried out within the framework of CBT, and often form a major part of later sessions of therapy, but it is difficult to see how they could be achieved by strategies purely directed towards changing affective state - including medication.) Where the lack of an adequate support system was an important factor, therapy should perhaps be directed not only towards the index patient, but also towards significant others in the immediate environment, especially where they have no real understanding of the nature of depression and of the changes it induces in the depressed person. It should be remembered in this context that, over time, significant relationships may well be directly affected by the social behaviour of the depressed

individual (c.f. Coyne, 1976; Gotlib and Robinson, 1982; Hammen and Peters, 1978). Finally, where the prime maintaining factors were the cognitions that became available once the person was depressed, then reducing the frequency of such cognitions through distraction and activity-scheduling, and their power through rational restructuring and behavioural experimentation, would be a prime goal. In some cases (for example, where patients presented with a history of rejection, longstanding low self-esteem and inability to form intimate relationships), this operation could well take more than the traditional 20 sessions of CBT. These predictions have yet to be systematically tested by examining the effectiveness in appropriate patient groups of targetting the different maintaining factors described here.

THE THERAPEUTIC USEFULNESS OF ABSORBING ACTIVITY

Distraction procedures

Whatever the degree of primacy assigned to negative thinking in the development and maintenance of clinical depression, the research reported in this thesis, taken together with the studies carried out by Blackburn and Bonham (1980), Davies (1982), Fennell and Teasdale (1982) and Rötzer (1978) do suggest that active modification of the frequency or intensity of depressive cognitions can in itself bring about sizeable reductions in depressed mood and alterations in other aspects of the state of depression, at least in patients low in endogeneity. With regard to distraction, these findings support the usefulness of the

technique as a short-term emergency measure for alleviating dysphoria. While evidence of any lasting effect is currently minimal, and the time-course of any beneficial impact clearly needs systematic investigation, it should not be forgotten that the very brief, standardised distraction procedure used here produced marked change, in comparison to the control procedure, in patients who on average scored in the moderate-to-severe range of depression, had been depressed for some time, and mostly required day- or full-time hospital care. The power of the intervention could no doubt be enhanced in clinical practice by the addition of, for example, a therapeutic rationale, personal selection of distraction stimuli, use of stimuli which elicited actively positive thoughts (rather than the predominantly neutral thoughts reported here), training and regular practice. The reciprocal relationship between thinking and affect could then be put to good use, employing resultant improvements in mood to mobilise existing coping resources which the depression had effectively prevented patients from using (Simons et al., 1985), and to facilitate constructive problem-solving and nondepressive thinking.

Conversely, the results suggest that, in low endogenous patients, periods of inactivity are unlikely to be helpful. It appeared that in these patients the absence of any high information-processing demand allowed free rein to depressive ruminations on matters of current concern, leading directly to marked increases in depressed mood. Given the reciprocal relationship between thinking and mood, such intensifications of depression in turn would be expected to further hinder effective functioning, and to

render nondepressive thinking and constructive problem-solving yet more difficult. This is consistent with suggestions by McLean and Hakstian (1979). Commenting on features of behavioural treatment for depression agreed by therapists and patients alike to be conducive to change, they identified an external focus of attention, counteracting depressive ruminations, as one factor contributing to successful outcome. Schmitt (1983) has recently made a similar point, noting that "nondirective ... strategies with their inward focus on feelings may exacerbate the experience of negative affect in depressed clients ... Cognitive-behavioural strategies on the other hand, may facilitate improvement by directing attention away from affect". Schmitt suggests that this may account for the relative failure with depressed patients of nondirective, insight-oriented and supportive psychotherapies (c.f. McLean and Hakstian, 1979; Shipley and Fazio, 1973; Shaw, 1977). The finding of Fennell and Teasdale (1982) that a period of exploration, information-gathering and empathy produced no change either in belief in a specified negative thought, or in depressed mood, is consistent with this. Finally, Jacob, Turner, Szekely and Eidelman (1983), in a study of relaxation therapy for headaches, suggest that the failure of depressed patients to improve with treatment might be attributed to increases in depression produced by the fact that during relaxation sessions "they were at liberty to focus on their depressed mood or depressive cognitions, with an escalation of symptoms as a result". This, of course, is exactly what happened during the control condition with the low endogenous patients in Study II,

and with nondepressed student subjects reporting depressing thoughts, despite instructions to relax as far as possible and to concentrate attention on the white light.

Activity scheduling

Assuming that it is legitimate to generalise from very brief periods of engagement produced by an experimental manipulation, the results of Studies I and II support the usefulness for low endogenous patients of regular engagement in a structured programme of absorbing activities, as suggested by Beck and his colleagues (Beck et al., 1979, Chapter 7). Activities should be carefully selected, with regard to their ability to capture and retain attention, since depressed patients may be unable to concentrate effectively on many activities (for example, reading or watching television) which they normally enjoy (Watts and Sharrock, 1985). In a satisfactory programme, the effects of reducing the amount of channel-capacity available for negative thinking would no doubt be enhanced by other factors such as increased mastery, sense of self-efficacy and control, and broadening of opportunities for positive reinforcement. Yet loss of interest, pleasure and motivation to engage in any activity, and associated reductions in activity level, are often central to the experience of depression, and may result in lengthy periods of minimal engagement in anything other than unconstructive and distressing rumination. Anecdotally, I noticed that a number of hospital inpatients were actually quite pleased to take part in the two experiments reported here, because they represented something to do and something to think about other than

themselves.

LIMITATIONS OF DISTRACTION :

LONG-TERM CHANGE AND HOW TO MAINTAIN IT

Nonetheless, distraction, however effectively packaged, is unlikely in itself to produce recovery from an episode of clinical depression and restore normal functioning, nor is it intended that it should do so. In essence, it is a palliative measure, involving an instruction to the patient "not to think about it", and in practice care must be taken to ensure that it is not used as a means of cognitive avoidance. While in patients for whom depression about depression is a major maintaining factor, use of distraction may demonstrate graphically the influence of thinking on depression, and provide an experiential lesson about the possibility of controlling depressed mood, the major core strategies employed in CBT are active challenging of negative automatic thoughts and of underlying dysfunctional beliefs. The first of these is intended to produce symptom-relief and to work at resolving life-problems. The second is viewed more as a preventive measure, undermining the foundations of future depressions. Preliminary data on the immediate efficacy of modifying negative automatic thoughts is available from the experiments by Blackburn and Bonham (1980) and Fennell and Teasdale (1982) reported above, which also demonstrate the utility of the experimental paradigm employed with distraction to evaluate the effectiveness of other components of the CBT package. I

should like now to consider the nature of change occurring over the longer term, specifically over the treatment period as a whole, and how such change is best maintained once treatment is terminated.

Change over the main treatment period

As far as the modification of negative automatic thoughts is concerned, the fact that the central aim of CBT is to overcome depression by altering depressive thinking does not necessarily imply that cognitive change procedures as such are the only, or indeed the most powerful means of achieving this aim (Bandura, 1977; Coyne, 1982; Hollon and Kriss, 1984). CBT, as its name implies, contains a sizeable behavioural element (see Chapter 1). That is, rational thought-change procedures will be routinely followed by behavioural homework assignments encouraging the evaluation of new ideas through empirical testing. I would hypothesise that this interweaving of cognitive and behavioural change procedures forms a crucial element of the CBT package as a whole. Cognitive change opens the way to changes in overt behaviour, and facilitates engagement in behavioural assignments by, for example, reducing perceived risks, costs and disadvantages, and encouraging realistic preparation for a range of possible outcomes. That is, CBT acts as a means of persuading patients to behave in a way that is inconsistent with negative thinking (Coyne, 1982). Behaviour-change in turn produces

consequences that contradict the original negative thoughts and thus further erode their credibility. So, within the cognitive framework, behaviour change is a means to an end, rather than an end in itself. As the CBT manual explicitly states: "The ultimate aim of [behavioural] techniques in cognitive therapy is to produce change in the negative attitudes ... Behavioural methods can be regarded as a series of small experiments designed to test the validity of the patient's hypotheses or ideas about himself" (Beck et al., 1979, p.118).

This hypothesis (that the combination of cognitive and behavioural techniques is an important aspect of the success of CBT) should be open to empirical testing, since certain specific predictions follow from it. Specifically, a combination of cognitive and behavioural procedures should be more effective over the longer term than either separately. That is, the measurable immediate effects of purely cognitive manipulations should dissipate in the absence of appropriate behavioural follow-up tasks. These, in contrast, should allow cognitively mediated change to be maintained, and indeed increased (as, anecdotally, patients report that they do). Evidence to date on this issue is inconclusive. Taylor and Marshall (1977) found that in 28 mildly-to-moderately depressed female students, a combination of cognitive and behavioural treatment elements was significantly more effective in reducing depression than either element alone. Purely cognitive and behavioural treatments were about equally effective, and both

superior to a waiting-list control condition. These differences persisted at 6 weeks follow-up. Equally, the necessity noted by Fennell and Teasdale (1985) for both a coherent cognitive explanation of depression and an opportunity to test it out in practice before marked improvement occurred in rapid responders to CBT is consistent with this idea. On the other hand, Rabin et al. (1984) reported no superiority in clinically depressed women for a combined cognitive-behavioural self-control treatment over self-control treatments targetting only cognition or behaviour. A possible confounding factor is that cross-fertilisation between cognitive and behavioural change may be inevitable, given the high probability that changes in one area of functioning will be reflected in others (c.f. Kornblith, Rehm, O'Hara and Lamparski, 1979).

Returning to the modification of depressive cognitions per se, it is by no means clear that re-evaluation of negative interpretations of experience à la Beck is necessarily the most powerful available verbal change-procedure. Deficits in positive self-statements have been argued by some workers to be more central, at least in mild depression, than excesses of negative self-statements (Ingram and Smith, 1984; Ingram, Smith and Brehm, 1983). Similarly, increasing the availability of positive self-statements has been shown to result in significant improvements in clinical depression and in self-esteem (Rötzer, 1978), and to be superior both to a behavioural treatment programme designed to increase the frequency of mood-related pleasant activities and to a self-regulation programme based on the work of Rehm (Rötzer,

Koch, and Pflug, 1981). No direct comparison has yet been made, as far as I am aware, between the two procedures.

Another issue is the extent to which cognitive change strategies need to be embedded, if they are to succeed, in a warm, collaborative therapeutic relationship, which encourages the patient to discover alternatives to depressive thinking for him- or herself, explicitly avoiding persuasion, lecturing and extensive didacticism. Albert Ellis, for example, in the practice of Rational Emotive Therapy (Ellis, 1962), is unafraid of direct (and indeed aggressive) confrontation with clients' irrational beliefs, as the following extracts from transcripts of therapy sessions illustrate (Ellis is speaking): "I think that's completely asinine. You have one fucking life to live, zero else ... Now you're going to piss it away and let other people do what they want with you ... Now I think that's utterly asinine and un noble"; "No, that's not correct. You don't realise it, but that's not correct"; "No, that's wrong"; "Well, you see, that's your nutty standards"; "You see, that's a nutty definition in your head". Maultsby's rational self-counselling (1971), while less overtly aggressive, has a similarly didactic and confrontative style. Since neither of these approaches has been systematically evaluated (Engels and Diekstra, 1984), and no comparison has been made with the goal-directed but oblique socratic questioning central to the practice of CBT, it is difficult to tell how far differences in therapeutic style of this kind interact with the specific content of cognitive interventions to influence outcome

(Boelens, 1984). This situation should shortly change, since therapist characteristics such as directiveness, rapport, genuineness, warmth, sensitivity and ability to operate as an equal are currently under evaluation in relation to treatment outcome as part of the multicentre NIMH trial of CBT and interpersonal psychotherapy mentioned in Chapter 3 (DeRubeis, Hollon, Evans and Bemis, 1982).

Finally, little attention has as yet been paid to the relevance of research on attitude change to CBT as a system of persuasion (Craighead and Craighead, 1980), the effectiveness of which is likely to be influenced by variation in factors such as source credibility, disparity of messages from the client's existing position, client participation, client commitment, and the like.

The maintenance of change

Going beyond evaluation of the immediate effects of modifying depressive thinking, and of the influence of cognitive change procedures on progress over the treatment period as a whole, a further consideration is the means by which recovery from depression through CBT may best be maintained, and in particular whether, as Beck's model suggests, the restructuring of underlying cognitive structures (assumptions) is an essential prerequisite of long-term improvement. The CBT treatment manual (Beck et al., 1979) unequivocally states that "the patient will remain vulnerable to future depressions until these beliefs are identified and changed" (p.244). CBT should thus lead not only to recovery from the current episode of depression, via the interplay

of cognitive and behavioural change procedures described above, but also to reduced vulnerability to future episodes, via the replacement of dysfunctional cognitive structures with more adaptive and flexible rules for behaviour. The modification of assumptions implies that the schematic basis for encoding behaviour is fundamentally altered. The danger of relapse is reduced because the underlying principles whose activation gave rise to the depression in the first place have been, as it were, removed, rather than because the patient has been provided with an armoury of cognitive and behavioural skills with which to combat and cut short depression, as and when it recurs. Yet the fact of the matter is that a fair proportion of patients treated with CBT do become depressed again, and/or require further treatment (see Chapter 3). It may be, therefore, that attempting to alter highly generalised, unarticulated rules of behaviour, often established very early in life and repeatedly reinforced by years of experience, is not an easy task, and would usefully be supplemented by a maintenance package ensuring regular practice of depression-management skills of the kind actually taught in CBT (c.f. Kovacs et al., 1981).

The difficulties inherent in attempting to alter assumptions have been described by Hollon and Kriss (1984) in their comprehensive and lucid integration of ideas and research from cognitive therapy and from experimental cognitive psychology. They state: "The basic dilemma is this: the main thrust of the cognitive and social cognition research would seem to suggest that beliefs, once

adopted and organised into structures and processes, the latter presumably universal and quite possibly innate, are extremely difficult to change. These processes appear to make it unlikely that naturally occurring "corrective experiences" will occur, or, if they occur, that they will have an impact. Hence, the inertia in the system appears to militate against change". Factors contributing to the stability of early learning are identified by Hollon and Kriss as follows: repeated reinforcement, often over lengthy periods, and the accumulation of information apparently consistent with the belief; imperviousness to contrary evidence, since incoming information will have been filtered and interpreted in line with existing structures; a bias towards confirmatory rather than disconfirming instances (c.f. Wason, 1968); behaviour in accordance with existing beliefs producing data consistent with them, through the mechanism of self-fulfilling prophecies; the inaccessibility of higher level structures to conscious awareness (c.f. Nisbett and Wilson, 1977); and the state-dependence of activation of dysfunctional beliefs which may render them inaccessible or unbelievable when people are not depressed, while also destroying access to alternative adaptive structures when they are. Given this multitude of conservative tendencies, it is no wonder if successful modification of assumptions is a difficult and lengthy task. Indeed, Mahoney (1980) has speculated: "I think we should remain open ... to the possibility that beliefs are never eradicated ... we may be modifying the prepotency of a belief rather than its literal existence in our nervous systems. Belief-changing experiences may serve to reduce the strength or frequency with which a belief is activated, partly by

strengthening an incompatible belief that serves to inhibit its competitor. It might be heuristic ... to think of belief-change in terms of internal attentional shifts" (p.170).

Granted these difficulties, a more systematic emphasis on the acquisition and repeated rehearsal of cognitive problem-solving skills of the kind outlined in Chapter 1 might be a valuable addition to the CBT package, and contribute to prevention of relapse in the event of future adversity. The depressed person may be seen to enter therapy with an overlearned, "automatic", undiscriminated sequence of cognitive, affective and behavioural responses to distressing situations. During CBT, the patient first learns to identify the sequence, thus "deautomatising" it (Meichenbaum, 1977), and opening the way for change to occur. Dysfunctional automatic processing is brought under conscious control (Greenberg and Safran, 1981; Shiffrin and Schneider, 1977). With repeated rehearsal, both within therapy sessions and via independent homework assignments, discrimination of depressive setting conditions (upsetting situations) becomes quicker and more efficient, and modification of old responses more skilled and effective. In time, the new "rational" response may in itself become automatic, entirely replacing the original dysfunctional response, and occurring largely without conscious awareness. The modification of assumptions may be seen as a final stage in this process, a sort of economy measure (Bruner, Goodnow and Austin, 1956) which facilitates recognition of classes of equivalent stimuli and responses, rather than particular, discrete,

situation-specific thoughts, feelings and behaviours. Once such a class has been identified, the patient is increasingly in a position to deal with new examples on the basis of successful management of other members of the class already encountered, rather than having to face each as if it was wholly new. Eventually this in itself might become so automatic that the original depressive response was no longer triggered. At this point, we might say that a change in higher-level processing had occurred. The time-scale for such a change is currently unknown (Hollon and Kriss, 1984).

Thus the identification and challenging of assumptions facilitates generalisation to situations and issues not specifically dealt with during therapy. So, however, would regular rehearsal of core CBT skills. In addition, it might encourage realistic recognition of the possibility that, life being what it is, depression could recur. Continued use of skills might be reinforced by maintenance sessions over a period following termination of regular treatment(it would appear that something of this kind was in practice done over the one year follow-up period following CBT reported by Beck et al., 1985). The goal of such sessions would be to prevent normal upset or mild depression from escalating into a full-blown episode through the kind of vicious circle described by Teasdale (1983b and c, 1985). That is, they would be designed, at least in part, to undercut the tendency to react depressively to upsets suggested by results on the CQ in people who had previously been depressed. There has as yet been no formal investigation of the long-term efficacy of identifying and

challenging assumptions as opposed to (or in addition to) a structured programme of depression-management skills. Indeed, none of the outcome trials so far reported has explicitly stated whether or not assumptions were in fact a target for treatment in every case.

DISTRACTION AND ENDOGENEITY :

ARE THERE LIMITS TO THE USEFULNESS OF THE COGNITIVE MODEL OF DEPRESSION?

In clinically depressed patients low in endogeneity as measured by the Newcastle Diagnosis Scale, distraction significantly and reliably reduced the frequency of depressing thoughts, compared to the control procedure. Equally, in low endogenous patients, this change was reliably accompanied by marked reductions in depressed mood. In high endogenous patients, in contrast, distraction was less likely to reduce the frequency of depressing thoughts, and reductions which did occur were not necessarily accompanied by comparable reductions in depressed mood. Frequency of depressing thoughts was significantly correlated with change in depressed mood during the control condition for low endogenous patients, but not for high endogenous patients. Similarly, there was a significant correlation between the extent to which distraction controlled the frequency of depressing thoughts (i.e. the difference in frequency between distraction and the control condition) and the difference in mood-change between the two conditions in low endogenous patients ($r(10)=0.76$, $p<.01$), but not

in high endogenous patients ($r(16)=0.27$, $p>.1$). This apparent dysjunction between thinking and mood in high endogenous patients begs the question as to whether Beck's cognitive model of depression can be used to explain the development or maintenance of clinical depression in patients scoring high on measures of endogeneity. Following from this, it suggests the possibility that distraction in particular, and cognitive change procedures in general, may not be appropriate therapeutic interventions for these patients.

As far as distraction itself is concerned, high endogenous patients showed comparable increases in depressed mood over both experimental interventions and, in contrast to low endogenous patients, decreases in depressed mood over the two 5 minute periods of isolation and activity between interventions. It is possible that, for high endogenous patients, peace and quiet are more therapeutic than enforced engagement in any activity (c.f the comments of Gray (1983), based on personal experience, regarding the demoralising effects of occupational therapy and the need in severe endogenous depression to "sit in the corner and do nothing").

Generalisation should be cautious, however, from the immediate effects on thinking and mood of very brief, experimentally presented, standardised interventions designed to reduce frequency of depressing thoughts, to the impact on the whole constellation of clinical depression of complex psychological treatment packages

such as CBT. Unequivocal evidence for the relative appropriateness of psychological treatments for different subtypes of depression is currently lacking (Zeiss and Jones, 1983; Thase, Hersen, Bellack, Himmelhoch, Kornblith and Greenwald, 1984). Rush and Shaw (1983), reviewing treatment failures with CBT, state: "Endogenous or melancholic depressions are those which lack a capacity for enjoyment or pleasure and who suffer from a pervasive mood that is unreactive to environmental events. This group, we believe, has an affective disorder that derives mainly from a central nervous system dysfunction that colours one's thinking. Cognitive change techniques alone may result in only partial or transient symptom relief in this group". While this exactly describes the response to treatment of a small number of endogenously depressed women given social skills training by Thase et al. (1984), Rush and Shaw provide no data to substantiate their belief. Echoing the exclusion criteria for CBT originally specified by Beck et al. (1979), they continue: "Bipolar or manic-depressive illnesses, depressed phase, psychotic depression, and melancholic depression ... are among those that clinical experience suggests will not respond. However, controlled outcome studies to document these clinical hunches are not available". What evidence there is suggests no difference in responsiveness to CBT between endogenous and nonendogenous depressives. Kovacs et al. (1981), measuring endogenomorphicity on the Hamilton Rating Scale for Depression, found "no prejudice in the assignment of high or low endogenomorphs to either cognitive therapy or pharmacotherapy". Endogenomorphicity alone did not influence whether or not patients completed treatment, level of depression

at the end of the treatment period, post-treatment clinical course, or level of depression on the BDI at 12 months' follow-up. Similarly, Blackburn et al. (1981), examining 64 patients who completed their outcome trial of CBT, pharmacotherapy and a combination of the two in hospital and general practice patients, concluded that: "Endogenous patients [as defined by Research Diagnostic Criteria] responded as well to cognitive therapy as they did to drug treatment and combination treatment and nonendogenous patients responded as well to drugs as they did to cognitive therapy. Moreover, within each treatment group, a similar proportion of endogenous and nonendogenous patients responded". As has already been pointed out in relation to the study of distraction carried out by Davies (1982), RDC for endogenous depression do not necessarily include those NDS factors which discriminated between high and low endogenous patients in Study II, i.e. assessment of personality, maintaining stressors, blaming others and distinct quality of mood. I am not aware of any study using NDS scores to predict outcome of psychological treatment for depression.

It is conceivable that response to distraction might function as a marker of responsiveness to CBT. That is, it could be used to select patients who would do well with the package as a whole and, perhaps more importantly, those who would fail to respond to extensive therapeutic input. Both Blackburn and Bishop (1983) and Fennell and Teasdale (1985) have noted that a small number of patients signally fail to improve with CBT. One factor

contributing to this might be a high level of endogeneity, resulting in depressed mood being largely independent of current cognitions and hence resistant to cognitive change procedures. This point is, of course, highly speculative, but could be worth further investigation.

The relatively high level of depressing thoughts directly concerning the experiment itself reported by the high endogenous groups, together with the failure of distraction to produce an alleviation of depressed mood in high endogenous patients, could be of relevance here. Distraction markedly reduced the frequency of depressing thoughts relating to subjects' own circumstances in both high and low endogenous patients. However, this was accompanied by sizeable reductions in depressed mood only in low endogenous patients. One might hypothesise that the relatively high frequency of depressing thoughts concerning the experiment in high endogenous patients was a consequence of this dysjunction between cognition and affect. That is, continued (endogenous) depressed mood, unaffected by reduced preoccupation with external circumstances, influenced the interpretation of current experience (the distraction procedure) in a negative direction, producing a high level of depressing thoughts about the experiment itself. It is not difficult to imagine a similar process undermining progress in CBT, with the effects of cognitive change procedures being persistently undercut by autonomous dysphoria, leading to loss of confidence in the efficacy of the treatment, increased hopelessness about the possibility of change, and thus intensification of depression.

Another possible line of research would be to examine the relationship between interview measures of endogeneity such as the NDS, biochemical markers of endogenous depression such as the Dexamethasone Suppression Test (DST)(Carroll, Feinberg, Greden, Tarika et al., 1981), and psychological markers of responsiveness to environmental stimuli such as the distraction exercise described here. Davidson, Strickland et al. (1984) have suggested the use of biological markers to clarify membership of high and low endogenous patient groups defined by score on the NDS. Davidson, Lipper et al. (1984) showed the NDS to correlate with cortisol values and, using a cut-off of 4, found the scale to predict DST response with some accuracy. On a different track, Rush and Shaw (1983) report anecdotal evidence of the failure of DST nonsuppressors to improve with CBT. The three strands (traditional interview measures of endogeneity, biological and psychological markers of endogeneity, and treatment outcome) have not so far been drawn together. An examination of their relationships might provide much valuable information on the nature of endogenous and reactive depression, and on the relative usefulness of psychological and pharmacological treatments with different subtypes of depression.

Finally, it would be useful to characterise more clearly members of the high and low endogenous groups - if indeed they can be called groups, rather than representing different points on a continuum. It is curious, in a sense, that the cut-off of three

on the NDS, chosen initially on purely empirical grounds (the pattern of results in Study I) should apparently predict with some accuracy a positive response to distraction. The low endogenous patients in Study II appeared to be a relatively homogeneous group in terms of their response to the distraction procedure. The high endogenous patients, in contrast, were more variable. Some (n=6) responded to distraction in exactly the same way as low endogenous patients, with corresponding changes in thought-frequency and in mood; some (n=5) showed comparable changes in thought-frequency, but not in mood; and some (n=7) showed neither. This variability may suggest some sort of continuum, rather than two entirely discriminable and qualitatively different groups. Carney et al. (1965) originally advocated a cut-off of 5 on the NDS, because the distribution of scores within their sample was clearly bimodal. This bimodality has not, however, been replicated by other investigators. Davidson, Strickland et al. (1984), for example, found a major clustering of scores between 5 and 7 on the scale (13 out of 30 patients taking part in Study II scored within this range), and have suggested that it might be dimensionally rather than categorically employed. The same group (Davidson, Turnbull, Strickland and Belyea, 1984), in a comparison of five different measures of endogeneity including the NDS, found no conclusive evidence to support either a continuum or a categorical classification. In the context of the studies reported here, it would appear that for a sizeable proportion of patients, clinical depression is effectively an extension of normal dysphoria. This was not apparently the case with some of the high endogenous patients. Equally, these patients themselves stated that they

recognised their state to be something qualitatively different from what they would expect to experience emotionally in the face of normal adversity. With a larger group of high endogenous patients, it might be possible to gain a clearer and more comprehensive idea of what characterizes those patients who show total response, partial response and no response at all to distraction. On the NDS, distinct quality of mood and an absence of maintaining stressor are both congruent with the idea of an endogenous mood-disturbance, though the latter might alternatively indicate a high level of depression about depression inhibiting recovery in the absence of environmental difficulties. On the other hand, the tendency of nonresponders to distraction to report previously adequate personality seems in direct contradiction to the findings of Simons et al.(1984) on the role of learned resourcefulness. However, the simple distraction exercise employed here required little understanding or initiative on the part of subjects, and response to it might (unlike response to the treatment package as a whole) bear small relation to the adequacy of general cognitive and behavioural coping repertoires.

FUTURE DIRECTIONS

The within-subject research design devised to investigate the immediate effects of specific psychological interventions on depressive thinking and on other subjective and behavioural aspects of the state of depression seems to have demonstrated its usefulness in the evaluation of distraction reported here. The

results support both the cognitive model of depression and the clinical usefulness of a particular CBT component, at least in low endogenous patients. A number of possible avenues for further investigation, apart from those suggested in previous sections of this chapter, remain.

1. Extensions of the investigation of distraction

a) Selection of optimal distraction stimuli As far as maximising the effectiveness of distraction is concerned, the position is much as described by Kanfer and Goldfoot (1966) in relation to the control of experimentally induced pain: "Particular parameters of the environmental distraction procedure, e.g. modality of presentation, stimulus complexity, subjects' interest in the task, etc., remain to be investigated". Use of naturalistic stimuli judged to be neutral in hedonic tone by nondepressed raters may be inadequate to perform the task. In a pilot investigation for Study II, I tested a number of low endogenous patients ($n=8$, mean NDS score =1.50) with a distraction exercise consisting of 10 slides of urban environments and domestic and office interiors. These had previously been rated (as part of a larger collection of slides) by 10 independent raters on a 7-point scale ranging from -3 (extremely unpleasant) to +3 (extremely pleasant). Mean rating for the slides was +0.13 (i.e. marginally on the pleasant side of neutral). In this small groups of subjects, the slides did produce some reduction in frequency of depressing thoughts (mean=3.63) compared to the control procedure (mean=6.88), though it was not significant ($t(7)=2.22$, $p>.06$). In particular, the proportion of depressing thoughts related to subjects' own

circumstances without reference to the experiment was markedly reduced (from 93% of depressing thoughts to 21%). There was however a relatively high frequency of depressing thoughts related to the experiment during distraction (3 per subject on average, compared to almost none with the slides used in Studies I and II). This was partly because the slides acted as reminders of subjects' current difficulties (for example, feeling overwhelmed by domestic responsibilities) and partly because subjects tended to attend to negative aspects of the pictures themselves (for example, heavy traffic, dirt). Consistent with this, virtually no change in depressed mood occurred during the distraction condition (mean change=-1.63 on the VAS). The main requirement is therefore probably for a procedure which effectively directs attention away from depressing current concerns and occupies information-processing capacity with either pleasant or neutral aspects of the immediate environment.

b) Development of measures of short-term change The studies reported here support the usefulness of thought-sampling as a measure of cognitive activity, producing verbal reports with a high degree of validity both as regards hedonic tone and as regards content. The procedure was remarkably non-intrusive, as the following extracts from subjects' verbatim commentaries on the slides, taken from Study I, demonstrate. In each example (*) represents a tone, and (NO) a case where a subject reported a nondepressing thought: "We have a market of some kind with (*NO) sausages hanging up and smelling no doubt"; "Further away it looks (*NO) less built up"; "In the bottom bit of the house (*NO)

there's two big oval windows"; "There's a river running through the centre of it with 1, 2, 3, 4 (*NO) 5 bridges"; and "Looking through the stall there's a man with a (*NO) flat cap and dark overcoat".

Depressed mood, as measured by the VAS, proved sensitive to both interventions. Unfortunately, as a subjective measure, it remains open to possible demand effects, though no subject who guessed the purpose of the experiment was included in Studies II or III. The two behavioural measures of psychomotor speed, speech rate and writing speed, proved a little less satisfactory. In particular, speech rate was evidently influenced by activity level (vocalisation), and both measures were clearly affected, at least in some subject groups, by practice effects. On the other hand, these weaknesses did not on the whole prevent treatment effects from manifesting themselves.

Ideally, the need is for measures which are: 1) brief, since the effects of the interventions tested may be fleeting, particularly in the absence of any explicit therapeutic rationale; 2) easily administered and readily understood, since moderately-to-severely depressed patients may well be experiencing difficulties in concentration; 3) noninvasive; 4) not apparently tests, with connotations of success and failure; 5) not open to influence by demand effects; and 6) sensitive to change occurring over very brief periods. Selection is made more difficult in that few measures have been examined using a within-subject design with clinically depressed subjects and over short periods of time. More

commonly, data are available on subjects experiencing induced mood, on differences between groups differing in severity of depression, and on change over the course of treatment as a whole. In addition, it has proved difficult to find reliable measures other than mood, because even apparently homogeneous samples, defined according to accepted diagnostic criteria such as the RDC, will contain individuals with a variety of different symptom patterns. On the behavioural side, the lack of adequate measures was noted by Rehm in 1976, and remains a problem. Future investigations should perhaps further examine the viability of physiological measures such as corrugator EMG (c.f. Schwartz, Fair, Salt, Mandel and Klerman, 1976; Blackburn and Bonham, 1980; Teasdale and Bancroft, 1977).

c) Duration of effects Study II provided some indication that the effects of distraction persisted at least briefly after the point at which the intervention ceased. With an enhanced procedure, maximised for effectiveness, one would predict more lasting effects, though, given that it requires active direction of attention away from depressive ruminations, the long-term impact of distraction would be unlikely ever to equal that of rational responding to negative automatic thoughts. Nonetheless, the time-course and decay of beneficial effects in low endogenous patients should be investigated.

d) Application to other emotional disorders The recent publication of a treatment manual of CBT for anxiety and phobic disorders (Beck, Emery and Greenberg, 1985), the beginnings of systematic evaluation of CBT for anxiety (Clark, 1984; Durham and

Turvey, 1984), and the growing research interest in the nature of cognitive processes in anxiety (e.g. Beck, Lauder and Bohnert, 1974; Butler and Mathews, 1983; Hibbert, 1984), suggest the possible usefulness of the design employed here as a means of examining more closely the nature of links between thinking and mood in anxiety disorders. The effects of distraction on anxiety in depressed patients and in nondepressed students reported in Appendixes IX and XII support the potential usefulness of this line of investigation.

2. Other components of CBT

The purpose of the investigations reported here was not simply to evaluate distraction per se, but to use this as a prelude to examination of other CBT components, the longer term aim being to identify active ingredients in the treatment package, and to combine them so as to maximise the effectiveness and efficiency of the whole (Teasdale and Fennell, 1983). Suitable candidates for similar investigations would include re-evaluation of activity levels and of mastery and pleasure, identification and modification of negative automatic thoughts, and identification and modification of assumptions. The work of Blackburn and Bonham (1980) and of Teasdale and Fennell (1982) represents preliminary attempts to examine the immediate effects of modifying negative automatic thoughts. Future investigations could use this format with more standardised interventions to examine, for example, the relative efficacy of different thought-change procedures and of different therapeutic styles, the duration of effects, the importance of a therapeutic rationale and of a good relationship

with the therapist, and other variables likely to affect outcome. It should be noted that the standardisation of change procedures for more complex cognitive entities would be considerably more difficult than standardisation of distraction.

3. Re-assembling the treatment package

As a final step, therapy components shown to be effective in their own right could be re-combined to form a maximally efficient and effective CBT package. Rötzer (1978) has shown how within-session assessment of change can be combined with overall evaluation of outcome. A variety of different delivery systems could be systematically investigated, taking into account variations in response to therapy (Fennell and Teasdale, 1985). Patients high in learned resourcefulness, able with ease to form a collaborative therapeutic relationship and to work independently, and with depression about depression as a major maintaining factor, might benefit from a brief, highly structured, stripped-down educational therapy package, consisting perhaps of no more than 5 or 6 sessions, each focussing on a specific CBT strategy. Such a package could additionally be used, if effective, in a group therapy format. Other patients may require all the opportunity for rehearsal of depression-management skills that 20 or more sessions of CBT will provide. Patients who altogether fail to respond, on the other hand, might do better to receive the minimum number of sessions possible, since lengthy experience of unsuccessful CBT is painful and demoralising for both therapist

and patient (c.f. Blackburn and Bishop, 1983). A major concern in varying the delivery system as proposed here would be the need to select appropriate patients for each form of therapy. Careful assessment of factors maintaining the depression would be of crucial importance here, and could follow the guidelines suggested by Teasdale (1983b and c, 1985). In addition, the decision whether to continue therapy, and in what form, could be based on systematic monitoring of progress, both within and between sessions, as treatment continued (Fennell and Teasdale, 1985). The broad effectiveness of the CBT therapy package has now been repeatedly demonstrated. Experimental work of the kind reported here should allow for its elaboration and refinement.

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The Cognitions Questionnaire: Specific thinking errors in depression

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With the development of cognitive models of depression, interest in identifying an enduring cognitive style characteristic of depression-prone individuals has increased. However, empirical evidence for cognitive vulnerability of this kind is as yet sparse. The paper describes the development of a Cognitions Questionnaire (CQ), designed not only to provide an overall measure of depressive cognitive style, but also to assess specific dimensions of negative thinking in relation to different types of hypothetical events. Results of a study investigating the CQ's association with depression and its capacity to detect residual cognitive vulnerability following an episode of depression are reported.

The recent development of cognitive models of depression (e.g. Beck, 1967, 1976) has led to increasing interest in identifying an enduring cognitive style characteristic of people predisposed to depression. There is plentiful evidence both clinical and empirical of distorted negative thinking during depressive episodes (e.g. Wilkinson & Blackburn, 1981). In addition, the high risk of relapse in those previously depressed might indicate some enduring cognitive characteristics. However, empirical evidence for a lasting tendency to interpret events in a negative way, either before depression has developed or as a consequence of an episode, is at best inconsistent.

Metalsky *et al.* (1982), in a prospective investigation of the revised learned helplessness model of depression (Abramson *et al.*, 1978), found that in students a combination of internal, global attributions for failure and low mid-term grades (one month after the attributional assessment) resulted in depressed mood. Neither attributional style nor low grades alone were sufficient to produce depressed mood. Working within the same model, Golin *et al.* (1981), using a cross-lagged panel correlational design, showed that stable and global attributions for negative events and unstable attributions for positive events predicted depression one month later. The major problem with both these studies is their use of mildly depressed student groups.

In a group of 60 depressed in-patients, Reda *et al.* (1981) examined the persistence of dysfunctional assumptions using a modified version of the Dysfunctional Attitude Scale (DAS) (Weissman & Beck, 1978). While belief in most items declined with recovery, belief in a certain proportion remained unchanged. Eaves & Rush (1982) studying a sample of 31 depressed female patients, found that scores on the Automatic Thoughts Questionnaire (ATQ; Hollon & Kendall, 1980) declined with recovery and were no different on remission from those of normal controls. In contrast, however, elevated scores on the DAS and on response to negative items in the Attributional Style Questionnaire (ASQ; Seligman *et al.*, 1979) persisted. Thus dysfunctional depressive beliefs and a lasting tendency to attribute negative outcomes to internal, global, stable causes were identified as possible long-term cognitive characteristics. Both of these clinical studies seem promising. However, a major difficulty with each is the relatively brief period between remission and reassessment. These apparently enduring cognitive characteristics could simply be the 'time-limited residuals of an episode of depression' (Eaves & Rush, 1982).

Two investigations have failed to support the concept of cognitive vulnerability. Lewinsohn *et al.* (1981), using a large community sample and a variety of assessments including a measure of depressive beliefs, found no significant cognitive predictors or sequelae of depression. Wilkinson & Blackburn (1981) found no differences between recovered depressed patients and normal controls. Both groups scored significantly lower

on a range of cognitive measures than acutely depressed patients. In summary, cognitive vulnerability to depression, if indeed it exists, has not yet been consistently demonstrated.

These inconsistent findings may in part result from the nature of the measures used. Some, for example the ASQ (Seligman *et al.*, 1979), have been designed to assess only one aspect of depressive thinking. No consideration is given within the attributional model to the individual's response to the consequences of events rather than their causes. Yet the importance of this aspect of depressive thinking has been demonstrated (Hammen & Cochran, 1981). Other measures provide global assessments of the quantity or frequency of depressive thinking, e.g. the ATQ (Hollon & Kendall, 1980), the Cognitive Response Test (Watkins & Rush, 1978), and Krantz & Hammen's (1979) measure of depressive distortion. These do not however isolate specific dimensions of thinking such as misattribution or overgeneralization. Indeed, Krantz & Hammen (1979) report that independent judges were unable to distinguish reliably between Beck's various 'logical errors' (Beck *et al.*, 1979, pp. 14-15) as exemplified in their questionnaire.

Thus measures currently available assess either single dimensions of depressive thinking or a global tendency to interpret events in a distorted, negative way. No existing assessment instrument combines the two functions: the specification of particular thinking errors and a global assessment of depressive cognitive style. Yet cognitive vulnerability might be manifest only in particular dimensions of distortion (e.g. overgeneralization), or in response to particular types of event (e.g. losses). To test this hypothesis, a questionnaire was designed—the Cognitions Questionnaire (CQ)—which would provide a total score for depressive distortion and also allow the identification of a number of specific cognitive distortions in response to negative, positive and neutral hypothetical events.

The selection of response dimensions was guided by the revised learned helplessness model (Abramson *et al.*, 1978), which sees depression as a response to negative events viewed as highly aversive, attributed to internal global and stable causes and perceived to be uncontrollable. The dimensions chosen for the CQ resemble those identified by the attributional model with one crucial difference: apart from attribution, the identified dimensions were applied not to the *causes* of the hypothetical situations described but rather to their *consequences*.

Five dimensions of response were chosen: emotional impact (not in itself a cognitive distortion), attribution of causality, generalization across time (implications for the future), generalization across situations (how far events were seen as typical) and perceived uncontrollability (what could be done about the situation). On each dimension high scores were expected to be associated with depression.

(1) *Emotional impact* reflected the felt aversiveness of negative situations and the pleasantness of positive situations. Some evidence is available both for heightened sensitivity to unpleasant experiences (Lewinsohn *et al.*, 1973; Schless *et al.*, 1974), and for reduced sensitivity to pleasant experiences (Lewinsohn & Graf, 1973; Lewinsohn & MacPhillamy, 1974) in depressed individuals. Scoring on this dimension was as follows: (a) *Negatively interpreted events*. High scores reflect an extreme emotional response, or the absence of a response where some degree of upset would be regarded as normal. Low scores represent moderate or slight responses. (b) *Positively interpreted events*. High scores reflect absent or attenuated emotional responses, and low scores moderate or extreme responses. (c) *Neutral events* were hypothesized to constitute ambiguous stimuli, to which depressed subjects would respond as if they were negative and non-depressed subjects as if they were positive or neutral. On the dimension of emotional impact, high scores reflect more or less intense negative responses and low scores pleasure or no particular emotional reaction.

(2) *Attribution of causality*. A number of studies have found a relationship between

depression and the individual's tendency to attribute negative outcomes to the self, and positive outcomes to external factors (e.g. Klein *et al.*, 1976; Kuiper, 1978; Rizley, 1978; Janoff-Bulman, 1979). Misattribution of negative outcomes relates to Beck's 'personalization' error, the acceptance of excessive responsibility for unpleasant events (Beck *et al.*, 1979, p. 14). Thus: (a) *Negatively interpreted events*. High scorers blame unpleasant events on their own qualities or behaviour. Low scorers place the blame on other people or on circumstances. (b) *Positively interpreted events*. High scorers attribute pleasant events to other people or to circumstances. Low scorers attribute them to their own qualities or behaviour.

(3) *Generalization across time ('future')*. The expectation that negative outcomes will extend without relief into the future (hopelessness) is a core feature of depression, and one element of Beck's negative 'cognitive triad' (Beck *et al.*, 1979, pp. 11-12). Scoring was as follows: (a) *Negatively interpreted events*. High scorers see unpleasant events as extending into the future and likely to recur. Low scorers see them as short-lived and unlikely to recur. (b) *Positively interpreted events*. High scorers view pleasant events as short-lived and unlikely to recur. For low scorers the reverse is true.

(4) *Generalization across situations ('generalization')*. Generalization of hopelessness from a specific negative life-event has been identified as a key element in the development of depression by Brown & Harris (1978). Overgeneralization from specific events has also been identified by Beck as a logical error commonly occurring in depression (Beck *et al.*, 1979, p. 14) and is another element of the 'cognitive triad', the distorted negative view of the world. Thus: (a) *Negatively interpreted events*. High scorers see unpleasant events as typical of their lives as a whole. Low scorers view them as isolated exceptions. (b) *Positively interpreted events*. For these the reverse is true.

(5) *Perceived uncontrollability*. This dimension reflects the extent to which the individual believes constructive action may be taken to alter a negative situation or perpetuate or repeat a positive one. High scorers report avoiding action of any kind, believing that nothing can be done to change the situation. Low scorers plan active coping strategies.

Aims and hypotheses

The aims of the study may be summarized as follows: (1) to devise a questionnaire to assess cognitive style in relation to different levels of severity of depression; (2) to determine the relative contributions to total CQ score of the five response dimensions described above; (3) to establish the relative potency of differently valenced hypothetical events (negative, positive and neutral) as stimuli for depressive cognitions; and (4) to examine the persistence of negative thinking after recovery from an episode of clinical depression.

It was hypothesized that:

(A) *CQ scores and depression*. (1) The degree of overall cognitive distortion (total CQ score) would be positively related to severity of depression; (2) depression would be associated with higher scores for each type of hypothetical event (negative, positive and neutral), and the association would be strongest for negative events (i.e. those events most likely in real life to precipitate depression); (3) depression would be associated with higher scores on all five response dimensions when considered separately.

(B) *CQ scores and cognitive vulnerability*. (1) Recovered depressed individuals should score lower on the CQ than currently depressed individuals but higher than individuals who had never been depressed; (2) this difference would be most evident in relation to negative events.

Method

Eight brief scenarios were composed by a group of psychologists. These related to work (three scenarios), family (one), social relationships (two), finance (one) and the experience of depression itself (one). The scenarios were given to 10 non-depressed independent judges to code as negative (unpleasant), positive (pleasant) or neutral (neither one nor the other). Non-depressed individuals were expected to code neutral scenarios as either neutral or positive. Agreement with predetermined coding was good: 100 per cent for the two positive scenarios and the two neutral scenarios, and a mean of 82.5 per cent for the four negative scenarios. None of the latter was rated as positive. The lowest agreement was for the scenario describing depression (early waking followed by ruminations), which was rated negative by seven judges and neutral by three.

Each scenario was followed by five fixed-choice questions designed to assess the five response dimensions. Four alternatives were provided for each question. Of these the most depressed alternative scored two, the next most depressed scored one, and the remaining two alternatives (judged to be non-depressed) scored zero. Thus the higher total CQ score the more extreme the emotional response and the greater the degree of depressive distortion.

The questionnaire was given to six independent judges to score. There was high agreement between the authors' scoring system and the judges' categorization of responses as depressive or non-depressive. For the 160 individual items in the questionnaire, agreement between the independent judges and the authors ranged from 86 to 94 per cent (mean = 91 per cent).

Respondents were told to imagine themselves in each situation as vividly as possible. They were then instructed to choose, for each response dimension, the alternative which best described what they thought their reaction would be if they were actually faced with that situation. An example of a negative scenario and responses will be found at Appendix 1.

Respondents

There were two main groups: a sample of psychiatric patients from the wards and out-patient department of a single psychiatric hospital, and a community sample. The composition of the sample is shown in Table 1.

All individuals completed the CQ and the Beck Depression Inventory (BDI). A cut-off of 10 on the BDI for the non-depressed group was chosen. Thus marginally depressed individuals scoring 11–13, below the normally accepted lower boundary of mild depression (14), were included in the mildly depressed group. This would provide a more conservative test of the hypotheses than including these individuals in the non-depressed group. The psychiatric sample, which included 42 men, also gave information on age and education. They answered both questionnaires as part of normal out-patient assessment or, on the wards, in response to a request to take part in a study of people's reactions to certain situations. The community sample (all women) gave information on age. They completed the questionnaires as part of two separate and unrelated studies.

Results

General sample characteristics and total CQ scores

Age. There was no correlation between CQ total score and age. There was, however, a small but significant correlation between age and BDI score ($r = 0.202$, $P < 0.001$). This was an artifact of sampling procedures: the community sample, which contained most of the non-depressed individuals, was composed entirely of young women (mean age 29), whereas the psychiatric sample, which contained over two-thirds of all the currently depressed individuals, was on average older (mean age 42). Within the community sample age correlated neither with BDI score ($r = 0.099$, n.s.) nor with total CQ score ($r = -0.01$, n.s.). Similarly, within the psychiatric sample, there was no correlation between age and BDI score ($r = -0.021$, n.s.), nor between age and total CQ score ($r = 0.024$, n.s.).

Gender. There was no difference between men and women on total CQ score ($t = 0.37$, n.s.). Within the psychiatric sample, there were no significant differences between men and women with respect to BDI score ($t = 1.02$, n.s.) or total CQ score ($t = 1.94$, n.s.).

Table 1. Composition of the sample

Diagnostic criterion	Severity criterion	<i>n</i>	
		Female	Male
<i>(A) psychiatric sample</i>			
1. <i>Currently depressed</i> Currently meeting Research Diagnostic Criteria for Major Depressive Disorder (Spitzer <i>et al.</i> , 1978)	Beck Depression Inventory (BDI) score ≥ 11	29	15
2. <i>Past depressed</i> Previously meeting RDC for Major Depressive Disorder, but now recovered	BDI score ≤ 10	12	3
3. <i>Other diagnosis depressed</i> Not meeting RDC for Major Depressive Disorder, i.e. main diagnosis anxiety disorder, phobic disorder, etc.	BDI score ≥ 11 (i.e. significant mood disturbance in the absence of a primary diagnosis of depression)	25	11
4. <i>Other diagnosis non-depressed</i> Not meeting RDC for Major Depressive Disorder	BDI score ≤ 10	12	12
<i>(B) community sample</i>			
1. <i>Currently depressed</i>	BDI score ≥ 11	Female 19	
2. <i>Past depressed</i> Previously meeting criteria for Neurotic Depression (ID level ≥ 5) as defined by the Present State Examination (PSE) and CATEGO-ID programme (Wing & Sturt, 1978)	BDI score ≤ 10	19	
3. <i>Non-depressed</i> No known previous episode depression	BDI score ≤ 10	86	

Education. No information on educational status was available for the community sample. For the psychiatric sample, four categories of educational experience were used: secondary school only; apprenticeship/job training; clerical/commercial training; and further education, including university. Information on educational status was missing for three individuals. Neither BDI score ($F = 0.641$, d.f. = 3, 112, n.s.) nor CQ total score ($F = 0.305$, d.f. = 3, 112, n.s.) was related to educational status in the psychiatric sample.

Hypothesis A1: Depression and overall level of cognitive distortion

Depression level in the whole sample, as measured by the BDI, correlated positively with total score on the CQ ($r = 0.605$, $P < 0.001$). The first hypothesis, that overall degree of distortion would be positively related to depression, was therefore supported.

This was confirmed by a comparison of the total CQ scores of the various diagnostic groups (Table 2). The depressed psychiatric group (Group A1 in Table 1) scored

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significantly higher than the non-depressed psychiatric group (Group A4) ($t = 4.96$, $P < 0.001$), who scored the same as the non-depressed community group (Group B3). Thus the cognitive style assessed by the CQ did not characterize all psychiatric patients regardless of diagnosis, but was specific to those with depressed mood. Comparing the psychiatric and community samples, there were no significant differences on the CQ between the two currently depressed groups, the two past depressed groups and the two non-depressed groups. These two samples are therefore combined in the following analyses.

Table 2. CQ and BDI mean scores by diagnostic group

Diagnostic group	CQ score		BDI score		n
	Mean	SD	Mean	SD	
Depressed psychiatric	27.93	11.1	25.07	9.43	44
Other diagnosis depressed	24.61	9.6	20.28	7.76	36
Past depressed psychiatric	16.20	7.4	5.2	2.98	15
Non-depressed psychiatric	15.96	5.3	5.17	3.4	24
Depressed community	23.95	6.7	17.63	5.54	19
Past depressed community	18.26	5.6	6.42	3.32	19
Non-depressed community	15.46	6.5	3.28	3.01	86

Table 3. Mean score for each event type in relation to severity of depression

Event type	Non-depressed (n = 144)	Mild (n = 47)	Moderate (n = 23)	Severe (n = 29)
Negative				
Mean	10.92	13.81	17.52	22.10
SD	(4.45)	(5.32)	(3.76)	(5.41)
Positive				
Mean	2.94	4.04	5.65	6.31
SD	(2.28)	(2.64)	(2.90)	(3.30)
Neutral				
Mean	2.36	3.13	4.22	4.45
SD	(1.48)	(2.53)	(2.75)	(3.22)

— Non-significant differences $P < 0.05$.

--- Non-significant differences $P < 0.01$.

Hypothesis A2: Depression and type of event

The second prediction was that depression would be associated with high scores for each type of hypothetical event (negative, positive and neutral), and that the differences in scoring between different levels of depression would be clearest in relation to negative situations. The sample was divided into four groups according to score on the BDI: non-depressed (BDI < 10); mildly depressed (BDI 11–19); moderately depressed (BDI 20–25); and severely depressed (BDI > 26). Table 3 shows the mean scores for each level of severity of depression in relation to each type of event.

A series of one-way analyses of variance showed the expected relationship between depression level and mean score for each type of event: negative events ($F = 52.68$,

d.f. = 2, 239, $P < 0.001$); positive events ($F = 19.07$, d.f. = 2, 239, $P < 0.001$); neutral events ($F = 11.49$, d.f. = 2, 239, $P < 0.001$). *Post hoc* Newman-Keuls tests confirmed that negative events discriminated consistently between different levels of severity of depression. For positive and neutral events, the comparisons between non-depressed and mildly depressed and between moderately and severely depressed individuals failed to reach significance. The inability of neutral events to discriminate sensitively between different levels of depression reflects the restricted range of scores obtained in response to both events. (On one, 76 per cent of individuals scored 0.)

Hypothesis A4: Depression and response dimensions

For this and subsequent analyses, the sample was divided into three groups: 'current depressed' (all individuals scoring 11 or more on the BDI); 'never depressed' (all individuals currently scoring 10 or less on the BDI and not known to have previously suffered any depressive episode); and 'past depressed' (all individuals currently scoring 10 or less on the BDI following recovery from an episode of clinical depression).

Hypothesis A4 predicted that the depressed group would score more highly than the non-depressed on all five response dimensions. Mean scores are presented in Table 4. A series of one-way analyses of variance showed significant differences between the groups on all five response dimensions: emotional impact ($F = 4.15$, d.f. = 2, 240, $P < 0.02$); attribution ($F = 21.34$, d.f. = 2, 240, $P < 0.001$); future ($F = 31.94$, d.f. = 2, 240, $P < 0.001$); generalization ($F = 40.96$, d.f. = 2, 240, $P < 0.001$); control ($F = 6.69$, d.f. = 2, 240, $P < 0.001$).

Post hoc Newman-Keuls tests showed that the currently depressed group scored significantly higher than the never depressed group on each response dimension except emotional impact. From the F values, generalization can be seen to be the most powerful discriminator between the groups. This was also the dimension that correlated most highly

Table 4. Mean score for each response dimension in current, past and never depressed groups

Response dimension	Current depressed ($n = 100$)	Past depressed ($n = 34$)	Never depressed ($n = 109$)
Emotional impact			
Mean	5.27	4.91	4.35
SD	(2.53)	(1.93)	(2.23)
Attribution			
Mean	6.50	4.91	4.38
SD	(2.52)	(2.25)	(2.28)
Future			
Mean	4.81	2.44	2.49
SD	(2.85)	(1.42)	(1.77)
Generalization			
Mean	5.33	2.88	2.25
SD	(2.97)	(2.20)	(2.11)
Control			
Mean	3.55	2.29	2.48
SD	(2.67)	(2.14)	(2.13)

— Non-significant differences $P < 0.05$.

--- Non-significant differences $P < 0.01$.

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with the BDI ($r = 0.63$, $P < 0.001$). Taking each question separately, generalization correlated more highly with the BDI than any other dimension in seven out of eight cases.

Hypothesis B1: Vulnerability and overall CQ score

This hypothesis predicted that past depressed individuals would have lower total scores than currently depressed individuals, but higher total scores than individuals who had never been depressed. Results are presented in Table 5.

Table 5. Mean total CQ score and mean score for each event type in relation to current, past and never depressed groups

	Currently depressed ($n = 100$)	Past depressed ($n = 34$)	Never depressed ($n = 109$)
Total CQ score			
Mean	25.94	17.35	15.57
SD	(9.90)	(6.46)	(6.25)
Negative events			
Mean	17.09	11.88	10.58
SD	(6.09)	(4.44)	(4.41)
Positive events			
Mean	5.07	3.09	2.88
SD	(3.04)	(2.39)	(2.26)
Neutral events			
Mean	3.37	2.29	2.37
SD	(2.82)	(1.43)	(1.50)

— Non-significant differences $P < 0.05$.

One-way analysis of variance revealed highly significant differences between the three groups ($F = 46.31$, $d.f. = 2, 240$, $P < 0.001$). *Post hoc* Newman-Keuls tests showed the differences to lie between the currently depressed and the other two groups ($P < 0.01$). There was no significant difference between past and never depressed.

Hypothesis B2: Vulnerability and event-type

This hypothesis predicted that response to negative events would most sensitively reflect cognitive vulnerability. Results are presented in Table 5.

Three one-way analyses of variance revealed highly significant differences between the three groups of each type of event: negative events ($F = 43.06$, $d.f. = 2, 240$, $P < 0.001$); positive events ($F = 19.65$, $d.f. = 2, 240$, $P < 0.001$); neutral events ($F = 19.98$, $d.f. = 2, 240$, $P < 0.001$). However, *post hoc* Newman-Keuls tests showed these differences to lie between the currently depressed and the other two groups. There were no significant differences between the past and the never depressed groups. The hypothesis is therefore not supported.

Other findings

In these areas no specific hypotheses had been generated as to direction of effects.

Vulnerability and response dimension. The results of the *post hoc* comparison between the past and never depressed groups are found in Table 4. As with situation type,

significant differences revealed by a one-way analysis of variance were accounted for by differences between the currently depressed group and the other groups. There were no significant differences between past and never depressed individuals on any dimension.

Depression, vulnerability and the interaction between event type and response dimension. To examine the possibility of a relationship between event type and response dimension, a series of one-way analyses of variance were carried out comparing currently depressed with past and never depressed individuals. Each dimension was considered in relation to each event type, i.e. emotional impact for negative, positive and neutral situations, attribution for negative, positive and neutral situations, etc. *Post hoc* Newman-Keuls tests were used to examine the nature of differences between the groups revealed by the overall analysis.

The analyses demonstrated that, for negative events, all dimensions except emotional impact discriminated well between the currently depressed and the other two groups. For positive and neutral events only future and generalization effectively distinguished between the currently depressed and the other groups. Only one category of response discriminated between those who had previously been depressed and those who had not: generalization from negative situations. On this dimension the past depressed, as predicted, had significantly higher mean scores than the never depressed group ($P < 0.05$). Thus individuals who had recovered from a previous episode of depression were more likely to see unpleasant events as typical of their lives than those had never been depressed.

Generalization from negative events also correlated most highly with BDI scores ($r = 0.62$, $P < 0.001$) and with total CQ score ($r = 0.68$, $P < 0.001$).

The persistence of cognitive distortions after recovery

The analyses reported above have separately examined: event types; response dimensions; and the relationship between event type and response dimension. Only one difference emerged between the past and the never depressed – generalization from negative events. However, it may be that the past depressed group are characterized not by their responses to individual dimensions, events, or some combination of the two, but by a particular overall pattern of scores. In order to examine this possibility a discriminant function analysis was carried out to see which items from the CQ best discriminated between the past depressed and the never depressed groups.

A function composed of nine items (including three from the question about the experience of depression itself) discriminated between the groups. Using these nine items, 32 per cent of the past depressed group were found to have a significantly different pattern of response from the never depressed group ($\chi^2 = 17.83$, $P < 0.001$).

This difference was partly accounted for by responses to the question about the experience of depression itself. Some past depressed individuals may have a very specific vulnerability to experiences which might be interpreted as the beginning of a new episode of depression, rather than some more general cognitive vulnerability. To examine this possibility, the question relating to the experience of depression was removed and the discriminant analysis repeated. The past depressed group were now not significantly different from the never depressed group.

Discussion

The major aim of the study was to devise a measure of cognitive style which could discriminate between different levels of severity of depression and identify specific residual errors in thinking after recovery from an episode of depression. The results may be summarized as follows: (1) a strong positive association was found between degree of depression and overall level of cognitive distortion; (2) negative events discriminated more

sensitively between different levels of depression than positive or neutral events (this could be because there were four negative events, and only two neutral and two positive events); (3) there were significant differences between currently depressed and never depressed individuals on all the response dimensions except emotional impact; generalization was most consistently sensitive to differences in depression level; (4) two possible markers emerged of residual cognitive vulnerability following an episode of depression: generalization from negative events, and responses to the question describing the experience of depression itself. It is perhaps worth bearing in mind that these results are based on a predominantly female sample, and all of the non-depressed group were women.

The observed association between depressed mood and overall cognitive distortion as measured by the CQ is in accord with the findings of previous investigators who have used other measures (e.g. Wilkinson & Blackburn, 1981). However, the CQ differs from other measures in that, as well as providing a total score, it assesses a range of specific dimensions of response relating to the consequences of events.

Two findings stood out from the examination of these response dimensions. First, score on emotional impact discriminated less sensitively between the currently depressed and the never depressed than the other dimensions. Response on this dimension may reflect an immediate affective response to events, rather than being a product of cognitive distortion. The reported upset or pleasure was relatively constant in the sample, regardless of level of depression. Perhaps what distinguishes depressed from non-depressed individuals is not how they immediately feel about things that happen, but rather the interpretations that they subsequently place upon events. Where these interpretations are distorted in a negative direction, clinical depression will result. This finding is congruent with Teasdale's (in press) proposition that dysphoria is a normal consequence of serious loss-events, and that what determines whether or not clinical depression will develop is the type of cognitions that become available once such dysphoria is present.

Secondly, in contrast to the relatively poor discriminatory power of emotional impact, there was a strong and consistent association between depression and generalization across situations. In addition, generalization from negative events was the only response which distinguished those who had recovered from an episode of depression from those who had never been depressed. This finding should however be treated with some caution. It may genuinely reflect a highly specific error in thinking which characterizes people who have previously suffered an episode of depression. On the other hand, given the number of analyses carried out on the data, it is possible that it is simply a chance finding.

The results from the discriminant analyses suggest that a subgroup within the past depressed group have a pattern of scores on the CQ significantly different both from the rest of the past depressed and from the never depressed. The question contributing the greatest number of items to the significant discriminant function was that relating to the experience of depression itself. Given that this pattern of scores appears in only a minority of the past depressed, this finding cannot be attributed simply to prior experience of depression *per se*. Rather it would appear that some individuals who have previously been clinically depressed retain a specific vulnerability in the shape of a tendency to interpret normal dysphoria as the onset of a new episode. While it is unlikely that this vulnerability would be useful in predicting initial onset, it could have considerable therapeutic implications for the prevention of relapse. As well as teaching patients how to manage the symptoms of depression, it may be important to help them to respond non-depressively to 'normal' low mood or other possible prodromals of depression. Patients should be encouraged to recognize that these do not necessarily signal the start of a full-blown depression, and that to react as if they did may increase the probability that such an episode will indeed develop.

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Copies of the Cognitions Questionnaire may also be obtained from this address or from the British Lending Library (Supplementary Publication Number 90073).

Appendix 1

D. You work in a small firm which you joined four years ago. As far as you know your work has been satisfactory. The time has now come when you might expect to be offered promotion but instead a workmate who joined after you is promoted over your head.

Score

-
- | | |
|---|---|
| | 1. <i>On hearing this you feel:</i> |
| 2 | (i) Extremely upset. |
| 0 | (ii) Moderately upset. |
| 0 | (iii) Slightly upset. |
| 1 | (iv) Not at all affected. |
| | 2. <i>When you think of what happened you think:</i> |
| 0 | (i) It was luck, a matter of being in the right place at the right time. |
| 0 | (ii) My workmate is probably a competent and hard worker. |
| 2 | (iii) Perhaps my work hasn't been entirely satisfactory after all. |
| 1 | (iv) My work was good enough, but the boss simply doesn't like me. |
| | 3. <i>When you think of your future prospects you think:</i> |
| 0 | (i) If I apply myself I'll get the promotion I want soon. |
| 2 | (ii) I'm always going to be stuck where I am. |
| 1 | (iii) It is going to be more difficult than I thought but sooner or later I'll get promotion. |
| 0 | (iv) Despite this happening I won't have any problems with promotion in the future. |
| | 4. <i>When you think about your life in general you think:</i> |
| 0 | (i) This is an unusual event; in other situations I always get what I want. |
| 0 | (ii) Although I am occasionally disappointed, I mostly get what I want. |
| 2 | (iii) It's the same with everything, nothing works out the way I hope. |
| 1 | (iv) I've had a few other disappointments like this recently. |
| | 5. <i>When you consider what to do you think:</i> |
| 1 | (i) I'll leave this job there is no point in staying. |
| 2 | (ii) There is no point in doing anything, I can't change the situation now. |
| 0 | (iii) I'll try harder and wait to see what happens. |
| 0 | (iv) I'll find out from the boss if I need to make any changes and then take the appropriate steps. |
-

COGNITIONS QUESTIONNAIRE

Date:

Informant No:

Below and on the following pages you will find a number of situations briefly described. Please try to imagine yourself in each situation as vividly as possible. Then choose one statement, from each group below, that you think would describe the way that you would respond if you were really in that situation. Try to choose one even if some do not fit exactly what you think you would do. To show which alternative you have chosen put a ring round your choice e.g.

- (i) Extremely pleased
- (ii) Moderately pleased
- (iii) Slightly pleased
- (iv) Not at all pleased

Choose one statement from each group of four. Do not think for too long before choosing.

A. YOU ARE HAPPY IN YOUR JOB AND GET ON WELL WITH THE OTHER PEOPLE THERE. YOU HEAR THAT THE BOSS IS LEAVING AND YOU WILL BE GETTING A NEW BOSS WHOM YOU KNOW NOTHING ABOUT.

1. On hearing this you feel:

- 1 (i) Anxious that he may not be as nice as your last boss.
- 0 (ii) Pleased, you like a change.
- 0 (iii) It doesn't affect you, you will wait and see what he is like.
- 2 (iv) Unhappy; having a new boss always disrupts routine.

2. When you think of what has happened you think:

- 1 (i) Trust me to be in the kind of job where the boss is always changing.
- 0 (ii) Everyone has to have a change of boss now and again.
- 2 (iii) Perhaps the old boss left because he did not like working with me.
- 0 (iv) Prospects here aren't so good, I'm not surprised people leave.

3. When you think of the future you think:

- 0 (i) It won't make any difference to me, I'll carry on the same as usual.
- 0 (ii) It will take some time to get used to a new boss, but we'll settle down after a while.
- 1 (iii) It will be difficult and take a long time to adjust to working with someone new.
- 2 (iv) I'll never get used to working with someone new.

4. When you think about your life in general you think:

- 2 (i) I never seem to have any control over what happens to me.
- 1 (ii) Things are bound to be changed over your head now and then.
- 0 (iii) It is rare for me to be faced with something uncontrollable like this.
- 0 (iv) I'm glad these unexpected changes don't happen too often - usually I have some say in what goes on.

5. When you consider what you can do you think:

- 1 (i) I could leave this job before he arrives.
- 0 (ii) I'll wait and see how I get on with him, we'll adjust given time.
- 0 (iii) I could try to find out what he is like and how best to get on with him.
- 2 (iv) No point in doing anything, either we get on or we don't.

2

B. YOU GO FOR AN INTERVIEW FOR A JOB THAT YOU VERY MUCH WANT. WHILE YOU WAIT TO GO IN FOR THE INTERVIEW YOU WAIT WITH SEVERAL OTHERS WHO HAVE APPLIED FOR THE SAME JOB. A WEEK LATER YOU HEAR THAT YOU HAVE GOT THE JOB.

1. On hearing this you feel:

- 0 (i) Extremely pleased.
- 0 (ii) Moderately pleased.
- 1 (iii) Slightly pleased.
- 2 (iv) Not at all affected.

2. When you think of what has happened you think:

- 1 (i) I was lucky to be picked instead of the others.
- 2 (ii) The other applicants can't have been much good.
- 0 (iii) I must have done best in the interview.
- 0 (iv) Obviously I was the person with the best qualifications and experience for the job.

3. When you think of your future job prospects you think:

- 2 (i) This kind of thing will never happen again, I've just been lucky.
- 1 (ii) The fact that I've got this job doesn't guarantee me doing so well in the future.
- 0 (iii) I'll never have much trouble getting the jobs I want.
- 0 (iv) I can't be certain that I'll always get the job I want, but this is a good sign.

4. When you think about your life in general you think:

- 0 (i) I always manage to get the things that are really important to me.
- 0 (ii) Things often turn out the way that I want them to.
- 1 (iii) This is unusual for me, most things don't turn out as I hope.
- 2 (iv) Getting this job is pretty incredible as usually I never get what I want.

5. When you consider what you can do you think:

- 1 (i) I'll turn the job down, I wouldn't be able to handle it.
- 2 (ii) I don't know whether to take the job or not, I'll think it over for a few days.
- 0 (iii) I'll phone and let them know when I can start.
- 0 (iv) Since I've done so well, I'll apply for a slightly better job instead.

C. YOU HAVE LIVED IN YOUR PRESENT HOUSE FOR SEVERAL YEARS AND GET ON WELL WITH YOUR NEIGHBOURS. ONE OF THEM ASKS YOU IF YOU WILL KEEP AN EYE ON THEIR HOUSE WHILE THEY ARE AWAY FOR A COUPLE OF DAYS.

1. On hearing this you feel:

- 0 (i) Very pleased that they have asked you.
- 1 (ii) A bit annoyed at the imposition.
- 0 (iii) It doesn't really bother you one way or another.
- 2 (iv) Upset at being given this responsibility on top of your own.

2. When you think of what happened you think:

- 0 (i) They probably asked me because they know that I am reliable.
- 2 (ii) They know that I am too soft and cannot say no to anyone.
- 1 (iii) They didn't particularly want me, I just happened to be at home when they called.
- 0 (iv) Neighbours often ask each other to do this sort of thing.

3. When you think of the future you think:

- 2 (i) I will always be put upon by other people because I can't stand up for myself.
 0 (ii) People will continue to trust me and to find me reliable.
 1 (iii) They won't ask me to do it again since I'll probably make a mess of it.
 0 (iv) It is all the same to me whether they ask me again or not.

4. When you think about your life in general you think:

- 2 (i) People are always expecting me to do things for them.
 0 (ii) My neighbours and I often do this kind of thing for each other.
 0 (iii) People only ask this sort of thing of me now and again.
 1 (iv) Rarely do people ask me for favours.

5. When you consider what you can do you think:

- 2 (i) Tell them that I'm not up to taking on the responsibility.
 0 (ii) I'll ask them what exactly they want me to do and then decide.
 0 (iii) I'll agree to doing it on this occasion.
 1 (iv) I don't really want to do it. I'll make a mess of it and they won't ask me again.

D. YOU WORK IN A SMALL FIRM WHICH YOU JOINED 4 YEARS AGO. AS FAR AS YOU KNOW YOUR WORK HAS BEEN SATISFACTORY. THE TIME HAS NOW COME WHEN YOU MIGHT EXPECT TO BE OFFERED PROMOTION BUT INSTEAD A WORKMATE WHO JOINED AFTER YOU IS PROMOTED OVER YOUR HEAD.

1. On hearing this you feel:

- 2 (i) Extremely upset.
 0 (ii) Moderately upset.
 0 (iii) Slight upset.
 1 (iv) Not at all affected.

2. When you think of what happened you think:

- 0 (i) It was luck, a matter of being in the right place at the right time.
 0 (ii) My workmate is probably a competent and hard worker.
 2 (iii) Perhaps my work hasn't been entirely satisfactory after all.
 1 (iv) My work was good enough, but the boss simply doesn't like me.

3. When you think of your future prospects you think:

- 0 (i) If I apply myself I'll get the promotion I want soon.
 2 (ii) I'm always going to be stuck where I am.
 1 (iii) It is going to be more difficult than I thought but sooner or later I'll get promotion.
 0 (iv) Despite this happening I won't have any problems with promotion in the future.

4. When you think about your life in general you think:

- 0 (i) This is an unusual event; in other situations I always get what I want.
 0 (ii) Although I am occasionally disappointed, I mostly get what I want.
 2 (iii) It's the same with everything, nothing works out the way I hope.
 1 (iv) I've had a few other disappointments like this recently.

5. When you consider what you can do you think:

- 1 (i) I'll leave this job there is no point in staying.
 2 (ii) There is no point in doing anything, I can't change the situation now.
 0 (iii) I'll try harder and wait to see what happens.
 0 (iv) I'll find out from the boss if I need to make any changes and then take the appropriate steps.

E. YOUR PARENTS, WHO LIVE SOME DISTANCE AWAY, COME TO STAY WITH YOU FOR A FEW DAYS. ON THE SECOND DAY YOU HAVE AN ARGUMENT WITH THEM ABOUT SOME TRIVIAL THING AND THEY DECIDE TO LEAVE EARLIER THAN ORIGINALLY PLANNED.

1. On hearing this you feel:

- 2 (i) Extremely upset.
- 0 (ii) Moderately upset.
- 0 (iii) Slightly upset.
- 1 (iv) Not at all affected.

2. When you think of what happened you think:

- 0 (i) This sort of thing is bound to happen from time to time.
- 0 (ii) My parents must just be very difficult people to get on with.
- 1 (iii) I don't make enough effort to get on with them.
- 2 (iv) It's all my fault, it's wrong to lose my temper with my parents, no matter what happens.

3. When you think of what will happen in the future you think:

- 2 (i) I'll always have a poor relationship with my parents.
- 0 (ii) We will soon make this up and be on good terms again.
- 1 (iii) It will be difficult perhaps but we will eventually make things up.
- 0 (iv) If anything our relationship will improve now that we have cleared the air.

4. When you think about your life in general you think:

- 2 (i) This is typical of me, I'm always having arguments with other people.
- 0 (ii) I get on pretty well with most people; families are always more difficult.
- 0 (iii) I can't think what came over me, I'm never usually argumentative.
- 1 (iv) I seem to be getting into quite a few arguments at the moment.

5. When you consider what you can do you think:

- 1 (i) I just won't bother to have anything more to do with them.
- 2 (ii) There is no point in trying to make up for it, I can't change the situation.
- 0 (iii) Next time they come, I'll try harder to get on with them.
- 0 (iv) I'll phone them, find out what really upset them and try to make peace with them.

F. YOU HAVE LIVED IN YOUR PRESENT NEIGHBOURHOOD FOR SEVERAL YEARS. THIS YEAR YOU ORGANISED A NEW YEAR'S PARTY FOR NEIGHBOURS AND FRIENDS. OVER THE NEXT FEW DAYS, SEVERAL PEOPLE TELL YOU HOW MUCH THEY ENJOYED THEMSELVES.

1. On hearing this you feel:

- 0 (i) Extremely pleased.
- 0 (ii) Moderately pleased.
- 1 (iii) Slightly pleased.
- 2 (iv) Not at all affected.

2. When you think over their comments later you think:

- 0 (i) I didn't do too badly in having a success, but the mood was just right - it always is at New Year.
- 0 (ii) I organised the party well - right people, right music, enough food and drink.
- 1 (iii) My organisation wasn't too good, but people enjoyed themselves in spite of that.
- 2 (iv) The success of the party was nothing to do with me, it is the guests who really make it.

3. When you think about future parties you think:

- 2 (i) I doubt if I could get the mixture right again.
 0 (ii) It was just a flash in the pan - a good party is a once-in-a-lifetime thing.
 1 (iii) Feel sure that another party you organised would be just as good.
 0 (iv) I'm confident I could manage it again, though you can never be sure of getting it right.

4. When you think about things in general you think:

- 1 (i) No-one ever comes near me unless I make the first move.
 2 (ii) It was a good evening but I wish that it happened more often.
 0 (iii) I'm sorry that I don't see much of friends and neighbours apart from these special occasions.
 0 (iv) I'm really pleased to have such friends and neighbours, we always have a good time together.

5. Your birthday is coming up in a couple of months. You:

- 0 (i) Think it might be better to have a smaller do - it is not so easy to cope with so many people.
 2 (ii) Can't make up your mind - it is a lot of effort and you may not feel like it by April.
 0 (iii) Decide to have another party and start planning the guest list now.
 1 (iv) Decide definitely not to have another party - it couldn't possibly be as good.

G. YOUR OLD CAR IS ON ITS LAST LEGS. AFTER QUITE A SEARCH YOU TRADE IT IN FOR ANOTHER CAR WHICH IS THE RIGHT PRICE AND SEEMS TO BE IN GOOD CONDITION. AFTER A WEEK IT BREAKS DOWN AND YOU DISCOVER THAT IT WILL BE VERY EXPENSIVE TO REPAIR.

1. On hearing this you feel:

- 2 (i) Extremely upset.
 0 (ii) Moderately upset.
 0 (iii) Slightly upset.
 1 (iv) Not at all affected.

2. When you think of what happened you think:

- 0 (i) It is modern society - people are so dishonest and grasping.
 1 (ii) The salesman should have been more honest about the state of the car, but it was up to me to make sure of its condition.
 2 (iii) What a fool you were to let yourself be taken in like that.
 0 (iv) Blame the person who sold the car - how can he expect to run a decent business on that basis.

3. When you think about the money you will have to pay you think:

- 0 (i) I'll have to cut back on other things in order to afford it.
 0 (ii) Agree it is a lot but can't see any reason why I shouldn't be able to afford it without even trying.
 1 (iii) It is worrying that it may take some time to reorganise my finances after this unexpected blow.
 2 (iv) I can't imagine how on earth I'm going to manage over the next few months - this is a major set back.

4. Reflecting on other things you have bought recently you think:

- 2 (i) I wonder why it is always me that gets taken in.
 0 (ii) Thank goodness my business dealings usually turn out better than this.
 1 (iii) This kind of thing is happening to me all too often these days.
 0 (iv) Recently I made the same sort of mistake with another purchase but normally I'm quite sharp about these things.

5. When you consider how best to handle the situation you think:

- 1 (i) I'll never buy another car - I'll only get taken for a ride again.
 2 (ii) I'll put off the decision to get the car repaired for a few days.
 0 (iii) In future I'll get proper advice when buying a car and meanwhile I'll
 plan out my finances.
 0 (iv) I'll manage somehow, small economies will probably take care of it.

H. YOU WAKE ONE MORNING BEFORE YOUR USUAL TIME. THOUGH FEELING TIRED AND HEAVY, YOU CANNOT GET BACK TO SLEEP AGAIN, NO MATTER HOW YOU TRY. YOU TURN OVER IN YOUR MIND ALL THE THINGS THAT YOU HAVE TO DO. THE DAY AHEAD SEEMS ENDLESS.

1. Faced with this situation you feel:

- 2 (i) Extremely upset.
 1 (ii) Moderately upset.
 0 (iii) Slightly upset.
 0 (iv) Not at all upset.

2. When you consider the situation you think:

- 1 (i) It must have been something I ate.
 2 (ii) What's the matter with me - I should pull myself together and stop being
 pathetic.
 0 (iii) There must have been a noise outside to wake me.
 0 (iv) It is quite normal to wake early when you go to bed as early as I do.

3. When you think ahead you think:

- 1 (i) Looks like I might be heading for a bit of a rough patch, but it won't
 last for ever.
 0 (ii) I'm sure to feel better as soon as I get moving.
 2 (iii) This is the start of another black mood - when will it ever end?
 0 (iv) Today looks a bit grim but I should be OK by this evening.

4. When you consider the way you feel you think:

- 2 (i) It is always the same - I never seem to feel any different from this.
 0 (ii) Everyone has the occasional bad day.
 0 (iii) How lucky that I practically never wake early and get worked up like this.
 1 (iv) This has happened to me quite a lot lately.

5. When you consider how to tackle the situation you think:

- 0 (i) It's no good lying here fretting, I'll get up and start the day.
 1 (ii) There's no point in doing anything - I'll feel terrible all day no matter
 what I do.
 2 (iii) I can't decide whether to get up or to stay in bed.
 0 (iv) I'll read a bit, that will take my mind off things.

Effects of distraction on thinking and affect in depressed patients

Melanie J. V. Fennell and John D. Teasdale

Beck's cognitive model of depression suggests that negative cognitions can maintain depression. Thus reducing the frequency of negative cognitions should reduce depression. Consistent with this proposition, in low endogenous patients with primary major depressive disorder, distraction produced fewer depressing thoughts than the control procedure, with corresponding differences in self-report and psychomotor measures.

Beck's cognitive model of depression (Beck *et al.*, 1979), on which cognitive-behavioural therapy (CBT) of depression is based, proposes that clinical depression can be maintained by negative cognitions. Reducing the frequency or intensity of these should alleviate depression. However, it is possible that behavioural and 'non-specific' elements, rather than thought-change strategies as such, account for the effects of the CBT package. Thus treatment effectiveness provides only limited validation of the model. To overcome this difficulty, Teasdale & Fennell (1983) have suggested investigating the immediate effects on clinical depression of brief interventions designed to modify depressive thinking. Three previous studies have used this approach (Teasdale & Fennell, 1982). The present study compared the effects of a brief, standardized distraction procedure with those of a control procedure. Distraction is used early on in CBT to reduce the frequency of depressing thoughts (Beck *et al.*, 1979, pp. 171–172). We aimed to test both the prediction that altering the frequency of negative thoughts will modify depression, and the effectiveness of a specific CBT component.

Sixteen depressed patients, meeting Research Diagnostic Criteria for Primary Major Depressive Disorder (Spitzer *et al.*, 1978), and scoring ≥ 20 on the Beck Depression Inventory (mean 30.25, range 20–43) took part in a study of 'the way people react to certain experiences when depressed'. None was familiar with CBT, and no indication of possible therapeutic benefit was given. Before the experiment, the Newcastle Diagnosis Scale (Carney *et al.*, 1965), a measure of endogeneity, was given (median score 3, range 0–7).

Measures. (1) *Frequency of depressing thoughts.* At 26 s intervals during each intervention, a tone sounded (10 in all). Each time subjects reported whether what they were thinking was depressing ('a thought that would make anyone depressed if they had it') or not. On three randomly chosen occasions, subjects reported their thoughts aloud. The thoughts were rated on a seven-point scale as depressing (–1 to –3) or not (0 to +3) by three independent judges, blind to experimental condition. There was agreement between patients and all three judges on categorization of 82 per cent of thoughts sampled, and between patients and two judges on a further 14 per cent. (2) *Depressed mood* was measured using a 10 cm line visual analogue scale (VAS). (3) *Speech rate.* Time taken to count from 1 to 10 was measured. (4) *Writing speed.* The number of numbers from 100 downwards written in 1 minute was recorded. (5) *Incentive ratings.* Subjects rated on a 0–10 scale their desire to engage in 12 potentially pleasant activities. (6) *Word associations.* On each occasion, latency of response to four stimulus words was measured.

Procedure. Each subject experienced both interventions. In the *distraction condition* (5 min), subjects concentrated on slides depicting outdoor scenes, described aloud in as much detail as possible. In the *control condition* (also 5 min), subjects sat quietly looking at a square of white light projected on the wall. Before and after each intervention, the measures of depression were administered in the order given above. Order of presentation of the two interventions was random and balanced as far as possible. After the experiment, three questions were asked to assess the influence of experimental demand: (1) What do you think the experiment was about? (2) What do you think I expected to happen? (3) Do you think I expected you to feel better after looking at the slides than after looking at the white light? Three independent judges rated replies according to how far subjects correctly guessed the purpose of the experiment, on a five-point scale from 0 (did not guess at all) to 4 (guessed completely). Only one subject was consistently judged (from her response to question 3) to have guessed the purpose of the experiment. This subject is included as her removal did not affect the results.

Table 1. Mean scores on depression measures before and after each intervention

Measure	Distraction (D) mean		Control (C) mean	
	Pre	Post	Pre	Post
Depressed mood	59.09	53.23	39.95	71.50
Counting time (s)	7.60	6.93	7.12	8.52
Writing speed	32.45	34.91	34.00	30.36

Results. The difference in frequency of negative thoughts between the two conditions, although in the predicted direction, was not significant for the sample as a whole. As our previous work had found that distraction was effective only for subjects with low scores on the Newcastle Diagnosis Scale, patients scoring at or below the median ($n = 11$) were examined separately. For these, the frequency of negative thoughts [medians: 2 (distraction) and 7 (control)] differed significantly between the two conditions ($P < 0.04$, sign test). The results reported below relate only to these 11 subjects. Multivariate analysis of variance, with order of interventions as a between-subject factor, was used to compare change scores in the two conditions on all five measures of depression. This revealed significant overall differences between the two conditions ($F = 3.79$, d.f. = 5, 5, $P < 0.04$, one-tailed). There was no significant effect for order ($F = 1.38$, d.f. = 5, 5, $P > 0.1$) and no significant intervention \times order interaction ($F = 2.92$, d.f. = 5, 5, $P > 0.1$). Univariate analysis of variance of change scores showed significant differences between the two conditions as predicted on three measures: self-reported mood ($F = 11.88$, d.f. = 1, 9, $P < 0.004$); speech rate ($F = 6.14$, d.f. = 1, 9, $P < 0.02$); and writing speed ($F = 6.81$, d.f. = 1, 9, $P < 0.01$). Mean scores before and after each intervention for these measures are given in Table 1.

Clearly, generalization from such a small number of subjects should be done only with caution, and replication is called for. None the less, considering only the low-endogenous patients for whom the intervention was effective, the results are consistent with the theoretical prediction that modifying the frequency of naturally occurring depressing thoughts will alter depression. Numbers were too small to determine why distraction was not effective with high-endogenous patients. Unexpectedly, the control condition produced more consistent and larger effects, particularly on mood and counting time, than distraction. This appeared to be because it allowed negative ruminations to emerge unchecked by external information-processing demands; 83 per cent of depressing thoughts reported aloud during distraction concerned the procedure itself (e.g. 'I can't do this properly'), whereas in the control condition 88 per cent concerned patients' real-life preoccupations (e.g. 'I've let my family down'). Clinically, this suggests the importance of depressed patients avoiding periods of fruitless rumination, and the use of distraction as a short-term emergency measure.

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A. THE NEWCASTLE DIAGNOSIS SCALE

- | | |
|---|----|
| 1. Adequate personality (no history of neurotic breakdown, no disabling neurotic symptoms or serious social maladjustment) | +1 |
| 2. No adequate psychogenesis (no psychological stress or difficulty continuing to operate after onset of symptoms to explain continuation of illness) | +2 |
| 3. Weight loss (\geq 7lbs) | +2 |
| 4. Previous episode | +1 |
| 5. Depressive psychomotor activity (objective evidence of psychomotor slowing, stupor or agitation) | +2 |
| 6. Anxiety | -1 |
| 7. Nihilistic delusions (of doom, imminent destruction, body breaking down, poverty of patient and/or family) | +2 |
| 8. Blame others | -1 |
| 9. Guilt | +1 |
| 10. Distinct quality (patient feels mood is different from usual depression in reaction to problems) | +1 |

Total

B. THE NEWCASTLE DIAGNOSIS SCALESTANDARDISED INTERVIEW SCHEDULE1. Adequate personality

(To follow questions establishing duration of current episode of Major Depressive Disorder, and duration of current mood disturbance)

Apart from that, have there been any times in the past when you have had trouble with your nerves? Have you ever had to ask for help for problems of that kind? Do you have any problems of that sort, even when you are not feeling the way you do now?

2. No adequate psychogenesis

Since you became depressed, have there been any stresses or difficulties in your life which might help to account for the fact that you have't got back to normal? What are they?

3. Weight loss

Have you lost any weight since you became depressed? Have you been trying to lose weight deliberately, or is it more to do with just not feeling like eating?

4. Previous episodes

Have there been any times in the past when you've felt the way you do now? How many times has that happened?

5. Depressive psychomotor activity

Are there ever times when you just can't sit still, you have to get up and move around? Or do you find that you are more slowed down than usual, that you're thinking more slowly, speaking more slowly, doing things more slowly than you normally would?
(Distinguish from having difficulty getting down to doing things)

6. Anxiety

As well as feeling low, d'you find you get anxious?

Cont'd/...

Cont'd/...

7. Nihilistic delusions

D'you ever get the feeling that something dreadful has happened or is going to happen, some sort of fate or doom?

D'you ever get the feeling that your body is breaking down, that you've got some terrible disease?

D'you ever get the feeling that you or your family could lose everything and be left destitute?

(If "yes" to any of these, check whether the reply is based on any real evidence or not - "Can you tell me more about that?")

8. Blame others

Where d'you put the responsibility for the way you feel? D'you ever find yourself blaming anyone else?

9. Guilt

D'you find you feel guilty?

10. Distinct feeling

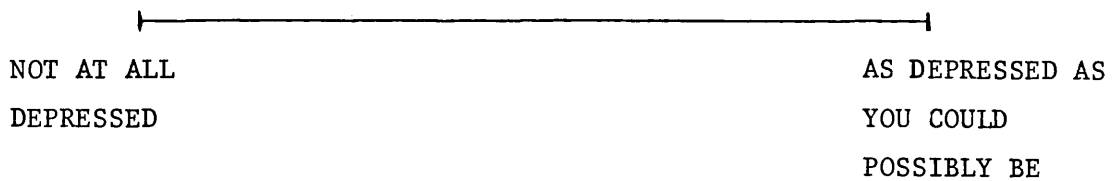
I suppose we all get what we call "depressed" when things go wrong in our lives. If you compare that kind of feeling, the way you previously felt when things went wrong, with the way you feel now, is it the same kind of feeling now, only worse, or is it a different kind of feeling?

(If different kind of feeling, ask in what way)

A. STUDY I : MEASURES

1. Depressed mood (VAS)

Subject makes a cross on the line to indicate how depressed he or she feels "right now".



2. Speech rate

Subject counts from one to ten aloud, in his or her own time. Two counts are tape-recorded on each occasion, and the mean of the two is the measure.

3. Writing speed

Subject writes down numbers from 100 downwards - 100, 99, 98, 97, 96 and so on - in his or her own time. Stopped by experimenter after 1 minute. The number of numbers written in the minute is the measure.

Cont'd/...

4. Rating of pleasurable activities (0-10)

<u>Activity</u>	<u>Rating</u>	P.	1.	2.	3.	4.
1. Go to a concert of your favourite music with a group of friends *						
2. Watch your favourite TV programme						
3. Go out for a drink with an old friend						
4. Go shopping for a present for a friend						
5. Go to a party *						
6. Read a good book						
7. Go out for a meal with a group of new and interesting people *						
8. Listen to your favourite radio programme						
9. Go and see a good film with a friend						
10. Go for a country walk by yourself						
11. Talk to someone close to you						
12. Do something practical - e.g. knitting, gardening, cooking, woodwork - something you would normally enjoy						

* Social activities high in effort

Cont'd/...

5. Word association latency

(Words used on each assessment occasion)

	1.	2.	3.	4.
<u>Practice</u>	Apple	Sunshine	Sister	Pain
<u>Before 1st intervention</u>	Paper	Birds	Sex	Sorrow
<u>After 1st intervention</u>	Fear	Love	Wood	Life
<u>Before 2nd intervention</u>	Music	Shoe	Accident	School
<u>After 2nd intervention</u>	Parent	Hate	Happy	Snow

Cont'd/...

6. Thought-tapping (frequency of depressing thoughts)

	<u>Timing of tone (mins)</u>	<u>Distraction/Control</u>		<u>Distraction/Control</u>	
1.	1.00	Y	N	Y	N
2.	1.26	Y	N	Y	N
3.	1.52*	Y	N	Y	N
4.	2.18	Y	N	Y	N
5.	2.44	Y	N	Y	N
6.	3.10	Y	N	Y	N
7.	3.36*	Y	N	Y	N
8.	4.02	Y	N	Y	N
9.	4.28	Y	N	Y	N
10.	5.00*	Y	N	Y	N

THOUGHTS SAMPLEDIntervention I

1.

2.

3.

Intervention II

1.

2.

3.

- Notes
- Y Circle if patient reports depressing thought
- N Circle if patient reports nondepressing thought
- * Ask patient to report thought aloud verbatim

B. STUDY I : INFORMATION FOR PATIENTS

1. INTRODUCTORY INTERVIEW

As Dr ... has explained to you, this is part of a study of the way people who are depressed react to certain experiences.

You could help this research by giving about an hour-and-a-half of your time. Basically, I would be asking you to do two things. One is to spend some time looking at a series of slides, pictures of people and places. The other is to spend some time simply sitting comfortably, relaxing and looking at a square of white light. From time to time I should take some brief measures of how you are getting on. None of this takes very long, or is very difficult. Also I should say that it is not a test of any kind - there are no right or wrong answers, I am simply interested in the way you personally react.

Obviously it would be very helpful if you did feel able to help. As you will appreciate, the more we know about depression, the better position we will be in to understand it. However, whether you take part or not will have absolutely nothing to do with whatever care you receive, and you are under absolutely no obligation to do the experiment if you don't want to, so please do say if you would rather not. I would much rather you did not do it against your will. Also, if you feel you would be willing to take part, and then you decide while we are doing it that you want to stop, you are quite free to say so.

Finally, I should say that anything you say to me will not go any further than that - whatever you say is completely confidential.

What do you think? Is there anything you would like to ask, or that I haven't explained very clearly?

(If patient is doubtful, give them time to think about it, and fix a time to meet again and discuss their decision.)

Thank you very much indeed for coming today - that really is helpful. And don't forget - if you feel at any point that you would rather not go on, just say so, and we will stop.

Overview

Now, as I said, basically I'm going to be asking you to do two things. One is to spend some time looking at a series of slides, and the other is to simply sit quietly, relaxing and looking at a square of white light. From time to time I shall take some brief measures of how you are feeling. The experiment will be divided into two parts. Firstly, I shall go through everything you will be expected to do, so that you know exactly what to expect. Then we will do the experiment itself. OK?

BDI

OK, before we begin, could you just fill in this questionnaire for me please. It's about how you're feeling at the moment. Let me know if you have any problems. Thank you.

Description and rehearsal of measures of depression

As we go through the experiment, I should like to take some brief measures from time to time of how things are going for you. Let me tell you about them now, so that you will know exactly what to expect.

Mood ratings The first thing I shall ask you to do is to tell me how depressed you are feeling at a particular moment. You see this line here. What I should like you to do is to make a mark on the line to show me how depressed you feel "right now", this very moment. OK? So if you are feeling just as depressed as you could possibly be, you'll make your mark at the right-hand end (point). If, on the other hand, you're not feeling depressed at all right now, then you'll make your mark at the left-hand end (point). If you're feeling moderately depressed, you'd be somewhere in the middle. And of course you could be anywhere in between. OK? Right, would you like to do that right now then; make a cross on the line to show how depressed you feel right now, this minute. Thank you.

Cont'd/...

Speech rate I shall also be asking you to count out loud from 1 to 10 in your own time. Would you like to do that now, please? And again, please? Thank you.

Writing speed Now, on this piece of paper, I should like you to please write down numbers from 100 downwards - 100, 99, 98, 97, 96, 95 and so on. OK? Take your own time, and I'll tell you when to stop. Thank you.

Incentive ratings Now, here is a list of a number of activities. They are all the kind of thing that people enjoy to do. Now, I shall read out the list, and I want you to tell me how much you would like to do each activity, right now, if you had the chance, by giving me a number out of 10. Ten would mean you really, really wanted to do whatever it was; zero would mean you didn't want to do it at all. You could be anywhere in between. Please base your ratings on how you feel right now. OK? Let's take the first one, "Go to a concert of your favourite music with a group of friends". How much would you like to do that right now, if you had the chance, out of 10? Ten would mean you really, really wanted to do it, 0 that you didn't want to do it at all, and so on. Where would you put yourself out of 10? OK, now let's take the next one. How much out of 10 would you like to do that, right now, if you had the chance?

(Continue through list. If patient has never enjoyed an activity, even when not depressed, then substitute - e.g. magazine or newspaper for book)

Word association latency OK, now, I am going to say a word to you, and when I do so, I want you to say the first word that my word makes you think of. Please use single words, not phrases. Just give me the first word that comes into your head when I say my word. Just let me give you an example. Supposing I said "chair" for instance, the first word you thought of might be "table", so you'd say that. OK? Or supposing I said "door", what might come into your head then? Good. OK, let's just practice that, then. I'll say my word, and you say whatever comes into your head. Don't try to search out a particular word that you think should fit - just give me the first thing that pops into your mind.

(Go through practice list)

Cont'd/...

Description and rehearsal of experimental procedures: Distraction

OK. Now let me tell you what I'm actually going to be asking you to do. One thing is to spend some time looking at a series of slides. They're all pictures of people, pictures of places. What I'm going to ask you to do is to try to involve yourself in each slide as much as you can. Really try to get as absorbed in each one as you possibly can. To help you to do that, I'm going to ask you to describe each slide out loud in as much detail as possible. The aim is to get as much out of each slide as you can. When you feel you have got as much out of a particular slide as you can, then just press this button, and a new slide will come up. Do that whenever you want to. Just go at your own pace, and spend as much time on each slide as you want.

This is not a test of any kind. There are no right and wrong answers. Don't worry if you find it difficult to concentrate at first - just go at your own pace, and try to involve yourself in what you see as far as you can. This is not a personality test or anything like that either. I shall not be trying to read anything deep into what you say. And I shall not be asking you to remember anything that you've seen. I am asking you to describe the slides aloud simply as a means of helping you to concentrate. So just say whatever comes into your head.

Let me just show you with one slide exactly what I want you to do. OK? Now, if I was you, looking at this slide, I might say:

"This looks like a cloister - part of a church, or a cathedral, something like that. On the left are some arches - eight of them I think. The sun is shining through them and making patterns on the floor. The floor and the arches are made of stone. I can't see what's beyond the arches - could be a garden, or a courtyard. The sun looks very bright, so I expect it's quite hot. It makes it dark in the cloisters - you can't really see the ceiling. There are two life-size stone statues on the big pillars between the arches - they're wearing long robes, got long hair and beards, so I guess they could be kings, or prophets, or something. There are two people standing to the right of the picture. There's a

Cont'd/...

man, standing with his back to us, wearing a grey suit. He's got something in his hand, something white, and he's gesturing towards the arches - could be a guide-book or something. Then there's a girl, standing sideways on, with long hair, trousers, a white mac, I think some sunglasses. And there's someone sitting between the arches, facing outwards, you can just see their back - looks as if they're wearing a fawn jumper".

OK? Any questions about how to do that? Really, the idea is to get as much out of each slide as you can, and to help yourself to do so by describing each one out loud, just as I did then with that one.

Description and rehearsal of experimental procedures: Control

The other thing I'll be asking you to do is to spend some time simply sitting in a relaxed way, and looking at a square of white light on the wall, like this. While you're doing that, you may find your mind wandering. Don't worry if that is the case. Just let your thoughts go where they will.

Thought-tapping

The last thing I'll ask you to do is this. While you are looking at the slides and at the white light, from time to time you will hear a "beep", like this. When you hear the "beep", I want you to tell me whether the thought you were thinking at that moment was depressing or not. By "depressing" I mean the kind of thought that might make anyone feel depressed if they had it. For example, "I feel terrible today", "Why am I so pathetic?", or "The future looks bleak". Examples of thoughts that would not be depressing might be "What shall I have for supper tonight?", "How nice the flowers look today", or "I'm looking forward to going out tomorrow night". Or again, you might be completely involved in a slide, or perhaps not thinking anything at all at the moment the beep goes.

Could you give me an example of a depressing thought, so that I can be sure that I've explained properly what I mean? Thank you. What about nondepressing thoughts? Thank you. Now, when you hear the "beep", if

Cont'd/...

you are thinking a depressing thought, say "Yes". If not, say "No". And on some occasions, I shall ask you to tell me what you actually were thinking when the "beep" went. OK? Try to tell me what you were thinking in so many words, please, rather than giving me the general topic. For example, if you were thinking about one of the slides, you'd say "Wondering what kind of tree that was", not "Thinking about the slide". D'you see what I mean? Good.

Any questions about all that? Good. Incidentally, I don't want to give you any more detail about it right now, in case I influence how you react. But if you've got any further questions when we've finished, please feel free to ask.

Experimental procedure (assumes distraction presented first)

OK. Now let's move on to the experiment itself. First of all, let's just go through the various measures. First, would you like to put a cross on the line here to show how depressed you feel right now. Thank you very much. Now if you'd like to count out loud from 1 to 10 please. And again please. Thank you very much. Now on this sheet, would you like to write numbers from 100 downwards. Thank you. Now the list of activities. Remember, I'd like you to rate each one out of 10 for how much you'd like to do it right now, if you had the chance. Thank you. Now I'm going to say my words, and I want you to say whatever word first comes into your head in response to each. Thank you.

Right, now, the first thing I'd like you to do is to look at the slides. Remember, the idea is to get as involved in each one as possible, and to help yourself to do that by describing each one in as much detail as possible, out loud, just like I did with the practice one. Take as long on each slide as you want, and turn to a new one whenever you want to. OK? Don't forget, from time to time you'll hear the "beep". When you do, just say "Yes" if you were thinking a depressing thought at that moment, and "No" if you weren't. And on two or three occasions I shall ask you exactly what you were thinking. As soon as you've told me, just go straight back to the slides. OK? Off you go then.

(5 minutes of slides)

Cont'd/...

(Measures, as above)

Now I'd just like you to tell me how far you felt you were able to involve yourself in the slides, overall. You see this scale. What I'd like you to do is to ring the number on the scale which represents how involved you felt you got. So if you were completely involved, you'd ring 10. If you were not involved at all, you'd ring 0. If you were about half involved, you'd ring 5 or 6. And so on. OK? Thank you very much.

Right, now I'd like to take a brief break, and then we'll get on with the second half of the experiment. I'll be back in a moment.

(5 minutes)

(Measures, as above)

Now, what I'd like you to do this time is to look at the white light. Just sit comfortably, let yourself relax, and keep your attention on the white light. Don't worry if you find your mind wandering while you do this, that's fine. And don't forget again that you'll be hearing the "beep" from time to time. When you do, just say whether you were thinking a depressing thought or not, and go back to the white light. Again, I'll ask you on two or three occasions what you actually were thinking. OK? Off you go then.

(5 minutes)

(Measures, as above, including rating of involvement)

(Post-experimental questionnaire, feedback, debriefing, including use of distraction as a means of controlling depressed mood if appropriate)

B. Summary tables for analyses of variance

(Low endogenous patients)

1. Depressed mood (VAS)

(Analysis of variance of change scores over distraction (D) and the control condition (C), with order of presentation of the two interventions as a between-subject factor)

<u>Source of variance</u>	<u>Sum of squares</u>	<u>d.f.</u>	<u>Mean square</u>	<u>F</u>	<u>p</u>
Order	26.37	1	26.37	0.09	.7702
Error	2617.83	9	290.87		
Treatment	8432.01	1	8432.01	11.08	.0088
Treatment x order	330.92	1	330.92	0.43	.5262
Error	6849.83	9	761.09		

2. Speech rate (time taken to count from 1 to 10 in secs)

(Analysis of variance of change scores, D vs. C, with order of presentation as a between-subject factor)

<u>Source of variance</u>	<u>Sum of squares</u>	<u>d.f.</u>	<u>Mean square</u>	<u>F</u>	<u>p</u>
Order	0.01	1	0.01	0.01	.9058
Error	8.02	9	0.89		
Treatment	16.32	1	16.32	6.41	.0321
Treatment x order	0.39	1	0.39	0.16	.7028
Error	22.91	9	2.55		

3. Writing speed (number of numbers from 100 downwards written in 1 min)

(Analysis of variance of change scores, D vs. C, with order of presentation as a between-subject factor)

<u>Source of variance</u>	<u>Sum of squares</u>	<u>d.f.</u>	<u>Mean square</u>	<u>F</u>	<u>p</u>
Order	0.48	1	0.48	0.02	.9029
Error	277.33	9	30.81		
Treatment	134.01	1	134.01	6.81	.0283
Treatment x order	6.37	1	6.37	0.32	.5832
Error	177.08	9	19.68		

Contd/...

4. Incentive ratings (social activities high in effort)
(Analysis of variance of change scores, D vs. C, with order of presentation as a between-subject factor)


<u>Source of variance</u>	<u>Sum of squares</u>	<u>d.f.</u>	<u>Mean square</u>	<u>F</u>	<u>p</u>
Order	460.32	1	460.32	3.33	.1012
Error	1242.77	9	138.09		
Treatment	169.32	1	169.32	1.35	.2746
Treatment x order	1245.68	1	1245.68	9.96	.0116
Error	1125.77	9	125.09		

5. Word association latency
(Analysis of variance of change scores, D. vs. C., with order of presentation as a between-subject factor)

<u>Source of variance</u>	<u>Sum of squares</u>	<u>d.f.</u>	<u>Mean square</u>	<u>F</u>	<u>p</u>
Order	1.01	1	1.01	1.47	.2563
Error	6.18	9	0.69		
Treatment	0.10	1	0.10	0.10	.7586
Treatment x order	0.95	1	0.95	0.92	.3617
Error	9.25	9	1.03		


A. STUDY II : MEASURES1. Depressed mood (VAS)

Subject makes a cross on the line to indicate how depressed he or she feels "right now"


 NOT AT ALL AS DEPRESSED AS
 DEPRESSED YOU COULD
 POSSIBLY BE


2. Happiness (VAS)

Subject makes a cross on the line to indicate how happy he or she feels "right now"


 NOT AT ALL AS HAPPY AS
 HAPPY YOU COULD
 POSSIBLY BE


3. Energy (VAS)

Subject makes a cross on the line to indicate how energetic he or she feels "right now"


 NOT AT ALL AS ENERGETIC AS
 ENERGETIC YOU COULD
 POSSIBLY BE

4. Anxiety (VAS)

Subject makes a cross on the line to indicate how anxious he or she feels "right now"


 NOT AT ALL AS ANXIOUS AS
 ANXIOUS YOU COULD
 POSSIBLY BE

B. STUDY II : INFORMATION FOR PATIENTS1. INTRODUCTORY INTERVIEW

As in Study I (see Appendix VB), except that depression should not be mentioned. Introduce experiment as "part of a study of stress and perception, that is, the way people see things around them at times when they are having difficulty or under stress". Say participation would be helpful because "the more we know about stress, the better position we will be in to understand it".

2. INSTRUCTIONS FOR EXPERIMENTAL SESSION

Thank you very much for coming today. - that really is helpful. And don't forget - if you feel at any point that you would rather not go on, just say so, and we will stop.

Overview

Now as I said, basically I'm going to be asking you to do two things. One is to spend some time looking at a series of slides, and the other is simply to sit quietly, to relax as far as possible, and to keep your attention focussed on a square of white light. From time to time I shall take some brief measures of how you are feeling. The experiment will be divided into three parts. First, we will go through the various measures and things, so that you will know exactly what to expect. Then we'll have a short break and do the first part of the experiment, and another short break and do the second part. OK?

BDI

Now first of all, I'd like you please to fill in this questionnaire. It's about how you've been feeling over the last week, including today. You'll see that for each question, there are four possibilities. Just put a ring round the number of the one which best fits how you've been feeling. If your feelings have been variable, you can ring more than one. Let me know if you have any difficulties. Thank you.

Cont'd/...

Description and rehearsal of measures of depression

As we go through the experiment, I should like to take some brief measures from time to time of how things are going for you. Let me tell you about them now, so that you will know exactly what to expect.

Depressed mood Now, the questionnaire you've just done was to do with how you've been feeling over the last week. These measures here (show mood ratings booklet) are more to do with how you feel at a particular moment, right now, when you actually fill them out. For example, the first one, you can see here, is to do with how depressed you are feeling right now. What I'd like you to do is to make a mark on the line to show how depressed you feel right now, this minute. So if you were feeling as depressed as you could possibly be, you'd put your mark up at the right-hand end (point). And if you weren't feeling depressed at all, you'd put your mark at the left-hand end. And of course you could be anywhere in between. OK? Would you like to do that now then, please. Just make a mark on the line to show how depressed you feel, right now.

Happiness Right, now, this one here works on the same principle, but it's to do with how happy you feel right now. So if you're feeling as happy as you possibly could be, you'd put your mark at the right-hand end; if you're not feeling happy at all, you'll put it at the left-hand end; and you could be anywhere in between. OK? Would you like to do that now, please?

Energy OK, now this one is about how energetic you feel right now. Would you like to just show me on that how energetic you're feeling right now. Right-hand end for as energetic as possible, and left-hand end for not at all energetic. Thank you.

Anxiety And last of all, how anxious you're feeling right now. Not at all anxious at the left-hand end, and as anxious as you could possibly be at the right-hand end. Would you like to do that now, please, to show how anxious you're feeling right now. Thank you very much.

Speech rate The next thing I'd like you to do, please, is to count out loud from 1 to 10 in your own time. Would you like to do that now please?

Cont'd/...

And again please? Thank you very much.

Writing speed Now, on this piece of paper, I'd just like you to write down numbers from 100 downwards - 100, 99, 98, 97, 96 and so on. OK? Take your own time, and I'll tell you when to stop. (1 minute) Thank you.

OK now, any questions about how to do any of those? OK. Incidentally, if you'd like to know more about what we're doing after the experiment is finished, I'd be very happy to answer any questions you have. I'd rather not go into more detail just now, though, in case I influence the way you react. OK?

Description and rehearsal of experimental procedure: Distraction

Now let me tell you what I'm actually going to be asking you to do. One thing is to spend some time looking at a series of slides. They're all pictures of places, pictures of people. What I'm going to ask you to do is to try to concentrate on each slide as hard as you can. The idea is to get as absorbed in each one just as much as you can. To help you to do that, I'm going to ask you to describe each one, to yourself, silently, in as much detail as possible. Let me show you with one slide exactly what I mean. Now I'm going to describe it out loud, obviously, or you wouldn't know what I was doing. When it's your turn, though, I'd like you to do it in your head. OK?

Now, if I was you, looking at this slide, I might say:

"This looks like a cloister, part of a church, or a cathedral, something like that. On the left are some arches - one, two, three main groups of arches, each one divided into one, two, three, four smaller arches by small pillars with carved tops and bottoms. On the big pillars between the groups of arches, there are stone statues; they look to be about life-size. They're wearing long robes, got long hair and beards, so I guess they could be kings or prophets from the bible, something like that."

Cont'd/...

OK, do you see what I'm getting at? The idea is to describe the slide in as much detail as you can, so as to help you to concentrate on it and get as much out of each one as you possibly can. Would you like to carry on now, with this one, so I can be sure I've explained properly just what I mean? (If insufficient detail, prompt with questions) OK? That's good. Any questions now about what you're supposed to do?

Don't forget, you'll be doing that silently, in your head, not out loud like we did just now. Don't worry if you find it difficult to concentrate at first, just do the best you can. This is not a test of any kind, there are no right or wrong answers. I'm just interested in your own personal reactions. OK? And I'm not going to ask you to remember what you've seen, or to read anything deep into what you say, or anything like that, OK? Just try to get as absorbed in each picture as you can. And don't worry if the picture changes before you've had a chance to finish describing it to yourself; just get as much out of each one as you can, while it's on the screen. Any questions about that?

Description and rehearsal of experimental procedure: Control

The second thing I'll be asking you to do is to sit as comfortably as you possibly can, to relax as far as you can, and to keep your attention on a square of white light, like this. OK? Just relax, and focus on the light.

Thought-sampling

Right, now, while you're looking at the slides and relaxing with the white light, from time to time you'll here a "beep", like this (demonstrate). When you hear the "beep", I'd like you to tell me what you were thinking just at that moment. Just what was running through your mind at the moment when you heard the "beep". OK? Now, it could be a number of things. It could be that you're completely absorbed in the slides, or in the white light, and that you're just thinking about that. Or you might be thinking about your own concerns, for instance, what you're going to be doing later in the day. Or there may be times when you're not thinking anything at all, your mind is just a blank. OK? Whatever it is, just say briefly what it was, and then go straight back to looking at the slides or relaxing with the white light. OK? Any questions? Would you just like to repeat back to me what I'm asking you to do, then, so I can be sure I've explained it properly. Thank you.

Incidentally, could you please try and tell me what you were thinking in so many words, rather than just giving the general topic. So, for instance, if you were thinking about the slide, you might say "Wondering what sort of tree that was on the left", not just "Thinking about the slide". OK?

Ok now, any questions about any of that? Do you feel reasonably clear about what you're going to be doing? Good. Now, before we begin the experiment itself, I'd just like to take a short break. I'm going to leave you alone for that, but don't worry, there's nothing sinister about that, no hidden cameras or whatever! I'd just like you to have time to settle down before we begin the experiment itself.

(5 minutes)

Experimental procedure (assumes distraction presented first)

OK. Now let's move on to the experiment itself. First of all, let's just go through the various measures. First, would you like to put a mark on the line to indicate how depressed you feel right now. Thank you. Now, a mark for how happy you feel right now. Thank you. And how energetic. Thank you. And last of all, how anxious. Thank you. Now, if you'd just count out loud from one to ten please. And again please. Thank you. Now, on this sheet, would you like to write the numbers from 100 downwards please. Thank you.

Right, now. The first thing I'd like you to do is to look at the slides. Remember, the idea is to get as involved in each one as you possibly can, and to help yourself to do so by describing each one, to yourself, in as much detail as possible, just like we did before out loud. And don't forget, every now and then you'll hear the "beep". When you do, just say briefly what you were thinking at the moment you heard it, and then go straight back to the slides. OK? Off you go then.

(5 minutes of slides)

(Measures, as above)

Now, I'd just like you to show me how far you felt you were able to involve yourself in the slides, overall. You see this scale. What I'd like you to do is to ring the number on the scale which represents how

involved you felt you got. So if you were completely involved, you'd ring 10. If you were not involved at all, you'd ring 0. If you were about half involved, you'd ring 5 or 6. And so on. OK? Thank you.

Right, now we'll just take another short break, and then we'll do the second part of the experiment. I'll be back in a moment.

(5 minutes)

(Measures, as above)

Now, what I'd like you to do this time is to relax with the white light. Just sit as comfortably as you can, let yourself relax as far as you can, and keep your attention focussed on the white light. And don't forget, from time to time you'll be hearing the "beep". When you do, just say what you were thinking at that moment, and go straight back to relaxing with the white light. OK? Off you go then.

(5 minutes)

(Measures, as above, including rating of involvement)

(Post-experimental questionnaire, categorisation of thoughts as depressing or not, feedback, debriefing (including use of distraction as a means of controlling depressed mood, if appropriate)).

APPENDIX VIII

A. Study II : Mean frequency of depressing thoughts during distraction and during the control condition, and scores on measures of depression before and after each intervention, presented separately for patients receiving the control first (C→D) and for patients receiving distraction first (D→C)

<u>Measure</u>	<u>Low endogenous patients (NDS score ≤ 3) a</u>				<u>High endogenous patients (NDS score > 3) b</u>			
	<u>Distraction</u>	<u>Control</u>	<u>Distraction</u>	<u>Control</u>	<u>Distraction</u>	<u>Control</u>	<u>Distraction</u>	<u>Control</u>
<u>1. Frequency of depressing thoughts</u>								
C→D	0.50	4.50	3.11	3.78				
D→C	1.33	6.67	2.44	5.00				
<u>2. Depressed mood (VAS)</u>								
C→D	60.83	49.83	52.33	54.89	42.56	54.44	54.44	
D→C	51.67	40.83	63.00	65.89	58.00	74.44	74.44	
<u>3. Speech rate (secs)</u>								
C→D	5.93	6.70	6.51	5.31	5.31	5.47	5.47	
D→C	8.92	9.51	10.04	6.50	6.51	6.64	6.64	
<u>4. Writing speed</u>								
C→D	43.83	42.50	42.00	41.22	39.11	40.89	40.89	376
D→C	29.83	32.00	31.67	41.00	43.22	42.11	42.11	

B. Summary Tables for Analyses of Variance and Covariance1. Study II : Low endogenous patients (NDS score ≤ 3)a. Frequency of depressing thoughts

(Analysis of variance, Distraction (D) vs. Control (C), with order of presentation of the two interventions as a between-subject factor)

<u>Source of variance</u>	<u>Sum of squares</u>	<u>d.f.</u>	<u>Mean square</u>	<u>F</u>	<u>p</u>
Order (C→D vs. D→C)	13.50	1	13.50	3.97	.0743
Error	34.00	10	3.40		
Treatment (D vs. C)	130.67	1	130.67	31.36	.0002
Treatment x order	2.67	1	2.67	0.64	.4423
Error	41.67	10	4.17		

b. Depressed mood (VAS)

(Analysis of covariance, D vs C, with order of presentation as a between-subject factor)

<u>Source of variance</u>	<u>Sum of squares</u>	<u>d.f.</u>	<u>Mean square</u>	<u>F</u>	<u>p</u>
Order	1042.27	1	1042.27	0.93	.3600
Order covariate	4395.29	1	4395.29	3.92	.0790
Error	10084.05	9	1120.45		
Treatment	2374.65	1	2374.65	11.19	.0086
Treatment x order	138.51	1	138.51	0.65	.4400
Treatment covariate	160.33	1	160.33	0.76	.4074
Error	1910.34	9	212.26		

c. Speech rate

(Analysis of covariance, D vs. C, with order of presentation as a between-subject factor)

<u>Source of variance</u>	<u>Sum of squares</u>	<u>d.f.</u>	<u>Mean square</u>	<u>F</u>	<u>p</u>
Order	0.00	1	0.00	0.00	.9760
Order covariate	198.53	1	198.53	142.40	.0000
Error	12.55	9	1.39		
Treatment	0.80	1	0.80	1.52	.2488
Treatment x order	0.43	1	0.43	0.82	.3877
Treatment covariate	13.33	1	13.33	25.41	.0007
Error	4.72	9	0.53		

d. Writing-speed

(Analysis of covariance, D vs. C, with order of presentation as a between-subject factor)

<u>Source of variance</u>	<u>Sum of squares</u>	<u>d.f.</u>	<u>Mean square</u>	<u>F</u>	<u>p</u>
Order	14.94	1	14.94	0.69	.4268
Order covariate	2995.55	1	2995.55	138.88	.0000
Error	194.12	9	21.57		
Treatment	22.37	1	22.37	5.66	.0413
Treatment x order	3.51	1	3.51	0.89	.3704
Treatment covariate	98.08	1	98.08	24.80	.0008
Error	35.59	9	3.95		

2. Study II : Low (NDS score ≤ 3) vs. high (NDS score > 3) endogenous patients

- a. Frequency of depressing thoughts
(Analysis of variance, Distraction (D) vs. Control (C), with level of endogeneity and order of presentation as between-subject factors)

<u>Source of variance</u>	<u>Sum of squares</u>	<u>d.f.</u>	<u>Mean square</u>	<u>F</u>	<u>p</u>
Endogeneity	1.60	1	1.60	0.15	.6971
Order	11.38	1	11.38	1.10	.3036
Endogeneity x order	5.38	1	5.38	0.52	.4770
Error	286.56	26	10.33		
Treatment	141.88	1	141.88	35.55	.0000
Treatment x endog.	33.61	1	33.61	8.42	.0075
Treatment x order	9.34	1	9.34	2.34	.1381
Treatmt x endog. x order	0.28	1	0.28	0.07	.7940
Error	103.78	26	3.99		

- b. Depressed mood (VAS)
(Analysis of covariance, D vs. C, with level of endogeneity and order of presentation as between-subject factors)

<u>Source of variance</u>	<u>Sum of squares</u>	<u>d.f.</u>	<u>Mean square</u>	<u>F</u>	<u>p</u>
Endogeneity	3464.31	1	3464.31	4.19	.0512
Order	1196.62	1	1196.62	1.45	.2400
Endogeneity x order	51.20	1	51.20	0.06	.8054
Endog. x order covar.	9134.92	1	9134.92	11.06	.0027
Error	20653.42	25	826.14		
Treatment	1433.86	1	1433.86	6.42	.0179
Treatment x endog.	514.55	1	514.55	2.30	.1415
Treatment x order	344.46	1	344.46	1.54	.2257
Treatmt x endog. x order	0.01	1	0.01	0.00	.9947
Treatment covariate	969.77	1	969.77	4.34	.0475
Error	5582.12	25	223.28		

c. Speech rate

(Analysis of covariance, D vs. C, with level of endogeneity and order of presentation as between-subject factors)

<u>Source of variance</u>	<u>Sum of squares</u>	<u>d.f.</u>	<u>Mean square</u>	<u>F</u>	<u>p</u>
Endogeneity	0.32	1	0.32	0.42	.5231
Order	0.19	1	0.19	0.24	.6252
Endogeneity x order	0.27	1	0.27	0.36	.5536
Endog./order covar.	520.20	1	520.20	683.04	.0000
Error	19.04	25	0.76		
Treatment	1.79	1	1.79	3.38	.0779
Treatment x endog.	0.38	1	0.38	0.72	.4048
Treatment x order	0.14	1	0.14	0.27	.6105
Treatmt x endog. x order	0.37	1	0.37	0.69	.4125
Treatment covar.	10.74	1	10.74	20.24	.0001
Error	13.27	25	0.53		

d. Writing speed

(Analysis of covariance, D vs. C, with level of endogeneity and order of presentation as between-subject factors)

<u>Source of variance</u>	<u>Sum of squares</u>	<u>d.f.</u>	<u>Mean square</u>	<u>F</u>	<u>p</u>
Endogeneity	6.91	1	6.91	0.50	.4862
Order	15.47	1	15.47	1.12	.3005
Endogeneity x order	6.26	1	6.26	0.45	.5074
Endog./order covar.	9166.60	1	9166.60	662.42	.0000
Error	345.95	25	13.83		
Treatment	15.62	1	15.62	2.86	.1033
Treatment x endog.	7.15	1	7.15	1.31	.2633
Treatment x order	1.40	1	1.40	0.26	.6169
Treatmt x endog. x order	0.31	1	0.31	0.06	.8131
Treatment covar.	39.57	1	39.57	7.24	.0125
Error	136.54	25	5.46		

A. Summary of results and comments for VASs measuring happiness, energy and anxiety in Study II

1. Happiness

a. Low endogenous patients only (NDS score ≤ 3)

Summary There was no significant main treatment effect on happiness in low endogenous patients ($F(1,9)=2.20$, $p>.1$), though mean score was somewhat higher after distraction than after the control condition. There was no significant main effect for order of presentation of the two interventions ($F(1,9)=0.10$, $p>.7$), and no significant interaction between order and treatment ($F(1,9)=0.87$, $p>.3$).

Comment Happiness was apparently relatively little affected by the two interventions, though results were in the direction one might predict. The main effect of distraction was to reduce depression, rather than to enhance positive affect. A less severely depressed sample might prove more sensitive on this measure. Alternatively, the neutral ratings given to most nondepressing thoughts by the independent judges may explain the lack of marked effects. In order to increase happiness, it may be necessary to introduce a higher frequency of actively happy thoughts.

b. Low vs. high (NDS > 3) endogenous patients

Summary There was a significant main effect for treatment on happiness when high and low endogenous patients were considered together ($F(1,25)=4.72$, $p<.04$), both groups being happier after distraction than after the control condition. There were no significant main effects for endogeneity ($F(1,25)=1.63$, $p>.2$) or for order of presentation ($F(1,25)=0.11$, $p>.7$), and no significant interactions between endogeneity and order ($F(1,25)=0.75$, $p>.3$), endogeneity and treatment ($F(1,25)=0.66$, $p>.4$), order and treatment ($F(1,25)=1.36$, $p>.2$) or endogeneity, order and treatment ($F(1,25)=0.19$, $p>.6$).

Comment The significant main effect for treatment obscures the fact that pattern of change in the two patient groups was different (see Appendix IXF). Low endogenous patients on average showed an increase in happiness over distraction, and a decrease over the control condition. High endogenous patients, in contrast, showed small decreases in happiness over both interventions. This is entirely consistent with the average increases in depressed mood that high endogenous patients

showed over both interventions.

2. Energy

a. Low endogenous patients only (NDS score ≤ 3)

Summary There was no significant main effect on energy for treatment ($F(1,9)=0.26$, $p>.6$), though low endogenous patients were marginally more energetic after distraction than after the control condition. There was no significant main effect for order of presentation ($F(1,9)=0.81$, $p>.3$), and no significant interaction between order and treatment ($F(1,9)=0.36$, $p>.5$).

Comment There was no particular effect of either intervention on rated energy. Apparent differences on change scores (see Appendix IXF) were mainly the result of differences in pre-intervention levels. This measure, like the Incentive Ratings used in Study I, may simply be insensitive to short-term change, at least as brought about by interventions of this type. It may be that measurable differences in energy level will only occur in patients this depressed over a longer treatment period. Alternatively, the procedures used in Study I, which involved differences in activity level between the two experimental conditions, might have produced larger effects.

b. Low vs. high endogenous patients (NDS score > 3)

Summary There were no significant main effects on energy for treatment ($F(1,25)=0.04$, $p>.8$), endogeneity ($F(1,25)=0.38$, $p>.5$) or order of presentation ($F(1,25)=0.44$, $p>.5$). Equally, there were no significant interactions between endogeneity and order ($F(1,25)=0.66$, $p>.4$), endogeneity and treatment ($F(1,25)=0.23$, $p>.6$), order and treatment ($F(1,25)=2.86$, $p>.1$), or endogeneity, order and treatment ($F(1,25)=0.80$, $p>.3$).

Comment There were no marked differences between the two interventions on this measure for either group. The pattern of change over the two interventions was similar in both groups (see Appendix IXF), and less marked in the high endogenous patients.

3. Anxiety

a. Low endogenous patients only (NDS score ≤ 3)

Summary There was a significant main treatment effect for anxiety in low endogenous patients ($F(1,9)=6.59$, $p<.04$), mean score being, as one might predict, lower following distraction than following the control procedure. There was no significant main effect for order of presentation ($F(1,9)=0.02$, $p>.8$), and no significant interaction between order

and treatment ($F(1,9)=0.00$, $p>.9$).

Comment The pattern of response among low endogenous patients for anxiety was similar to their pattern of response on the VAS measuring depressed mood. On average, they showed comparable decreases in anxiety during distraction, and increases during the control condition. This is perhaps not surprising, since all 12 reported experiencing significant anxiety when interviewed on the Newcastle Diagnosis Scale. Whether this change in anxiety is simply a correlate of change in depression, or whether it reflects a reduction in anxious as well as in depressing thoughts, is impossible to guess, since no measure of anxious thoughts was taken during the course of the experiment. In any case, the results reflect the ability of distraction to reduce negative affect.

b. Low vs. high endogenous patients (NDS score > 3)

Summary There was a significant main treatment effect on anxiety when high and low endogenous patients were considered together ($F(1,25)=5.24$, $p<.04$). Both groups were on average less anxious after distraction than after the control condition, though this difference was less marked in high than in low endogenous patients (see Appendix IXE). There were no significant main effects for endogeneity ($F(1,25)=1.06$, $p>.3$) or for order of presentation ($F(1,25)=0.47$, $p>.4$), and no significant interactions between endogeneity and treatment ($F(1,25)=2.19$, $p>.1$), endogeneity and order ($F(1,25)=2.54$, $p>.1$), order and treatment ($F(1,25)=0.02$, $p>.9$), or endogeneity, order and treatment ($F(1,25)=0.12$, $p>.7$).

Comment Taking pre-intervention levels into account, both patient groups were less anxious after distraction than after the control condition, though in fact high endogenous patients on average showed slight increases in anxiety over both interventions (this complements the pattern of change they showed within interventions on depressed mood). Unlike depressed mood, however, there was no significant interaction between endogeneity and treatment. There was no difference between the two groups, in fact, when the proportion of patients reporting anxiety was measured on the NDS. The lack of significant interaction perhaps reflects a specific effect of distraction on depressing thoughts and depressed mood in low endogenous patients. Finally, the ability of distraction to alter anxiety-level suggests that it could be of interest to use this experimental

paradigm to examine the role of cognition in anxiety disorders, and the effectiveness of distraction as an anxiety-management technique.

APPENDIX IX

B. Study II: Mean scores on measures of happiness, energy and anxiety at the practice point, and before and after distraction and the control, low and high endogenous patients, those receiving the control condition first (C→D) and those receiving distraction first (D→C), and both groups combined (All)

<u>Measure</u>	<u>Low endogenous patients (NDS score ≤3)</u>						<u>High endogenous patients (NDS score 3)</u>					
	<u>Practice</u>		<u>Distraction</u>		<u>Control</u>		<u>Practice</u>		<u>Distraction</u>		<u>Control</u>	
	<u>Pre</u>	<u>Post</u>	<u>Pre</u>	<u>Post</u>	<u>Pre</u>	<u>Post</u>	<u>Pre</u>	<u>Post</u>	<u>Pre</u>	<u>Post</u>	<u>Pre</u>	<u>Post</u>
<u>1. Happiness (VAS)</u>	(n = 12)											
C→D	30.17	30.50	35.33	36.67	34.00	41.89	32.11	27.33	41.44	30.33		
D→C	16.00	26.50	36.00	30.33	21.83	18.00	31.67	32.44	20.44	18.89		
All	23.09	28.50	35.67	33.50	27.92	29.95	31.89	29.89	30.94	24.61		
<u>2. Energy (VAS)</u>	(n = 18)											
C→D	44.67	30.00	35.50	45.17	35.17	33.22	18.22	16.44	31.78	27.00		
D→C	11.00	25.17	25.50	30.33	20.00	16.00	13.00	20.33	10.44	13.11		
All	27.84	27.59	30.50	37.75	27.59	24.61	15.61	18.39	21.11	20.06		
<u>3. Anxiety (VAS)</u>	(n = 18)											
C→D	65.17	64.67	50.00	45.50	54.83	48.00	46.78	57.22	49.33	62.44		
D→C	76.00	70.83	61.50	65.47	76.67	61.22	63.00	60.22	63.11	62.56		
All	70.59	67.75	55.75	55.59	65.75	54.61	54.89	58.72	56.22	62.50		

C. Study II: Summary tables for analyses of covariance for happiness, energy and anxiety, low endogenous patients only (NDS score=3)

1. Happiness (VAS)

(Analysis of covariance, distraction vs. the control condition, with order of presentation of interventions as a between-subject factor)

<u>Source of variance</u>	<u>Sum of squares</u>	<u>d.f.</u>	<u>Mean square</u>	<u>F</u>	<u>p</u>
Order	26.57	1	26.57	0.10	.7595
Order covariate	1516.77	1	1516.77	5.74	.0402
Error	2379.31	9	264.37		
Treatment	515.21	1	515.21	2.20	.1725
Treatment x order	205.23	1	205.23	0.87	.3740
Treatment covariate	179.05	1	179.05	0.76	.4050
Error	2111.04	9	234.56		

2. Energy (VAS)

(Analysis of covariance, D vs. C, with order of presentation as a between-subject factor)

<u>Source of variance</u>	<u>Sum of squares</u>	<u>d.f.</u>	<u>Mean square</u>	<u>F</u>	<u>p</u>
Order	190.70	1	190.70	0.81	.3918
Order covariate	1970.08	1	1970.08	8.36	.0179
Error	2121.34	9	235.70		
Treatment	28.54	1	28.54	0.26	.6227
Treatment x order	39.22	1	39.22	0.36	.5651
Treatment covariate	0.75	1	0.75	0.01	.9361
Error	989.67	9	109.96		

Cont'd/...

3. Anxiety (VAS)
 (Analysis of covariance, D vs. C, with order of presentation as a
 between-subject factor)

<u>Source of variance</u>	<u>Sum of squares</u>	<u>d.f.</u>	<u>Mean square</u>	<u>F</u>	<u>p</u>
Order	7.76	1	7.76	0.02	.8915
Order covariate	10220.13	1	10220.13	25.91	.0007
Error	3549.70	9	394.41		
Treatment	1566.29	1	1566.29	6.59	.0304
Treatment x order	0.31	1	0.31	0.00	.9721
Treatment covariate	1373.74	1	1373.74	5.78	.0397
Error	2140.09	9	237.79		

D. Study II: Summary tables for analyses of covariance for happiness, energy and anxiety, low (NDS score=3) vs. high (NDS score 3) endogenous patients

1. Happiness (VAS)

(Analysis of covariance, distraction (D) vs. the control condition (C) with endogeneity and order of presentation of interventions as between-subject factors)

<u>Source of variance</u>	<u>Sum of squares</u>	<u>d.f.</u>	<u>Mean square</u>	<u>F</u>	<u>p</u>
Endogeneity	337.53	1	337.53	1.63	.2140
Order	21.86	1	21.86	0.11	.7483
Endog. x order	155.10	1	155.10	0.75	.3956
Endog. x order covar.	9107.65	1	9107.65	43.87	.0000
Error	5190.43	25	207.62		
Treatment	828.21	1	828.21	4.72	.0395
Treatment x endog.	115.18	1	115.18	0.66	.4254
Treatment x order	239.37	1	239.37	1.36	.2538
Treatment x endog.x order	33.17	1	33.17	0.19	.6674
Treatment covar.	1867.98	1	1867.98	10.65	.0032
Error	4385.21	25	175.41		

2. Energy (VAS)

(Analysis of covariance, D vs. C, with endogeneity and order of presentation as between-subject factors)

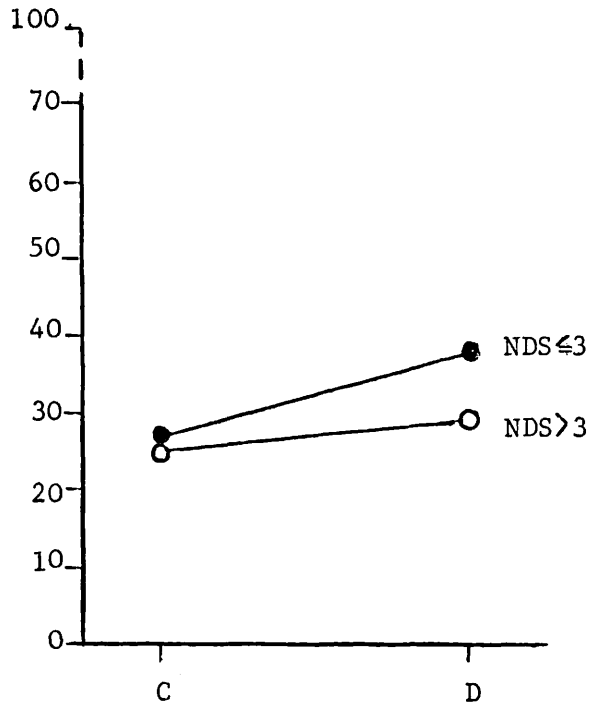
<u>Source of variance</u>	<u>Sum of squares</u>	<u>d.f.</u>	<u>Mean square</u>	<u>F</u>	<u>p</u>
Endogeneity	169.84	1	169.84	0.38	.5414
Order	194.64	1	194.64	0.44	.5135
Endog. x order	291.23	1	291.23	0.66	.4252
Endog. x order covar.	1817.68	1	1817.68	4.10	.0536
Error	11075.96	25	443.04		
Treatment	8.50	1	8.50	0.04	.8431
Treatment x endog.	48.51	1	48.51	0.23	.6368
Treatment x order	606.83	1	606.83	2.86	.1034
Treatment x endo.x order	169.01	1	169.01	0.80	.3809
Treatment covar.	144.00	1	144.00	0.68	.4180
Error	5309.31	25	212.37		

3. Anxiety (VAS)

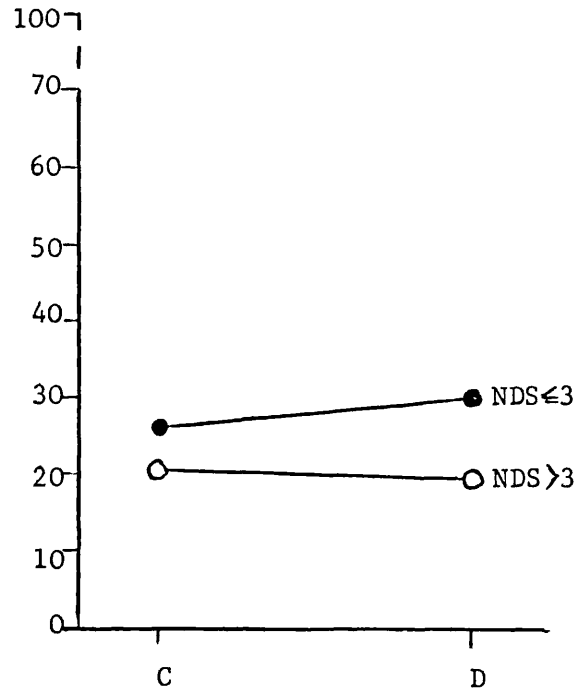
(Analysis of covariance, D vs. C, with endogeneity and order of presentation as between-subject factors)

<u>Source of variance</u>	<u>Sum of squares</u>	<u>d.f.</u>	<u>Mean square</u>	<u>F</u>	<u>p</u>
Endogeneity	423.30	1	423.30	1.06	.3140
Order	188.51	1	188.51	0.47	.4992
Endog. x order	1020.02	1	1020.02	2.54	.1232
Endog. x order covar.	26973.00	1	26973.00	67.29	.0000
Error	10021.61	25	400.86		
Treatment	1157.81	1	1157.81	5.24	.0307
Treatment x endog.	483.89	1	483.89	2.19	.1513
Treatment x order	3.52	1	3.52	0.02	.9006
Trtmt x endog.x order	26.74	1	26.74	0.12	.7308
Treatment covar.	881.97	1	881.97	3.99	.0566
Error	5520.64	25	220.83		

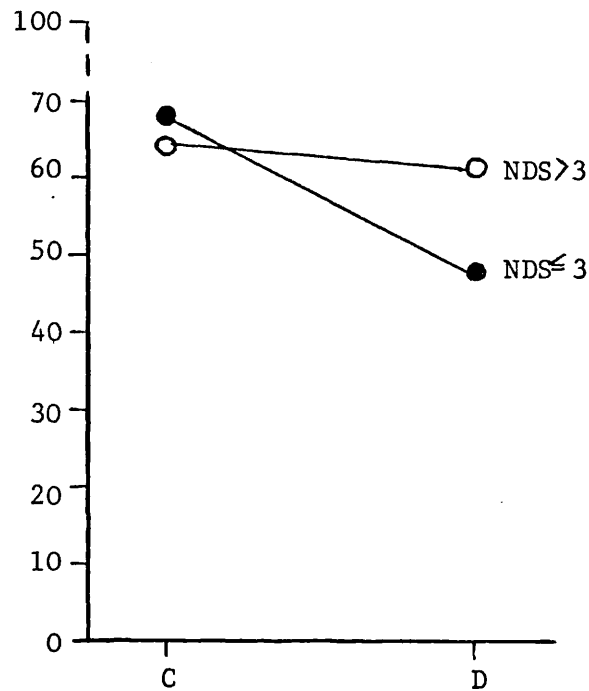
E. Study II: Adjusted mean post-intervention scores on measures of happiness, energy and anxiety, distraction (D) vs. the control condition (C), low (NDS \leq 3) and high (NDS $>$ 3) endogenous patients



a) Happiness (VAS)



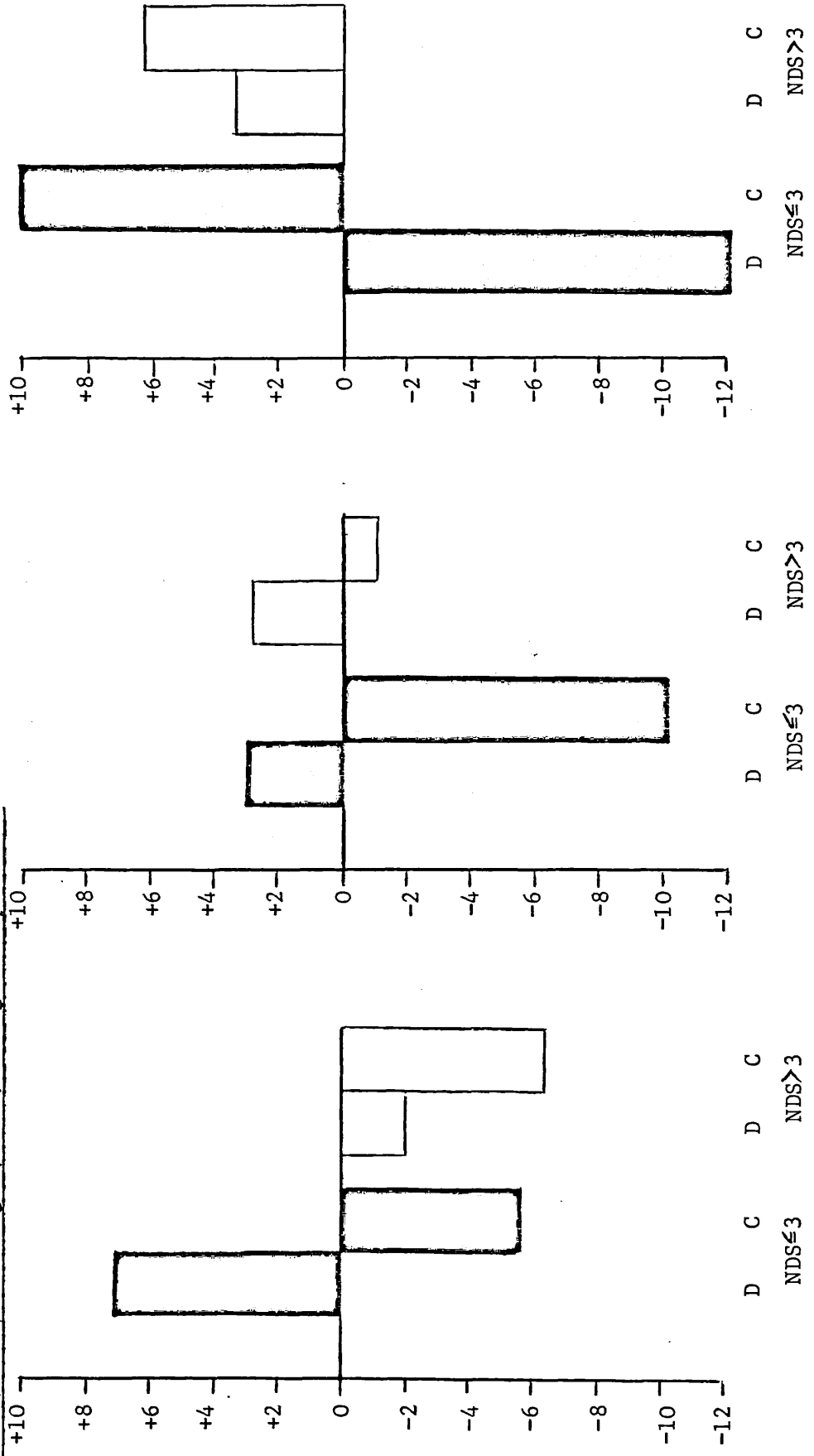
b) Energy (VAS)



c) Anxiety (VAS)

APPENDIX IX

F. Study II: Mean change scores for happiness, energy and anxiety, distraction (D) vs. the control condition (C), for low (NDS ≤ 3) and high (NDS > 3) endogenous patients



APPENDIX XA. STUDY III : MEASURES

1. Depressed mood (VAS))
)
2. Happiness (VAS))
)
3. Energy (VAS))
) As in Study II
4. Anxiety (VAS))
)
5. Speech rate)
)
6. Writing speed)

7. Thought-sampling

Ten tones sound during each intervention, the first 1 minute after starting, the remainder at random intervals thereafter (as in Study II). At each tone, the subject states whether what she was thinking was depressing ("Yes") or not ("No"). On three occasions, E asks the subject to state out loud what she actually was thinking (as in Study I). These thoughts are transcribed verbatim on record sheet.

8. Involvement rating

As in Studies I and II.

9. Pleasantness rating

Subject rates each intervention according to how pleasant it was immediately after experiencing the intervention, on the following scale. Subject circles appropriate number on the scale.

-3	-2	-1	0	+1	+2	+3
Extremely pleasant		Neither pleasant nor unpleasant				Extremely unpleasant

APPENDIX XB. STUDY III : INFORMATION FOR PARTICIPANTS1. INTRODUCTORY INTERVIEW

I work at the Department of Psychiatry, just down the road. I'm doing an experiment at the moment, which is part of a study of stress and perception. I wonder if you might be interested to take part? Let me tell you a bit more about it.

It would take about one hour of your time. Basically, I would ask you to do two things. One is to spend some time looking at a series of slides - pictures of places and people. The other is to spend some time just relaxing and looking at a white light. From time to time I'd take some brief measures of how you were feeling. You'd get £1.00 for doing that.

What do you think?

2. INSTRUCTIONS FOR EXPERIMENTAL SESSION

Thank you very much for coming today - that really is helpful.

Overview

As in Study II.

BDI

As in Study II.

Description and rehearsal of measures of depression

As in Study II.

Description and rehearsal of experimental procedure: Distraction

As in Study I.

Description and rehearsal of experimental procedure: Control

As in Study II.

Thought-sampling

The last thing I'd like you to do is this. While you are looking at the slides and at the white light, from time to time you will hear a "beep", like this. When you hear the "beep", I want you to tell me whether the thought you were thinking at that moment was depressing, or not. By "depressing", I mean the kind of thought that might make anyone feel depressed if they had it. Not depressing might be a thought like "What shall I have for supper today?", or maybe you might be thinking about what you're going to do at the weekend. Or again, you might be completely involved in the slides or the white light, and just thinking about that. Or there might be time when in fact your mind is a blank, when you're not thinking anything at all.

Now, when the "beep" goes, if you were thinking a depressing thought at that moment, just say "Yes". If you were not, say "No". OK? "Yes" means a depressing thoughts, and "No" means a nondepressing thought, or nothing at all. And on two or three occasions I shall ask you to tell me what you actually were thinking when the "beep" went. OK? Try to tell me what you were thinking in so many words, please, rather than giving me the general topic. For example, if you were thinking about the slides, you'd say "Wondering what kind of tree that was", not "Thinking about the slide". D'you see what I mean? OK, now would you just like to repeat back to me what I'm asking you to do when the "beep" goes, please, so I can be sure I've explained it properly.

OK, now, any questions about any of that? Do you feel reasonably clear about what you're going to be doing? Good. Now, before we start the experiment itself, I'd just like to take a short break. I'm going to leave you alone for that, but don't worry, there's nothing sinister about that, no hidden cameras or whatever! I'd just like you to have time to settle down before we begin the experiment itself.

(5 minutes)

Experimental procedure (assumes distraction presented first)

Measures presented as in Study II.

Right now, the first thing I'd like you to do is to look at the slides. Remember, the idea is to get as involved in each one as you possibly can, and to help yourself to do so by describing each one out loud in as much detail as possible, just like I did with the practice one. Take as long on each one as you want, and turn to a new one whenever you want. And remember, every now and then you'll hear the "beep". When you do, just say "Yes" if you were thinking a depressing thought, and "No" if you weren't. And on two or three occasions I'll ask you what you were actually thinking. When you've done that, just go straight back to the slides. OK? Off you go then.

(5 minutes of slides)

(Measures, as in Study II, including involvement)

Now, last of all, I'd just like you to show me how pleasant or unpleasant you found it, looking at the slides. You see this scale here. Just put a ring round the number that represents how pleasant or unpleasant you found it. Thank you.

Right, now we'll just take another short break, and then we'll do the second part of the experiment. I'll be back in a moment.

(5 minutes)

(Measures, as in Study II)

Control instructions as in Study II

(5 minutes)

(Measures, as in Study II, and including involvement and pleasantness rating)

(Post-experimental questionnaire, feedback, debriefing)

Subjects with depressing thoughts Subjects with no depressing thoughts

	<u>Distraction</u>		<u>Control</u>		<u>Distraction</u>		<u>Control</u>	
	<u>Pre</u>	<u>Post</u>	<u>Pre</u>	<u>Post</u>	<u>Pre</u>	<u>Post</u>	<u>Pre</u>	<u>Post</u>
4. <u>Speech rate</u> (secs)								
C→D	5.58	5.21	6.32	6.01	4.33	4.16	4.97	4.48
D→C	5.43	5.15	5.19	5.43	6.29	6.00	5.75	5.69
5. <u>Writing speed</u> (No. of nos written in 1 minute)								
C→D	52.44	56.13	51.63	51.88	54.08	55.25	52.08	53.25
D→C	53.71	54.00	55.07	54.00	47.29	49.79	49.86	50.00

Notes

a C→D n = 16 for each mean

 D→C n = 14 for each mean

b C→D n = 12 for each mean

 D→C n = 14 for each mean

B. Summary Tables for Analyses of Variance and Covariance

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1. Study III : Subjects with one or more depressing thoughts onlya. Frequency of depressing thoughts

(Analysis of variance, Distraction (D) vs. Control (C), with order of presentation of the two interventions as a between-subject factor)

<u>Source of variance</u>	<u>Sum of squares</u>	<u>d.f.</u>	<u>Mean square</u>	<u>F</u>	<u>p</u>
Order (C→D vs.D→C)	0.22	1	0.22	0.14	N.S.
Error	43.18	28	1.54		
Treatment (D vs.C)	32.27	1	32.27	17.16	< .001
Treatment x order	2.04	1	2.04	1.09	N.S.
Error	52.69	28	1.88		

b. Depressed mood (VAS)

(Analysis of covariance, D vs.C, with order of presentation as a between-subject factor)

<u>Source of variance</u>	<u>Sum of squares</u>	<u>d.f.</u>	<u>Mean square</u>	<u>F</u>	<u>p</u>
Order	879.04	1	879.04	5.52	.0264
Order covariate	10600.58	1	10600.58	66.56	.0000
Error	4299.86	27	159.25		
Treatment	3431.83	1	3431.83	12.55	.0015
Treatment x order	71.78	1	71.78	0.26	.6125
Treatment covariate	1159.53	1	1159.53	4.24	.0492
Error	7381.05	27	273.37		

Cont'd/...

c. Happiness (VAS)

(Analysis of covariance, D vs.C, with order of presentation as a between-subject factor)

<u>Source of variance</u>	<u>Sum of squares</u>	<u>d.f.</u>	<u>Mean square</u>	<u>F</u>	<u>p</u>
Order	844.23	1	844.23	7.15	.0126
Order covariate	8128.95	1	8128.95	68.85	.0000
Error	3187.94	27	118.07		
Treatment	570.22	1	570.22	3.28	.0814
Treatment x order	63.05	1	63.05	0.36	.5522
Treatment covariate	39.98	1	39.98	0.23	.6355
Error	4697.24	27	173.97		

d. Speech rate

(Analysis of covariance, D vs.C, with order of presentation as a between-subject factor)

<u>Source of variance</u>	<u>Sum of squares</u>	<u>d.f.</u>	<u>Mean square</u>	<u>F</u>	<u>p</u>
Order	1.46	1	1.46	5.93	.0218
Order covariate	210.89	1	210.89	856.81	.0000
Error	6.65	27	0.25		
Treatment	2.03	1	2.03	4.62	.0408
Treatment x order	0.01	1	0.01	0.02	.9023
Treatment covariate	2.40	1	2.40	5.45	.0273
Error	11.89	27	0.44		

Cont'd/...

e. Writing speed

(Analysis of covariance, D vs.C, with order of presentation as a between-subject factor)

<u>Source of variance</u>	<u>Sum of squares</u>	<u>d.f.</u>	<u>Mean square</u>	<u>F</u>	<u>p</u>
Order	70.36	1	70.36	5.38	.0282
Order covariate	2384.66	1	2384.66	182.22	.0000
Error	353.34	27	13.09		
Treatment	75.48	1	75.48	9.39	.0049
Treatment x order	32.38	1	32.38	4.03	.0549
Treatment covariate	26.42	1	26.42	3.29	.0810
Error	217.08	27	8.04		

Cont'd/...

2. Study III : Subjects with depressing thoughts vs. subjects with none

a. Depressed mood (VAS)

(Analysis of covariance, D vs. C with presence or absence of depressing thoughts and order of presentation as between-subject factors)

<u>Source of variance</u>	<u>Sum of squares</u>	<u>d.f.</u>	<u>Mean square</u>	<u>F</u>	<u>p</u>
Thoughts (0 vs. =1)	1092.16	1	1092.16	6.06	.0173
Order	873.82	1	873.82	4.85	.0322
Thoughts x order	143.68	1	143.68	0.80	.3762
Thts x order covar.	15676.01	1	15676.01	86.96	.0000
Error	9193.34	51	180.26		
Treatment	1182.52	1	1182.52	6.46	.0141
Treatment x thoughts	1990.55	1	1990.55	10.88	.0018
Treatment x order	332.20	1	332.20	1.82	.1838
Trtmt x thts x order	50.45	1	50.45	0.28	.6018
Treatment covar.	1568.49	1	1568.49	8.57	.0051
Error	9330.68	51	182.95		

b. Happiness (VAS)

(Analysis of covariance, D vs. C, with presence or absence of depressing thoughts and order of presentation as between-subject factors)

<u>Source of variance</u>	<u>Sum of squares</u>	<u>d.f.</u>	<u>Mean square</u>	<u>F</u>	<u>p</u>
Thoughts	13.25	1	13.25	0.11	.7415
Order	803.70	1	803.70	6.67	.0127
Thoughts x order	112.84	1	112.84	0.94	.3376
Thts x order covar.	17014.13	1	17014.13	141.27	.0000
Error	6142.40	51	120.44		
Treatment	288.78	1	288.78	2.37	.1296
Treatment x thoughts	232.89	1	232.89	1.91	.1726
Treatment x order	105.69	1	105.69	0.87	.3557
Trtmt x thts x order	0.00	1	0.00	0.00	.9975
Treatment covar.	112.16	1	112.16	0.92	.3415
Error	6205.69	51	121.68		

Cont'd/...

c. Speech rate

(Analysis of covariance, D vs. C, with presence or absence of depressing thoughts and order of presentation as between-subject factors)

<u>Source of variance</u>	<u>Sum of squares</u>	<u>d.f.</u>	<u>Mean square</u>	<u>F</u>	<u>p</u>
Thoughts (0 vs. =1)	0.17	1	0.17	0.54	.4649
Order	1.65	1	1.65	5.34	.0249
Thoughts x order	0.13	1	0.13	0.41	.5266
Thts x order covar.	379.02	1	379.02	1226.01	.0000
Error	15.77	51	0.31		
Treatment	1.03	1	1.03	3.56	.0648
Treatment x thoughts	1.31	1	1.31	4.55	.0377
Treatment x order	0.01	1	0.01	0.04	.8442
Trtmt x thts x order	0.00	1	0.00	0.00	.9776
Treatment covar	2.89	1	2.89	10.05	.0026
Error	14.69	51	0.29		

d. Writing speed

(Analysis of covariance, D vs. C, with presence or absence of depressing thoughts and order of presentation as between-subject factors)

<u>Source of variance</u>	<u>Sum of squares</u>	<u>d.f.</u>	<u>Mean square</u>	<u>F</u>	<u>p</u>
Thoughts	5.62	1	5.62	0.44	.5095
Order	33.50	1	33.50	2.63	.1110
Thoughts x order	41.36	1	41.36	3.25	.0774
Thts x order covar.	5180.09	1	5180.09	406.70	.0000
Error	649.59	51	12.74		
Treatment	74.70	1	74.70	8.37	.0056
Treatment x thoughts	10.40	1	10.40	1.17	.2855
Treatment x order	12.24	1	12.24	1.37	.2471
Tratmt x thts x order	17.48	1	17.48	1.96	.1677
Treatment covar.	59.39	1	59.39	6.65	.0128
Error	455.29	51	8.93		

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Comparison between low endogenous patients taking part in Study II, and students with ≥ 1 depressing thoughts in Study III

1. Frequency of depressing thoughts

(Analysis of variance, distraction (D) vs. the control condition (C), and low endogenous patients vs. nondepressed student subjects with depressing thoughts)

<u>Source of variance</u>	<u>Sum of squares</u>	<u>d.f.</u>	<u>Mean square</u>	<u>F</u>	<u>p</u>
Subjects	149.57	41			
Status (patient vs. student)	40.67	1	40.67	14.95	<.002
Error	108.90	40	2.72		
Treatment	119.05	1	119.05	58.65	<.002
Treatment x status	61.89	1	61.89	30.49	<.002
Error	81.06	40	2.03		

2. Depressed mood (VAS)

(Analysis of variance using post-intervention scores, D vs. C, and low endogenous patients vs. nondepressed student subjects with depressing thoughts)

<u>Source of variance</u>	<u>Sum of squares</u>	<u>d.f.</u>	<u>Mean square</u>	<u>F</u>	<u>p</u>
Subjects	3604.95	41			
Status (patient vs. student)	3178.52	1	3178.52	3.67	N.S.
Error	32862.43	40	821.56		
Treatment	6205.76	1	6205.76	22.96	<.002
Treatment x status	111.47	1	111.47	0.41	N.S.
Error	10810.77	40	270.27		

A. Summary of results and comments for VASs measuring energy and anxiety1. Energy

Summary There was a significant mean treatment effect on energy, both subject groups feeling more energetic after distraction than after the control condition ($F(1,51)=13.22, p < .001$). There was no significant main effect for presence or absence of depressing thoughts ($F(1,51)=1.31, p > .2$), and no significant interaction between thoughts and treatment ($F(1,51)=0.02, p > .8$). Examination of change within interventions (see the figure at Appendix XIID) showed the same pattern of response in subjects who reported depressing thoughts and in those who reported none, but muted in the latter group. There was no significant main effect for order of presentation ($F(1,51)=0.71, p > .4$), and no significant interactions between order and treatment ($F(1,51)=0.65, p > .4$), order and thoughts ($F(1,51)=0.08, p > .7$), or between order, treatment and thoughts ($F(1,51)=0.17, p > .6$).

Comments Rated energy was clearly responsive to the two treatment conditions, but was evidently not sensitive to the presence or absence of depressing thoughts. Given the similarity of response in those reporting depressing thoughts and in those reporting none, it seems likely that the difference between the two experimental conditions resulted from some quality inherent in them. The most likely candidate would probably be the different levels of activity required from subjects in the two conditions, i.e. the requirement during distraction, but not during the control condition, to maintain a running commentary on the slides and to manipulate the controls of the slide projector. Equating activity-level (as in Study II) by removing these requirements would allow this hypothesis to be tested.

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Alternatively, it could be that different mechanisms were operating in the two groups. That is, increases and decreases in energy in subjects reporting depressing thoughts were associated with increases and decreases in level of depressed mood, whereas increases and decreases in energy in those who reported no depressing thoughts were associated with changes in level of activity/relaxation (c.f. the comments these subjects made about how relaxed, sleepy and peaceful they felt during and after the control condition). The correlations between depressed mood and energy at the practice point in the two groups do not, however, support this interpretation (subjects with depressing thoughts: $r(28)=-0.06$, N.S.; subjects with no depressing thoughts: $r(24)=-0.37$, $p > .1$).

2. Anxiety

Summary There were no significant main effects on anxiety for treatment ($F(1,51)=1.99$, $p > .1$) or for presence or absence of depressing thoughts ($F(1,51)=1.88$, $p > .1$). The interaction between thoughts and treatment was, however, significant ($F(1,51)=5.29$, $p < .03$) (see the figure at Appendix XIIE). Post hoc Tukey tests showed a significantly lower level of anxiety after distraction than after the control procedure ($p < .01$) in subjects who reported depressing thoughts. There was no such significant difference in subjects who reported no depressing thoughts. Indeed, mean post-intervention scores in this group were almost the same (24.15 after distraction and 21.46 for the control condition). Examination of within-intervention change showed small decreases in anxiety in these subjects over both interventions. The difference between subjects reporting depressing thoughts and those reporting none was significant after

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the control procedure ($p < .01$) but not after distraction. Thus distraction reduced the anxiety of subjects reporting depressing thoughts to a level comparable to that of subjects reporting none. There was no significant main effect for order of presentation ($F(1,51)=1.69, p > .1$), and no significant interactions between order and treatment ($F(1,51)=1.90, p > .1$), order and thoughts ($F(1,51)=0.04, p > .8$), or between order, treatment and thoughts ($F(1,51)=0.37, p > .5$).

Comments Results on the VAS measuring anxiety were broadly similar to results on depressed mood, especially in the subjects who reported depressing thoughts. This is not perhaps surprising; the stimulus situations described by these subjects could well give rise to anxiety as well as to depression, and it is known that the two often co-exist and may be difficult to discriminate clearly (Gotlib, 1984; Thorpe, Barnes, Hunter and Hines, 1983). Consistent with this, there was a significant positive correlation between depression and anxiety in subjects reporting depressing thoughts ($r(28)=0.59, p < .002$). (A similar correlation was not present in subjects who reported no depressing thoughts: $r(24)=-0.06, N.S.$) In practice, subjects appeared readily able to discriminate between depressing and anxiety-provoking thoughts, when asked to do so.

References

- Gotlib, I.H. Depression and general psychopathology in university students. Journal of Abnormal Psychology, 1984, 93, 19-30
 Thorpe, G.L., Barnes, G.S., Hunter, J.E. and Hines, D. Thoughts and feelings: Correlations in two clinical and two nonclinical samples. Cognitive Therapy and Research, 1983, 6, 565-74

APPENDIX XII

B. Study III : Mean scores on measures of energy and anxiety at the practice point, and before and after distraction and the control, subjects with and without depressing thoughts, those receiving distraction first (D→C) vs. those receiving the control condition first (C→D), and both groups combined (All)

<u>Measure</u>	<u>Subjects with depressing thoughts^a</u>						<u>Subjects with no depressing thoughts^b</u>					
	<u>Practice</u>		<u>Distraction</u>		<u>Control</u>		<u>Practice</u>		<u>Distraction</u>		<u>Control</u>	
	<u>Pre</u>	<u>Post</u>	<u>Pre</u>	<u>Post</u>	<u>Pre</u>	<u>Post</u>	<u>Pre</u>	<u>Post</u>	<u>Pre</u>	<u>Post</u>	<u>Pre</u>	<u>Post</u>
<u>1. Energy (VAS)</u>												
C→D	45.13	43.75	54.44	52.56	40.38	55.75	50.50	59.75	53.50	48.75		
D→C	53.71	46.36	49.93	50.86	42.79	62.43	62.14	60.21	52.57	51.21		
All	49.13	44.97	52.34	51.77	41.50	59.19	56.77	60.00	53.00	50.07		
<u>2. Anxiety (VAS)</u>												
C→D	33.31	30.63	23.69	31.88	40.13	13.92	19.42	20.83	26.92	20.92		
D→C	43.57	42.14	30.57	33.07	35.07	27.79	36.07	27.00	26.86	21.93		
All	38.10	36.00	26.90	32.44	37.77	21.38	28.39	24.15	26.89	21.46		

Notes

a C→D n = 16 for each mean; D→C n = 14 for each mean

b C→D n = 12 for each mean; D→C m = 14 for each mean

C. Study III : Summary tables for analyses of covariance, energy (VAS) and anxiety (VAS), subjects with depressing thoughts vs. subjects with none

1. Energy (VAS)

(Analysis of covariance, D vs.C, with presence or absence of depressing thoughts and order of presentation as between-subject factors)

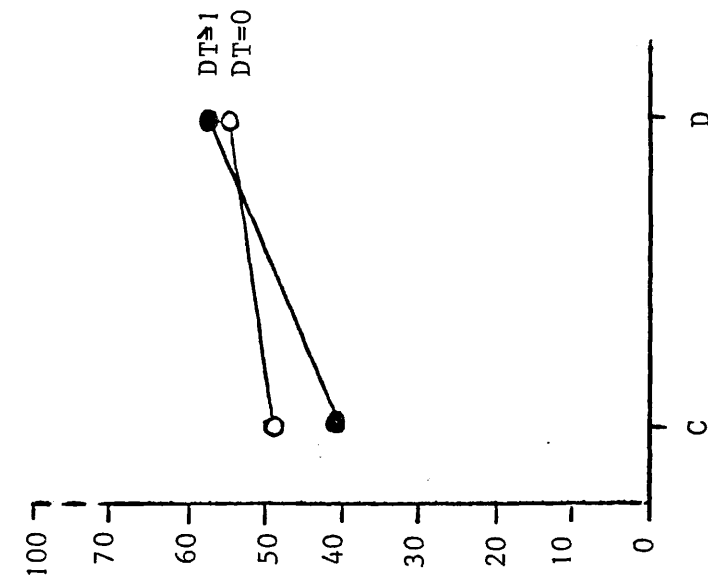
<u>Source of variance</u>	<u>Sum of squares</u>	<u>d.f.</u>	<u>Mean square</u>	<u>F</u>	<u>p</u>
Thoughts	235.86	1	235.86	1.31	.2579
Order	128.21	1	128.21	0.71	.4029
Thoughts x order	15.20	1	15.20	0.08	.7727
Thts x order covar.	20561.21	1	20561.21	114.11	.0000
Error	9189.66	51	180.19		
Treatment	2939.80	1	2939.80	13.22	.0006
Treatment x thoughts	5.40	1	5.40	0.02	.8767
Treatment x order	145.25	1	145.25	0.65	.4227
Trtmt x thts x order	36.89	1	36.89	0.17	.6855
Treatment covar.	7.55	1	7.55	0.03	.8545
Error	11339.78	51	222.35		

2. Anxiety (VAS)

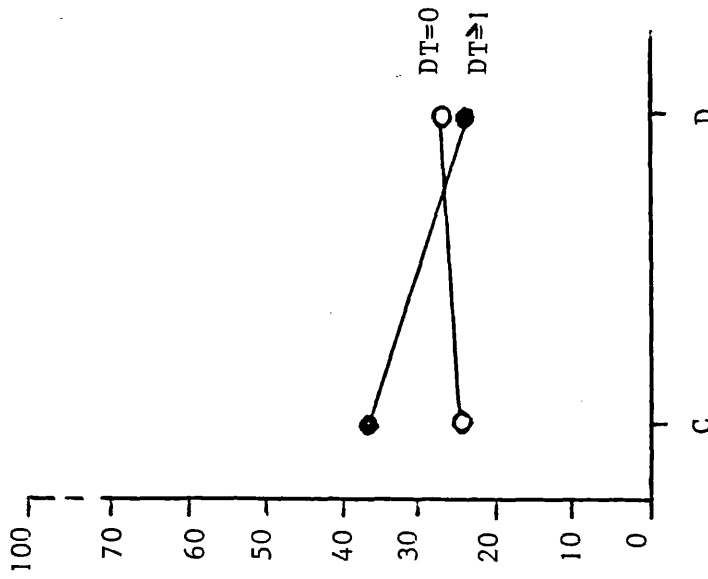
(Analysis of covariance, D vs.C, with presence or absence of depressing thoughts and order of presentation as between-subject factors)

<u>Source of variance</u>	<u>Sum of squares</u>	<u>d.f.</u>	<u>Mean square</u>	<u>F</u>	<u>p</u>
Thoughts	407.91	1	407.91	1.88	.1762
Order	366.66	1	366.66	1.69	.1993
Thoughts x order	8.31	1	8.31	0.04	.8456
Thts x order covar.	24879.77	1	24879.77	114.74	.0000
Error	11058.65	51	216.84		
Treatment	437.73	1	437.73	1.99	.1641
Treatment x thoughts	1160.70	1	1160.70	5.29	.0256
Treatment x order	416.40	1	416.40	1.90	.1745
Trtmt x thts x order	80.73	1	80.73	0.37	.5470
Treatment covar.	1.08	1	1.08	0.00	.9443
Error	11199.56	51	219.60		

D. Study III : Adjusted mean post-intervention scores on measures of energy and anxiety, distraction (D) vs. the control condition (C), for nondepressed students reporting depressing thoughts ($DT \geq 1$) and for those reporting none ($DT=0$)

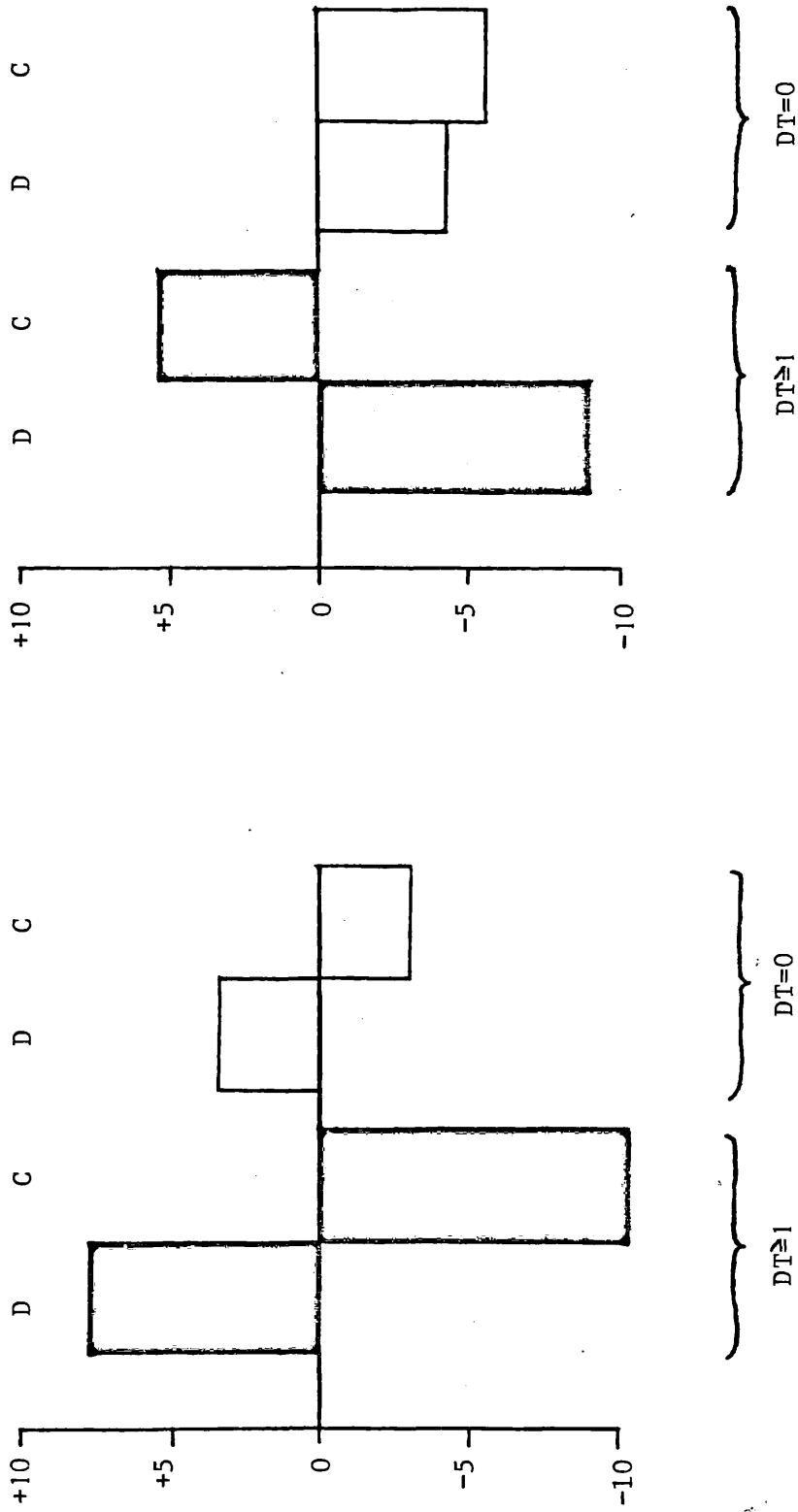


a) Energy (VAS)



b) Anxiety (VAS)

E. Study III : Mean change scores for energy and anxiety, distraction (D) vs. the control condition (C), for non-depressed student subjects reporting depressing thoughts (DT≥1) and for those reporting none (DT=0)



b) Anxiety (VAS)

a) Energy (VAS)