Selective memory effects in neurotic patients: an experimental investigation

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SELECTIVE MEMORY EFFECTS IN NEUROTIC PATIENTS : AN EXPERIMENTAL INVESTIGATION

by

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To my parents,

Yiorgos and Efthokia

Contents

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Abstract

Beck and Rush (1978) have proposed that depressives possess a negative self-schema. This led to Derry and Kuiper (1981) finding that depressives' incidental recall patterns reveal a clear preference for depressed content. Beck has also proposed that a negative self-schema is present in anxious individuals also. This study was designed to determine if these proposals hold true for clinically depressed out-patients, clinically anxious out-patients and clinically agoraphobic out-patients, compared with controls.

In the first experiment, a cognitive task was used involving free recall of three 20 item word lists, the first consisting of 10 depression and 10 neutral words, the second of 10 anxiety and 10 neutral words, the third of 10 agoraphobia and 10 neutral words. They were presented in 4 trials each.

The results showed that all groups - including controls - had a similar pattern of recall on the anxiety list; agoraphobics, anxious and controls had a similar pattern of recall on the agoraphobia list and depressives and controls a similar pattern of recall on the depression list.

Anxiety subjects were less likely to recall the depression list and the most experimental words were clustered on the anxiety list. However, only in clustering scores, on trial one, both groups (subjects including controls and subjects without controls) showed greater clustering overall.

It was concluded that clinically depressed out-patients do not possess a stable negative self-schema and that clinically anxious and agoraphobia out-patients do not possess a stable self-schema though agoraphobics seem to be, in a way, drawn to agoraphobic items and recall these better than depression, anxiety and neutral items.

The second experiment tested the view that anxious patients would show superior recall for and subjective organisation of personal adjectives with an anxious content, a depressed content or a combined anxious and depressed content ("both"). Three adjective lists containing ten of one type of emotional adjectives and ten neutral adjectives were used. Patients' memory for each list was tested in a free recall paradigm over two trials. A self-rating (describes you?) task was then carried out on all the adjectives. Superior recall was shown for anxious, depressed and "both" content self-reference adjectives - especially for anxious - compared to neutral content adjectives (of Derry and Kuiper, 1981).

Superior subjective organisation was only shown for depressed and "both" content adjectives compared to neutral adjectives. Results were discussed in terms of a fairly weak self-schema (Beck, 1976) containing both elements of anxiety and depression, but with anxiety dominant.

CHAPTER ONE

Review of the Literature

> It is very obvious that we are influenced not by "facts" but by our interpretation of facts.
>
> Alfred Adler

This thesis will begin with definitions of the main terms that are used. When the word "cognition" is used it is a general term which covers all the various models of knowing, such as perceiving, remembering, imagining, conceiving, judging, reasoning. According to H.J. Eysenck's (1968) view, cognition consists of the general intellectual level and of thought processes. Moreover, cognition depends on the variability of human performance, the test content and the type of problems.

A more modern definition of 'cognition' would cover all the various models of perception, attention, memory, language and thinking. Similarly in philosophy, as in psychology as well, the cognitive function, as an ultimate mode or aspect of the conscious life, is constructed with the affective and conative modes - feeling and willing, or Plato's distinction of noesis and orexis.

Furthermore, a brief look should be had of what neurotic disorder can be. Firstly, the two-word term can be replaced by the one-word term : 'neurosis'. Neurosis, then, is defined as a functional disorder, psychogenic in origin, of the nervous system (the term 'psychoneurosis' is also used meaning the same thing). Also in

psychoanalysis, a neurotic disorder is regarded as a conflict phenomenon, involving the thwarting of some fundamental instinctive urge.

In accordance with most psychologists' opinions, neurosis is considered to take three main forms : anxiety neurosis, phobic neurosis and neurotic depression.

Anxiety is mainly defined as a complex emotional state with apprehension or dread as its most prominent component. Anxiety is considered as a characteristic of various nervous, mental and emotional disorders. Also anxiety is usually regarded as an irrational fear. However, this definition applies strictly only to phobic anxiety (we'll make it clearer below), which seems to be evoked by objects and situations such as open spaces (agoraphobic anxiety), closed spaces (claustrophobic anxiety), heights, spiders, snakes, thunder, travel, crowds, strangers, etc. to an extent which is out of all proportion to their actual danger.

Freud has three theories of anxiety. The first was that it is a manifestation of repressed libido, the second was that is represented a repetition of the experience of birth (Freud 1915), while the third, which can be regarded as the definitive psychoanalytical theory of anxiety, is that there are two forms : primary anxiety and signal anxiety, both of which are responses of the ego to increases of instinctive or emotional tension. Signal-anxiety, in accordance with psychoanalytic theory, is considered as an alerting mechanism which forewarns the ego of an impending threat to its equilibrium; primary anxiety is regarded as the emotion which accompanies dissolution of the

ego. The function of signal-anxiety is to ensure that primary anxiety is never experienced by enabling the ego to institute defensive precautions and it can be regarded as an inwardly directed form of vigilance. Primary anxiety represents a failure of defence and occurs in Nightmares (Freud 1926, Hoch and Zubia 1950, Rycroft 1968, Rosenberg 1949).

In general other forms of anxiety described in the psychoanalytic literature are: a) Castration anxiety, provoked by real or imagined threats to the sexual function, b) Separation anxiety, provoked by the threat of separation from objects conceived to be essential for survival. c) Depressive anxiety, provoked by fear of one's own hostility towards 'good objects' d) Paranoid (persecutory) anxiety, provoked by fear of being attacked by 'bad objects' e) Objective anxiety, fear provoked by real, external danger.

The term 'phobia' is usually used to define a dread, or uncontrollable fear, generally of a morbid or even pathological character, of some object or situation. Also, phobia is regarded as the symptom of experiencing unnecessary or excessive anxiety, in some specific situation or in the presence of some specific object. So, agoraphobia is considered as an anxiety in open spaces, claustrophobia an anxiety in an enclosed space, spiderphobia an anxiety when confronted with a spider, snakephobia an anxiety when confronted with a snake etc. Similarly a phobic neurosis is defined as a particular kind of neurosis in which phobia, in the sense we've given above, is the predominant sympton. In this sense phobic neurosis is synonymous with phobic illness and anxiety-hysteria.

Another thing we should do about definitions is to see what most psychologists mean, when they use the term 'depression', or more specifically, 'neurotic depression.'

In general, 'depression' is considered as an emotional attitude. However, when psychologists say 'neurotic depression', they usually mean a pathological aspect in depression; also depression involves a feeling of some inadequacy and hopeless anxiety, sometimes overwhelming, accompanied by a general lowering of psychophysical activity; additionally 'neurotic depression' usually refers to the symptom complained of by many people, especially neurotics; in most cases it refers to a mixture of anxiety, aggression, despair, apathy, guilt and a sense of inhibition.

The term 'emotion' is differently described and explained by different psychologists, but most of them agree that it is a complex state of the organism, involving bodily changes of a widespread character - in breathing, pulse, gland secretion etc. - and, on the mental side, a state of excitement or perturbation, marked by strong feelings and usually an impulse towards a definite form of behaviour. If the emotion is intense there is some disturbance of the intellectual functions and of the tendency for action. We can say that beyond this general description anything else would mean an entrance into the controversial field.

From the psychoanalytic point of view, the term 'emotion' mainly means a state of both body and mind consisting of a subjective feeling which is either pleasurable or unpleasant but never neutral, which is accompanied by expressive behaviour or posture and by physiological

changes. Furthermore, psychoanalytical theory tends to assume that emotions are affects, i.e. that they are quanta (a term which is taken from physics) of energy attached to ideas, that their presence indicates a disturbance in physical equilibrium, and that they interfere with adaptation.

Another term to be defined is 'mood'. Psychologists usually use this term when they want to refer to an affective condition or attitude, enduring for some time, characterized by particular emotions in a condition of sub-excitation, so as to be readily evoked, e.g. an irritable mood, or a cheerful mood. However, psychiatry only recognized two moods - elation and depression. In addition, especially in accordance to psychoanalytic theory, disturbances of mood characterize the affective disorders.

The last term to be defined is 'memory'. As we mentioned above, memory - as one of the various models of knowing - is mostly regarded as one of the main sub-categories or components of 'cognition'. We should also mention that 'memory' in relation with anxiety, agoraphobia and depression will be the particular interest of this project. In the abstract and most general sense 'memory' can be considered as that characteristic of living organisms in virtue of which, what they experience leaves behind effects which modify future experience and behaviour, in virtue of which they have a history, and that history is recorded in themselves; memory can also be considered as that characteristic which underlies all learning, the essential feature of which is retention; in a narrow sense the term 'memory' covers terms such as 'recall' and 'recognition' - what we call remembering. However, it is easily understood that there may be learning without remembering.

From the psychoanalytic point of view, memory fulfils the biological function of enabling organisms to respond to present circumstances in the light of past experience and thereby to replace simple, automatic, 'instinctual' reactions by complex, selective, learned responses. Freud's theory of memory seems to be in reality a theory of forgetting. It assumes that all experiences, or at least all significant experiences, are recorded but that some cease to be available to Consciousness as a result of repression, this mechanism, being activated by the need to diminish anxiety.

It seems likely that there is no doubt that anxiety is highly related to depression, or not only can anxiety be replaced by depression, but depression is usually accompanied by anxiety as well.

According to C. Stavrakaki's and B. Vargo's (1986) opinions, there are currently two opposing conceptual models, as well as a third intermediary position, defining how anxiety and depression are related. These focus on anxiety and depression as: (a) variants of the same disorder differing quantitatively (unitary model); (b) distinct disorders differing qualitatively and (c) a mixture of the two syndromes, phenomenologically different from either primary anxiety or primary depression (anxious depressive position)

But now let me come to our main point : How cognition is related with neurotic disorders or with mood. Recently there has been a great deal of interest and literature, as well in the relation between mood and cognition, with most research following on depression.

Also, after a lot of research, it seems that attention is highly affected in neurotic disorders (e.g. MacLeod et al, 1986). Similarly, it is suggested that there is not only an attentional reduction in people who suffer from these disorders, but also attentional bias, which means that so called 'neurotics' have the tendency to attend (remember and use, as well) more to those words that are more close to their feelings or to aspects of their disorder; for example, there are more possibilities for a 'neurotic' to recall, select and use emotionally threatening words than any other word. E.g. some of the category of the socially threatening words are : criticized, inadequate, lonely, ridiculed, hated, failure etc; some of the category of the physically threatening words are : emergency, disease, harm violence, unwell, fatal and so on (MacLeod et al, 1986).

From MacLeod et al's point of view, according to Bower's network model of memory (1981), anxious subjects should display recall biases that parallel those already demonstrated in depression. A second prediction by Bower was that selective attention would be biased toward the encoding of mood-congruent material. There is, also, a good deal of empirical evidence to support such a relation between selective attention and situational or phobic anxiety.

Thus, Burgess et al (1981) found that individuals experiencing phobic anxiety showed an increased ability to detect fear-relevant words presented to the unattended channel in a dichotic listening task. However, because these words were individually selected for each subject, familiarity or expectancy may account for these results. Mathews and MacLeod (in press) conducted a related study concerned with generalized anxiety, where the unattended message was too quiet to enable detection.

For the anxious, but not for the control subjects, threat-related material in this unattended channel was found to draw disproportionately on processing resources, as evidenced by differential impairment on a simultaneous, simple reaction-time task.

Similarly, Nunn, Stevenson and Whalan (1984) organized two experiments testing the view that agoraphobic patients would show superior recall for phobic-related material relative to neutral material. In Experiment 1, subjects were required to recall a series of five passages; three contained potentially phobic information and two contained neutral information. The results showed that phobic patients recalled more propositions from the phobic passages than did controls. In Experiment 2, subjects completed four study-test trials with a list of 20 words: 10 phobic words and 10 neutral words. The results showed that the patients recalled more phobic than neutral words while the reverse was the case for controls. The results are discussed in terms of the cognitive organization of phobic patients and are related to Beck & Rush's (1975) proposal that phobics have a cognitive organization of situations labelled as dangerous. The possible sources of these selective memory effects are also considered (see Nunn, Stevenson, and Whalan, 1984).

Other current studies have clearly demonstrated that anxious subjects shift attention toward emotionally threatening stimuli in their visual environment. Normal control subjects, on the other hand, tend to shift attention away from such stimuli (MacLeod et al, 1986).

Furthermore, Neisser (1976) has characterized perception as a cyclic process. The first stage involves the passive intake of partial

information from the environment. This is then mapped onto internal representations or schemata, which both accommodate the information and direct processing resources during the next intake cycle toward particular elements of the stimulus array. The functioning of such schemata appears to differ in anxious and non-anxious subjects, when this array includes elements that are emotionally threatening.

MacLeod et al's (1986) study clearly supports their original hypothesis that high anxiety leads to a bias in selective attention that favours the pick up of emotionally threatening information. The same study has also demonstrated that whereas in the anxious subjects they operate in a manner that facilitates the encoding of threatening stimuli, in the case of non-anxious subjects, they actively inhibit such encoding (MacLeod et al, 1986).

Let us now have a look at a brief review of the literature about the three main emotional disorders (anxiety, agoraphobia and depression) in relation to cognition. As we have already seen, agoraphobia, in brief, is the fear of open spaces. In accordance with Beck's point of view, Westphal (1872) coined the term agoraphobia, which literally means "fear of the market place". In his monograph "Die agoraphobie", he describes the following symptoms: "... impossibility of walking through certain streets or squares, a possibility of doing so only with the resultant dread of anxiety ... agony was much increased in those hours when the particular streets dreaded were deserted and the shops closed. The patients experienced great comfort from the companionship of men, or even an inanimate object like a vehicle or a cane". Marks (1969) includes in this syndrome multiple phobias such as fear of fainting in public, of

crowded places, large open spaces, and crossing bridges or streets. When questioned, the person with agoraphobia typically expresses a fear that some calamity will befall him away from the security of his home and that nobody will help him. Consequently, he is comforted by the presence of somebody he knows can obtain aid if he has an acute physical problem. In general, the further the individual is from specific medical assistance, the greater his phobia. Some patients express a fear of intense loneliness or of being lost, as though being alone in a strange place might permanently separate them from their friends and family. Others have a fear of streets crowded with strangers. They fear loss of control, which would lead to social humiliation. The patient may be afraid that he will faint, start shouting insanely, or involuntarily defecate and consequently make a spectacle of himself. The fear of loss of personal control is interwoven with the fear of social disapproval (Beck, 1976).

In addition, according to Mathews et al (1981), in Bandura's (1977) view, all behavioural change following the treatment of fear depends on changes in self-efficacy expectations; that is, individuals come to believe that they are capable of performing successfully the previously avoided behaviour. In this account, efficacy expectations are distinguished from outcome expectations, which are defined as beliefs about the consequences of the newly acquired behaviours, and which are not accorded a crucial role in the treatment process. The application of this model to agoraphobia is made difficult by the vagueness of these definitions and of the distinction between the two concepts (Mathews, Gelder and Johnston, 1981). Mathews et al suggest that cognition is highly affected not only in agoraphobia itself but also in the treatment of this neurotic disorder. Similarly, it would

appear that there is a mutual influence between cognition and agoraphobia, since agoraphobia implies cognitive changes and cognitive changes - partly caused by treatment - may enable the patient to cope in an improved way, with his agoraphobia.

According to Mathews et al, in a strictly behavioural sense, agoraphobic patients know that they are able to go out but do not do so because of the risk of panic. Given sufficient incentive, however (e.g. a real threat to survival), patients quickly show themselves capable of going out. Before treatment, panic may be regarded as being beyond the control of the individual, while afterwards it is seen as controllable by anxiety management techniques. In this case, it is possible to argue that patients have actually acquired new behavioural skills in the control of panic and that this is the crucial change. Alternatively, patients may simply become aware that as they practice going out, the fear they experience becomes less. In this case, rather as Borkovec (1978) has argued, any change in expectancy seems more explicable as a consequence of behaviour change rather than its cause. However, it seems likely that a two-way interaction may come to exist between expectations and self-exposure practice (Mathews, Gelder and Johnston, 1981).

The only obvious way of testing whether or not cognitive changes are causal rather than merely secondary to self-observation of behaviour would be to develop treatments that alter expectations directly. More specifically, we need to know if exposure to the feared situation is always necessary before phobic anxiety can be eliminated, or whether prior cognitive change can produce equivalent effects.

Since there is a trivial sense in which behavioural change cannot be observed in the absence of exposure, the latter term is taken to refer to systematic practice in situations previously avoided because of anticipated anxiety. The nearest approach to answering this question would seem to be provided by investigations of the effects of cognitive or other non exposure treatments on agoraphobia (Mathews et al, 1981).

One approach to treatment that does not necessarily involve exposure is cognitive restructuring. As used by Emmelcamp et al (1978), cognitive restructuring consists of three cognitive modification procedures. The first is the provision of a rational explanation for the patient's fear; the second is discussion of underlying irrational beliefs; and the third is practice in replacing negative self-statements with more positive ones. In a comparison of five sessions of cognitive restructuring and in vivo exposure (each given for one week in a crossover design), exposure was found to be by far the more effective treatment. However, in a subsequent study (Emmelcamp, 1980) of eight sessions of cognitive restructuring, in vivo exposure, or both combined, the results were more complex. Immediately after treatment, outcome resembled that of the earlier study; that is, cognitive restructuring apparently had little effect. However, one month after treatment, there was much less difference between the groups because further improvement had taken place in those who had received the cognitive restructuring treatment; this effect was seen particularly in ratings of phobic anxiety. Unfortunately, the treatment that combined exposure with cognitive restructuring was no better than either alone. Thus it is not clear that cognitive restructuring adds to exposure treatment, but again, there are indications that exposure may not always be necessary for improvement.

It is of interest that the effects of cognitive restructuring were not always immediately obvious; perhaps time is required, either to consolidate the cognitive changes induced, or to allow them to be translated into behaviour. This possibility leaves unresolved the question of whether cognitive change may in some way reduce anxiety, as implied by the suggestion that phobics may add to their experience of anxiety by frightening thoughts. Alternatively, cognitive modification may be effective for a different reason: because it acts as an incentive, motivating patients to test themselves out in phobic situations (see Mathews et al, 1981).

We have already noted that a thinking disorder is at the core of agoraphobia. We have also seen through Mathews et al's opinion that the cognitive structure of patient's thought is interfered with by his agoraphobic disorder. Let me then come to another important point of that brief review : the relation of general anxiety neurosis with people's cognitive structures and cognitive disorders.

Moreover, I suppose it would be very helpful for us to take into account Lazarus' (1967) opinion about cognitive disorders caused by stress. Lazarus has studied cognitive and personality factors underlying threat and coping. He believes that what we must do in psychological stress analysis is to identify the cognitions that underlie threat and the specific appraisals that lead to each form of coping, with its observable behavioural and physiological pattern. Particular appraisals underlie attack which is expressed behaviourally; somewhat different appraisals underlie the impulse to attack which is inhibited. Still different appraisals underlie flight patterns. The same might be said for each form of defense as well. It should be

noticed that this is only a general approach to Lazarus' opinions, but conditions do not permit me to do more than present Lazarus' general point here. So, coming to this point, these appraisals are, in turn, shaped by the stimulus configuration and personality as they interact.

Also, two fundamental assumptions are made in Lazarus' work: First, the observed pattern of reaction depends on intervening psychological activities, such as the coping process. Secondly, underlying each type of coping is a particular kind of appraisal in which the consequences of cues are interpreted. This appraisal leads to the selection of a coping process that is appropriate to it, though not necessarily to what is required for good adaptiveness or reality testing. Lazarus also believes that research on the conditions that determine the coping process and the observed patterns of stress reaction would proceed faster and more fruitfully if we sought to conceptualize the appraisals involved in each type of coping. Research would also proceed faster and more fruitfully if we ceased to fear phenomenological terms and concepts and used them to the fullest extent to locate the empirical conditions accounting for varieties of stress reaction (see Appley and Turnbull, 1967).

Similarly, according to Beck's (1976) point of view, in the case of anxiety neurosis, the thinking of the anxious patient is dominated by themes of danger to his domain; that is, he anticipates detrimental occurences to himself, his family, his property, or to his status and to other valued intangibles. In contrast to the phobic patient who experiences anxiety in avoidable situations, the anxiety-neurotic perceives danger in situations he cannot avoid. A person who is continuously afraid of developing a serious or fatal illness may

interpret any unusual physiological symptom as a sign of such illness. Shortness or breath may arouse the idea that he/she is having a heart attack; diarrhoea and constipation or a vague pain may lead to him to believe he has cancer. Frequently, the fears envelop external stimuli. Any unexpected sound may be interpreted as a signal of disaster. Noises in his house arouse fears of burglars breaking in; automobile backfire suggests gunshots; a youngster's shout stimulates visions of physical violence.

Many anxious patients are afraid predominantly of psychological harm. The anxious person is often concerned that other people, strangers as well as friends, will reject, humiliate, or depreciate him. Anticipation of physical or psychological harm is chained to anxiety; consequently, when such expectations are formed, anxiety is stimulated (Beck, 1976).

We have already noted (see above) that a thinking disorder is at the core of anxiety neurosis. The interference with realistic thinking is readily observed by the anxious patient himself/herself. The characteristic manifestations are: 1. Repetitive thoughts about danger. The patient has continuous verbal or pictorial cognitions about the occurence of harmful events ("false alarms"). In these cases of anxiety neurosis, as Beck says in one of his chapters' titles, "the alarm is worse than the fire" which means that anxiety in most cases is worse than the real danger about which anxiety is supposed to warn. 2. Reduced ability to "reason" with the fearful thoughts. The patient may suspect that his anxiety-producing thoughts are not reasonable; however, his capacity for objectively evaluating and reappraising is impaired. Even though he may be able to question the reasonableness of

his anxiety-producing thoughts, he believes predominantly in their validity. 3. "Stimulus generalization". The range of anxiety-evoking stimuli increases so that almost any sound, movement, or other environmental change may be perceived as a danger.

For example, a woman in an acute anxiety attack has these experiences: She heard the siren of a fire engine and thought, "My house may be on fire". At the same time, she visualized her family trapped at home in the fire. Then she heard an airplane flying overhead and had a pictorial image of herself in the airplane and the airplane's crashing. As she imagined the crash, she experienced anxiety (Beck, 1976).

Beyond all this I should underline that most of the literature, referring to cognition and neurotic disorders, has been written specifically about depression. However, theories advanced have not yet provided a durable solution to the problem of depression. But let's discuss now some of the main cognitive aspects of depression. In accordance with psychoanalytic literature, melancholic depression is a pathological form of mourning, the lost object being an 'internal object' not an actual person. This internal object was ambivalently invested so that the depressed person felt dependent on an object to which he was none the less hostile. In depression he imagines that he has destroyed this object (hence the depression). This view of melancholic depression assumes that persons subject to it are, even in health, in a state of precarious balance, since their stability is based on a complex, ambivalent relationship towards an internal object (Rycroft, 1968).

In addition, according to A.T. Beck's point of view, the thought content of depressed patients centers on a significant loss. The patient perceives that he has lost something he considers essential to his happiness or tranquility; he anticipates negative outcomes from any important undertaking; and he regards himself as deficient in the attributes necessary for achieving important goals. This theme may be formulated in terms of the cognitive trial : a negative conception of the self, a negative interpretation of life experiences, and a nihilistic view of the future.

The sense of irreversible loss and negative expectation leads to the typical emotions associated with depression: sadness, disappointment, and apathy. Furthermore, as the sense of being trapped in an unpleasant situation or of being enmeshed in insoluble problems increases, spontaneous constructive motivation dissipates. The patient, moreover, feels impelled to escape from the apparently intolerable condition via suicide (Beck, 1976).

According to Beck, motivational change and the reversals in major objectives are among the most puzzling characteristics of the seriously depressed patient. He not only desires to avoid experiences that formerly gratified him or represented the main stream of his life, but he is drawn toward a state of inactivity. He even, sometimes, seeks to withdraw.

To understand the link between the changes in motivation and the patient's perception of loss, it is valuable to consider the ways in which he has "given up". He no longer feels attracted to the kinds of enterprizes he ordinarily would undertake spontaneously. In fact, he

finds that he has to force himself to engage in his usual activities. He goes through the motions of attending to his ordinary affairs because he believes he should, or because he knows it is "the right thing to do", because others urge him to do it - but not because he wants to. He finds he has to work against a powerful inner resistance, as though he were trying to drive an automobile with the brakes on or to swim upstream.

In the most extreme cases, the patient experiences "paralysis of the will": He is devoid of spontaneous desire to do anything except to remain in a state of inertia. Nor can he mobilize "will power" to force himself to do what he believes he ought to do.

From this description of the motivational changes, one might surmise that, perhaps, some physically depleting disease has overwhelmed the patient so that he does not have the strength or resources to make even a minimal exertion. An acute or debilitating illness such as pneumonia or advanced cancer would conceivably reduce a person to such a state of immobility. The physical-depletion notion, however, is contradicted by the patients own observation that he feels a strong drive to avoid "constructive" or "normal" activities. His inertia is deceptive in that it is derived not only from a desire to be passive but also from a less obvious desire to shrink from any situation he regards as unpleasant. He may feel repelled by the thought of performing even elementary functions such as getting out of bed, dressing himself and attending to personal needs.

In contrast, the physically ill person generally wants to be active. It is often necessary to enforce bedrest in order to keep him

from taxing himself. The depressed patient's desire to avoid activity and to escape from his current environment are the consequences of his peculiar constructions: the negative view of his future, his environment and himself.

Everyday experiences - as well as a number of well-designed experiments - demonstrate that when a person believes he cannot succeed at a task, he is likely to give up. He adopts the attitude, "there is no use trying" and does not feel any spontaneous drive to work at it.

Moreover, the belief that the task is pointless and that even successful completion is meaningless, minimizes his motivation. Since the depressed patient expects negative outcomes, he does not experience any internal stimulation to make an effort; he sees no point in trying because he believes the goals are meaningless. People generally try to avoid situations they expect to be painful; because the depressed patient perceives most situations as onerous, boring or painful, he desires to avoid even the usual amenities of living. These avoidance desires are powerful enough to override any tendencies toward constructive, goal-directed activity.

The setting for the patient's powerful desire to seek a passive state is illustrated by this sequence of thoughts: "I am too fatigued and sad to do anything. If I am active I shall only feel worse. But if I lie down, I can conserve my strength and my bad feelings will go away".

Unfortunately, this attempt to escape from the unpleasant feeling by being passive does not work; if anything, it enhances the

dysphoria. The patient finds that far from obtaining any respite from his unpleasant thoughts and feelings, he becomes more preoccupied with them (Beck, 1976).

So, let us now come to another point of our discussion: the motivational and volitional determinants of depression.

According to Kuhl's (1986) information processing model of depression, the chronicity of depressive mood states is maintained by so-called degenerated (unfulfillable) intentions that claim working memory capacity needed to enact new (fulfillable) intentions. The results of an experiment are reported, in which an attempt was made to induce a degenerated intention in a group of depressive patients as well as in several control groups. But let us talk first about the degenerated-intention hypothesis itself.

According to Kuhl and Helle (1986) one of the most salient characteristics of depression is the perseverance of depressive affect. When a person enters an acute depressive episode, depressive mood typically perseveres for several days or even weeks. Normally, emotional states are rather transient (Izard, 1977), and cognitive memory structures even require continuous rehearsal to stay active for more than a few seconds (Anderson, 1983). What could be a psychological mechanism accounting for the extraordinary stability of depressed mood associated with depression? One possible answer may be found in motivation theory. Motivational states seem to have an intrinsic property of perseverance (Atkinson & Birch, 1970; Freud, 1915/1949; Kuhl and Blankenship, 1979; Lewin, 1935). The perseverance of wishes, needs, and intentions seems to be supported by

many mechanisms on different levels of processing. Even a subcortical mechanism seems to be involved in the maintenance of intentional states (see Kuhl, 1985, for a detailed summary of the evidence supporting this claim).

The central hypothesis of Kuhl and Helle, then, is that the psychological mechanism common to all types of severe depression involves one or several persevering motivational states, especially intentional states, which are the most self-committing and persistent motivational states (Kuhl, 1984). According to Kuhl and Helle, a distal antecendent of depression such as separation, object loss, or loss of control does not result in a depressive disorder unless it leads to a persevering intentional state (which may or may not be represented on a conscious level of awareness). Normally, unattainable goals are renounced after a certain number of futile attempts to attack them (Atkinson and Feather, 1966; Klinger, 1975). The antecendent event is expected to lead to a depressive disorder only if the individual is unable to eliminate the intention. Several recent results from experiments based on the learned-helplessness paradigm (Seligman, 1975) suggest that overmaintenance of intentional states is a function of a situationally produced degeneration of one or several components of the mental structure encoding the persevering intentional state (Kuhl, 1981; Kuhl and Weiss, 1984). An interesting overlap exists between Kuhl and Helle's model and Klinger's (1975) incentive theory of current concerns. By this account, a current concern refers to an intentional structure similar to what Kuhl and Helle call an intention, that is, a motivational tendency to which an organism has become committed. According to Klinger, depression may be an adaptive process because it helps the organism disengage from unattainable

goals. Kuhl and Helle's theory is an accordance with this view and goes beyond it by specifying information-processing mechanisms under-lying depressive symptoms, that is, the degeneration of the cognitive structure encoding intentions and the blocking of working memory by various action-control mechanisms that mediate the maintenance of the currently activated intention.

Kuhl and Helle's experiment was designed to test the two assumptions of the model central to the preceding discussion. First, do hospitalized depressives - as compared to other clinical and non-clinical subjects - have an increased tendency to maintain unrealistic intentions, even after their acute depressive symptoms have been reduced as a result of treatment? Second, do patients who report a considerable amount of depressive symptoms (as assessed by the Beck Depression Inventory [BDI]; Beck, 1967) have a reduced memory capacity after an unrealistic goal has been suggested to them? Kuhl and Helle suspect that the short-term memory deficits expected following the induction of a degenerated intention may be associated with the degree of acute depressive symptoms (as assessed by clinical diagnosis) because recovery from a depressive episode may restore the ability to shield short-term memory from degenerated intention even if depressives' tendency to encode too many action tendencies in an intentional format remains (see Heckhausen & Kuhl, 1985, and Kuhl, 1985, for theoretical support for this assumption).

Specifically, in Kuhl and Helle's study, these predictions were applied to the degeneration of one component of an intention, the context component specifying the conditions under which the intended action is to be executed (see Kuhl, 1984, for a discussion of other components).

To understand better, Kuhl's and Helle's degenerated-intention hypothesis it would be very useful to take into account other studies, such as, for example, Akiskal and McKinney's model. This model and other research leads have focused on the distal determinants of depression [such as negative thinking (Beck, 1967), learned helplessness (Seligman, 1975), loss of reinforcement (Lewinsohn, 1974), and separation (Bowlby, 1969; Spitz, 1945)], but the proximal psychological processes that could be directly related to the neurophysiological mechanisms involved have as yet rarely been the subject of systematic studies. Moreover, there is still a considerable gap between distal psychological determinants of depression such as separation, object loss, behaviour-outcome noncontingency, and so forth, and the neurophysiological deficits specified.

After presenting Kuhl's and Helle's overview of their method used below, we'll discuss, then, the results of the experiment that examines a model of depression specifying the "final common pathway" of the psychological determinants of depression (Kuhl, 1985a). So firstly, to test the two assumptions regarding overmaintenance of degenerated intentions and impaired selective inattention to them, Kuhl and Helle confronted their experimental subjects with a messy table and asked them to clean it up. Subsequently, they told them that they could not start immediately because other tasks had to be done first. It would be up to them to decide when there would be an opportunity to clean up the table. This part of the instruction was designed to induce a degeneration of the context component of the intention, which specifies the conditions under which the intended action is to be performed. The experiment contained a control group of subjects who were not instructed to clean up the messy table.

Kuhl and Helle's assumption was that subjects having a history of depressive episodes (irrespective of the intensity of acute depression) would tend to encode this instruction in an intentional format, thus highly committing themselves to it. The extent of intentional encoding was assessed by an interference measure: Subsequent to the experimental manipulation, an attempt was made to induce an executable intention that could easily be forgotten ("Number each sheet when finishing each of the following tasks"). Because cognitive interference between a pair of elements and the degree of forgetting them increases with increasing similarity between the elements (Anderson, 1976), subjects who encode the experimental instruction in an intentional format should be more likely to "forget" a further instruction encoded in a similar format (i.e. in an intentional format) than subjects who encode the experimental instruction in a format that differs from the intentional format of subsequent instructions (e.g., a wish format: "I might clean up the table if the opportunity arises").

Some of the tasks administered subsequent to the experimental manipulation assessed short-memory capacity. It was expected that subjects who had not fully recovered from a depressive episode (as indicated by a high score on the Beck Depression Inventory) would show a reduction of short-term memory capacity in the experimental condition (containing the clean-up-table instruction) as opposed to depressive subjects in the control condition (no clean-up-table instruction).

Discussing the results, then, we'll find that all of them confirm Kuhl and Helle's hypotheses regarding the functional significance of perseverating intentional states in depressive disorder. Because the clinical diagnosis of depression was based on a personal history of two

or more severe depressive episodes (irrespective of the degree of acute depressive symptoms), Kuhl and Helle were able to directly check the differential effects of a history of depression (as assessed by the clinical diagnosis) in contrast to those of an acute depressive episode (as assessed by the BDI).

The degree of acute depressive symptoms does not seem to increase the tendency to encode unrealistic instructions in intentional format as assessed by the degree to which subjects forgot to enact a realistic intention. As hypothesized, the tendency to encode unrealistic instructions in an intentional format seems, however, to be associated with a personal history of depressive episodes.

However, the inability to keep cognitions related to an unrealistic intention from intruding into working memory seems to depend on the degree of acute depressive symptoms (BDI score). These results are especially important because previous studies failed to find any consistent main effect regarding short-term memory deficits in depressives (Miller, 1975).

The present result suggests that short-term memory deficits specific to acute depressive disorder (as opposed to schizophrenia and alcoholism) can be found under the condition specified in Kuhl's model (Kuhl, 1985).

Furthermore, after that, it would be useful to refer to Byrne et al's (1986) experiment which studied effortful and automatic cognitive processes in depression. So in this experiment, ten patients with major depression and ten age - and sex - matched normal controls were

presented with two contrasting cognitive tasks: one requires sustained effort and information processing, and the other required only superficial information processing that could be accomplished automatically, with little effort. According to the results, depressed patients performed more poorly only on the effort-demanding cognitive task. Thus depressed patients are impaired on a specific type of cognitive operation, one that requires effort and presumably involves different mechanisms than those used for automatic and more superficial information processing.

In addition, Newman et al (1984) administered levodopa to normal elderly controls and found an improvement in the normal baseline level of free recall (effortful processing) without any change in automatic processing (remembering how often an event occurred).

Similarly, Weingartner et al (1984), in studying patients with Parkinson's disease, showed a selective deficit in effort-demanding learning and memory similar to that seen in depressed patients, but no impairment for tasks that require superficial information processing and can be accomplished automatically.

The similarities between the cognitive impairment seen in Parkinson's disease and that in depression are also consistent with recent suggestions that the "pseudodementia" of depression most closely resembles the "subcortical dementias" and with theories that anatomic connections between parts of the limbic system and basal ganglia may play a crucial role in integrating mood and motivation.

Furthermore, the selective impairment of effort-demanding learning in depressed patients suggests that the neurochemical and neuroanatomic mechanisms mediating these cognitive processes may also play an integral role in the pathophysiology of depression.

Working in this frame of reference, which is limited by the definition given above, Eysenck (1968) found that neurotic disorders produce very little deterioration of the general level of cognitive abilities. A small amount of impairment was however found on the Babcock test.

Furthermore, Eysenck found that psychiatric groups, both neurotic and psychotic are no more variable in their test performance than normals. Also, differences in variability cannot explain the general cognitive abnormalities so far dealt with.

About the content of the tests : Eysenck found that there is no evidence that any psychiatric group finds any particular sort of test content especially difficult, while unequivocal studies are lacking. The differences in test scores discussed can be explained more easily in other ways.

About the thought processes it was found that :

1. Some neurotics may have perceptual disabilities which might be related to anxiety. It is tempting also to relate perceptual abnormalities to feelings of unreality in neurotics, although no studies appear to have been done.

2. Neurotics are less fluent than normals, and psychotics are less fluent than neurotics. Manics may be an exception in being more fluent than normal. It is difficult to account for many cognitive differences in terms of differences in fluency. It is conceivable that fluency might be related to the general level of activity although specific studies are lacking.

3. There is no evidence that any abnormal groups have a specific disability for tests involving deductive reasoning.

About cognitive processes, Eysenck found:

A. Speed : 1. Motor and mental slowness can account for a good deal of the general deterioration noted in different groups and can partly explain the subtest order produced on many tests of general intelligence. 2. There is probably a curvilinear relationship between cognitive speed and neuroticism; moderately neurotic individuals being faster than extremely stable or extremely neurotic individuals. 3. Extraverts tend to be faster than introverts on cognitive speed measures. 4. Cognitive slowness can probably be produced in a number of different ways, and different abnormal groups may be slow for quite different reasons.

B. Persistence : 1. There is no evidence about intellectual persistence in neurotics, but there is no reason to believe them abnormal in this respect. 2. There is some slight evidence that introverts may be more persistent than extraverts on cognitive tests.

C. Error : Extraverts are more careless and impulsive, and tend to make more errors. This can in part explain why they perform tests of general level more poorly.

D. Distractibility : 1. Distraction probably affects timed tests much more than untimed tests. 2. A great deal of the deterioration found in cases of affective disorder on cognitive tests may be due to distraction. Individuals whose main symptom is profound depression, with feelings of guilt and unworthiness from which they cannot free their minds, may obtain low test scores largely because they are unable to attend and concentrate. 3. Distraction may be the main cause of abnormal cognitive slowness in many depressed patients. 4. While dysthymic neurotic patients may be more distracted by their symptoms (anxiety, guilt feelings), extraverts may be more easily distractible than introverts.

E. Memory span : 1. There is some evidence that memory span is reduced by anxiety in normal people. 2. Neurotics tend to have a lower memory span than normal. 3. These data are ambiguous, since they could be due to distraction or to true differences in the capacity of the mechanism of immediate memory. The differences are, however, strikingly similar to the differences between the groups produced by distraction.

F. Learning : The relationship between learning and introversion-extraversion can partly account for the differences in general cognitive level between different neurotic groups. Dysthymics are best at learning and have the highest I.Q. Hysterics are worse at both learning and intelligence test performance and psychopaths are lower still.

G. Retention : 1. There are no adequate studies of long-term retention in abnormal subjects in which learning ability has been controlled. 2. What evidence there is suggests that retention may be almost completely unaffected in functional psychiatric disorders, although some patients may obtain low scores on information tests for other reasons (e.g. the inability to attend).

H. Drive : 1. The data relating drive to cognitive performance are somewhat conflicting, and only tentative hypothesis can be suggested. 2. There may be a linear relationship between unconditioned anxiety and speed of problem-solving, high anxiety producing high drive and fast performance. This could partly explain why neurotic subjects as a group are of above average general intelligence. 3. A high degree of introversion (conditioning ability) could produce a large number of distracting conditioned anxiety responses (or obsessional checking tendencies) themselves correlated with level of anxiety, which could slow down cognitive test performance more than high drive, by itself, speeds it up. These obsessional rechecking tendences could, however, be responsible for the reduction in error found in introverted groups. 4. These two relationships when added together, could produce in a heterogeneous group a tendency for cognitive speed to appear to be related curvilinearly with neuroticism, or level of anxiety. 5. Because of these relationships, extraverted neurotics, when tested in a state of high drive (produced by "stress"), will work fastest, stable extraverts less fast, stable introverts slower, and introverted neurotics slowest of all.

I. Rigidity : 1. There is no general factor of rigidity, so that it is not possible to generalize about rigidity tests. 2. Guilford's analysis suggests that there are two independent kinds of intellectual rigidity, adaptive flexibility, or the ability to overcome a set, and spontaneous flexibility, or the ability to produce a diversity of ideas. 3. There is evidence that stress increases adaptive rigidity or Einstellung rigidity. This is probably because in Einstellung tests the set is learned, and high drive makes learning more rapid. It would be reasonable to expect introverts to be more rigid on this sort of problem than extroverts. This type of rigidity could account for part of the decrement in intellectual performance produced by stress in introverted neurotics. 4. Spontaneous Flexibility has been very little investigated.

Furthermore, and especially in recent years, depression has been studied from several perspectives, such as phenomenological reports, psychoanalytic views, physiological theories and finally, what especially we are interested in, cognitive theories, which focus on the depressed person's self-defeating processes and learning theories, which contend with the curtailment of activity associated with depression. In general, most processes which consist of cognitive functions are affected more or less in depression. In particular, paying attention is an exhausting effort for the depressed. They have difficulty in taking in what they read and what other people say to them. Conversation is sometimes a chore for many prefer to sit alone and to remain silent. They usually speak slowly, after long pauses, using few words and low monotonous voices. Others are too agitated and cannot sit still. They pace, wring their hands, sighing and moaning all the while or complaining. When depressed individuals are

confronted with a problem, ideas for its solution occur to them with great difficulty. Also, every movement has a great heaviness and their heads fill many times and reverberate with self-recriminations. Besides, recent discussions and previous research, as we have already seen, indicate that cognitive processes play a decisive role in emotional behaviour. In some theories of depression as in some concerning anxiety, thoughts and beliefs are regarded as causing the emotional state. In a way, Freud is a cognitive theorist too, for he viewed depression as resulting from a person's belief that loss is a withdrawal of affection (Davison and Neale, 1986).

In addition to Beck's theory, in recent years Martin Seligman's (1974) learned-helplessness theory of depression has been of considerable interest. In general, Seligman suggests that although anxiety is the initial response to a stressful situation,it is replaced by depression if the person comes to believe that control is unattainable.

Initially Seligman's view was a mediational learning theory, formulated to explain the behaviour of animals who received painful electric shocks in two different situations. In the first part of the experiment some dogs are put in a box with electric grids in the flooring and subjected to numerous painful electric shocks from which they cannot escape. In the second part these animals, as well as dogs who did not have this prior experience with inescapable shock, are placed in a similar apparatus. Now painful shock can be avoided if the dogs learn to leap over a partition to another compartment of the so-called shuttle box as soon as they hear a warning buzzer or see a lightcome on. The behaviour of the dogs is markedly affected by

whether they were earlier exposed to inescapable shock. Animals who have not had the earlier experience become quite upset when they receive the first few electric shocks but fairly soon thereafter learn to leap over the partition when they hear or see the conditioned stimulus and thereby avoid further painful shock. The animals who have had the earlier experience with inescapable shock behave quite differently. Soon after receiving the first shocks, they stop running around in a distressed manner; instead they seem to give up and passively accept the painful situation. Not surprisingly, they do not acquire the avoidance response as efficiently and effectively as the control animals do. Most of them in fact lie down in a corner and whine. Such experiments imply that animals can acquire what might be called a "sense of helplessness" when confronted with uncontrollable aversive stimulation.

This helplessness later tends to seriously and deleteriously affect their performance in stressful situations that <u>can</u> be controlled. They appear to lose the ability and motivation to learn to respond in an effective way to painful stimulation.

On the basis of this and other work on the effects of uncontrollable stress, Seligman felt that learned helplessness in animals can provide a model for at least certain forms of human depression. He noted similarities between the manifestations of helplessness observed in animal laboratory studies and at least some of the symptoms of depression. Obviously, we suppose it is not so easy to observe any cognitive deficits in animals but like many depressed people, the animals appear passive in the face of stress, failing to

initiate action that might allow them to cope. They also develop anorexia, having difficulty in eating or retaining what is eaten, and lose weight.

On the physiological level, one of the neurotransmitter chemicals, norepinephrine, was found to be depleted in Seligman's animals. Drugs that increase levels of norepinephrine have been shown to alleviate depression in human beings. Although effectiveness of treatment does not prove etiology, the fact that depression is reduced by a drug that increases the level of norepinephrine is consistent with the finding that learned helplessness in animals is associated with lower levels of the chemical.

Similarly, experiments with human beings have yielded results similar to those of experiments done with animals. People who have been subjected to inescapable noise, or inescapable shock, or who have been confronted with unsoluble problems, fail later to escape noise and shock and solve simple problems (for example Hiroto and Seligman, 1975; Roth and Cubal, 1975). Moreover, the performance of tasks by college students who rate as depressed on the Beck Depression Inventory (BDI) is similar to that of non-depressed students who have earlier been subjected to these same helplessness-including experiences (Miller, Seligman, and Kurlander, 1975; Klein and Seligman, 1976). This is of course, very important for it suggests that we can, in a laboratory setting, elicit from non-depressed subjects behaviour similar to that observed in depressed individuals.

In 1978 a revised version of the learned-helplessness model was proposed by Abramson, Seligman and Teasdale, for several inadequacies

of the theory and unexplained aspects of depression had become apparent. Many of life's misfortunes are beyond our control, but they do not sadden us to the extent that we become depressed. In addition, many depressed people hold themselves responsible for their failures. If they regard themselves as helpless, how can they blame themselves? And why do many depressed people have so little self-esteem?

The essence of the revised theory lies in the concept of attribution (Weiner et al, 1971) and in this way it blends cognitive and learning elements. Given a situation in which the individual has experienced failure, he or she will try to attribute the failure to some cause. Three questions are asked in Abramson, Seligman and Teasdale's formulation which is applied to indicate the ways in which a person might attribute his failure. 1) Are the reasons for failure believed to be internal (personal) or environmentally caused (universal)? 2) Is the problem believed to be stable or short-term? and 3) How global or specific is the inability to succeed perceived to be?

The attributional revision of helplessness theory postulates that the way the person attributes failure will determine its subsequent effects. Global attributions should increase the generality of the effects of failure. Attributions to stable factors will make them long-term. Finally, attributing the failure to internal characteristics is more likely to diminish self-esteem, particularly if the personal fault is also global and persistent.

People then become depressed when they believe either that desired outcomes are unattainable or that negative outcomes are unavoidable.

Whether self-esteem collapses too depends on whether they blame the bad outcome on their own inadequacies. The generality and chronicity of their depression and loss of self-esteem depend on the globality and persistence of the characteristic blamed.

In fact, the depression-prone individual is thought to show a "depressive attributional style", a tendency to attribute bad outcomes to personal, global, stable faults of character. When persons with this style have unhappy, adverse experiences they become depressed and self-esteem shatters (Peterson and Seligman, 1984).

Some research gives direct support to the reformulated theory. Seligman and his colleagues (1979) have devised the Attributional-Style Questionnaire (ASQ) and, as predicted by the theory, found that depressed college students did indeed more often attribute failure to personal, global, persistent inadequacies than did non-depressed students.

In addition, Metalsky and his colleagues (1982) have linked attributional style to depressed mood. A study was conducted with college students taking a course in abnormal psychology. Early in the semester the students completed the ASQ, an adjective checklist assessment of current mood, and a questionnaire concerning their grade aspirations. Eleven days later they again completed the adjective checklist assessing mood. Finally, five days later, after the midterm exam grade was returned, the students reported on their mood for a third time.

According to the reformulated helplessness theory, a tendency to attribute negative events to personal, global and persistent inadequacies, as determined by the ASQ, should predict a more depressed mood in those students who received a good grade. Students were divided into two groups, one consisting of those receiving good grades, another of those receiving poor grades. "Good" and "poor" depended on how their actual grades compared to their aspirations. A poor grade was defined as one equal to or less than the grade the student had earlier indicated he or she would be unhappy with. A good grade was one equal to or greater than that the student had said he or she would be pleased with. For each group correlations were then computed between measures from the ASQ and change in depressed mood from before to after the midterm exam. Consistent with the theory, correlations within the good grade group were not significant, for an increase in depressed mood required both a particular attributional style and a negative event. For the poor-grade group two or three measures - internality and stability of faults - from the ASQ did predict an increase in depression. Students who were prone to attribute negative events to personal and persistent inadequacies became more depressed after a negative event, a poor grade, as predicted by the theory.

Also, over the past several years the original learned-helplessness theory and its attributional reformulation have clearly been at the forefront of psychological research on depression. In fact, in 1978 an entire issue of a major professional publication, the Journal of Abnormal Psychology, was devoted to theoretical and experimental studies on depression and learned helplessness. Although the theory is promising, some problems do need to be addressed in future work.

1) Which type of depression is being modelled? In his original paper Seligman attempted to document the similarity between learned helplessness and "reactive depression", depression indicated in DSM-II to be brought on by stressful life events. But Depue and Monroe (1978) have demonstrated that learned helplessness resembles the symptoms of a bipolar patient in a depressive episode more than it does those of any form of unipolar depression. Clearly, neither Seligman's dogs nor human beings in helplessness studies have exhibited both mania and depression. Seligman's (1978) solution to this problem is to bypass the traditional classification schemes and regard learned helplessness as a model for "helplessness depression". In so doing, he proposes a new diagnosis based on presumed etiology. Only future research will tell whether his solution is more than a circular statement.

2) Can college student populations provide good analogues? Although some research on learned helplessness has been done with clinical populations (for example, Abramson et al, 1978), many studies have exmamined college students who are selected on the basis of scores on the Beck Depression Inventory. The inventory was not, however, designed to diagnose depression, only to allow an assessment of severity in a clinically diagnosed group. Indeed, accumulating evidence indicates that selecting subjects solely on the basis of elevated BDI scores does not yield a group of people who can serve as a good analogue for those with clinical depression. Hammen (1980), for example, found that high scorers, with a mean of 18.37 were, when retested two to three weeks later, down to an average of only 10.87. This transient nature of a high BDI score is particularly important because it is common research practice to test potential subjects with the BDI and then have them participate in a research study several

weeks or even months later. Hammen's results, then, caution us that some subjects designated as depressed on the BDI might not in fact be depressed by the time the actual study takes place.

3) Are the findings specific to depression? This issue is raised by the results of a learned-helplessness study that Lavelle, Metalsky and Coyne (1979) conducted with subjects classified as having high or low test anxiety. The subjects with high test anxiety performed a task poorly after going through a laboratory situation inducing helplessness. Thus the learned-helplessness phenomenon may not be specific to depression. Similarly, highly anxious persons blame their failures on themselves, just as depressives do (Doris and Sarason, 1955).

4) Are attributions relevant? At issue here is the underlying assumption that people actively attempt to explain their own behaviour to themselves and that the attributions they make have subsequent effects on behaviour. Some research indicates that making attributions is not a universal process. For example, Hanusa and Schulz (1977) allowed subjects in a helplessness experiment to make open-ended attributions about their successes or failures. Subjects did not spontaneously report them, and even after probing the attributions given did not fall into specific categories. Furthermore, relating attributions to behaviour has been difficult. Indeed, in a series of experiments Nisbett and Wilson (1977) showed that people are frequently unaware of the causes of their behaviour.

Similarly, the attribution literature makes the basic assumption that people care what the causes of their behaviour are. This central

idea is the brainchild of psychologists whose business it is to explain behaviour. It may be that psychologists have projected their own need to explain behaviour onto other people! Laypeople may simply not reflect on why they act and feel as they do to the same extent that psychologists do.

In addition, even if we allow that attributions are relevant and powerful determinants of behaviour, we should note that many findings supporting the learned-helplessness theory have been gathered by giving individuals the ASQ or by determining how they attribute laboratory-induced successes or failures. When depressives were asked about the five most stressful events of their lives, however, their attributions did not differ from those given by normal subjects (Hammen and Cochran, 1981).

5) Some research has provided clear refutations of some aspects of the theory. In a series of studies, Alloy and Abramson (1979) examined one of its central points, that depressed people perceive themselves as having little control over their lives. Subjects were placed in various experimental situations manipulated by the experimenter to give set percentages of contingency between their responses and an outcome. After subjects had experienced some actual percentage or level of control, they were asked how much control they believed that they had had. Contrary to the theory, depressed students did not underestimate their degree of control. Using a classic experimental situation to induce helplessness in subjects, Ford and Neale (1985) found that they did not underestimate their control on the subsequent task.

One key assumption of the revised learned-helplessness theory is that the depressive attributional style is a persistent part of the make up of depressed people. Using a battery of measures, including the ASQ, Hamilton and Abramson (1983) tested carefully diagnosed depressives on two occasions, first while they were in the midst of an episode of depression, and second just before they were discharged from the hospital. Results from the first assessment revealed the expected depressive pattern on the ASQ. But the information gathered just before the patients were discharged indicated that the pattern was no longer present (Davison and Neale; 1986)

On the other hand, summarizing Seligman's helplessness model, when human beings (and animals) are exposed to uncontrollable events, they exhibit four sets of deficits ; (1) motivational, which consists of retarded initiation of voluntary responses (i.e. people give up trying); (2) cognitive, which involves difficulty in learning new response-outcome contingencies (i.e. people have trouble learning that new outcomes are controllable); (3) emotional, particularly depressed effect; and (4) lowered self-esteem (Miller and Seligman 1982). The learned-helplessness model has been proposed to account for this symptomatology. As originally stated, the model's major premise for helplessness was that exposure to (and perception of) present uncontrollability (usually) produced the expectation of future uncontrollability. This expectation, in turn, produced the helplessness deficits. In other words, people who perceive themselves to be in a helpless (uncontrollable) situation come to expect to be helpless in the future. As a result of this expectation, they show motivational, cognitive, emotional and self-esteem deficits (Miller & Seligman, 1982).

This model has also been extended to account for the large subset of depressions which are characterized by parallel symptomatology. In the case of such "helplessness" depressions, individuals were thought to have a generalized expectation of uncontrollability which, in turn, was responsible for the occurrence of generalized depressive deficits.

Additionally, a revised version of the model has recently been proposed, in order more adequately to accommodate the burgeoning findings of recent research with helpless and depressed individuals. (Abramson, Seligman, & Teasdale, 1978). The reformulated model is more consistent with the available evidence than the original theory, and it stresses the role of attributional states and attributional styles in helplessness and depression, respectively, as modulators of the expectation of future uncontrollability, that is, the way in which a person construes the cause of his present helplessness determines when and where he will expect to be helpless in the future (Miller & Seligman, 1982).

Furthermore, coming back to the statement of the reformulated helplessness model, the major new premise of this model for explaining helplessness is that it posits an attributional state which intervenes between the perception of uncontrollability and its extrapolation to the future as an expectation of future uncontrollability. The major new premise of the model for explaining depression is that it postulates an insidious attributional style that filters failure in such a way as to produce the four deficits broadly, long lastingly, and directed toward self (Miller & Seligman 1982).

Here is a brief statement of the attributional premise of the reformulated view of helplessness. When individuals perceive that they are in a helpless (failure) situation, they ask themselves why they cannot do anything. The nature of the cause they assign determines in what new situations and across what span of time the expectation of future helplessness will be likely to occur. A person considered three relevant attributional dimensions : (1) Stability : he or she may decide that the cause of failure is due to stable factors, such as low IQ, which will persist into the future, or that the cause of failure is due to unstable and transient factors, such as being sleep-deprived, which will not recur. An attribution to stable factors produces chronic deficits, whereas an attribution to unstable factors produces transient deficits; (2) globality : he or she may attribute failure to global factors ("I'm incompetent at everything") which will produce failure in a wide variety of circumstances, or failure may be attributed to specific factors (I'm incompetent at flower-arranging) which will produce failure only in similar circumstances. An attribution to global factors produces deficits across different situations, whereas an attribution to specific factors produces deficits in the original situations alone. And finally, (3) internality : an attribution to internal factors ("It's due to something about me") produces self-esteem loss, whereas an attribution to external factors ("It's due to something about the world") does not. Conversely, in controllable (success) situations, making a specific, unstable and external attribution for success facilitates generalized, chronic and self-esteem deficits (Miller & Seligman, 1982).

Now, we should mention some very interesting and recent work about cued recall in depression by Watts and Sharrock (1987). They report an experiment in which a depressed and a control group were tested on free recall, cued recall and recognition memory for a prose passage. As expected from previous work the depressives tended to show less impairment on recognition than on free recall. However, contrary to what some theories would predict, cued recall performance was no better than free recall. The implications of this finding for the nature of the depressive memory deficit for neutral materials are discussed. It seems that neither the amount of verbal output required, nor the need to generate retrieval cues, are critical factors.

Coming to details, it is known that depressed patients show impaired memory performance in tests involving neutral material (McAllister, 1981). The extent of the impairment depends on the type of memory task, with more impairment in free recall than recognition tests (e.g. Calev and Erwin, 1985).

Watts and Sharrok's study was designed to advance our understanding of why this differential deficit should arise by the simple device of adding a test of cued recall to tests of free recall and recognition. Understanding the deficit, then, may eventually be relevant to advising patients how to make the best practical use of their impaired memory function.

Weingartner and Silberman (1982) have put forward the general view that cognitive impairment in depression occurs "in those situations or tasks that require effort, particularly sustained effort" and they cite more severe impairment on free recall than on recognition as an

illustration of this. On this view the degree of impairment found with a cued recall task would depend on the level of effort it required. If effort is the crucial factor, then a low-effort cued recall task should show only slight impairment comparable to that of recognition rather than of free recall. It should also be noted that a parallel view has been advanced that the extent of the depressive memory deficit depends on the level of effort required at encoding (Ellis et al, 1984), but this is not addressed by Watts and Sharrock's experiment.

The inclusion of a cued recall condition also bears on a hypothesis relating to retrieval cues. It is widely assumed that in free recall subjects generate their own retrieval cues. If depressed patients have difficulty in doing this, or generate relatively unhelpful ones, then their memory impairment should be reduced in a cued recall task. If, alternatively, the main problem is in using cues to retrieve material, there would be little advantage of cued over free recall (Watts & Sharrock, 1987).

The subjects were: (a) 21 depressed patients (mostly hospitalized= classified as depressed by the Levine-Pilowsky questionnaire (Pilowsky and Boulton, 1970). Most were on anti-depressant medication (b) 21 controls selected to have an exactly comparable mean score on the synonyms section of the Mill Hill vocabulary test.

About procedure, memory for prose was selected for study because of its similarity to everyday memory tasks. Subjects were played a recording of a passage. Immediately afterwards they were asked to recall as much as they could. Cued recall was then tested by 14 questions which could be answered in a single word or short phrase.

This form of cued recall was selected because it minimises the verbal output demanded of subjects. Finally, subjects were given a 20 item forced-choice recognition test, the statements in each pair differing slightly in wording or grammatical construction. Each subject completed all three memory tests. Provided this is done with free recall first and recognition last, the effects of one test on subsequent ones can be assumed to be small, though it cannot be dismissed (Watts & Sharrock, 1987).

The conclusion suggested by this experiment and its results is thus that it is relatively unimportant to the depressive memory deficit (a) how much verbal output is required at retrieval, and (b) whether subjects need to generate their own retrieval cues or are provided with them. From a clinical point of view it is disappointing that the provision of cues does not appear to alleviate the memory deficit of depressed patients (Watts & Sharrock, 1987).

Watts and Cooper's investigation of depressed patients' memory for stories indicated that while normal subjects showed particularly good recall for units central to the structure of the story, this did not hold for depressed patients. This is consistent with the hypothesis that depressed patients do not use structure to organize stories when encoding them. However, this interaction is not found for all unit variables related to memory; imagibility does not show a similar interaction with depression. In general, a failure to identify central aspects of material and selectively recall them is likely to be a handicap to everyday functioning (Watts & Cooper, 1987).

Coming to details, as we have discussed before, it is well established that depressed patients show a deficit in memory performance for neutral material (McAllister, 1981). Various lines of evidence converge to support this conclusion : comparisons of the performance of depressed patients in "depressed" and "recovered" states; comparisons of depressed patients with matched controls; and correlations of memory performance with severity of depression within a patient group.

In addition, the induction of depressed mood in normal subjects leads to impaired memory performance (e.g. Ellis et al, 1980). It is also clear that the memory deficit is not based on a mere lack of confidence or willingness to respond (Watts and Sharrock, 1987; Watts et al, in press). It is therefore of interest to investigate the exact nature of the memory deficit in depression.

There is reliable evidence based on experiments using word lists that depressed patients show less clustering at recall than controls (Koh et al, 1973, Russell and Beekhuis, 1976, Weingartner et al, 1981, Calev and Erwin, 1985). This suggests that depressed patients encode words in clusters less than do controls.

The related hypothesis of Watts and Cooper's research is that depressed patients impose less structure than do controls on a passage of prose. Similarly, research on recall of stories has shown that differences in the extent to which individual units are recalled can be predicted from their place in the overall structure of the story (Mandler, 1984). So, normal subjects show a bias towards recall of units that are central to the structure of a story. Obviously, this

bias depends on subjects being able to encode the story in a way that identifies which units are central to its structure. If depressed patients are deficient in this ability, they would be expected to show less bias than normals towards selective recall of control units. Then, a general failure in depressed patients to identify and selectively recall the important parts of material they are exposed to could have potentially serious consequences for everyday functioning (Watts & Cooper, 1987).

"These predictions contrast with the fixed order hypothesis proposed by Rubin (1985), that the probability of recall of the units of a passage of prose is invariant, regardless of both subject population and procedural variables such as retention period. Rubin would therefore expect which units are recalled by depressed patients to be predictable from how well individual units are recalled by normals. If the hypothesis of Watts & Cooper's research is confirmed (that depressed patients do not show the normal bias towards recall of units central to the structure and gist of a story) it would constitute a challenge to the fixed order hypothesis." (Watts & Cooper, 1987)

The subjects in Watts and Cooper's experiment were (a) 21 patients (mostly hospitalized), classified as depressed on the basis of their responses to the Levine-Pilowsky questionnaire, (b) 40 controls, 21 of whom were selected to have an equal mean score (18.4) on the synonyms section of the Mill Hill vocabulary test (Watts & Cooper, 1987).

About procedure, subjects were played a recording of a passage and immediately afterwards they were asked to recall as much as they could (Watts & Cooper, 1987).

The results reported in Watts and Cooper's experiment indicate that "depressed patients are less likely than normals to show a bias towards recalling units that were central to the structure of the story. Furthermore, this is not dependent on any particular method of identifying centrality, as it emerged equally clearly whether the analyses were based on story grammar levels or on subjective ratings of the gist of the story" (Watts & Cooper, 1987)

Also, the hypothesis that the memory performance of depressed patients shows a deficiency in the structuring of material is not novel and has already been moderately well established on word-list data, at least if clustering at recall is taken as an index of structuring at the encoding stage. Watts & Cooper's data indicate that "the structuring deficiency is not confined to word lists, but is also demonstrable with prose. This suggests that the problem may be sufficiently general to be of practical significance for the everyday functioning of depressed patients" (Watts & Cooper, 1987)

Finally, according to Watts & Cooper's view "understanding the nature of the encoding problem that is implicated in the memory deficit of depressed patients is relevant to developing remedial strategies. Simply looking at the overall recall levels of depressives may underestimate the problems caused in everyday functioning by their not being biased towards the recall of important units." The results of Watts and Cooper's study suggest that "it may be of particular value to depressed patients to develop strategies that help them to identify and selectively recall the important units of a passage." (Watts & Cooper, 1987).

Hence, it has been suggested that the poor performance of depressed patients on tests of memory reflects cautious response criteria other than reduced accessibility of memories. Studies of recognition memory enable this issue to be addressed. An experiment of Watts et al provides the first clear demonstration of a deficit in recognition memory in depression that is not explicable in terms of response bias. A subsidiary concern of this experiment was to examine the effect of requiring subjects to vocalize words on presentation. This had no significant effects on "hits", but interacted with depression on "false alarms", suggesting that discrepant claims in the literature regarding the effects of depression on false alarms may be attributable to procedural variations. As we have discussed before, there is previous research indicating that depressed patients have poor memory for neutral material (see McAllister, 1981). However, it is possible that this apparent memory deficit can be accounted for by conservative response biases, i.e. depressed people underperform, not because memories are less accessible, but because they lack confidence in them (Watts et al, 1987).

One experimental method that is relevant to exploring this question is a forced recall test. Using this, Leight and Ellis (1981) were able to demonstrate a decrement in recall in normal subjects who had been given a depressive mood induction procedure, and exclude an explanation in terms of willingness to respond. Another approach is to study recognition memory and examine whether a reduced level of hits in depression is parallelled by a reduced level of false alarms. The first problem that arises with such studies is that recognition memory is less sensitive to the effects of depression than free recall, even where the recall and recognition tasks are matched on for general

difficulty (Calev and Erwin, 1985). On the other hand, failures to find a significant effect of depression on 'hits' in recognition memory (e.g. Davis and Unruh, 1980; Cole and Zarit, 1984) may therefore be due to the limited sensitivity of recognition measures.

However, several studies have found a significant effect of depression on hits (Miller and Lewis, 1977; Silberman et al., 1983; Dunbar and Lishman, 1984). The critical question is then whether or not the lower level of hits in depression is parallelled by a lower level of false alarms, and is this interpretable in terms of a conservative response strategy. Silberman et al (1983) reported that false alarms were not affected by depression, whereas Miller and Lewis (1977) and Dunbar and Lishman (1984) found that both hits and false alarms were similarly reduced. Also, when a signal detection analysis was applied, Miller and Lewis (1977) and Dunbar and Lishman (1984) both found an effect of depression on B but not on d'. Silberman did not carry out a signal detection analysis.

Unfortunately, these studies have methodological features that render them inconclusive. In none of them were the groups matched on intelligence, which is important in such clinical studies.

There are also issues about the sensitivity of the experiments. These various issues leave the question of whether depression affects d' in recognition memory in depression is therefore required (Watts et al, 1987).

So, "two additional variables were incorporated" in Watts et al's experiment : 1) The presentation of three successive lists were

presented to each subject. This is partly because it is known from the work of Leight and Ellis (1981) that the memory deficit of depressed subjects may increase over successive recall trials. 2) Vocalization. This is known to improve free recall (e.g. Murray, 1965) though little seems to be known about its effects on recognition. It seems possible that some depressives might fail to encode even basic structural features of words presented visually, as has been suggested in connection with Alzheimer patients (Wilson et al., 1983).

The general hypothesis of Watts et al's experiment was that "if depressives show a deficit in d' in both vocalization and non vocalization conditions, an explanation in terms of a gross lack of encoding would be rendered less plausible."

The subjects in Watts et al's experiment were (a) 36 patients classified on the basis of their responses to the Levine-Pilowsky depression questionnaire (Pilowsky and Boulton, 1970). 75% were classified by the questionnaire as having endogenous depression. (b) 24 controls matched on age, sex, and (as far as possible) educational level.

The materials were "three lists of 20 words constructed for learning, together with three additional lists of 20 filler words for the recognition tests." All six lists were matched for concreteness, frequency and word length.

About the procedure, "half of the patient group and half of the control group were randomly allocated to the 'vocalization' condition, the remainder to the 'silent' condition." "Subjects in the

vocalization group were asked to say each word aloud as it was presented; the other subjects read them silently. All subjects were told that it was a memory test and asked to try to remember the words." Then, after a 4 minute interval subjects were shown "a series of 40 words on cards, (including 20 'filler' words) and asked to say 'Yes' or 'No' to each word to indicate whether or not they had just been shown it. They were told to guess if they were not sure."

"The results provide evidence of a strong and significant effect of depression on recognition memory, in that the depressed subjects produced fewer hits. This cannot be attributed to more cautious response criteria, as depression also has a strong and significant effect on d', with the depressed subjects having lower d's. It is particularly clear in the vocalization groups that the effect of depression in reducing hits is not due to cautious response criteria because the depressed subjects give more false alarms in this condition. There was also, no significant support for the supplementary hypothesis that vocalization would help to bring depressives up to the performance standards of normals. However, the fact that depressives were impaired in the vocalization condition establishes that the apparent memory impairment cannot be attributed to a simple failure to read the words."

Besides, "the present experiment, by demonstrating opposite effects of depression on false alarms within the same experiment depending on condition, indicates that procedural variables determine the direction of the effect." On the other hand, generalizing from other works' results (i.e. Dunbar and Lishman (1984), Miller and Lewis (1977) and Zuroff et al (1983), "one might suggest that depressives

show more false alarms than controls where procedures are used that require additional processing, but that in other conditions they show fewer false alarms". In general, "the conclusion is that the lower hit rate obtained by depressives in recognition memory is not always explicable in terms of response criteria. In this experiment, the effect of depression was on d'". (Watts et al, 1987).

Furthermore, Watts et al, - in another of Watts' articles - propose "a remedial strategy for memory and concentration problems in depressed patients." In particular Watts et al have seen that "depressed patients complain of problems of memory and concentration, and it would be helpful to have a procedure capable to alleviating these problems that could be used in the course of cognitive therapy". According to this point of view "the short term effects of an imagery formation technique were compared with brief relaxation on a range of subjective and objective measures. It was found from the results that "imagery formation substantially improved objective memory for a passage of prose, especially in non-endogenous depressives, though it had no comparable effects on subjective measures."

In details, the whole thing starts from Watts et al's statement that "among the cognitive symptoms of depression described by Beck et al (1979) are difficulties in concentration and memory." For example, in a recent study of a series of patients with relatively severe clinical depression, Watts and Sharrock (1985) found that 65% or more reported that their concentration was either 'affected a lot' or 'impossible' for each of (a) watching television, (b) reading, and (c) working/doing household jobs.

Additionally, "many clinicians assume, and probably correctly that the memory problems of which depressed patients often complain of are secondary to their concentration problems." Also, "it is difficult to disentangle what effects difficulties in concentration and memory have on other aspects of depression, though clinical observations suggest that they contribute to the maintainance of a negative mood state." And this is partly because "many patients find their concentration problems intensely frustrating and this contributes to a general state of being annoyed with themselves." So, Watts et al think that "it is reasonable to suggest that there is a feedback loop involving mood and concentration, comparable to that which obtains for mood and negative thoughts (Teasdale, 1983), in which mood has an adverse effect on concentration and concentration has an adverse effect on mood. If so, there would be a good rationale for including measures designed to improve concentration as part of cognitive therapy for depression."

In addition, "the distress caused is heightened by the fact that a substantial minority of patients do not recognize that their concentration problems are a symptom of depression" (Watts, MacLeod and Trezise, 1987). In support of this - in the Watts and Sharrock series - 35% said they did not expect that their concentration would return to normal when they get over their depression. As Beck et al (1979) point out, it is important for cognitive therapists to seek to correct these misattributions. In addition to effects on mood state, concentration problems probably play an important role in prolonging patients' functional incapacity. For example, severe difficulties in concentrating on job instructions can prolong absence from employment due to depression. It is also suggested by Watts et al that "sometimes patients become unable to engage in a variety of activities that are

potentially pleasurable, which would in turn be expected to contribute to the maintainance of a negative mood state." For these various reasons, in accordance with Watts et al's opinion, it is appropriate to include techniques aimed at concentration problems such as the structured concentration assignments suggested by Beck et al (1979) among the family of cognitive therapy techniques (Watts et al 1987). This is partly because "the characteristic description that depressed patients give of their difficulties in reading is that they can't 'take in' what they are reading, with the result that when they get to the bottom of a page they have no idea what they have just been reading about. This seems to be a phenomenological account of poor semantic processing. The relative lack of semantic clustering in the free recall of depressed patients (e.g. Weingartner et al, 1981) and their failure to selectively recall the units of a prose passage that are central to its semantic structure (Watts and Cooper, 1987) are also consistent with the hypothesis that their semantic processing is poor.

However, according to Watts et al, "the application of processing strategies to help depressed patients concentrate differs at several points from their standard laboratory application." This is mainly because most laboratory research has been done on word lists, though there is evidence of their applicability to prose (e.g. Shallert, 1976). It is also possible that the concentration problems of depressed patients will make them unable to derive as much benefit from processing strategies as non-depressed subjects, though the relevant data on this point is inconclusive (Weingartner et al, 1981, Ellis et al, 1984). In addition, most laboratory research has examined the effects of processing strategies on incidental recall rather than

intentional learning. Finally, there have been no studies of processing strategies that have included self-report measures of concentration as well as objective memory measures. It is therefore not known what subjective benefits they have (Watts, MacLeod & Trezise, 1987).

The processing strategy, in Watts et al's experiment focused "on the formation of visual imagery while listening to prose being read aloud." Furthermore, "there is a substantial experimental literature on the effects of imagery instructions on memory, including work on its effects on memory for prose in adults (see Alesandrini, 1982) though there is not yet agreement on whether these effects can be adequately accounted for in terms of depth of processing." It is also important to note about imagery formation, that it can be applied by patients in a "wide range of situations. For example, a depressed patient who was unable to return to work because of his inability to concentrate on job instructions reported that he was able to learn to imagine job operations while he was being given instructions, and that this produced a marked improvement in his concentration on them". (Watts et al, 1987).

Besides, attempts to use imagery strategies to improve the memory performance of neurological patients (see Powell, 1981) and the elderly (Kausler, 1982) have met with some success. Particularly relevant is the study of Edmunson and Nelson (1976) showing that imagery improved the recall performance of high anxious subjects more than low anxious subjects, and indeed eliminated the performance decrement associated with anxiety. In spite of that "there have so far been no attempts to use imagery strategies in depressed patients. The main challenge in

using imagery strategies with depressives seems likely to lie in getting them to use the strategies." In their experiment, Watts et al "anticipated that instructions alone would not be sufficient and that guided practice would be necessary." (Watts et al, 1987)

Turning to another aspect work on the control of negative thoughts by distraction suggests that endogenous patients show less benefit (Teasdale and Rezin, 1978; Fennell and Teasdale, 1984; Fennel, 1985). By analogy, the same might be expected to be true of the imagery intervention under investigation in Watts et al's experiment. In support of this "a further indication that the imagery technique might be less helpful in endogenous depressives is that there is a trend for the normal relationship between imagibility and recall to hold less strongly in endogenous than in non-endogenous depressives " (Watts, 1986). In addition, a questionnaire measure of visual imagery was included in Watts et al's experiment to test the hypothesis that visualisers would benefit most from the imagery procedure.

Coming to the method of Watts et al's experiment, subjects were 36 patients who had depression as their primary clinical diagnosis. The patients were administered the Levine-Pilowsky depression questionnaire (Pilowsky and Boulton, 1970).

The materials were prose passages constructed in this way "to be maximally sensitive to the imagery procedure." They thus dealt with concrete material capable of being imagined and needed a processing effort to be encoded.

In accordance with Watts et al's opinion, the results of their experiment provide clear support for the effects of imagery formation on the memory performance of depressed patients. It might be doubted whether patients could be trained briefly and effectively in an effortful strategy such as imagery formation, but the positive results obtained imply that this was achieved. The effects were also sufficiently substantial to be of clinical interest. In the total group, imagery resulted in an improvement of memory performance by about 30% in one of the experimental conditions, and in the sub-group of non-endogenous depressives memory scores increased by 70%. Further clinical work will be needed to explore the range of materials and contexts in which patients can benefit from imagery strategies. Watts et al's experiment results provide the experimental evidence to justify exploring their clinical application.

Watts et al commenting on the results wrote that "it was disappointing that imagery had no clear effect on either self-report measure (though there was a trend for it to reduce lapses of concentration in subjects with less state anxiety)." Also, "previous work on the effects of distraction had suggested that reactive depressives might respond to the interventions better than endogenous depressives, and this was confirmed for the imagery intervention." In addition "at the present time it is unclear whether endogenous depressives are less able to form imagery, or whether their imagery is equally vivid but for some other reason fails to facilitate recall in the usual way" but Watts et al conclude that "the evidence available so far is sufficient to justify recommending that endogeneity be included as a moderator variable in studies of cognitive interventions in depression" (Watts et al, 1987).

CHAPTER TWO

Introduction to the Experiments

The aim of this thesis is obviously to investigate the cognitive organisation of anxious, depressed and agoraphobic patients (the patients used in the first experiment were anxious, depressed and agoraphobic whereas the patients used in the second experiment were overall more anxious than depressed - see also Appendices D and T). The cognitive organisation of particular interest in this thesis is the organisation of information concerning the self, or the self-schema. The self-schema is described as an organised body of knowledge containing information about the self which is also capable of organising new incoming information about the self into the existing schema. So the self-schema can be seen as a cognitive mechanism for both storing and processing information which is relevant to the self. The schema itself can be seen as consisting of a number of traits organised in a hierarchial fashion (Rogers 1977) where the hierarchy consists of the most extreme traits, i.e. those that are individual "scores highest" on, followed by the next most extreme, then the next most extreme and so on until all meaningful traits are exhausted. (This is comparable to Kelly's (1955) theory of personal constructs, where the constructs are roughly equivalent to traits).

From this it is assumed that certain types of personal information are more easily integrated into the schema than others, and some types may not be integrated at all. For example, if a person rates themselves high on 'friendliness' ie they see themselves as very friendly and this is an extreme trait in their hierarchy of traits,

information they gain from social interaction which tells them they are friendly will be easily integrated into their existing schema. However, should they ever behave in an unfriendly manner then this information will not be integrated into the schema and if their schema is to remain stable they must attribute their unfriendly behaviour to external or situational factors. But it is also possible that a person might not have 'friendliness' within their schema so such information would be likely to be ignored and not integrated. A further possibility is the biasing effect of the schema. Social interaction is often ambiguous, so it is likely that an individual's self schema could have a biasing effect on an individual's social perception in such a way that potentially schema-contradictory personal information could be simply ignored or perceived in a way which was not contradictory to the existing schema.

This biasing effect was proposed by Beck (1976). He said that a depressive's self-schema contained a number of depressed-content or negative traits which were dominant in the person's idea of themselves. In order to maintain this dominance consistently, a biasing effect was necessary. As a result, a depressed individual's social perception was altered so that they ignored any positive feedback they might get from social interaction concerning themselves. But social interaction is not the only source of personal knowledge or information; activities carried out alone e.g. at work or in the home can also indicate such qualities as competence and the ability to enjoy an activity. According to Beck, such situations are also subject to the biasing effects of the depressive's schema. Similarly, biased memories are shown by depressives - they tend to remember only negative or unhappy experiences.

In general, according to the cognitive view, the individual's low self-esteem and negative, distorted thinking is the basic psychological problem in the depression syndrome. In particular, Beck and Rush (1978) invoked the concept of "schema" to explain this low self-esteem in depressives. Schemata were defined as stable cognitive patterns, of response to similar types of events. Thus, where a depressive might consistently make a negative self-reference following the negative evaluation of behaviour, Beck and his associates have reasoned that a stable schema is used to negatively bias such evaluations and self-references. Such negative bias, or cognitive distortion has consistency of virtue of its guiding schema; the result is a consistent set of negative self-references.

This theory led on to Kuipers and Rogers (1979) finding a consistent pattern for applicable self-referent words to be better recalled than non-applicable words. Although the clinical depressive's self descriptions included equal proportions of non-depressed and depressed content, their incidental recall patterns revealed a clear depressed content bias for a self reference task. Derry and Kuiper (1981) replicated this finding and made two further observations which provided further support for Beck's proposal that an efficient negative self-schema exists, specific to the disorder of depression: i) depressives recalled more self-rated adjectives than did controls. ii) depressives recalled depressive self-rated adjectives while controls recalled neutral self-rated adjectives.

Evidence for enhanced memory for depressive items can also work alongside suppression of recall for positive items. Breslow, Kocsis and Belkin (1981) conducted an experiment where subjects had to recall

as much of a story that was told to them as possible. The results showed that the depressed patient's memory was worse than that of controls but most of this was ascribed to a decrement in the recall of positive themes in the story. Depressive patients may omit to mention positive elements despite good memory for them, because of their frame of mind and its preoccupation with negativity has diminished the importance of these issues to the point that they are not considered significant enough to mention.

Furthermore, Clark and Teasdale (1982) found that depressed patients were more likely to remember unhappy past experiences than happy ones. This can be explained in terms of the self-schema bias because unhappy past experiences are likely to be those where the individual was behaving in a depressed manner ie one that is consistent with the self-schema. So the function of the self-schema bias is to maintain the existing self-schema by filtering out anything which is inconsistent with the individual's existing self-schema. The idea of a filter is supported by Clark and Teasdale's further finding that when the same patients were less depressed, they were more likely to recall happy experiences than unhappy ones. So, it is clear that the happy experiences were stored in memory whilst the patients were depressed, but to recall them would have threatened the consistency of the depressed self-schema, so they were filtered out somehow in the memory retrieval process. So, taking the idea that the self-schema causes depression presumably in the less depressed patients, the self-schema had been altered and the nature of the filter with it. This could have happened due to a very happy experience, a newly-found competence or anything which the negative bias could not distort sufficiently to give it a negative interpretation and integrate it into the individual's

depressed self-schema. Or, more directly, as Beck (1976) suggests, cognitive restructuring therapy where patients are made fully aware of their negative bias and are taught to replace it with a more positive appraisal of situations.

So, the self-schema can be seen as a stable entity which maintains itself by two related ways. First, in the ongoing situation the negative bias filters out, ignores, or distorts information which is inconsistent with the schema. Secondly, in a similar way, inconsistent memories are filtered out, not retrieved or "forgotten". The two processes are linked because the first is of an attentional nature and the second is of a retrieval nature.

Ultimately all experience which has attention paid to it becomes a memory and the nature and strength of that attention determines the nature and strength of the resulting memory trace. The point under investigation in this thesis is whether anxious, depressed and agoraphobic patients, in the first experiment, and anxious patients, in the second one, possess a similar self-schema. For example, since they behave in an anxious manner we would expect their self-schema to be correspondingly characterized and dominated by anxiety and anxiety-reported traits. A lot of the research into the cognitive organisation of neurotic patients has been carried out on phobics. For example, Beck and Rush (1975) conducted structured interviews with phobics and on the basis of these proposed a phobic schema. Within this schema are situations which have been labelled as dangerous by the individual. So when an individual appraises a situation as fearful, they integrate this into the schema and the overall "dangerous" label is adopted for that situation, and so triggers the anxiety they

subsequently experience. This is virtually the same as the depressive's self-schema which Beck (1976) postulated, except that the cognitive organisation revolves around situations rather than personal traits derived from situations. Nunn et al (1984) found that phobics remembered more phobic-related material than neutral material while the reverse was true for controls.

This finding was interpreted as support for Beck and Rush's phobic schema proposal. Phobics remembered more phobic-related material at the expense of neutral material, so this can be construed as evidence for the filter or bias generated by the schema-neutral material was either ignored during presentation or filtered out during memory retrieval, or both. This is comparable to Derry and Kuiper's (1981) finding that depressives recalled more depressed-content adjectives than neutral-content adjectives. Similarly, McDowall (1984) found that depressives recalled more unpleasant words than pleasant ones and that also they did this at the expense of recall for pleasant words. These two studies both invoked Beck's (1976) depressive self-schema proposal to explain their findings (though McDowall did only to lesser extent).

So, it is clear that cognitive organisation can be inferred from memory recall for different types of material. It is this type of inference which is used in both current experiments, so some elaboration on the relationship between cognitive organisation and experimental memory recall measures is needed.

Basically, when looking at memory in a free recall paradigm (as is used in both current experiments), there are two important measures which can be looked at. First, the recall total of one type of

material compared to another e.g. unpleasant material compared to pleasant material or phobic-related material compared to non-phobic related material. Then secondly, how much material of each type is grouped together on recall e.g. if from a mixed list of pleasant and unpleasant words, a subject recalls a number of all pleasant words then a number of all unpleasant words than the maximum grouping for each type of word at recall will have been done. Grouping or "clustering" measures can be taken which express the number of words of each type clustered as a proportion of the total number of words, of each type recalled or some number related to this total, e.g. the Ratio of Repetition (RR) measure of clustering (Cohen et al, 1954) (see RESULTS of the two experiments for more details), thus the clustering measure is independent of recall total in such a way that clustering scores for subjects with different totals can be compared. The clustering measure is taken as being a direct representation of the subjective organisation imposed on the material to be remembered by the individual (Sternberg and Tulving, 1977). The relative amount of material recalled can be interpreted in a number of ways. Either enhanced encoding of one type of material compared to another e.g. clustering by category, selective retrieval of one type compared to another or both processes together (see McDowall 1984).

These interpretations all imply the existence of some body of knowledge organised around a category concept e.g. depression or anxiety. That is, they imply a schema. The degree of subjective organisation is linked to recall total since it has been shown that this increases the memory capacity for items to be remembered (see Murphy 1979).

Thus, subjective organisation can be used as a more direct method for estimating whether persons use schemata to organise personal information (e.g. self-descriptive adjectives). In other words, subjective organisation refers to the imposition of a persistent word order on a randomly ordered list. On a multi trial free recall, subjects are presented with a group of words one at a time, over several trials; each trial has a random word order. Subjective organisation is observed when a subject consistently recalls the words in clusters. From a unique pattern of contiguous word recall, it is inferred that the subject has encoded the to-be-remembered words on the basis of word inter-relationships that be, and not the experimenter, has perceived. Bonsfield (1953) said that this clustering in free recall takes advantage of pre-existing associations and therefore organisation in memory thus reflects the degree to which the learner assimilates or schematises his (word) environment.

Similarly, Tulving (1962) noted the well established finding that the order of recall or randomly ordered word lists increases over trials as a function of subjective organisation. Further development studies suggest that subjective organisation itself increases as a function of "experience" with the semantic processing of words on a given list i.e. as a function of a schema of word meaning. Bjorklund, Ornstein and Haig (1977) showed that the ability to organise words for recall increases as a function of experience with the words. Presumably then, the greater the variety of contexts in which a word has been encountered, the more elaborated its meaning schema becomes, and thus the more likely it is that the word will be organised among others in recall.

In the special case of self-descriptive adjectives, if persons have organised and stable self-descriptions, that is if they have described themselves with similar terms over different contexts and over a period of time, it is likely that they have also developed schemata to represent the relations among self-reference adjectives prior to a recall task. Therefore if a depressive possesses a stable self-schema, it is expected that he would show significant differences in the subjective organisation of self descriptive adjectives and neutral adjectives.

Thus, if measures of clustering and relative levels of recall are examined in conjunction with each other it should be possible to infer more directly the nature of the underlying cognitive organisation. In this case, it is proposed that the individual will impose his or her own subjective organisation on the material on the basis of the agoraphobic, anxious or depressive nature of the material (i.e. the experimental category as determined in the first experiment - see Appendix G for material used).

Such subjective organisation is assumed to reflect underlying cognitive organisation systems in which the concepts of agoraphobia, anxiety, depression or both anxiety and depression are dominant.

These cognitive organisation systems could correspond to the agoraphobic self-schema, the depressive self-schema and an anxious self-schema since the concepts of agoraphobia, anxiety and depression respectively would play a dominant organisational role in these three self-schemas. However, it is not possible to jump to conclusions about the existence of a self-schema on the basis of subjective organisation

effects alone, only a general schema can be inferred from such effects. Bearing this in mind, a self-rating task was included in the design of the second experiment where subjects were asked to indicate whether or not the adjectives they had been asked to recall described them, i.e. whether or not they were self-referent.

Furthermore, Diethelm and Jones (1947) found the presence of clinical anxiety significantly decreased scores on many tests and maze learning was reliably slower under anxiety conditions, though it has also been suggested that as the learning process proceeded, the anxiety drive of a high anxiety group tended to improve performance.

However Beck and Rush (1978) propose that anxiety subjects do show some form of self-schema similar to depression subjects which interprets (or distorts) information relative to their behaviours and attributes. They also claim that phobias and anxiety are not two different forms of neurosis but are different positions on the anxiety scale.

Addison (1981) has shown that phobias act as an organising aid for the recall and clustering of phobic items and the phobic patients show more clustering of phobic words than neutral words. Therefore if anxiety is similar to phobias and contains a self-schema, then one can suppose that anxiety subjects will recall and cluster anxiety words more than neutral words.

CHAPTER THREE

Experiment One

3.1 Introduction

The first experiment used hospital outpatients or day patients who rated as depressed or anxious on the Leeds Anxiety and Depression Scale (Snaith et al, 1976) and also those who rated as agoraphobic on the Agoraphobia Test (See Appendix for the tests). The present experiment also used controls who were employees at the same hospital as the patients.

In a way, a modification of Tulving's (1962) experiment was used. Tulving presented subjects with a 16 word word-list over 16 separate trials, each trial involving list presentation then written recall. The aim was to investigate subjective organisation in subject's recall, but in the present experiment, subject's total recall of words was examined also. In the present experiment 12 trials (4 for anxiety and neutral words, 4 for depression and neutral words and 4 for agoraphobia and neutral words) were used. 20 words comprised each list - 10 emotional words (anxiety on the anxiety list or depression on the depression list or agoraphobia on the agoraphobia list) and 10 neutral words. This was to investigate whether anxiety, depression and agoraphobia subjects remembered more of their relative words overall than neutral items and showed clustering of these words in comparison to the control groups. The other main aim of this experiment was to explore the individual differences between subject groups on the experiment.

As mentioned before, Perry and Kuiper's (1981) depressed subjects recalled more self-rated words than did controls. Such recall should go hand in hand with clustering, and would provide support for Beck and Rush's (1978) proposal of a stable schema as an explanation of low self-esteem. If anxiety or agoraphobia subjects also recalled and clustered more self-rated words than controls this would also suggest a schema might be present, though Addison's (1981) experiment on phobias showed no difference in recall of phobic words and neutral words, only in clustering.

Aims of the Experiment

The aims of the first experiment were three-fold:

i) do anxious subjects show facilitation for the recall and clustering of anxiety words?

ii) do agoraphobic subjects show greater clustering and recall of agoraphobic words?

Beck and Rush (1978) suggest that anxiety imposes a negative self-schema on the anxious in the same way as phobias do. Hence anxiety subjects should show greater clustering and recall of emotional words.

iii) do depressives show superior recall and clustering of depressive words?

The aims can be considered in terms of the following hypotheses:

1. That depression, anxiety and agoraphobia can be construed as schemas, which will act to direct attention and memory of external events in these terms.

2. Anxiety subjects should remember more anxiety list words overall than agoraphobia, depression and control subjects and should also show greater clustering of anxiety list words.

3. Agoraphobia subjects should recall more agoraphobia list words overall than anxiety, depression and control subjects and should show greater clustering of agoraphobia list words.

4. Depression subjects should recall more depression list words overall than agoraphobia, anxiety and control subjects and should show greater clustering of depression list words. Also controls will not have any significant difference in recall for depression list words versus anxiety or agoraphobia list words, for anxiety list words versus depression or agoraphobia list words for agoraphobia list words versus anxiety or depression list words.

5. Anxiety subjects should recall more anxiety words than neutral words overall than depression, agoraphobia and control subjects and should show greater clustering for anxiety words.

6. Depression subjects should recall more depression words than neutral words overall than anxiety, agoraphobia and control subjects and should show greater clustering for depression words.

7. Agoraphobia subjects should recall more agoraphobia words than neutral words overall than anxiety, depression and control subjects and should show greater clustering for agoraphobia words.

8. In general, patients will recall more experimental (ie depressed, anxious or agoraphobic content) words compared to neutral words; no significant difference in recall for experimental versus neutral words will be found for the controls.

9. Since there are four trials for each list, the number of words recalled increase as we go from the first to the fourth trial and there will be a corresponding increase in the amount of clustering (Sternberg & Tulving, 1977).

10. There will be correlations between subjects' neuroticism, agoraphobia, anxiety, depression and disposition scores on the personality tests and these two measures (ie total recall and clustering) taken from the experimental words of each list separately. More specifically, it is hypothesised that agoraphobia scores will correlate with the measure from the agoraphobia list, anxiety scores will correlate with the measure from the anxiety list, depression scores will correlate with the measure from the depression list and the neuroticism and disposition scores will correlate with the measures from all three lists.

3.2 Method

Subjects

Twelve patients suffering predominantly from anxiety, twelve patients from depression, twelve patients from agoraphobia and ten controls served as subjects. The patients were all attending a local hospital either as outpatients or day patients.

The criteria for including the patients in the study were:

i) anxiety, depression or agoraphobia feelings were the main problem for each group
ii) they had not been outpatients or day patients for longer than six weeks
iii) they were not taking anti-depressant drugs or tranquillisers.

In the anxiety group, there were 7 females and 5 males. Their average age was 47 years (range 24-84 years). In the depression group, there were 9 females and 3 males. Their average age was 41 years (range 30-61 years). In the agoraphobia group, there were 10 females and 2 males. Their average age was 42 years (range 25-65 years). Also, ten persons served as controls. There were 8 females and 2 males. Their average age was 34 years (range 20-54 years). The controls were all employees at the same hospital as the patients. They were volunteers from the nursing, clerical and cleaning staff. As far as possible, the four groups were matched for age and education.

Materials

Firstly, three questionnaires were given to the subjects: a) The Eysenck Personality Questionnaire. b) The Anxiety and Depression scale which is consisted of 68 general questions about the subjects' life and feelings. c) The Agoraphobia Test which consisted of 13 words or short phrases which are threatening for agoraphobic patients, such as: theatres, supermarkets, high places, etc. At the end of the test after a short definition of what is a panic attack, subjects were asked to "indicate the total number of panic attacks" they had had in the previous seven days.

Examples of E.P.Q. questions are: "Do you have many different hobbies?", "Do you tend to keep in the background on social occasions?" etc. Examples of "The Anxiety and Depression Scale" questions are: "Are you often a moody person?", "Do you feel you often can't get your breath?", "Do you often feel nervous and shaky?" etc. Copies of the questionnaires are in Appendices A, B and C.

Secondly, three lists of words were constructed: the anxiety list, the depression list and the agoraphobia list. Each list consisted of 10 experimental words and 10 neutral words. For the anxiety list, the experimental words were rated high on anxiety and low on depression. Similarly, for the "depression" list the experimental words were rated high on depression and low on anxiety. For the "agoraphobia" list the words were rated high on agoraphobia threatening meanings and low on both depression and anxiety. Neutral words were not rated high on depression, anxiety or agoraphobia. (See Appendix G for word lists and ratings). The experimental and neutral words were

matched on number of syllables, frequency of occurence and imagery values. They were selected by discussion between a clinical psychologist and an experimental psychologist.

Examples of anxiety words are "panic", "shaking", "dizzy"; examples of depression words are "failure", "guilt", "disgust"; examples of agoraphobia words are "shopping", "train", "aeroplane" and examples of neutral words are "London", "autumn", "mirror". All lists were presented on the screen of a BBC mircocomputer. For each subject, the computer program randomised both the order of the lists and the order of the words within each list.

Design and Procedure

Firstly, the overall procedure was described to each subject. They were also assured that the information we obtained would be confidential. Subjects then signed a consent form agreeing to take part in the experiment (see Appendix R for Instructions).

Subjects were asked if they would take part in an experiment "to investigate the way people remember information". The experimenter thanked the subject for agreeing to take part and gave a further brief explanation of what the subject was required to do. The subject was told he/she would see three different lists each containing 20 words. He/she should read each word as it appeared on the computer screen. (Subjects were asked to read aloud, so that the experimenter could check for reading errors). Immediately after each list finished the subject was requested to say as many of the words he/she could remember. No time limit was set, subjects simply indicated that they

had said as many of the words as they felt they could remember. Then after each list had been recalled, the subject would read the same list again but with the words in a different order, and again would be asked to say as many of the words as he/she could remember when the list finished. This was repeated two more times (so, there was a total of four trials for each list, or each list had to be recalled four times).

The procedure for the control subjects was exactly the same as for the patients. After the experiment, the experimenter obtained personal information such as name, age and occupation. The subject was also given the EPQ, the Anxiety and Depression Scale and the Agoraphobic test and asked to fill them in at home and to return the completed questionnaires in an accompanying stamped addressed envelope.

3.3 Results

(A) Scoring Procedure

Two main measures were calculated.

i) Total recalled (see Appendix E) i.e. the total number of experimental and control words correctly recalled by each subject for each list on each trial. Sometimes subjects recalled the same word twice on the same trial; these repetitions were included in the total recall score for that trial.

ii) Looking at the order of recall of the words a clustering score (see Appendix F) for each subject on each list on each trial was calculated. A Ratio of Repetition (RR) (Cohen et al, 1954) was

calculated for each subject for each list and experimental and neutral words separately. It is calculated in the following way : $RR = \frac{r}{n - 1}$

where n = the number of words correctly recalled from a particular category i.e. experimental or neutral,

and r = the number of pairs of words consecutively recalled from the same category or "category repetitions".

What this measured was how much the subject clustered category words together and in such a way that the score calculated was independent of total recall. An example of the procedure is:- if a subject's total recall from a particular list (in this case, depression) was:-

Bargain, SUICIDE, SADNESS, FAILURE, Gallon, DISGUST, bashful, stress, WAKEFUL, FAILURE, London, Bathing, EFFORT

where words in upper case were the experimental words, words in lower case and underlined are the control words and words in lower case which are not underlined are words not on the list being recalled i.e. foreign words. It will also be noted that 'FAILURE' is repeated. This repetition is treated just the same as any other experimental word i.e. it is not excluded in any way from the results. Where more than one word of the same category are recalled together, this counts towards the total r. One pair is r = 1, two pairs are r = 2, three pairs are r = 3 and so on.

e.g. WAKEFUL, FAILURE, r = and for SUICIDE, SADNESS, FAILURE there are two pairs, so r = 2.

The total r for the depression list and for the particular subject is therefore r = 3 and n = 7 so RR = 0.50 for the experimental words. For the neutral words, r = 1 and n = 4, so RR = 0.33.

Treatment of Results

Various analyses were made to detect differences between combinations of the experimental groups, and the three word lists and the word type i.e. experimental words versus control words, using the two measures described above.

Results are in two parts : firstly patients and controls and secondly patients only. Besides looking at all subjects together, patients are also being looked at separately because not only were the controls not well matched with the patients, but also taking into account that controls, who are nurses, are very familiar with the patients and they are used to the vocabulary that is used for the memory tests. Also, for all the results, the data have been combined over all four trials.

(i) Total Recalled (including controls)

Since no difference was found between experimental and control words the data to be reported here do not include this factor. The mean number of words recalled by each group are shown in Table 1 below:

TABLE 1 : MEAN NUMBER OF WORDS RECALLED BY EACH SUBJECT GROUP

Subject Groups			
Agoraphobics	Anxious	Depressives	Controls
5.403	5.347	5.410	5.667

There was no reliable difference between the groups. All subjects remembered the words equally well ($F = 0.18$; $df = 3.92$; see also Appendix H).

However, as can be seen, control subjects scored more overall than patients, depressives more overall than agoraphobics and anxious, and agoraphobics more overall than anxious.

Although there are no significant differences overall, the analysis of variance revealed some interaction effects between lists and all subjects, and between each list and each subject group.

Taking all subjects, the mean number of words recalled on each list are shown in Table 2 below:

TABLE 2: MEAN NUMBER OF WORDS RECALLED ON EACH LIST

Lists		
Agoraphobia	Depression	Anxiety
6.038	4.777	5.527

Analysis of variance indicated a reliable difference between these scores ($F = 30.45$, $df = 2.84$; $p<0.01$, see also Appendix H).

Overall, subjects have a lower score for the depression list than for the anxiety list or the agoraphobia list. Also, overall subjects have a higher score for the agoraphobia list than for the depression list of the anxiety list. So, all subjects were less likely to recall depression words than anxiety and agoraphobia words.

Taking each subject group, the mean number of words recalled on each list are shown in Table 3 below (see also Fig. 1):

TABLE 3 : MEAN NUMBER OF WORDS RECALLED ON EACH LIST BY EACH SUBJECT GROUP

	Lists		
Groups	Agoraphobia	Depression	Anxiety
Agoraphobics	6.250	4.479	5.479
Anxious	6.083	4.396	5.563
Depressives	5.521	5.125	5.583
Controls	6.350	5.175	5.475

Analysis of variance indicated a reliable difference between these scores ($F = 2.38$; $df = 6.84$; $p<0.04$; see also Appendix H).

The main point that arises out of these findings is the pattern of scores on the depression list. Each subject group except depressives and controls was less likely to recall depression words than agoraphobia and anxiety words.

On the other hand, the depressive subject group was more likely to recall depression words than any other group except controls.

Also, the depressive group has a lower score for the agoraphobia list than the other groups have. Furthermore, agoraphobia, anxiety and control groups are more likely to recall agoraphobia words, less likely

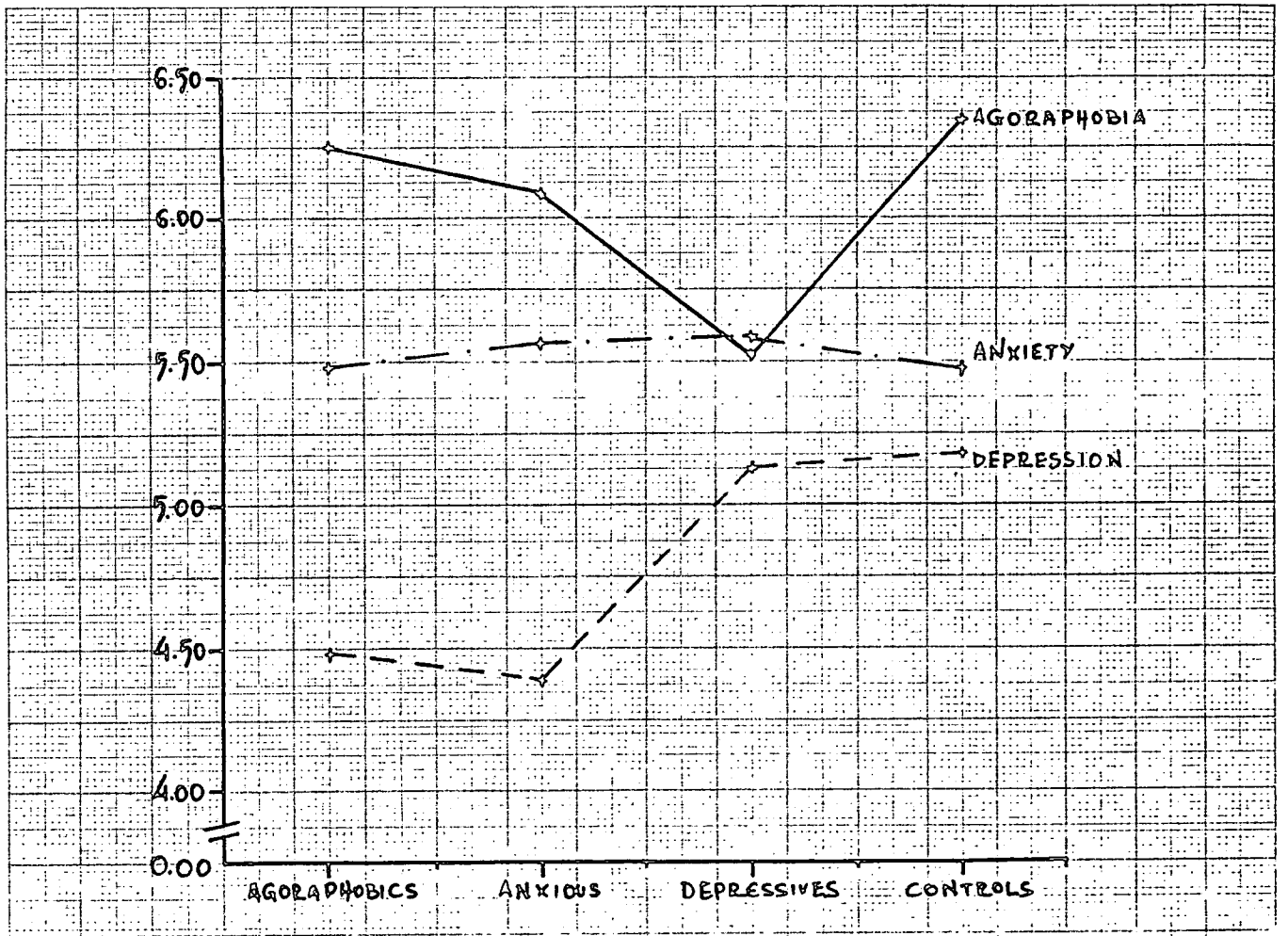


Fig. 1 : MEAN NUMBER OF WORDS RECALLED ON EACH LIST BY EACH SUBJECT GROUP

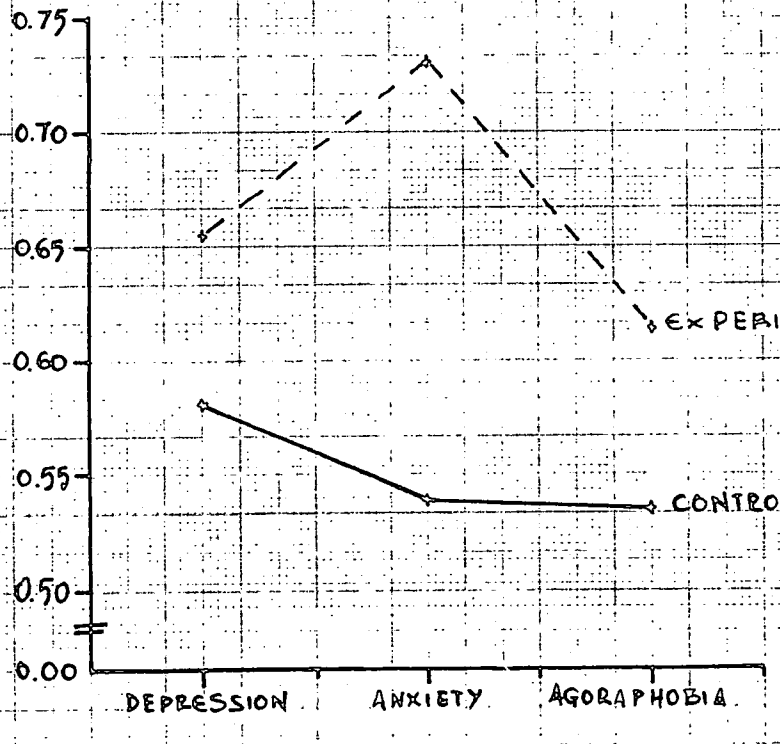


Fig. 2 : MEAN CLUSTERING SCORE FOR EACH WORD TYPE AND EACH LIST

to recall anxiety words and even less likely to recall depression words. Finally controls have a higher score for the agoraphobia list than for the depression list or the anxiety list. These results will be discussed in the "Discussion" part of this study.

(ii) Clustering RR (including controls)

Table 4 below shows the mean clustering scores for each subject group, including controls.

TABLE 4 : MEAN CLUSTERING SCORE BY EACH SUBJECT GROUP

Groups			
Agoraphobics	Anxious	Depressives	Controls
0.654	0.591	0.591	0.598

An analysis of variance indicated a difference between these clustering scores ($F = 2.58$; $df = 3.42$; $p<0.05$; see also Appendix I).

As can be seen, agoraphobics clustered more overall than all the other groups. Control subjects had about the same mean clustering score with anxious and depressive subjects. It should be remembered that a higher clustering score does not imply a greater word recall.

Furthermore Table 5 below shows the mean clustering score for each list.

TABLE 5: MEAN CLUSTERING SCORE FOR EACH LIST

List		
Depression	Anxiety	Agoraphobia
0.618	0.635	0.575

Analysis of variance indicated a reliable difference between these clustering scores ($F = 3.74$, $df = 2.84$; $p<0.03$; see also Appendix I).

From table 5, it can be seen that subjects have their lowest scores on the agorophobia list. On the other hand patients and controls, taken together, have their highest clustering scores on the anxiety list.

Table 6 shows the mean clustering score for each type of words:

TABLE 6: MEAN CLUSTERING SCORE FOR EACH TYPE OF WORDS

Type of words	
Experimental	Control
0.667	0.552

Analysis of variance indicated a reliable difference between these clustering scores ($F = 76.49$; $df = 1.42$; $p<0.01$; see also Appendix I).

Considering the clustering of neutral and emotional words (or control and experimental words respectively) taking all subjects and all lists over all trials there was more clustering of experimental than control words. Furthermore, taking all subjects and over all 4 trials, the mean clustering score for each type of word and each list is shown in Table 7 below (see also Fig. 2):

TABLE 7 : MEAN CLUSTERING SCORE FOR EACH WORD TYPE AND EACH LIST

	Type of words	
	Experimental	Control
Depression	0.655	0.581
Anxiety	0.731	0.539
Agoraphobia	0.614	0.535

Analysis of variance indicated a reliable difference between these clustering scores ($F = 7.18$; $df = 2.84$; $p<0.01$; see also Appendix I).

The main point that arises out of these findings is the experimental words' pattern of clustering scores on the anxiety list. All subjects were more likely to cluster the experimental words on the anxiety list than the experimental words on depression list of agoraphobia list. Also, all subjects were more likely to cluster the experimental words on the depression list than the experimental words on the agoraphobia list.

Similarly, all subjects over were more likely to cluster the control words on the depression list than the control words on the anxiety or the agoraphobia lists.

(iii) Total Recalled (without controls - patients only)

The mean number of words recalled by each group of patients are shown in Table 8 below:

TABLE 8 : MEAN NUMBER OF WORDS RECALLED BY EACH PATIENT GROUP

Patient groups			
Agoraphobics	Anxious	Depressives	All patients
4.847	4.951	4.823	4.879

There was no reliable difference between the groups. All subjects remembered the words equally well ($F = 0.04$; $df = 35.33$; $p<0.0.5$; see also Appendix J).

Taking all patients and overall 4 trials, the mean number of words recalled on each list are shown in Table 9, below:

TABLE 9 : MEAN NUMBER OF WORDS RECALLED ON EACH LIST

Agoraphobia	Depression	Anxiety
5.438	4.472	4.712

Analysis of variance indicated a reliable difference between these scores ($F = 27.02$; $df = 2.66$; $p<0.01$; see also Appendix J).

The main point that arises out of these findings is the patients' pattern of scores on the agoraphobia list. First, overall, patients have a higher score for the agoraphobia list than for the anxiety list or the depression list. Secondly, overall, patients have a little higher score for the anxiety list than for the depression list.

Taking all patients on all 3 lists the mean number of words recalled for each type of words, are shown in Table 10 below:

TABLE 10 : MEAN NUMBER OF WORDS RECALLED FOR EACH TYPE OF WORDS

Type of words	
Experimental	Control
5.387	4.361

Analysis of variance indicated a reliable difference between these scores ($F = 58.20$; $df = 1.33$; $p<0.01$; see also Appendix J).

Looking at the difference between two types of words, the analysis showed that patients were more likely to recall experimental words than control words.

Taking all patients overall 4 trials, the interaction between word-type and word-lists can be seen in Table 11 below (see also Fig. 3):

TABLE 11: INTERACTION BETWEEN WORD-TYPE AND WORD-LISTS FOR TOTAL RECALL

	Type of words	
	Experimental	Control
Agoraphobia	5.951	4.924
Depression	4.667	4.278
Anxiety	5.542	3.882

Analysis of variance indicated a reliable difference between these scores ($F = 11.35$; $df = 2.66$; $p<0.01$; see also Appendix J).

The main point that arises out of these findings is the experimental words' pattern of scores on the depression list. All patients were less likely to recall the experimental words on the depression list than the experimental words on the anxiety list or depression list.

Also, all patients have a higher score for experimental words on the agoraphobia list than for experimental words on the anxiety list. Similarly, all patients overall 4 trials, were more likely to recall control words on the agoraphobia list, less likely to recall control words on the depression list and even less likely to recall control words on the anxiety list.

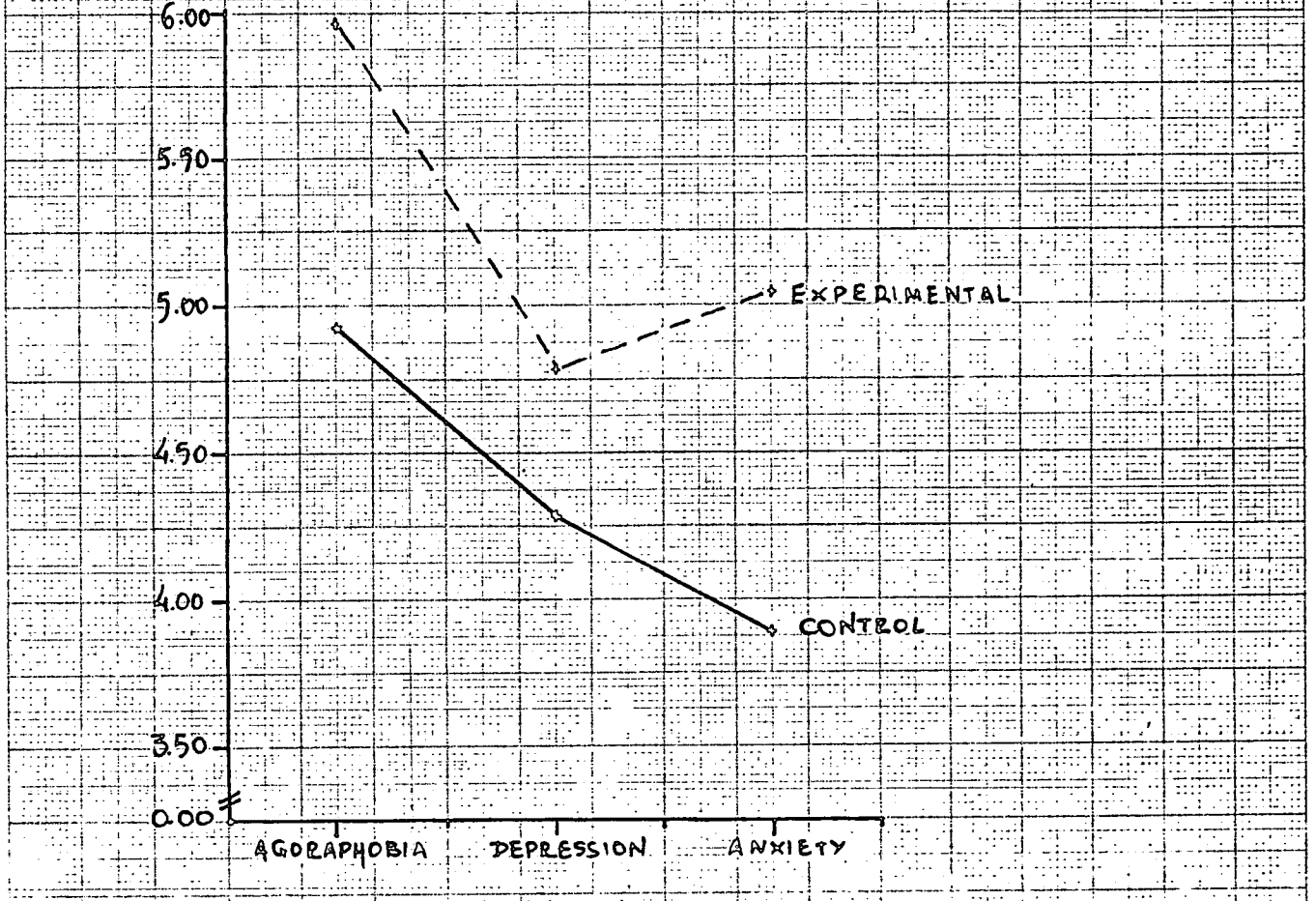


Fig. 3: INTERACTION BETWEEN WORD-TYPE AND WORD-LISTS FOR TOTAL RECALL

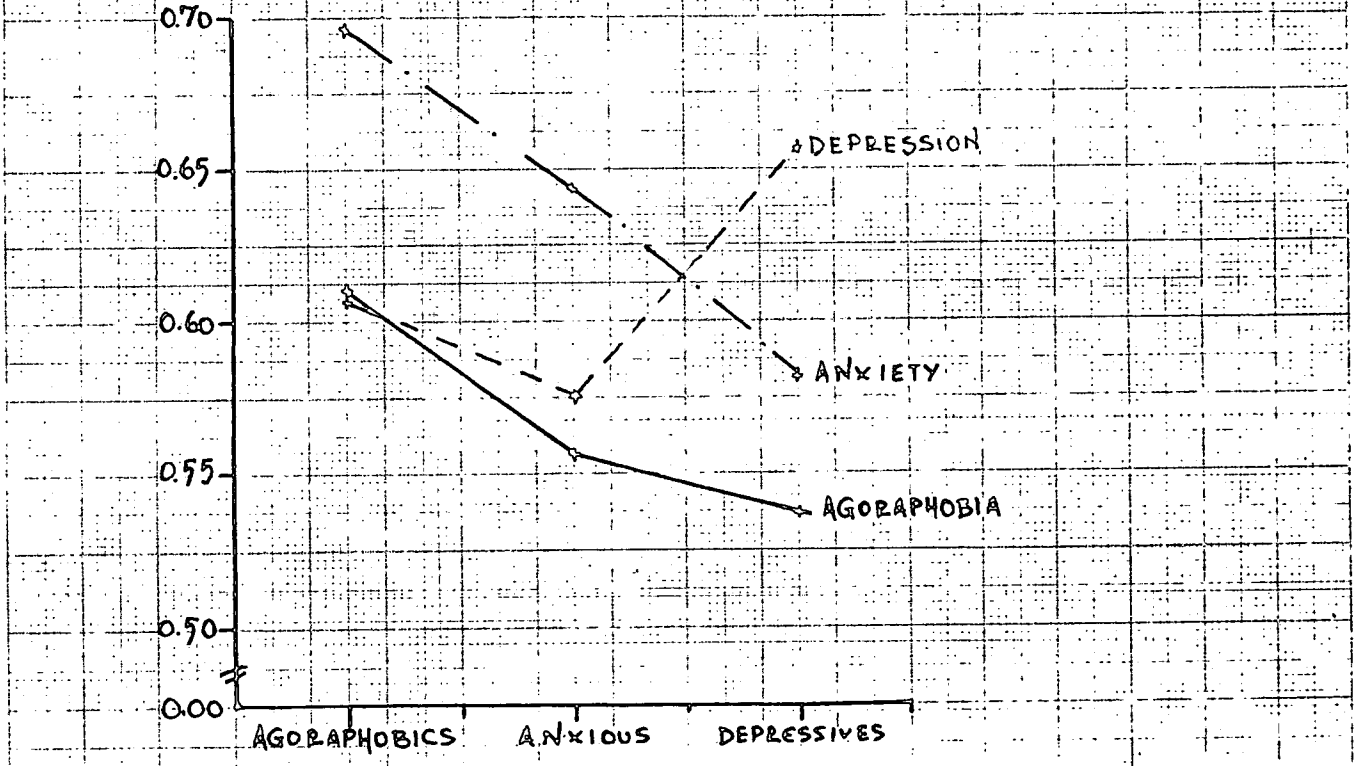


Fig 4 : MEAN CLUSTERING SCORE FOR EACH LIST AND BY EACH PATIENT GROUP.

Finally, on all 3 lists, patients have a higher score for experimental words than for control words. The difference of recall between experimental and control words is highest on the anxiety list and lowest on the depression list.

(iv) Clustering RR (without controls)

Table 12 below shows the mean clustering scores for each patient group:

TABLE 12: MEAN CLUSTERING SCORES BY EACH PATIENT GROUP

Groups		
Agoraphobics	Anxious	Depressives
0.654	0.591	0.591

Analysis of variance indicated a reliable difference between these clustering scores ($F = 3.58$, $df = 35.33$; $p<0.04$; see also Appendix K).

As can be seen agoraphobics clustered more overall than anxious and depressives. Anxious and depressive subjects had the same mean clustering score. It must be noted that a higher clustering score does not imply a greater word recall.

Furthermore table 13 below shows the mean clustering score for each list:

TABLE 13: MEAN CLUSTERING SCORE FOR EACH LIST

Lists		
Depression	Anxiety	Agoraphobia
0.629	0.640	.568

Analysis of variance indicated a reliable difference between these clustering scores ($F = 4.74$; $df = 2,66$; $p<0.02$; see also Appendix K).

From Table 13 it can be seen that patients have their lowest scores on the agoraphobia list. On the other hand, patients have their highest clustering scores on the anxiety list.

Table 14 shows the mean clustering score for each list and each group (see also Fig. 4):

TABLE 14 : MEAN CLUSTERING SCORE FOR EACH LIST BY EACH PATIENT GROUP

	Lists		
	Depression	Anxiety	Agoraphobia
Agoraphobics	0.657	0.697	0.610
Anxious	0.575	0.643	0.556
Depressives	0.656	0.581	0.537

The main point that arises out of these findings is the depressives' pattern of clustering scores on the depression list. Depressive group has a higher clustering score for the depression list than for the other two lists, whereas agoraphobic and anxious patients have a higher score for the anxiety list than for the other two lists.

Also, all three groups clustered more for anxiety list than for agoraphobia list. For the depression list, the anxiety group clustered less than the other two groups did, whereas for the anxiety and depression lists, agoraphobics have the highest scores and depressives the lowest.

However, the interaction between groups and lists was not significant ($F = 1.54$; $df = 2.4$; $p>0.20$; see also Appendix K).

(v) Correlations

Two correlation matrixes were constructed, the one with controls and the other without controls which correlated the five questionnaire scores of neuroticism, agoraphobia, anxiety, depression and disposition with the two measures i.e. total recall and clustering score of words correctly recalled taken from each word list - a total of six measures since only the experimental word category was used (see Appendix G).

a) Including controls

TABLE 15 : CORRELATION MATRIX (EXPERIMENTAL WORDS ONLY)

Correlations between Questionnaire Scores and Total Recall and Clustering Measures

Measures Taken	Word List	Questionnaire Scores * Neur	Agor	Anxiety	Depr	Disp
	Depression	.1451	-.1286	.2062	.1847	.2581
TOTAL	Anxiety	.0682	-.1750	.2449	.0664	.0494
RECALL	Agoraphobia	-.2180	-.1580	.0013	-.1139	-.2201
	Depression	.3997	-.0083	.0801	.2682	.3820
CLUSTERING	Anxiety	.0090	.2469	.2864	.1430	-.0461
	Agoraphobia	.2547	-.1397	.1440	.1326	.1101
	R ‰ .500 = .2907			R ‰ .100 = .3761		

* Neur = Neuroticism; Agor = Agoraphobia;

Depr = Depression; Disp = Disposition.

The main point that arises out of the correlation findings is the subjects' pattern of correlation on the depression list.

Firstly, there is no significant correlation between the scores of total recall of experimental words in any list and the general scores of neuroticism, agoraphobia, anxiety etc.

Secondly, there are two significant correlations in clustering : first, one between the clustering score of experimental words on the depression list and the general score of neuroticism (.40) and second, one between the clustering score of experimental words on the depression list and the general score of disposition (.382). The first correlation means that the higher score the subjects had in neuroticism the more likely they were to cluster experimental words from the depression list. The second correlation means that the higher score the subjects had in disposition, the more likely they were to cluster experimental words from the depression list.

It should be noted that i) if correlation is .291 then it is significant at p = .05, ii) if correlation is .376 or higher then it is significant at p = .01 and iii) if the correlation is lower than .291, then it is not significant because the probability, in this case, is high.

(vi) Correlations

b) Without controls

TABLE 16 : CORRELATION MATRIX (EXPERIMENTAL WORDS ONLY)

Correlations between Questionnaire Scores and Total Recall and Clustering Measures

Measures Taken	Word List	* Neur	Questionnaire Scores Agor	Anxiety	Depr	Disp
	Depression	.2611	-.1249	.3380	.3248	.3378
TOTAL	Anxiety	.0200	-.2199	.3327	.0403	.0747
RECALL	Agoraphobia	-.1704	-.1362	.1681	-.0319	-.1477
	Depression	.4726	-.0454	.0114	.2933	.4105
CLUSTERING	Anxiety	.2262	.2241	.2266	-.0125	-.1401
	Agoraphobia	.2273	-.2204	.2226	.1798	.2471
	R ‰ .0500 = .3291			R‰ .0100 = .4238		

* Neur = Neuroticism; Agor = Agoraphobia;
Depr = Depression; Disp = Disposition.

The main point that arises out of the correlation findings is the patients' pattern of correlation on the depression list.

Firstly, there is a significant correlation (.338) between the score of total recall of experimental words on the depression list and the general questionnaire score on anxiety. This correlation means

that the higher score the patients had in anxiety, the more likely they were to recall words from the depression list.

Secondly, there is a significant correlation (.338) between the score of total recall of experimental words on the depression list and the general score of disposition. That means that the higher score the patients had in disposition, the more likely they were to recall words from the depression list.

Similarly, there are two significant correlations with clustering: firstly, between the clustering score of experimental words on the depression list and the general score of neuroticism (.473) and secondly, between the clustering score of experimental words on the depression list and the general score of disposition (.411).

It should be noted that i) if correlation is .329 then it is significant at $p = .05$, ii) if correlation is .424 or higher then it is significant at $p = .01$ and iii) if the correlation is lower than .329, then it is not significant because the probability, in this case, is high.

3.4 Discussion

In terms of the hypotheses, dealing with the recall totals first, the original hypothesis that anxiety subjects should remember more anxious words overall than agoraphobia, depression and control subjects is not borne out by the results. From Table 3, it can be seen that anxious patients were more likely to recall words on the agoraphobia list than words on the other lists. Also, depressives and not anxious patients were the ones who had the highest score on the anxiety list although the difference with each other score on the same list is very small.

Similarly, the original hypothesis that depression subjects should recall more depression words overall than the other subject groups should do is refuted by the results. From Table 3 again, it can be seen that depressives were more likely to remember words from the anxiety list than words from any other list. Also, controls and not depressives were the ones who had the highest score on the depression list although the difference of controls' and depressives' scores on the depression list was very small.

In addition, the hypothesis that agoraphobics should remember more agoraphobia words overall than the other subject groups should do is only partly borne out by the results. In particular, from Table 3 again, it can be seen that agoraphobics do have their highest score on the agoraphobia list but on the other hand controls have a higher score on the same list.

Finally, the hypothesis that there will be no significant difference in recall between the lists for controls is also refuted by the results, as control subjects have got their highest score on the agoraphobia list and there is also a difference between controls' scores on the depression list and the anxiety list.

Furthermore, the original hypothesis that anxiety subjects, agoraphobics and depressives should remember more anxiety, agoraphobia and depression words respectively than neutral words, is not borne out by the results, since analysis of variance indicated no difference between these factors. Also, as it was expected, it showed no difference in recall for experimental versus neutral words for the controls.

Furthermore, for patients it was hypothesised that they would remember more experimental words compared to neutral words; this hypothesis is borne out by the results. From Table 10 it can be seen that patients did remember more experimental words than control words. This fact can also be seen from the Table 17 below.

TABLE 17 : MEAN NUMBER OF WORDS RECALLED FOR EACH WORD-TYPE

Patient Groups	Type of Words	
	Experimental	Control
Agoraphobics	5.403	4.292
Anxious	5.347	4.556
Depressed	5.410	4.236

Also, the original hypothesis about the trials is borne out by the results. All subjects did recall more words overall on the second trial than on the first trial, more words overall on the third than on the second trial and more words on the fourth than on the third trial. This fact can be seen from the Table below (see also Appendix J):

TABLE 18 : MEAN NUMBER OF WORDS CORRECTLY RECALLED OVER FOUR TRIALS

	Trials			
	1	2	3	4
Including controls	4.449	5.225	5.920	6.196
Without controls	3.366	4.801	5.537	5.792

The above results are significant. ($F = 46.56$; $df = 3,126$; $p<0.01$; see also Appendix H).

For clustering scores, the original hypothesis that anxiety subjects would have higher clustering scores for anxiety list words is borne out by the results since, as seen in Table 14 anxious subjects showed greater clustering on the anxiety list words than words on the other lists. However, agoraphobics and not anxious subjects were the ones who had the highest clustering score on the anxiety list although the difference of anxious' and agoraphobics' scores on the anxiety list was small.

Similarly, the original hypothesis that depression subjects should cluster more depression words overall than the other groups should do is borne out by the results since from Table 14 again, it can be seen

that depressives not only clustered more words from the anxiety list than words from any other list but also were the ones who had the highest clustering score on the depression list than any other group; however agoraphobics' clustering score on the depression list is roughly equal to the clustering score of depressives on the same list.

On the other hand, the hypothesis that agoraphobics should cluster more agoraphobia words overall than the other subject groups should do is only partly borne out by the results. In particular from Table 14 again, it can be seen that agoraphobics are the ones who have the highest score on the depression list (although depressives' clustering score is roughly equal to agoraphobics' clustering score) but were less likely to cluster the agoraphobia list words than words from any other list.

Finally, the hypothesis that there will be no significant difference in clustering between the lists for controls is borne out by the results as there was no reliable difference between clustering scores for controls.

Furthermore, the original hypothesis that anxiety subjects, agoraphobics and depressives should cluster more anxiety, agoraphobia and depression words respectively than neutral words, is not borne out by the results, since analysis of variance indicated no difference between these groups.

Also, as there was no reliable difference in clustering scores for experimental versus neutral words for the controls.

Furthermore, for patients it was hypothesised that they would cluster more experimental words compared to neutral words; this hypothesis is borne out by the results. From Table 19 below, it can be seen that patients did cluster more experimental words than control words.

TABLE 19 : MEAN CLUSTERING SCORE FOR EACH WORD-TYPE

Type of Words	
Experimental	Control
0.674	0.551

For all patients it should be noted that analysis of variance indicated a reliable difference between these clustering scores ($F = 3.08$; $df = 2.33$; $p = 0.05$; see also Appendix K).

All subjects clustered more words overall on the first trial than on any other trial; also all subjects clustered more words overall on the third trial than on the second one and more words on the fourth trial than on the third one.

In addition, considering just the patients, they clustered more words overall on the first trial than on any other trial; besides all patients clustered more words on the second trial than on the third one and more words on the fourth trial than on the second one. This fact can be seen from the Table over the page.

TABLE 20 : MEAN CLUSTERING SCORES OVER FOUR TRIALS

	Trials			
	1	2	3	4
Subjects	0.634	0.596	0.600	0.607
Patients only	0.632	0.604	0.598	0.615

However, the above results are not significant ($F = 0.98$; $df = 3,126$; $p>0.05$; see also Appendix I).

For the correlations between questionnaire scores and the two measures carried out on the experimental words only one of the original hypotheses was partly borne out by the results in the "including controls" case. This was that there would be significant correlations between neuroticism and disposition scores and the words clustered from the depression list.

Similarly in the "without controls" case, only one, of the original hypotheses was partly borne out by the results. This was that, as before, there would be significant correlations between neuroticism and disposition scores and the words either recalled or clustered from the depression list.

However, a correlation between anxiety score and the score of total recall of experimental words on the depression list was borne out by the results without having been hypothesised originally.

Furthermore, looking at Table 9 it can be seen that all subjects were more likely to recall agoraphobia words, less likely to recall anxiety words and even less likely to recall depression words. This may be because depression words are too unpleasant to be recalled a lot when agoraphobia words are easy enough to be effortlessly remembered.

CHAPTER FOUR

Experiment Two

4.1 Introduction

Derry and Kuiper (1987) required subjects to carry out the self-referent rating task before they were required to free recall as many of the adjectives as possible. In this experiment subjects were simply presented with the words and told they would have to recall them at the end of the presentation. The self-rating task was carried out after this memory task.

The main reason for carrying out the experiment in this order was to ensure that the subject's recall was truly subjectively organised in terms of self and not imposed by the experimenter.

A possible explanation of the Derry & Kuiper finding that depressives remember a greater proportion of yes-rated depressed-content personal adjectives than yes-rated nondepressed-content adjectives is that the existing self-schema had been strengthened to provide these memory effects which would not have otherwise occured.

Another difference between this experiment and Derry & Kuiper's is the nature of the material used. Derry and Kuiper used personal adjectives differentiated on the basis of depressed versus non-depressed content.

This experiment uses personal adjectives differentiated on three different types of content:- depressed, anxious and a combination of anxious and depressed (i.e. both, see Appendix P). Also the initial pool of personal adjectives was made up of these adjectives judged to be unpleasant or negative by the experimenter. This differs from Derry and Kuiper's initial pool which contained personal adjectives "viewed as representative of a broad range of normal characteristics", and personal adjectives derived from the depression literature. All words were rated for content (anxiety and depression) and imagery in this experiment. (See procedure). So the crucial difference is that the adjectives used here are not differentiated on the basis of negative versus positive content. Examples of neutral adjectives used by Derry & Kuiper are "amiable", "curious", "loyal" and "organised" which would not be judged as negative.

Thus, it is possible that Derry and Kuiper's adjectives were distinguishable on two measures - depressed content versus nondepressed content and negative content versus a range of "un-negative" to positive content (possibly mostly positive). Since these two measures went together, it is not possible to say whether the depressed content adjectives were remembered because of their depressed and negative content or simply because of their depressed content or simply because of their negative content.

McDowall (1984) has already found that depressives remember more negative or unpleasant content words than positive or pleasant words, so by removing the positive versus negative distinction by having all the words unpleasant (as in this experiment) it should be possible to determine whether subjects remembers words primarily for their depressed content and similarly, primarily for their anxious content.

There are three word lists (see Appendix P). In one, the words were differentiated on the basis of depressed content adjectives versus non-depressed content and non-anxious content adjectives. In the second, the words differed in terms of anxious content adjectives versus non-anxious content and nondepressed content adjectives. The third word list differentiated on the basis of anxious and depressed content adjectives versus non-anxious and non depressed content adjectives.

Since the patients used in this study scored higher overall than controls on measures of both anxiety and depression, it is hypothesised that their underlying cognitive organisation will reflect both these elements, thus increasing the likelihood of adjectives containing both anxiety and depression being integrated or encoded within that organisation. It is further hypothesised that this effect will be greater on the third ("both") list than on the anxiety or depression lists where only one element is present.

So, in terms of experimental results, a number of findings are hypothesised. First, that patients will recall more experimental (i.e. depressed, anxious or both content) adjectives compared to neutral adjectives, and the highest difference in recall will be found for the "both" list; no significant difference in recall for experimental versus neutral words will be found for the controls although the overall recall level will be higher due to the overall higher IQ inferred from educational background.

Secondly, that a corresponding pattern of clustering scores will be found.

Thirdly, since there are two trials for each list, that the number of adjectives recalled on the second trial will increase and there will be a corresponding increase in the amount of clustering (Sternberg & Tulving, 1977).

Fourthly, out of the experimental words correctly recalled, the proportion of "yes-self-rated adjectives will be greater than the corresponding proportion out of the neutral adjectives, and again this difference will be greatest for the "both" list. No significant difference is hypothesised for the controls.

Finally, there will be correlations between individual subject's anxiety, depression and neurotic scores on the personality tests and these three measures (ie recall, clustering and proportion of self-rated words correctly recalled) taken from the experimental adjectives of each list separately. More specifically, that anxiety scores will correlate with the measures from the anxiety list and "both" list, depression scores will correlate with the measure from the depression list and the neurotic (neuroticism) scores will correlate with the measures from all three lists.

4.2 Method

A) Preliminary study for construction of word lists used in main experiment

Subjects

Four students at Durham University served as subjects. There were two females and two males and all were aged 20 years.

Materials

A list of personal adjectives was constructed. The criteria for inclusion on this list were:

a) The adjectives had a frequency of occurence in English of between 10 and 50 as measured by Thorndike & Lorge (1944).

b) Adjectives were all judged to be negative by the experimenter. Examples of negative adjectives are "careless", "cruel", "feeble" and "ashamed".

Procedure

The list of words was read out to each subject. After hearing each word the subject was asked to rate it on a 9-point scale either of anxiety descriptiveness or depression descriptiveness (see Appendices M and N). On the anxiety scale an adjective was rated '1' if it "describes a person who is very relaxed" and '9' if it "describes a

person who is very anxious". The corresponding end points on the depression scale were 'very happy' (1) and 'very depressed' (9). The words were in a different random order for every presentation. The subject was then asked to rate the words on the depression or anxiety scale in the same way, again the words were in a different random order.

About a week later, the same subjects rated the words for imagery. They were given instructions to read which were adapted from Paivio et al's (1968) study of 925 nouns. (The instructions used are shown in Appendix O). The adjectives were rated on a 7-point scale where 1 was "low imagery" and 7 was "high imagery". This was done using the same procedure as for the anxiety and depression descriptiveness ratings.

Thus, for each word, three sets of ratings were obtained : anxiety, depression and imagery. From these sets, average anxiety, depression and imagery ratings were calculated.

B) Main Study

Subjects

Twelve patients suffering predominantly from anxiety (but in some cases also depression to a lesser extent (see Appendix T)) and eight unmatched controls served as subjects. The patients were all attending a local hospital either as outpatients or daypatients. (Only two out of twelve were day patients). The criteria for including the patients in the study were : (i) anxiety or depression feelings, or both, were

their main problem. (ii) they had not been outpatients or day patients for longer than six months. (iii) they were not taking anti-depressant drugs or tranquillisers.

There were six female patients and six male patients. Their average age was 40.8 years (range 26-66 years). Eight students at Durham University served as controls. There were two females and six males. Their average age was 19 (range 18-20). Educational details for the two groups of subjects are given in the results section, Table 22.

No attempt was made to match the two groups of subjects for age, occupation and education. It was thought that these factors would have some effect on the overall numbers of words remembered i.e. students would remember more words than patients. However, it was not thought they would affect the pattern of results.

Materials

Three lists of 20 words were constructed : the anxiety list, the depression list and the "both" list . East list consisted of 10 experimental words and 10 neutral words all taken from a list of words used in the preliminary study. For the anxiety list, the experimental words were rated high on anxiety and low on depression. Similarly, for the depression list, the experimental words were rated high on depression and low on anxiety. For the "both" list the words were rated high on both depression and anxiety. Neutral words were not rated high on either depression or anxiety. (See Appendix P for word lists and ratings). The words were rated by 5 independent judges

(undergraduate students) on a 5 point scale for anxiety and for depression.

The experimental and neutral words were matched on number of syllables, frequency of occurrence and imagery value.

Examples of anxiety words are "frantic", "uncomfortable" and "watchful"; examples of depression words are "desolate", "wretched" and "desperate" and examples of neutral words are "vulgar", "horrible" and "contrary". All lists were pre-recorded and preceded by a practice list (see Appendix Q). Three tapes were made of the following three different list orders:

(i) practice, "both", anxiety, depression
(ii) practice, depression, "both", anxiety
(iii) practice, anxiety, depression, "both"

So every list appeared first, second and third in order of presentation to the subject. The words in each list except the practice list were in a different random order every time they were recorded. The words were recorded at a rate of approximately one every four seconds. For the self-rating task, a fourth tape was made of all the words (except those on the practice list) recorded at a rate of one every five seconds (see Appendix S). The Leeds self-assessment scale questionnaire was used, along with the Eysenck Personality Questionnaire (see Appendices L and C).

Design and Procedure

Subjects were asked if they would take part in an experiment "to investigate the way people remember information" followed by some questionnaires. They were immediately escorted next door and introduced to the waiting experimenter. The experimenter thanked the subject for agreeing to take part and gave a further brief explanation of what the subject were required to do. The subject was told he/she would hear three different lists each containing 20 words. He/she was required to listen to each list carefully and then immediately after each list had finished say as many of the words that he/she could remember. No time limit would be set, subjects simply indicated that they had said as many of the words as they felt they could remember. Then after each list had been recalled, the subject would listen to the same list again but with the words in a different order, and again would be asked to say as many of the words as he/she could remember when the lists finished. When all the lists had been recalled twice there would be some brief questionnaires. Once fully acquainted with what they were asked to do, the subjects were given a consent form to read and sign if they still wished to take part in the experiment (see Appendix R). Before the main experiment began, subjects heard and recalled the practice list so the experimenter and the subject could feel absolutely sure that the instructions had been understood.

After the memory test had finished the subjects heard the fourth tape which had been recorded for the self-rating task. In the pauses between words, subjects were required to say "yes" if they felt the word described them recently i.e. in the past few days or week and "no" if they felt it did not.

Because of a possible response bias in favour of "yes" and because of the unpleasant nature of the words, subjects were told that it was not important if they said many more "no's" than "yes's". The experiments noted the "yes" and "no" responses and then obtained details of age, occupation, age left school and type of school attended. Then subjects were given the Eysenck Personality Questionnaire (E.P.Q.) and the Leeds self-assessment scale and asked to fill them in.

The procedure for the control subjects was exactly the same as for the patients except that: (i) they were approached by the experimenter rather than the clinical psychologist. (ii) the test took place in a room which was usually the subject's own, rather than a "foreign" hospital room. (iii) the control subject was alone with the experimenter rather than a colleague of the experimenter being present throughout the whole experiment. (iv) the experimenter presented the questionnaires to the control subjects rather than the experimenter's colleague who presented them to the patients.

4.3 Results

1. Subject Details

(A) Questionnaire Scores

Anxiety and Depression scores for each subject were calculated from the Leeds Self Assessment Scale and a neuroticism score was calculated from the E.P.Q. The mean questionnaire scores for each group are shown in Table 21 below.

TABLE 21 : MEAN QUESTIONNAIRE SCORES FOR EACH SUBJECT GROUP

	Subject Group	
Type of Questionnaire Score	Patients	Controls
Anxiety	9.75	4.14
Depression	5.92	2.71
Neuroticism	16.32	10.86

(B) Subjects' Education

TABLE 22 : EDUCATION OF SUBJECTS

Subject Group	Average Age on leaving	Numbers who attended each type of school		
		Comprehensive	Secondary Modern	Grammar
Patients	15.5	3	5	4
Controls	18	5	0	3

Three main measures were calculated.

i) Total recalled (see Appendix U) i.e. the total number of experimental and control words correctly recalled by each subject for each list on each trial. Sometimes subjects recalled the same word twice in the same trial; these repetitions were included in the total recall score for that trial.

ii) To obtain some measure of clustering, a recall count was based on words recalled as adjacent pairs : the number of depression or anxiety or "both" words recalled in a clustered fashion for each subject, for one trial and experimental and neutral words separately, was counted as the number of sequentially occurring adjacent word pairs and this measure was taken as a proportion of all the words recalled for that trial, considered as the number of possible sequential adjacent pairs, irrespective of word type.

Words were only included in this count as a measure of clustering if they occurred at least as a pair.

If a pair of words of a particular category was identified either side of a repeated word, the pair of words was only counted as such if the middle word was of the same category, so there is an assumption here that the organising principle for these three words would be the same. This did not matter in constructing the denominator of the score of course.

A Ratio of Repetition (RR) (Cohen et al, 1954) is calculated in the following way : $RR = \frac{r}{(n-1)}$

where n = the number of words correctly recalled from a particular category i.e. experimental or neutral,

and r = the number of pairs of words consecutively recalled from the same category or "category repetitions".

What this measured was how much the subject clustered category words together and in such a way that the score calculated was independent of total recall. An example of the procedure is : if a subject's total recall from a particular list (in this case, depression) was :

critical, TRAGIC, HELPLESS, LONELY, hurried, GLOOMY, bathful, BEATEN, HELPLESS, childish, clumsy, DREARY

where words in upper case are the experimental words, words in lower case and underlined are the control words and words in lower case which are not underlined are words not on the list being recalled i.e. foreign words. It will also be noted that 'HELPLESS' is repeated. This repetition is treated just the same as any other experimental word i.e. it is not excluded in any way from the results. Where more than one word of the same category are recalled together, this counts towards the total r. One pair is r = 1, two pairs are r = 2, three pairs are r = 3 and so on.

e.g. BEATEN, HELPLESS, r = 1 and for TRAGIC, HELPLESS, LONELY there are two pairs so r = 2; also, childish, clumsy, r = 1. The total r for

the depression list is therefore r = 3 and n = 7 so RR = 0.50 for the experimental words. For the neutral words, r = 1 and n = 4, so RR = 0.33 (see also Appendix V).

iii) The proportions of self-rated words correctly recalled (see Appendix W) was calculated. That is, for each subject, out of the words they correctly recalled, some of them were self-rated. The proportion of correctly recalled words which were self-rated was calculated for each word category on each word list with both trials combined and for each subject.

Treatment of results

Various analyses were made to detect differences between combinations of the experimental groups, and the three word lists and the word type i.e. experimental words versus control words, using the three measures described above. Except where explicitly mentioned the results were combined for the 2 trials. As in the first experiment results are in two parts: firstly patients and controls and secondly patients only. Besides looking at all subjects together, patients are also being looked at separately because not only were the controls not matched with the patients, but also taking into account that controls, who are students are very familiar and used to the vocabulary that is used for the memory tests.

i) Total Recalled (including controls)

The mean number of words recalled by each subject group are shown in Table 23 below:

TABLE 23: MEAN NUMBER OF WORDS RECALLED BY EACH SUBJECT GROUP

Subject Groups	
Controls	Patients
4.740	3.021

Analysis of variance indicated a reliable difference between these scores ($F = 7.05$; $df = 1,19$; $p<0.02$; see also Appendix X).

The only effect here is the expected effect of subject group on overall total recall. Control subjects remembered more words overall than patients.

Taking all subjects on all three lists, the mean number of words recalled for each trial are shown in Table 24 below:

TABLE 24 : MEAN NUMBER OF WORDS RECALLED FOR EACH TRIAL

Trial 1	Trial 2
3.458	3.958

Analysis of variance indicated a reliable difference between these scores ($F = 4.91$; $df = 1,18$; $p<0.05$; see also Appendix X).

From Table 24 it is clear that for all subjects on all three lists, there is increased recall on the second trial - as it was expected - and this effect is also significant.

Taking all subjects on all three lists and overall 2 trials, the mean number of words recalled for each type of words, is shown in Table 25 below:

TABLE 25 : MEAN NUMBER OF WORDS RECALLED FOR EACH WORD TYPE

Control	Experimental
3.200	4.217

Analysis of variance indicated a reliable difference between these scores ($F = 23.43$; $df = 1,18$; $p<0.01$; see also Appendix X).

Looking at the difference between two types of words, the analysis showed that subjects were more likely to recall experimental words than control words.

Taking each subject group, the mean number of words recalled for each word-type can be seen in Table 26 below (see also Fig. 5):

TABLE 26 : MEAN NUMBER OF WORDS RECALLED FOR EACH WORD-TYPE BY EACH SUBJECT GROUP

	Type of words	
	Control	Experimental
Controls	3.854	5.625
Patients	2.764	3.278

Analysis of variance indicated a reliable interaction between subject group and type of word ($F = 7.09$; $df = 1.18$; $p<0.02$; see also Appendix X).

The main point that arises out of these findings is the control's pattern of scores on the experimental type of words.

Each subject group was more likely to recall experimental words than control words. Also controls have a higher score for both experimental and control words. In addition the difference at recall between controls and patients on the experimental type of words was at least twice the difference on the control type of words.

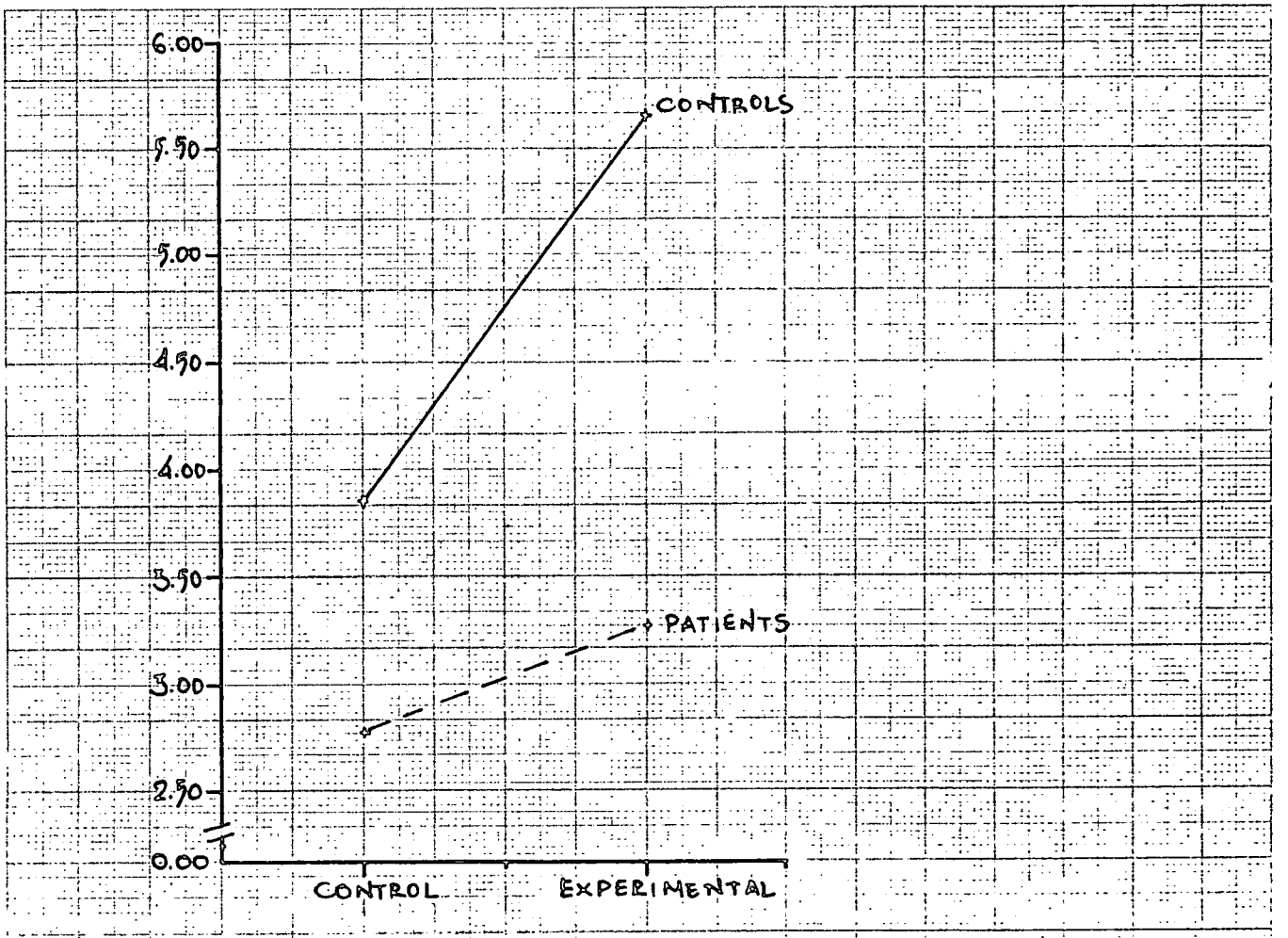


Fig. 5 : MEAN NUMBER OF WORDS RECALLED FOR EACH WORD-TYPE BY EACH SUBJECT GROUP

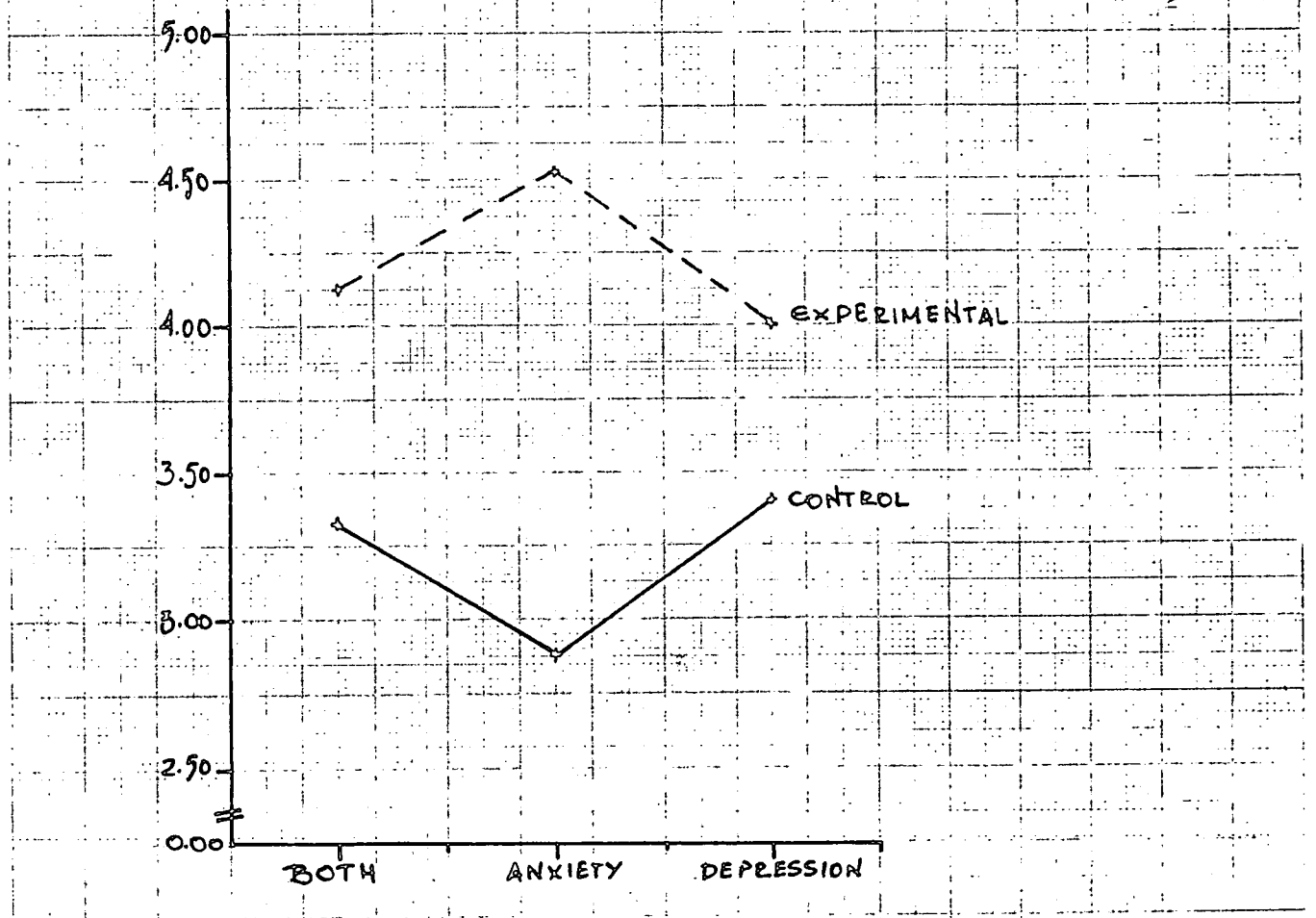


Fig. 6 : INTERACTION BETWEEN WORD-TYPE AND WORD-LIST FOR TOTAL RECALL

Taking all subjects overall 2 trials, the interaction between word-type and word-lists can be seen in Table 27 below (see also Fig. 6):

TABLE 27: INTERACTION BETWEEN WORD-TYPE AND WORD-LIST FOR TOTAL RECALL

Lists	Type of words	
	Control	Experimental
Both	3.325	4.125
Anxiety	2.875	4.525
Depression	3.400	4.000

Analysis of variance indicated a reliable difference between these scores ($F = 5.03$; $df = 2.38$; $p<0.02$; see also Appendix X).

The main point that arises out of these findings is the words' pattern of scores on the axiety list. All subjects were less likely to recall the control words on the anxiety list than the control words on the "both" list or depression list. On the other hand, all subjects have a higher score for experimental words on the anxiety list than for experimental words on the "both" list or depression list.

Finally, it can be seen once more that on all 3 lists, subjects have a higher score for experimental words than for control words. The difference of recall between experimental and control words is highest on the anxiety list and lowest on the depression list.

ii) Clustering (including controls)

Table 28 below shows the mean clustering score for each list and each group (see also Fig. 7):

TABLE 28: MEAN CLUSTERING SCORE FOR EACH LIST BY EACH GROUP

Groups	Lists		
	Both	Anxiety	Depression
Controls	0.416	0.372	0.617
Patients	0.361	0.434	0.316

Analysis of variance indicated a reliable difference between these clustering scores ($F = 4.65$; $df = 2.36$, $p<0.02$; see also Appendix Y).

From Table 28 it can be seen that patients have their lowest scores on the depression list whereas controls have their highest. Similarly, patients have their highest clustering scores on the anxiety list whereas controls have their lowest clustering scores on this list. So the pattern of results for each group mirrors that of the other. From Table 28, it can also be seen that controls clustered more overall than the patients. The difference of clustering between controls and patients is highest on the depression list. The total mean clustering score for the controls was calculated to be 0.46 whereas for the patients it was 0.37. However, this difference was not significant.

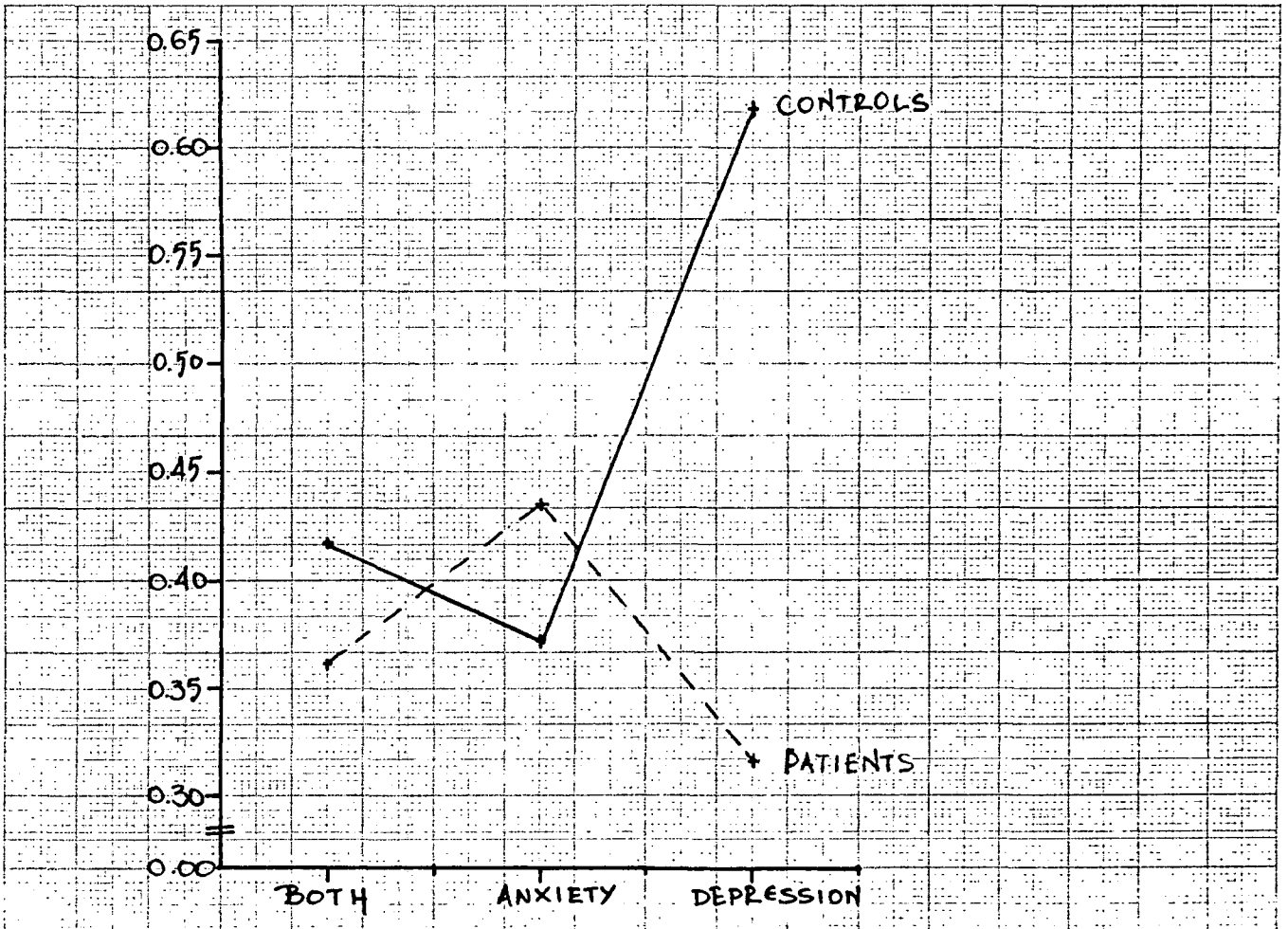


Fig. 7 : MEAN CLUSTERING SCORE FOR EACH LIST BY EACH GROUP

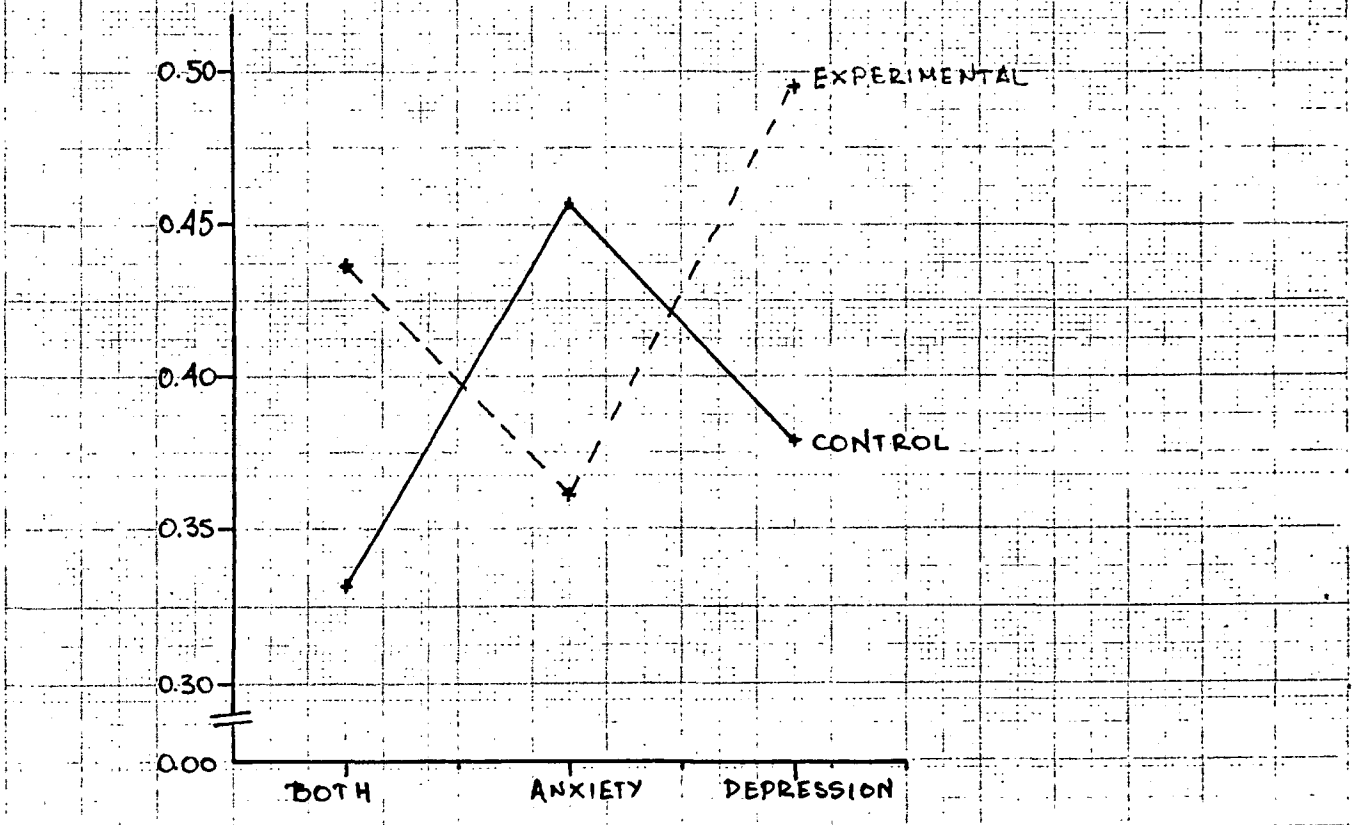


Fig. 8 : MEAN CLUSTERING SCORE FOR EACH WORD-TYPE AND EACH WORD-LIST

Taking all subjects and overall 2 trials, the mean clustering score for each type of words and each list, is shown in Table 29 below (see also Fig. 8):

TABLE 29: MEAN CLUSTERING SCORE FOR EACH WORD-TYPE AND EACH WORD-LIST

Lists	Type of words	
	Control	Experimental
Both	0.331	0.437
Anxiety	0.457	0.361
Depression	0.378	0.495

Although the probability is only marginal, analysis of variance indicated a difference between these clustering scores ($F = 2.95$, $df = 2.36$; $p0.05 < p < 0.07$; see also Appendix Y).

From Table 29 it can be seen that experimental type of words has its lowest scores on the anxiety list whereas control type of words has its highest. On the other hand experimental type has its highest clustering scores on the depression list whereas control type has its lowest clustering scores on the "both" list. It can also be seen that overall subjects clustered more experimental words than control words.

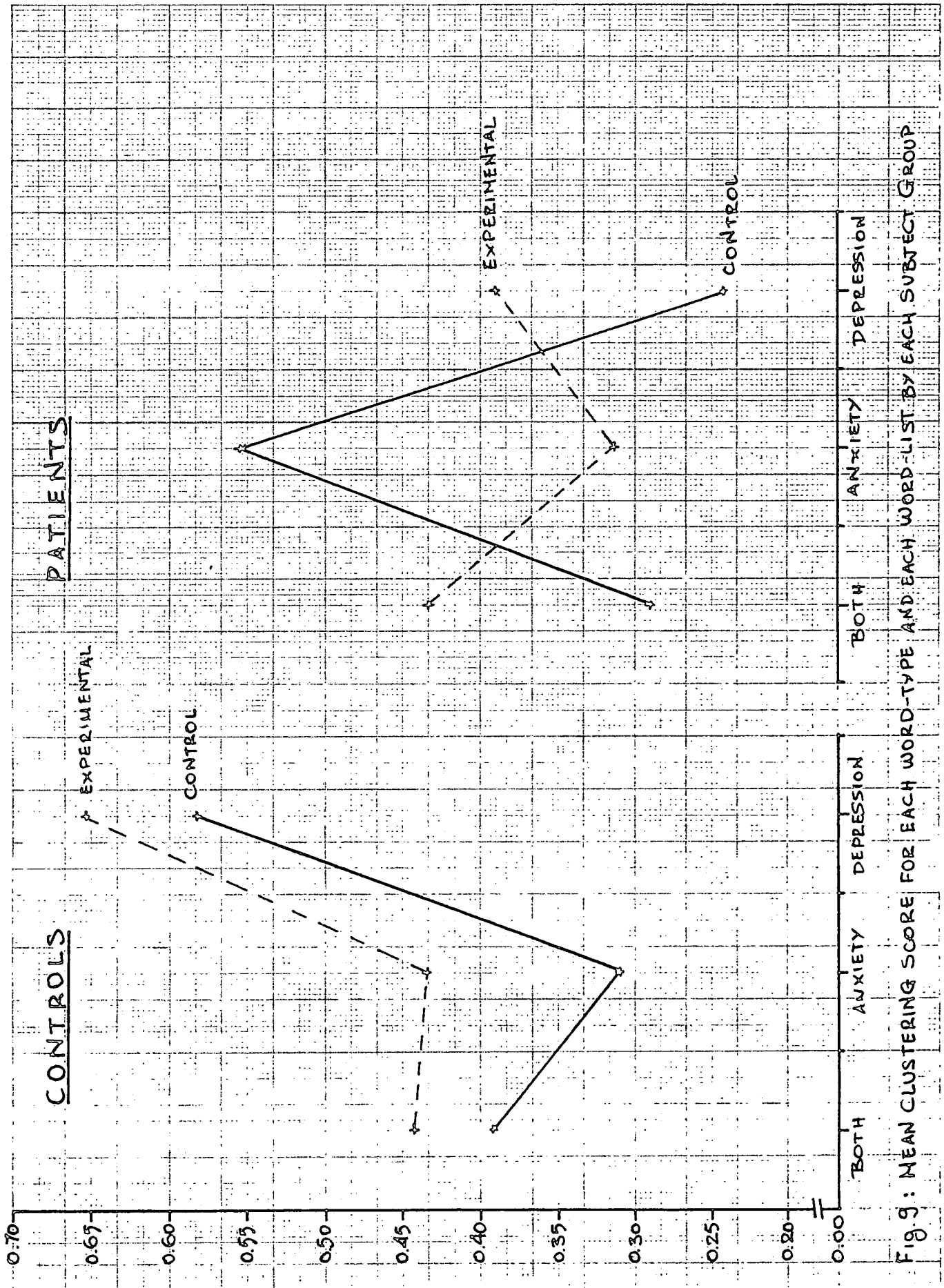


Fig. 9: Mean clustering score for each word-type and each word-list by each subject group

Furthermore, taking patients and controls separately and overall 2 trials, the mean clustering score for each type of words and each list is shown in Table 30 (see also Fig. 9):

TABLE 30: MEAN CLUSTERING SCORE FOR EACH WORD-TYPE AND EACH LIST BY EACH SUBJECT GROUP

a) Controls

Lists	Type of words	
	Control	Experimental
Both	0.392	0.442
Anxiety	0.309	0.434
Depression	0.582	0.653

b) Patients

Lists	Type of words	
	Control	Experimental
Both	0.290	0.433
Anxiety	0.555	0.313
Depression	0.242	0.390

Analysis of variance indicated a reliable difference between these clustering scores ($F = 5.79$; $df = 2.36$; $p<0.01$; see also Appendix Y).

a) Controls

The main point that arises out of these findings is the words' pattern of clustering scores on the depression list. Controls were

more likely to cluster both the experimental and control words on the depression list, less likely to cluster the words on the "both" list and even less likely to cluster the words on the anxiety list. Also, on all 3 lists, controls were more likely to cluster experimental words than control words.

b) Patients

The second part of Table 30 is similar to Table 29. In this part, it can be seen that control type of words has its highest scores on the anxiety list whereas experimental type of words has its lowest. On the other hand experimental type has its highest clustering scores on the "both list" whereas control type has its lowest clustering scores on the depression list.

From the second part of Table 30, it can also be seen that patients clustered more overall experimental words than control words. Also, from both parts of Table 30, it can be seen that the overall difference of clustering between experimental and control words is higher in the case of controls than in the case of patients.

iii) Proportion of self-rated words correctly recalled (including controls)

The mean number of self-rated words recalled over 2 trials by each subject group are shown in Table 31 over:

TABLE 31: MEAN NUMBER OF SELF-RATED WORDS RECALLED OVER 2 TRIALS

Subject Groups	
Controls	Patients
0.170	0.216

Although Table 31 indicates that patients recall a higher proportion of self-rated overall than do controls, this difference was not reliable ($F<1$).

Taking all subjects and overall 2 trials, the mean number of self-rated words recalled on each list are shown in Table 32 below:

TABLE 32: MEAN NUMBER OF SELF-RATED WORDS RECALLED ON EACH LIST

Lists		
Both	Anxiety	Depression
0.174	0.245	0.173

Looking at the difference between three lists, the main point that arises is the subjects' pattern of scores on the anxiety list. Subjects, overall, have a higher score for the anxiety list than for the "both" list or the depression list, although the difference was not statistically reliable ($F = 1.25$, $df = 2.36$; see also Appendix Z).

Taking each subject group, the mean number of self-rated words recalled on each list are shown in Table 33 below (see also Fig. 10):

TABLE 33: MEAN NUMBER OF SELF-RATED WORDS RECALLED ON EACH LIST BY EACH SUBJECT GROUP

Subject Groups	Lists		
	Both	Anxiety	Depression
Controls	0.114	0.243	0.153
Patients	0.214	0.246	0.187

The main point that arises out of these findings is the difference between controls and patients on the "both" list, however as before, this difference is not reliable ($F<1$).

In general, patients have higher scores on all three lists than controls do. The difference between controls and patients is highest on the "both" list and lowest on the anxiety list.

From Table 33, it can also be seen that both groups (controls and patients) have their highest scores on the anxiety list, whereas controls have their lowest scores on "both" lists and patients have their lowest scores on depression list.

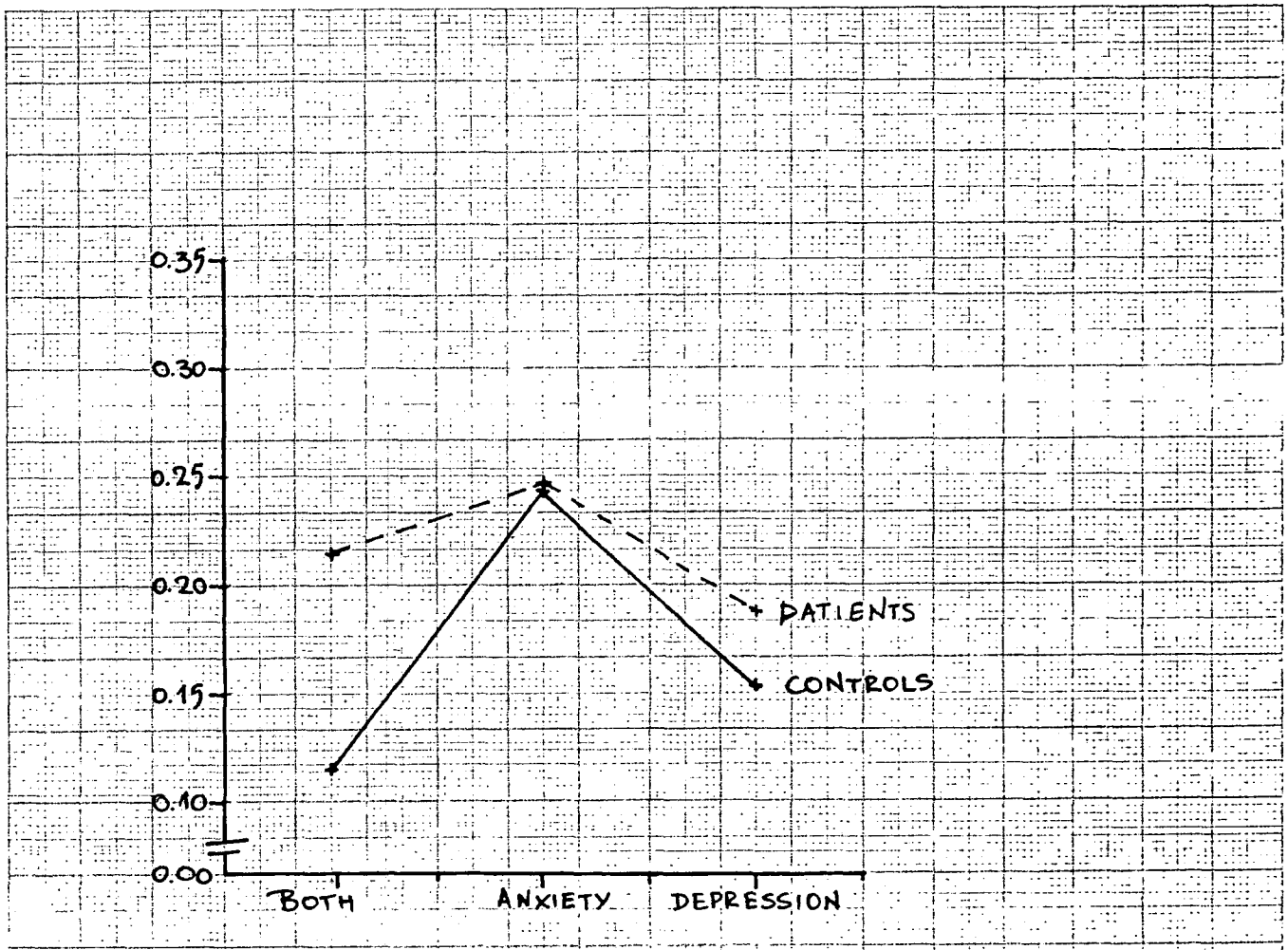


Fig 10: MEAN NUBER OF SELF-RATED WORDS RECALLED ON EACH LIST BY EACH SUBJECT GROUP.

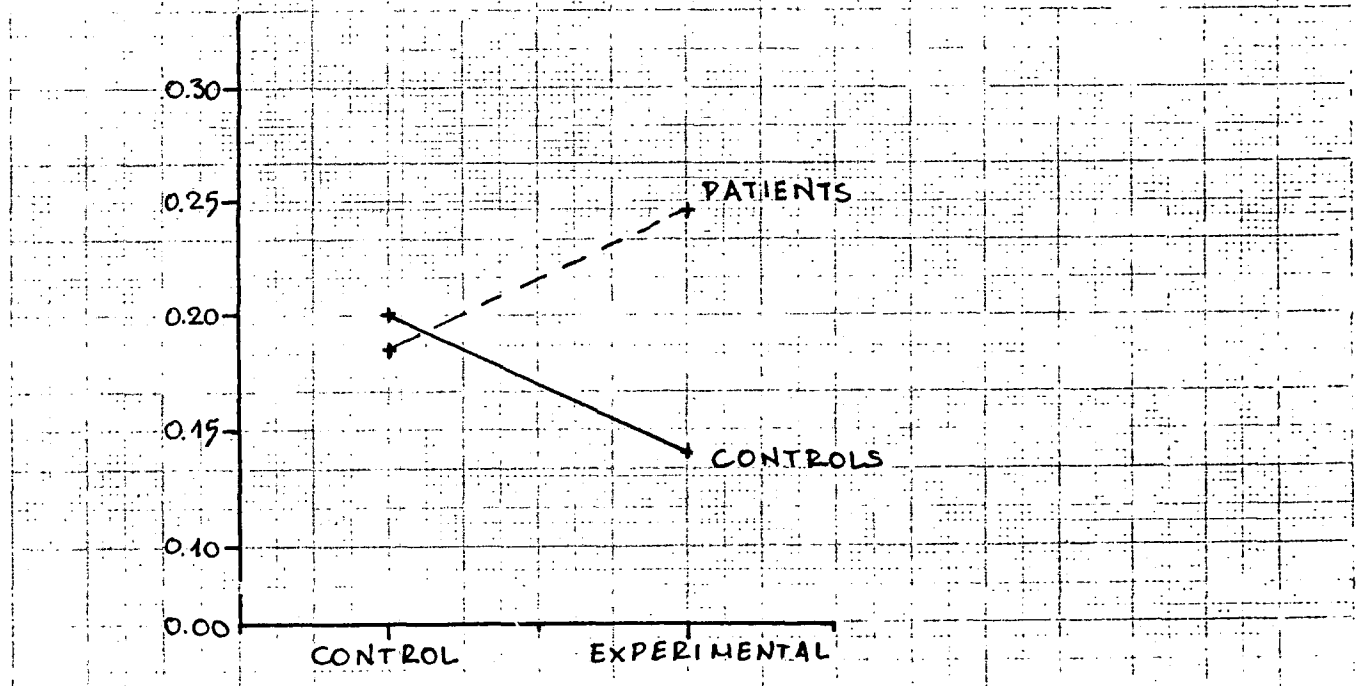


Fig 11: MEAN NUMBER OF SELF-RATED WORDS RECALLED FOR EACH WORD TYPE BY EACH SUBJECT GROUP

Taking each subject group, the mean number of self-rated words recalled for each word-type can be seen in Table 34 below (see also Fig. 11):

TABLE 34: MEAN NUMBER OF SELF-RATED WORDS RECALLED FOR EACH WORD-TYPE BY EACH SUBJECT GROUP

Subject Groups	Type of words	
	Control	Experimental
Controls	0.200	0.140
Patients	0.185	0.246

Again there was no reliable difference between these scores ($F = 1.65$; $df = 1.10$; see also Appendix Z).

However, from Table 34, it can be seen, as expected, that controls have a higher score for the control words than for the experimental words. Also, controls have a higher score for control words than patients do for these words, whereas patients have a higher score for the experimental words than controls do for these words. The difference of scores between controls and patients is higher for the experimental type of words than it is for the control type of words.

(iv) Correlations (including controls)

Two correlation matrices were constructed (the one without controls and the other including controls) which correlated the three

questionnaire scores of anxiety, depression and neuroticism with the three measures i.e. total recall, clustering score and proportion of self-rated words correctly recalled taken from each word list - a total of nine measures since only the experimental word category was used (see Table 35).

TABLE 35 : CORRELATION MATRIX (EXPERIMENTAL WORDS ONLY)

Correlations between Questionnaire Scores and Total Recall, Clustering and "Proportion Measures"

Measure Taken	Word Lists	Questionnaire Scores		
		Anxiety	Depression	Neuroticism
	Both	-.5356	-.5126	-.2941
Total	Anxiety	-.5143	-.3803	-.1520
Recall	Depression	-.3508	-.3963	-.0133
	Both	-.0047	-.1987	-.1566
Clustering	Anxiety	-.0628	-.4534	-.0148
	Depression	-.5739	-.4561	-.3035
Proportion	Both	.6964	.4756	.3630
Self-Rated	Anxiety	-.0269	.0702	.1270
Recalled	Depression	.5744	.2919	.3270
R @ .0500 = .4683		R @ .0100 = .5897		

It should be noted that i) if the correlation is 0.468 then it is significant at p = 05, ii) if the correlation is 0.589 or higher then

it is significant at p = .01 and iii) if the correlation is lower than 0.468, then it is not significant because the probability, in this case, is high.

The main point that arises out of the correlation findings is the positive correlation of 0.69 ($p<.01$) between anxiety questionnaire score and the proportion of self-rated words recalled for the "both" list.

Secondly, there are five significant negative correlations at $p<0.5$. These are between anxiety score and total recall on the "both" list (0.53), anxiety score and total recall on the anxiety list, (0.51), anxiety score and clustering score on the depression list (0.57), depression score and total recall on the "both" list (0.51) and depression score and the proportion of self-rated words recalled for the "both" list.

There is also one significant positive correlation as $p<.05$ of .57 between anxiety questionnaire score and the proportion of self-rated words recalled for the depression list.

(v) Total Recalled (without controls)

Taking all patients on all three lists, the mean number of words recalled for each trial are shown in Table 36 below:

TABLE 36: MEAN NUMBER OF WORDS RECALLED FOR EACH TRIAL

Trial 1	Trial 2
3,458	3.958

Analysis of variance indicated a reliable difference between these scores ($F = 4.51$; $df = 1.19$; $p<0.05$; see also Appendix Z1).

From Table 36 it is clear that for all subjects on all three lists, there is increased recall on the second trial - as was expected - and this effect is also significant.

Taking all patients in all three lists and overall 2 trials, the mean number of words recalled for each type of words, is shown in Table 37 below:

TABLE 37: MEAN NUMBER OF WORDS RECALLED FOR EACH WORD TYPE

Control	Experimental
3.200	4.217

Analysis of variance indicated a reliable difference between these scores ($F = 14.64$; $df = 1,19$; $p<0.01$; see also Appendix Z1).

Looking at the difference between two types of words, the analysis showed that patients were more likely to recall experimental words than control words.

Taking all patients overall 2 trials, the interaction between word-type and word-list can be seen in Table 38 below (see also Fig. 12):

TABLE 38: INTERACTION BETWEEN WORD-TYPE AND WORD-LIST FOR TOTAL RECALL

Lists	Type of words	
	Control	Experimental
Both	3.325	4.125
Anxiety	2.875	4.525
Depression	3.400	4.000

Analysis of variance indicated a reliable difference between these scores ($F = 4.91$; $df = 2,38$; $p<0.02$; see also Appendix Z1).

The main point that arises out of these findings it the words' pattern of scores on the anxiety list. All patients were less likely to recall the control words on the anxiety list than the control words on the "both" list or depression list. On the other hand, all patients have a higher score for experimental words on the anxiety list than for experimental words on the "both" list or depression list. Finally, it can be seen once more that on all 3 lists, patients have a higher score for experimental words than for control words. The difference of recall between experimental and control words is higher on the anxiety list and lowest on the depression list.

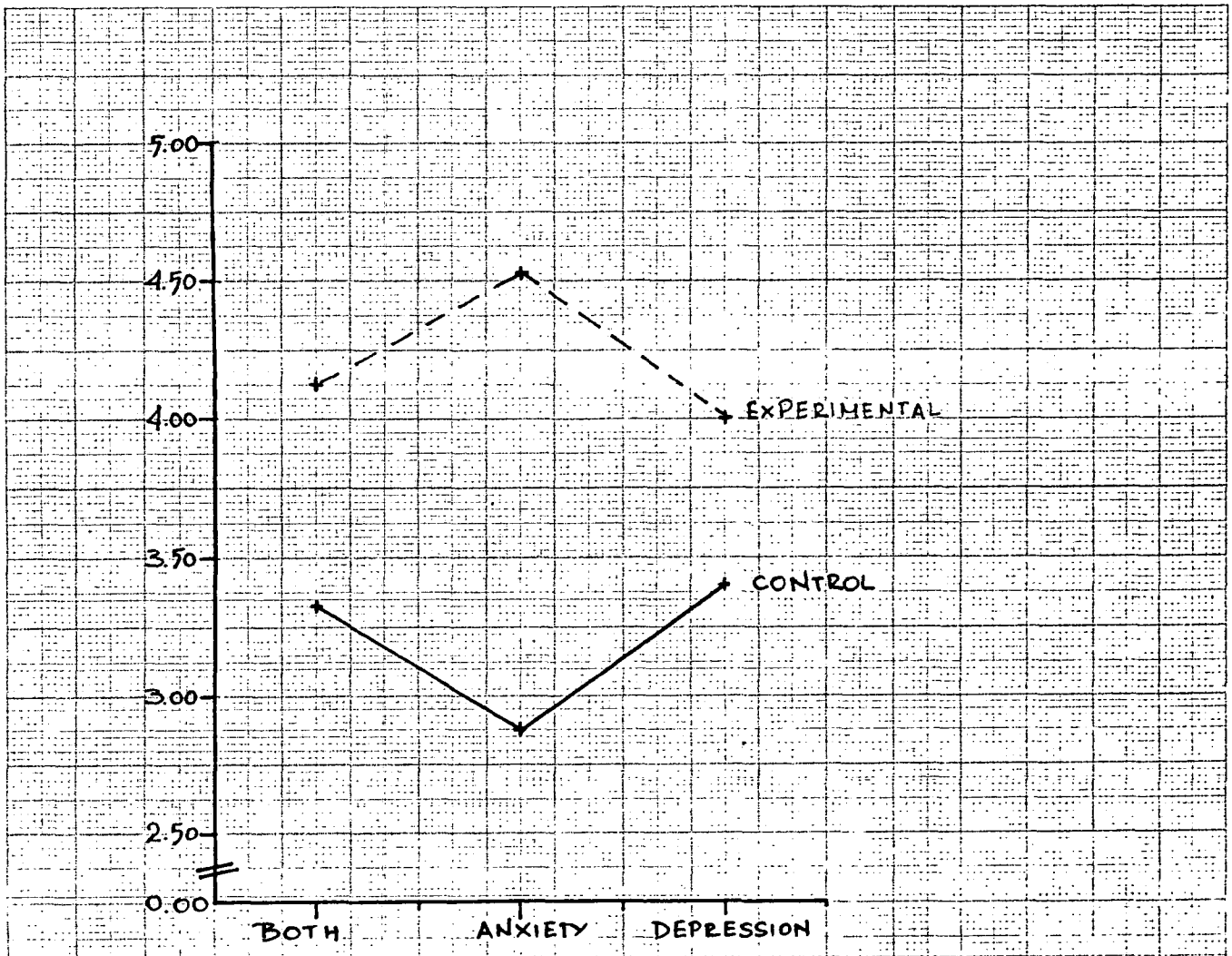


Fig. 12: INTERACTION BETWEEN WORD-TYPE AND WORD-LIST FOR TOTAL RECALL

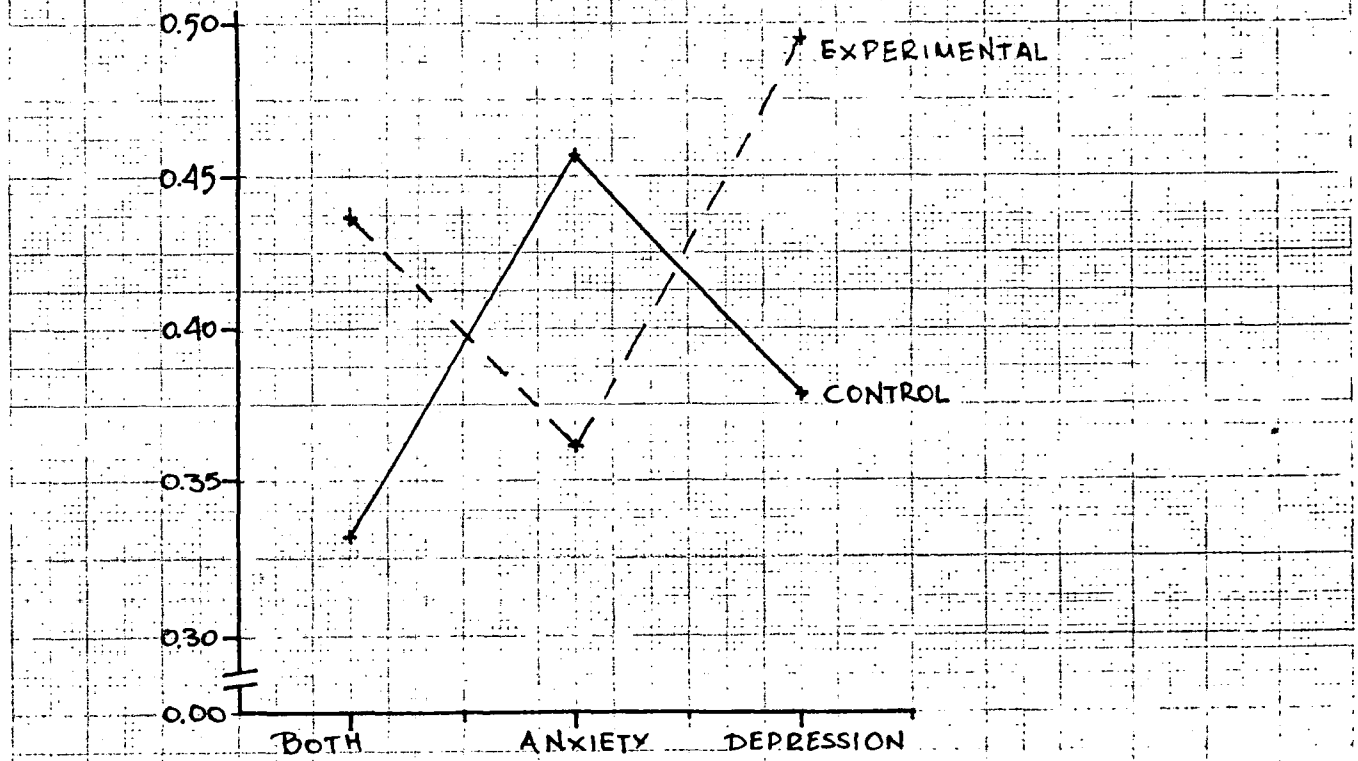


Fig. 13: MEAN CLUSTERING SCORE FOR WORD-TYPE AND EACH WORD-LIST

(vi) Clustering rr (without controls)

A) Taking all patients on all three lists, the mean clustering score for each trial are shown in Table 39 below:

TABLE 39: MEAN CLUSTERING SCORE FOR EACH TRIAL

Trial 1	Trial 2
0.391	0.428

Table 39 indicates that for all patients on all three lists there is an increased clustering score on the second trial, as was expected. However, this difference was not reliable ($p>0.4$; $F<1$).

Taking all patients on all three list and overall 2 trials, the mean clustering score for each type of words, is shown in Table 40 below:

TABLE 40: MEAN CLUSTERING SCORE FOR EACH WORD TYPE

Control	Experimental
0.388	0.431

Looking at the difference between two types of words, the analysis showed that patients were more likely to cluster experimental words

than control words. However, as before, this difference is not reliable ($F<1$; $p>0.2$).

Taking all patients overall 2 trials, the interaction in clustering between word-type and word-lists can be seen in Table 41 below (see also Fig. 13):

TABLE 41: MEAN CLUSTERING SCORE FOR WORD-TYPE AND EACH WORD-LIST

Lists	Type of words	
	Control	Experimental
Both	0.331	0.437
Anxiety	0.457	0.361
Depression	0.378	0.495

Analysis of variance indicated a reliable difference between these clustering scores ($F = 4.01$; $df = 2.34$; $p<0.03$; see also Appendix Z2).

From Table 41 it can be seen that experimental type of words has its lowest score on the anxiety list whereas control type of words has its highest. On the other hand experimental type has its highest clustering score on the depression list whereas control type has its lowest clustering score on the "both" list.

From Table 41, it can also be seen that patients clustered more overall experimental words than control words.

(vii) Proportion of self-rated words correctly recalled (without controls)

Taking all patients and overall 2 trials, the mean number of self-rated words recalled on each list are shown in Table 42 below:

TABLE 42: MEAN NUMBER OF SELF-RATED WORDS RECALLED ON EACH LIST

Lists		
Both	Anxiety	Depression
0.174	0.245	0.173

Looking at the difference between three lists, the main point that arises is the patients' pattern of scores on the anxiety list. Patients overall, have a higher score for the anxiety list than for the "both" list or the depression list, although the difference was not statistically reliable ($F = 1.13$; $df = 2.34$; $p>0.3$; see also Appendix Z3).

Taking all patients, the mean number of self-rated words recalled for each word-type can be seen in Table 43 below:

TABLE 43: MEAN NUMBER OF SELF-RATED WORDS RECALLED FOR EACH WORD-TYPE

Type of words	
Control	Experimental
0.191	0.204

Again there was no reliable difference between these scores ($F = 0.07$; $df = 1.19$; $p>0.7$; see also Appendix Z3).

However, from Table 43, it can be seen, as expected, that patients have a higher score for the experimental words than for the control words.

Taking all patients and overall 2 trials, the mean number of self-rated words recalled on each list for each word-type are shown in Table 44 below (see also Fig. 14):

TABLE 44: MEAN NUMBER OF SELF-RATED WORDS RECALLED ON EACH LIST FOR EACH WORD-TYPE

Lists	Control	Experimental
Both	0.135	0.212
Anxiety	0.237	0.252
Depression	0.200	0.147

From Table 44, it can be seen that control type of words has its lowest score on the "both" list whereas experimental type of words has its lowest score on the depression list. On the other hand each type of words has its highest scores on the anxiety list. It can also be seen that patients have a higher score overall on the experimental self-rated words than on the control self-rated words. However, depression list is the only exception, whereas patients recalled more

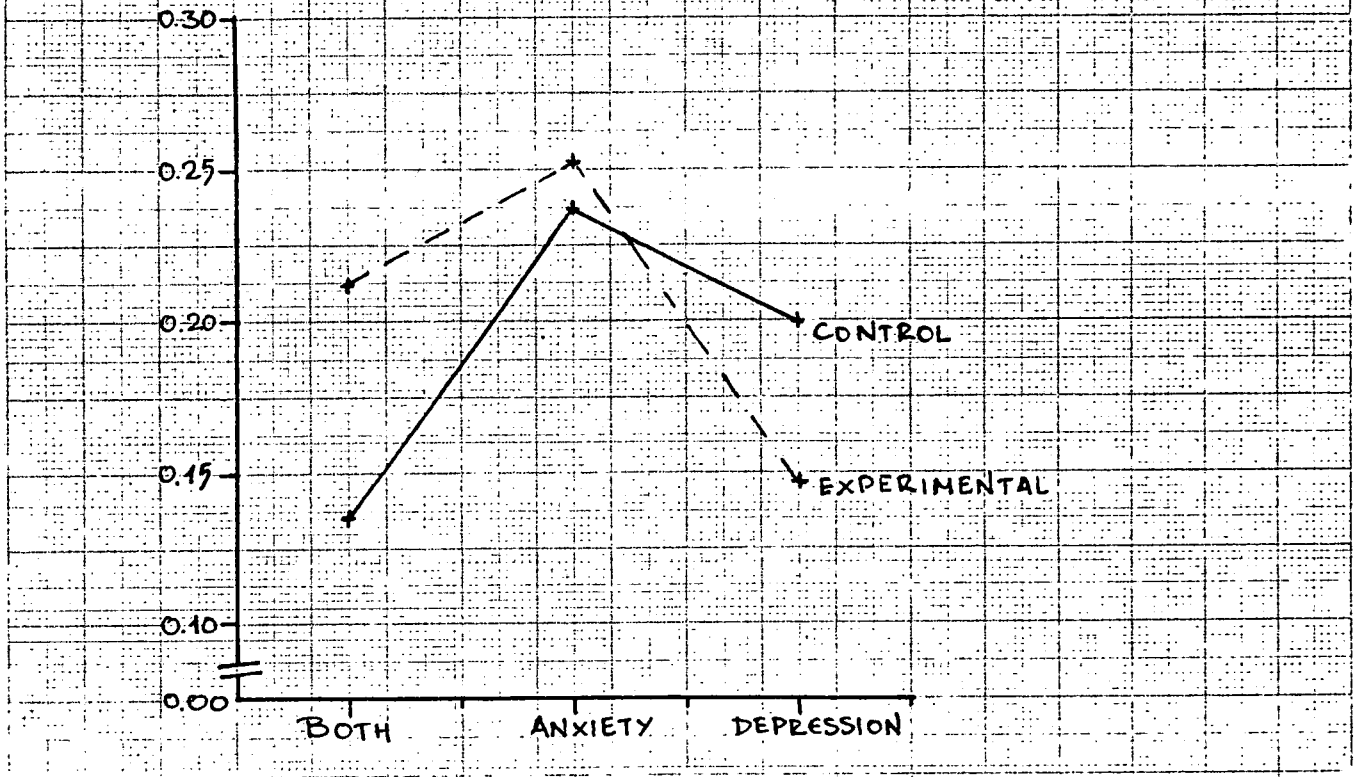


Fig. 14: MEAN NUMBER OF SELF-RATED WORDS RECALLED ON EACH LIST FOR EACH WORD-TYPE

control self-rated words than experimental self-rated words. However, as before, these differences are not reliable ($F = 0.60$; $df = 2.38$; $p>0.5$; see also Appendix Z3).

(viii) Correlations (without controls)

Table 45 shows the correlation matrix. Firstly, it should be noted that i) if correlation is 0.602 then it is significant at $p = 0.05$, ii) if correlation is 0.734 or higher then it is significant on $p = 0.01$ and iii) if the correlation is lower than 0.602, then it is not significant because the probability in this case is high.

TABLE 45 : CORRELATION MATRIX (EXPERIMENTAL WORDS ONLY)

Correlations between Questionnaire Scores and Total Recall, Clustering and "Proportion Measures"

Measure Taken	Word Lists	Questionnaire Scores		
		Anxiety	Depression	Neuroticism
	Both	-.5737	-.4144	-.0783
Total	Anxiety	-.4715	-.1365	.2203
Recall	Depression	-.4010	-.3756	.0487
	Both	.3125	.1014	.3735
Clustering	Anxiety	-.2242	-.5177	-.0241
	Depression	-.2887	-.2748	-.0086
Proportion	Both	.5714	.3790	.1203
Self-Rated	Anxiety	-.3386	.0911	-.0209
Recalled	Depression	.5704	.1877	.1887
	R @ .0500 = .6021		R @ .0100 = .7348	

Secondly, there are no significant correlations either positive or negative, in this correlation matrix. However, there are four interesting correlations; two of them are positive and two of them are negative; all of them are reliable at $p>0.05$.

These are the anxiety score and total recall on the "both" list (-0.57), the anxiety score and the proportion of self-rated words recalled for the "both" list (0.57), the anxiety score and the proportion of self-rated words recalled for the depression list (0.57 and finally, the depression score and clustering score on the anxiety list (-0.51).

4.4 Discussion

Dealing with the recall totals first, the original hypothesis that patients would remember more experimental adjectives than neutral adjectives is borne out by the results. The overall mean number of experimental words recalled by the patients is more than the overall mean number of neutral words recalled, so the difference is significant (see Appendix Z1). From Table 38 it can be seen that this difference is due to all lists, since in every list more experimental adjectives than neutral adjectives are recalled overall two trials.

For controls, it was hypothesised that there would be no difference in recall between experimental and neutral adjectives. However, the overall mean recall for experimental adjectives is found to be higher than for neutral adjectives. From Table 27 it can be seen that taking all subjects overall 2 trials, the difference of a recall between experimental and control words is highest on the anxiety list.

The original hypothesis that all subjects would recall more words overall on the second trial than on the first trial is borne out by the results.

For clustering scores, the original hypothesis that patients would have higher clustering scores for experimental words and that there would be no difference in clustering scores for control subjects was not borne out.

Table 46 shows that both groups had higher clustering scores for the experimental words, but the difference was not statistically significant for either group and the patients have the smallest difference.

TABLE 46: MEAN OVERALL CLUSTERING SCORES FOR EXPERIMENTAL VERSUS NEUTRAL ADJECTIVES

Subject Group	Word Category	
	Neutral	Experimental
Controls	0.428	0.510
Patients	0.362	0.379

As can be seen, control subjects clustered more overall than patients, mirroring their greater overall recall totals. However, this result is not significant ($F = 0.68$; $p>0.4$).

Also, Table 47 below shows the mean clustering scores for each subject group

TABLE 47: MEAN CLUSTERING SCORE FOR EACH SUBJECT GROUP

Subject Groups	
Controls	Patients
0.469	0.371

Although there are no significant differences overall ($F = 2.76$; $df = 1.18$; see also Appendix Y) the analysis of variance revealed significant interaction effects between list and group ($F = 4.65$; $p<0.02$; see also Appendix Y).

Table 48 below shows the interaction effects between list and group:

TABLE 48: INTERACTION BETWEEN LIST AND GROUP

Groups	Lists		
	Both	Anxiety	Depression
Controls	0.417	0.372	0.617
Patients	0.361	0.434	0.316

First, overall, patients have a higher clustering score for the anxiety list than for the "both" list or the depression list. Secondly, controls have a higher score for the depression list than for the "both" list, or for the anxiety list. On the other hand, overall, patients have their lowest clustering score for the depression list and controls have their lowest clustering score for the anxiety list.

For the proportion of 'yes' self-rated adjectives out of the total recalled, the original hypothesis that patients would have a higher score on this measure for the experimental adjectives than on the neutral adjectives was not borne out by the statistical analysis. However, a greater proportion of the experimental adjectives correctly recalled by the subjects were 'yes' self-rated than the corresponding proportion of neutral adjectives whereas the opposite was true for the control subjects (see Table 34).

The other point of interest is found when the data is broken down in terms of lists. From Table 33 it can be seen that for patients the greatest proportion of 'yes' self-rated adjectives which were correctly recalled is found in the experimental half of the anxiety list.

For the correlation between the questionnaire scores and the three measures carried out on the experimental adjectives only one of the original hypotheses was borne out by the results. This was that there would be a positive correlation between anxiety score and the proportion of yes self-rated words recalled from the "both" list and this was borne out by the "including controls" part of the results.

One more of the hypotheses was disproved by the "including controls" part of the results as well, i.e. that there would be a significant positive correlation between depression scores and the total recalled on the "both" list. Instead of a positive correlation there was a negative one. Thus the more depressed patients were, the less experimental adjectives they were likely to recall from the "both" list, or vice versa - the more experimental adjectives a subject recalled from the "both" list, the lower their depression score was likely to be.

CHAPTER FIVE

General Discussion

Looking firstly at the first experiment for all lists, in the patient vs. control groups comparison there was an effect of trials as expected. Recall of all words increased with trials as did clustering. However, there was no difference between subject groups for recall and there was a small and nonsignificant difference in agoraphobics' group for clustering.

This refutes one of the hypotheses that patients should remember more experimental words overall than control subjects and show greater clustering of experimental words.

The findings of this experiment does not provide support for Beck's (1978) proposal that at least depressives possess negative self-schemata which were defined as stable cognitive patterns of response to similar types of events, leading to a consistent set of negative self references. However Davis (1979) has inferred that short term depressives may lack schemata to represent the relationship between personal adjectives and their perceived attributes and behaviours. He also suggests that undergraduate depressives (and these ones can be compared with the out-patients of the first experiment) tend to have short term depressions, inferring that they had not yet developed stable self-schemata. That is, the words rated as self-descriptive may only have received such a rating for as long as those subjects had been "idiosyncratically distorting personal information to fit a negative bias" i.e. for as long as they had been depressed.

Consequently the out-patient short term depressives may have lacked a familiarity advantage with such words and may have shown deficits in organisation as a result. The cognitive theory of depression (Beck, Rush, Shaw and Emery, 1978) has not taken into account the possibility that short-term out-patient depressives do not describe themselves consistently. In fact Davis suggests that Beck's theory itself (Beck and Rush, 1978) might require minor modification since it states that depressives employ relatively stable negative schemata for interpreting (or distorting) information relative to one's behaviours or attributes, and makes no distinction between short-term out-patient and long-term institutionalised depressives.

However there was a difference between groups in the depression vs. anxiety and agoraphobia groups comparison on the depression list. The depressives were more likely to recall depressive words than the anxiety and agoraphobia group. However, recall was similar between the depression group and the control group.

On the other hand this finding was not mirrored in the analysis on the clustering scores since the corresponding clustering scores differences were not significant ($p>0.1$). This difference between clustering scores and total recall scores was not to be expected as clustering facilitates recall as a subject is imposing his own organisation on the words, although it can be said in general that a higher clustering score does not imply obligatorily a greater word recall.

As the depression group did not differ from the controls' group in the recall or clustering of depression words it is likely that the

difference between the depression group and the anxiety group can be attributable to the anxiety group. It may be that the anxiety state is not similar to depression in that the negative self-schema, if it is present, does not act as an instrument which enhances memory for negative emotional words (depressive, anxious and agoraphobic) but the anxiety itself avoids these words and, though remembered, prefers to concentrate more on the safer, neutral words.

It may also be that the neutral words are more memorable and that the depressive group do have enhanced memory for depressive words but this is unlikely as the depression vs. controls comparison showed no evidence for this.

There was also an effect of trials; recall increased with trials. However it is not happening the same in clustering although in both cases the differences among trials are not significant ($p>0.1$ and $p>0.07$). Looking at the anxiety vs. control groups comparison on the anxiety list, again, there was no big difference between groups. However there was an interesting effect of word type; anxiety words were clustered significantly more than neutral words. Similarly, agoraphobia and depression words were clustered more than neutral words. Although there is not enough information about that in total recall, the fact that the effect of word type was in favour of experimental words seem to be contradictory to the fact that there was no difference between subject groups.

But the fact that anxiety words were clustered more than neutral words by all groups in addition with the fact that all the groups (including controls) clustered more the experimental words than the

neutral words, refutes support for Beck and Rush's (1978) proposal that anxiety imposes a negative self schema on the anxious individuals in the same way as agoraphobia do (Addison, 1981).

The fact that all kinds of experimental words (i.e. anxiety, depression and agoraphobia words) are in general clustered more than the neutral words by all groups, even by the control group, may be due to the fact that experimental words are more easily clustered than control words since experimental words are similar to each other and they are referred to the same situation (i.e. anxiety, depression and agoraphobia) whereas neutral words cannot be organised so easily since each of them is referred to different contexts and situations.

On the other hand there is also a possibility for the experimental words that they would have been clustered more than they were but all patients are suppressing the emotional words; however this is unlikely as the patients' vs controls' group comparison showed no evidence for this. Therefore from all these one cannot rule out completely the possibility that anxious people do possess a negative self-schema. The fact that there were no group differences at all may reflect a difference between the severely anxious and non-severely anxious patients.

Table 49 (see also Fig. 15) shows that in the clustering analysis there was also a three way interaction - non-significant though - between groups, word-type and trials

TABLE 49 : MEAN CLUSTERING SCORE FOR EACH WORD-TYPE AND EACH TRIAL BY EACH SUBJECT GROUP

Group 1 : Agoraphobics

	Type of Words	
Trials	Experimental	Control
1	0.766	0.692
2	0.674	0.509
3	0.634	0.576
4	0.741	0.643

Group 2 : Depressives

	Type of Words	
Trials	Experimental	Control
1	0.645	0.456
2	0.680	0.627
3	0.633	0.560
4	0.613	0.517

Group 3 : Anxious

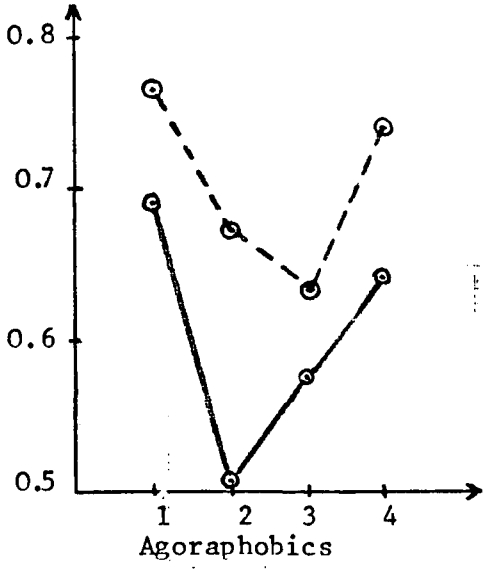
Trials	Type of Words: Experimental	Control
1	0.752	0.479
2	0.665	0.470
3	0.642	0.546
4	0.638	0.538

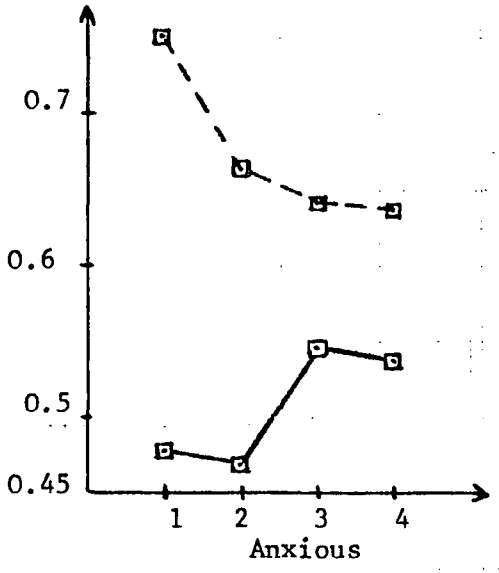
Group 4 : Controls

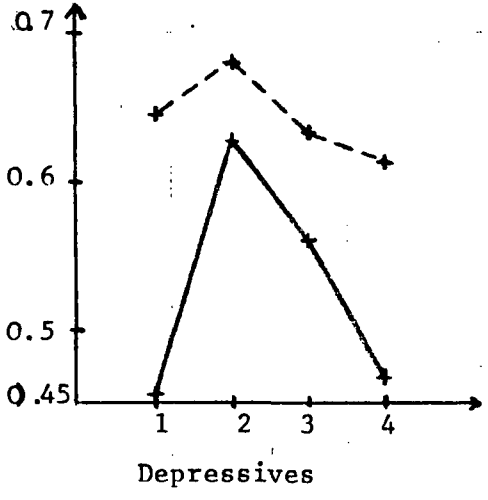
Trials	Type of Words: Experimental	Control
1	0.688	0.598
2	0.619	0.516
3	0.649	0.561
4	0.613	0.541

($F = 1.23$; $df = 9,126$; $p>0.2$)

On trial 1 the depressed and anxious subjects show greater scores in clustering of experimental words compared to neutral words, but this difference is less marked for agoraphobics and controls. So in this three way interaction, trial 1 is the critical trial. This is the first exposure to items, and the anxiety and depressive subjects may override their suppression of experimental words in order to do well on recall, whereas in the remaining trials, performance is good enough on the experimental words to dampen recall of neutral words.







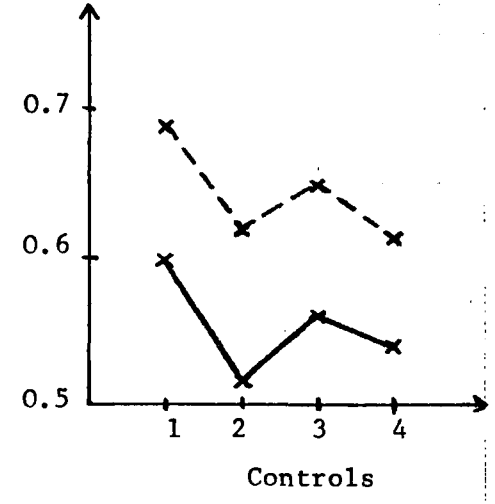


FIG. 15

(In all four diagrams the vertical axis represents Clustering Scores and the horizontal axis represents the number of Trial. Also the red dash line denotes Experimental data while the blue continuous line shows Control results.)

MEAN CLUSTERING SCORES FOR EACH WORD-TYPE AND EACH TRIAL BY EACH SUBJECT GROUP.

Another possibility is that if, as hypothesised before, the anxiety and depressive subjects possess a negative self-schema, they pick out the experimental words on trial one at the first exposure but the remaining trials may give sufficient exposure to override some of the emotionality effects. There was also, as said before, an effect of trials in each comparison : recall and clustering in general increased with trials.

The first experiment was lacking in many respects. In the original study, Tulving (1962) used 16 trials, and scored the recall for the repeated ordering of certain items sequentially. In the present experiment, as explained previously, only four trials were possible. This meant that a more crude analysis of the data had to be adopted.

Also the words recalled in clusters by emotional subjects and their controls, were emotional or not as designated by the experimenter. More controlled work has to be done on this aspect both to elucidate aspects of the mechanism proposed here as organising the material, and also to elaborate upon the nature of the type of items involved in depression, anxiety and agoraphobia recall.

Apart from stringent control on factors that were beyond the control of the present study (i.e. sample number, matching groups for certain factors etc.) more attention could be devoted to developing the approach used in this study. For instance longer word lists, more trials, sets of stimulus words arranged in an "emotional hierarchy" (using additionally severely anxious, depressed and agoraphobic subjects' reports as well as the present experiment's subjects'

reports, imagery values and so on). This would yield more information concerning the relations and processing occuring for and between emotional items.

Despite these limitations clear answers were provided for the aims of the first experiment. Short-term out-patient depressives in this study do not show the same superior recall and clustering of depressive words as their severely depressed counterparts. This suggests that they are qualitatively different and provides support for Davis' (1979) theory that short term depressives do not possess stable negative self-schema.

Also clear from this study was that non-severely anxious and agoraphobia subjects do not show the same facilitation for the clustering and recall of anxiety and agoraphobia words as their severely anxious and agoraphobic counterparts. This suggests that Beck and Rush (1978) were either incorrect in their proposal that anxiety imposes a negative self schema on the anxious individual in the same way as phobias do, or that non-severely anxious subjects are qualitatively different to their severely anxious counterparts.

One possibility that arises from this experiment is that where phobics are in a way more drawn to phobic items and recall and cluster these better than neutral items, anxious, or at least non-severely anxious individuals, are, in a way, drawn, as well, to anxious items but at the same time they avoid some part of negative emotional words. Although they seem to remember more anxiety words than neutral words, they also seem to supress recall of these items.

However this proposal goes hand in hand with the fact that anxious people are also anxious to perform well on the experiment and there is a point when this factor may override the desire to suppress emotional items for the sake of performance, if it is otherwise likely to be low. In particular, this pattern is apparent for depressive, anxiety and agoraphobia words, suggesting that anxious subjects will behave in this way for different kinds of emotional words.

Looking at the second experiment, none of the original three hypotheses were borne out by the results. However, these all predicted that the three measures taken (ie recall total, clustering proportion score and proportion of "yes" self-rated adjectives correctly recalled) would distinguish the experimental adjectives overall (i.e. lists and trials combined) from the neutral adjectives.

However, what was not explicitly hypothesised but was inferred in the introduction was that the different word lists would have an effect, the main effect being explicitly stated that the greatest distinction between experimental and neutral words would be found in the "both" list. This, however, does not seem to have been the case. Despite this a number of significant interactions involving word lists, trials, adjective type and subject group in various combinations were found. Some of these provide tentative support for cognitive organisation <u>per se</u> and possibly self-schema type cognitive organisation. But this can only be demonstrated by discussion of these results.

So, looking first at the anxiety list several significant patterns were found. The picture that emerges from these patterns is one where subjects recall more adjectives overall on the second trial than on the first trial although the corresponding part of the results was not significant.

TABLE 50 : MEAN NUMBER OF WORDS RECALLED FOR EACH WORD-TYPE AND EACH TRIAL ON THE ANXIETY LIST

Anxiety List

	Type of Words	
Trials	Control	Experimental
1	2.600	4.350
2	3.150	4.700

(F = 0.64; df = 2,36; p>0.5)

TABLE 51 : MEAN CLUSTERING SCORE FOR EACH WORD-TYPE AND EACH TRIAL ON THE ANXIETY LIST

Anxiety List

	Type of Words	
Trials	Control	Experimental
1	0.482	0.322
2	0.431	0.400

(F = 0.61; df = 2,36; p>0.5)

FIG.16

MEAN CLUSTERING SCORE FOR EACH WORD-TYPE AND EACH TRIAL ON THE ANXIETY LIST

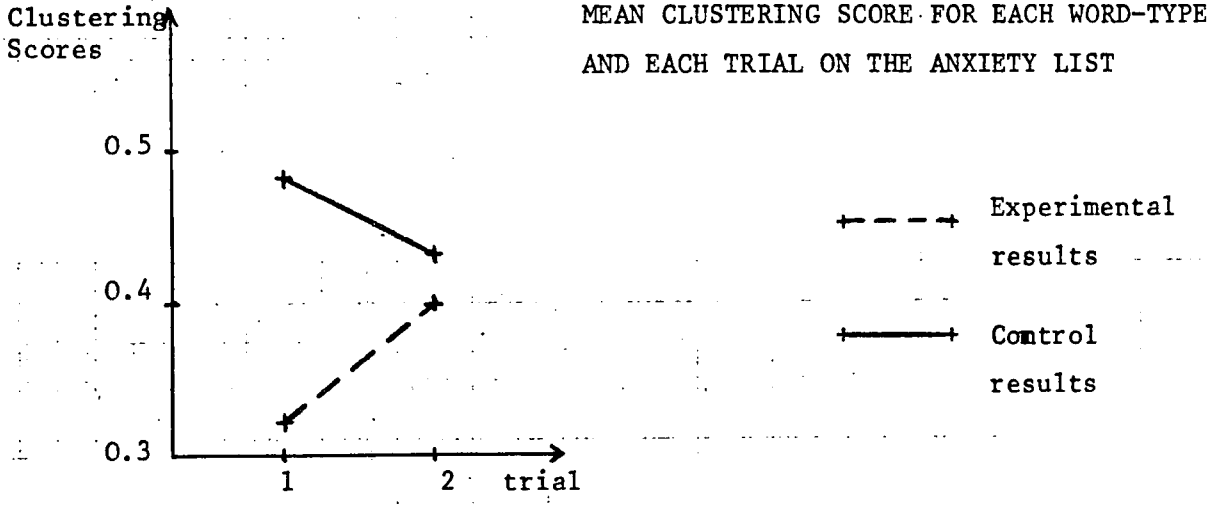
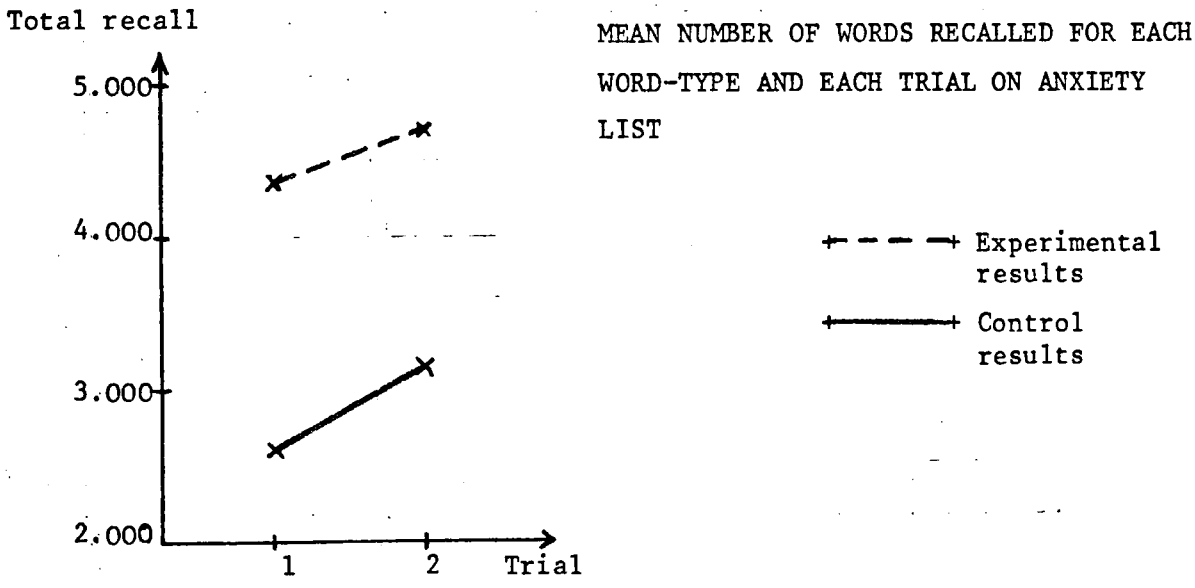


FIG.17

MEAN NUMBER OF WORDS RECALLED FOR EACH WORD-TYPE AND EACH TRIAL ON ANXIETY LIST



Tables 50 and 51 (see also Fig. 16 and 17) show on the first trial they recall more anxious adjectives than neutral adjectives although these anxious adjectives are less clustered than the neutral adjectives. On the second trial, the overall increase in the number of adjectives recalled is due to the subjects recalling more neutral adjectives than on the first trial, but not so substantially increasing the number of anxious adjectives they recalled. Thus, the recall on the second trial is composed of more neutral adjectives than anxious adjectives, i.e. the relative composition is the reverse of the first trial composition. Further, the clustering for the neutral adjectives decreases on the second trial, so this cannot be cited as being related to the increased recall total. So, it would seem that some memory enhancing strategy other than subjective organisation on the basis of adjective category is being used on the second trial. It seems that subjects having used subjective organisation on the first trial reject this strategy and simply try to recall the adjectives they did not recall on the first trial. It may be possible that they adopted another form of subjective organisation, e.g. clustering adjectives together on the basis of same initial letter (s), which would not be detected by the clustering measure used. (E.g. subjects could cluster "stormy", "solitary" and "savage", together). If a clustering measure was being made on the basis of initial letter then the number of repetitions (r) would be 2, however with the clustering measure used, i.e. on the basis of anxious/neutral category, the number of repetitions is zero since "solitary" belongs to a neutral category, whereas the other two adjectives belong to the anxious category (see Anxiety list, Appendix P).

One patient actually made it clear that he was using a strategy of encoding the words by the alphabet, to see if the initial letter sounds would act as a retrieval cue for the phonetically-encoded words.

But this does not wholly explain why this particular pattern of decreased category clustering for neutral type of adjectives on the second trial was observed only for the anxiety list since examination of all three lists indicates that the maximum number of repetitions on the basis of initial letter for each list are roughly equivalent: for the "both" list it is eight, and for the other two lists it is seven.

It also does not explain why this pattern for total recall was observed both for the patients and for the controls on the anxiety list as can be seen in Table 52 (see also Fig. 18) below:

TABLE 52 : MEAN NUMBER OF WORDS RECALLED FOR EACH WORD-TYPE AND EACH LIST BY EACH SUBJECT GROUP

a) Controls

	Type of Words	
Lists	Control	Experimental
Both	3.813	5.438
Anxiety	3.625	6.188
Depression	4.125	5.250

b) Patients

	Type of Words	
Lists	Control	Experimental
Both	3.000	3.250
Anxiety	2.375	3.417
Depression	2.917	3.167

($F = 0.42$; $df = 2,36$; $p>0.6$ - This result is not significant)

The original explanation is therefore the best one i.e. subjects are anxious to do well on the second trial and having used subjective organisation they are aware that they have remembered more anxious adjectives than neutral adjectives on the first trial so try and remember all the neutral adjectives they left out on the first trial at the expense of the anxious adjectives.

From the "both" list results there are a number of points of interest. The finding of a significant positive correlation between anxiety scores and the proportion of correctly recalled self-rated "both" content adjectives gives support to a self-schema organised in terms of anxiety and depression. The highest anxiety scores were shown by the patients (See Appendix T) and overall all subjects were about half as depressed as they were anxious, thus there is a similar but weaker correlation between depression scores and the proportion of "both" adjectives which were correctly recalled (see Table 35).

So, taking these facts together with the finding that the patients' highest proportion of correctly recalled self-referent

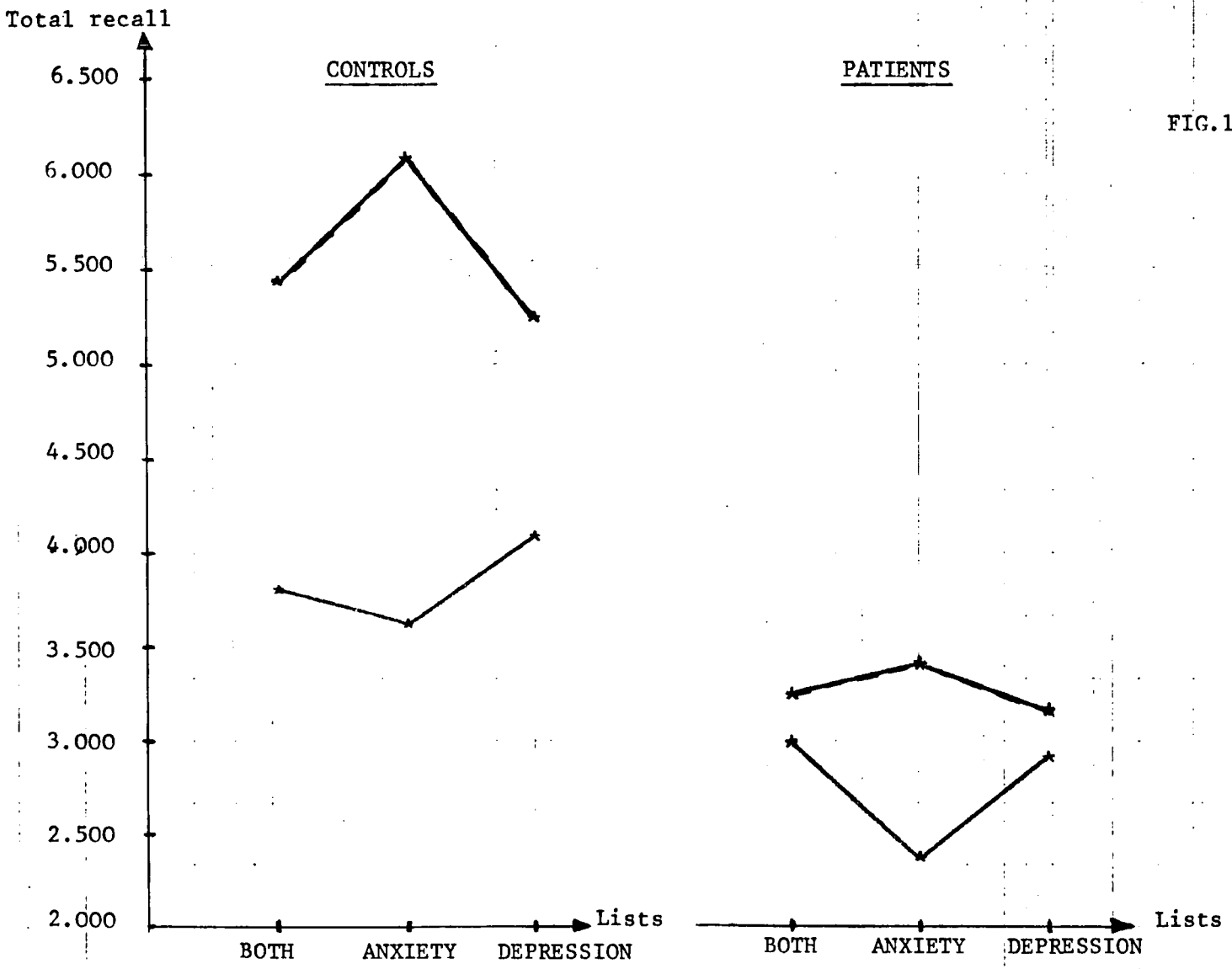


FIG.18

MEAN NUMBER OF WORDS RECALLED FOR EACH WORD-TYPE AND EACH LIST BY EACH SUBJECT GROUP.

Experimental results

Control results

adjectives were the experimental adjectives from the "both" list, it appears that patients remember these words because they are self-referent rather than they self-rate the adjectives because they have correctly recalled them. It is clear that these words from the "both" list are mostly self-referent for the patients because they contain components of both anxiety and depression, reflecting the components of the patients' emotional disorders in every way except the relative proportions of the two components.

That is, patients have lower depression scores than anxiety scores whereas the anxiety and depression descriptiveness ratings for the experimental "both" adjectives are roughly equivalent. This explains why there is only a weak correlation between depression scores and the self-referent proportion of the correctly recalled experimental adjectives from the "both" list.

This finding is not completely comparable to Derry and Kuiper's (1981) finding that depressives recall a greater proportion of depressed content self-rated adjectives than nondepressed content adjectives since their proportion was taken out of the number of affirmatively self-rated adjectives, whereas the one used here was taken out of the numbers of adjectives correctly recalled. So, whereas their measure adjusted for the number of yes-ratings, the measure used here adjusted for total recall.

However, a post hoc analysis using the same calculation as Derry & Kuiper revealed similar findings namely that patients recall more self-rated "both" content adjectives than non-"both" content and adjectives.

The mean adjusted recall scores for "both" content adjectives and non-"both" content adjectives are respectively 0.23 and 0.11, Derry & Kuiper's were : 0.41 and 0.16 for depressed content adjectives and non depressed content adjectives respectively. This is a lower proportion than Derry & Kuiper's patients remembered. Since there were only twelve patients used in this experiment and twenty in Derry & Kuiper's this could be due to a difference in the two group's characteristics. In fact, it is possible to ascertain that the two groups are different with respect to age and gender composition : the patients' average age in this experiment was 40.8 years compared with 32 years in Derry & Kuiper's group, and the patients group was half males and half females compared with all females in Derry & Kuiper's group. The debate about possible sex-based differences in the quality of emotional disorder arises from the fact that roughly twice as many women as men seek treatment for emotional disorders (Amenson and Lewinsohn, 1981). However, the debate continues and for the purposes of this experiment it is assumed that whatever the possible differences in origins of male and female depression, the underlying cognitive organisation is not substantially different. But these factors are only worth considering if one is assuming that the depression self-schema operates in the same way and to the same extent as the anxiety-depression self-schema which is being proposed.

The patients' performance on the anxiety list indicates that if they are organising their recall on the basis of an underlying self-schema, then this organisational principle is not consistently evoked, thus leading to the inference that overall a much weaker (in terms of consistency) self-schema exists for anxious-depressed patients.

The controls came up with a surprising result on the anxiety list (see Table 52 and Fig. 18). This was the list on which they recalled - not significantly though - much more experimental adjectives than neutral adjectives. This is possibly related to clustering (see Table 30 and Fig. 9) since the clustering is greater for anxious adjectives. But this result is peculiar because overall for control subjects, a low proportion of clustering was found on the anxiety list whereas a high overall total recall was also found for the anxiety list. What this would appear to mean is that the absolute amount of clustering has not increased compared to the other two lists (because the clustering proportion score is calculated so that it is inversely related to the total recall score - see Results under 'measures taken'). If it had increased, the proportion of clustering would have remained the same. So much less of this effect can be ascribed to subjective organisation i.e. it is possible that controls were using subjective organisation to recall some of the adjectives but not at all clear why they managed to recall so many of the others, apparently without the aid of subjective organisation. However, the answer to this may lie in the fact that overall, controls recalled a greater proportion of self-rated anxious content adjectives than neutral content adjectives for the anxiety list.

Thus controls may have been displaying superior recall for some anxious content adjectives because they were self-referent. So it seems that control subjects were displaying superior recall for anxious content per se and because of their greater self-reference. This suggests an anxiety self-schema, but the feature of this schema is that it does not lead to highly organised recall, suggesting that the underlying schema is not highly organised or that it leads to

disorganised recall. This is a similar finding to Nunn et al (1984) where selective memory effects without corresponding clustering were found. It may be that when the schema is activated this induces a slightly anxious mood or response and this leads to the disorganisation. There is a qualitative difference here between the controls and the patients. It is possible that for the patients on the second trial, the anxiety schema had become so strongly activated that the disorganisation of recall was combined with suppression of anxious adjectives to avoid further activation of the anxiety schema and further mood induction.

Thus, this is their coping strategy, compared with the control subjects' which was to dilute the anxious adjectives recalled by interspersing them with neutral adjectives.

Now, the depression list is discussed. Since the depression component of the patients' emotional disorder was not particularly large, striking effects of selective memory for depressed content adjectives at the expense of neutral adjectives, subjective organisation (clustering) on the basis of depression and a high proportion of self-rated recall were not expected and nor were they found.

Finally, the correlations are discussed. The negative correlation between the depression questionnaire score and the number of experimental adjectives recalled from the "both" list seems to suggest one of two things. Either the more depressed a person is the less likely they are to recall experimental adjectives from the "both" list (which implies that they are suppressing them or not attending to them

at some stage in cognitive operations), or that the more experimental adjectives they recall from the "both" list the less likely they are to be depressed. Since the controls were less depressed than the patients, what this amounts to is the fact that controls recalled more of the experimental "both" words than the patients. Thus it is unwise to jump to the conclusion that patients were suppressing "both" adjectives when this effect can be explained in terms of differing group characteristics ie the patients' deficit was due to a general deficit on memory.

However, such strong negative correlations were not found for the other two lists, so it would appear that either suppression on the part of the patients or enhanced recall on the part of the controls is still a possibility which needs to be tested using subject groups matched for academic ability (and by inference, memory capacity). Similarly, there is a negative correlation between depression score and the proportion of clustering on the anxiety list. Here the two subject groups are in fact matched - over the two trials each subject's mean clustering proportion is almost exactly the same. So, the more depressed a person is, the less likely they are to organise a large proportion of anxious content words in their recall. Why this should only happen to a significant extent on the anxiety list is unclear. Since those patients with the highest depression scores also have some of the highest anxiety scores, it might be possible to say that this is due to the anxiety self-schema being invoked and producing, disorganising and suppression effects were it not for the fact there is no significant negative correlation between anxiety scores and the proportion of experimental adjectives clustered at least for two out of the three lists.

So there is something about the anxious adjectives or something about depression which means that the anxious adjectives do not get clustered. It seems likeliest that it is something to do with both.

To summarise, patients' enhanced memory for anxiety/depression ("both") content adjectives was shown to be related to the degree of self-reference of these adjectives and also anxiety questionnaire scores, indicating that patients had a weak self-schema containing aspects of both anxiety and depression, but with anxiety dominant.

It is possible that this weak schema produces suppression of anxious - content adjectives when invoked over a period of time (ie two trials). Selective memory effects were also observed for controls especially on the anxiety list, these were accompanied by relatively low proportions of subjective organisation and higher proportions of the anxious adjectives recalled were self-reference than the neutral adjectives. This led to the conclusion that a fairly weak anxiety self-schema was being invoked which led to the selective memory. It was postulated that the lack of organisation was a coping mechanism which meant that anxious adjectives were 'watered down' by being interspersed with neutral adjectives. It was thought this was so that anxious mood would be avoided being induced.

Furthermore, C. Stavrakaki's and B. Vargo's (1986) opinion is borne out by the results, i.e. that anxiety is highly related to depression in that anxiety usually accompanies depression and vice versa. The model that has come out from the results of these experiments focuses on anxiety and depression as variants of the same disorder differing quantitatively (unitary model).

It seems also possible that the findings of - especially - the first experiment do not provide support for MacLeod et al's (1986) proposal that people who suffer from emotional disorders or so called neurotics show the tendency to attend (and remember and use) more to those words that are more closed to their feelings or to aspects of their disorders. That means, for instance, that anxiety subjects are not obligatorily biased to remember more anxiety words than other words and also they do not show significant differences in recalling the anxiety words compared with their controls.

However, it seems that agoraphobic patients show superior recall for phobic-related material relative to neutral material, comparing with anxious patients who would show less difference of recall for anxious-related material relative to neutral material. This last finding provides support for Nunn et al's (1984) proposal that phobics have a cognitive organisation of situations labelled as dangerous.

In addition, MacLeod et al's (1986) study is also under discussion, since it is demonstrated that whereas in the anxious subjects they operate in a manner that facilitates the encoding of threatening stimuli, in the case of non-anxious subjects, they actively inhibit such encoding and this is a bias referring to selective attention. The findings of our two experiments do not provide evidence that a similar thing is happening in recalling emotional and neutral words, since the differences between patients and controls were not high and significant to support a hypothesis like MacLeod's.

Also, according to Byrne et al's (1986) experiment, depressed patients performed more poorly only on the effort-demanding cognitive

task. Thus, depressed patients are impaired on a specific type of cognitive operation, one that requires effort and presumably involves different mechanisms than those used for automatic and more superficial information processing.

The findings of our experiments do provide support for Byrne et al's proposal, since depressives had in general lower recall scores than the other groups both for experimental and neutral words and since the word-recall task can be classified as an effortful cognitive task.

Furthermore, comparing the findings of our two experiments with Martin Seligman's (1974) learned-helplessness theory of depression, firstly it can be seen that they provide support for Seligman's proposal about the closed relation between anxiety and depression, since Seligman suggests that although anxiety is the initial response to a stressful situation, it is replaced by depression if the person comes to believe that control is unattainable.

Secondly, the fact that in our first experiment, depressives had often the lowest scores in total recall, may mirror an aspect of Seligman's theory, according to which depressives exhibit cognitive details besides motivation and emotional deficits and lowered self-esteem. According to Seligman's view, cognitive deficits involve difficulties in learning new response-outcome contingencies, which of course has some effects on memory, in that if learning is depressed then so too is memory.

However, Seligman, Abramson and Teasdale's (1978) proposal for depressives that in uncontrollable situations making a stable, global and external attribution for failure facilitates generalized (including cognitive), chronic self-esteem deficits is not borne out by the findings of the two experiments, since no clear cut deficits in depressives were found across both experiments. This was particularly true for experiment one. This suggests that Seligman, Abramson and Teasdale (1978) were either incorrect in their proposal that depression imposes stability, globality and internality in failure's attribution, or that day patient depressive subjects are qualitatively different to their clinically severely affected counterparts.

Furthermore, Watts' and Cooper's (1987) study of depressed patient's memory for stories indicated that while normal subjects showed particularly good recall for units central to the structure of the story, this did not hold for depressed patients. Similarly, in accordance with Watts and Cooper's proposal, there is a reliable evidence based on experiments using word lists, that depressed patients show less clustering at recall than controls (Koh et al, 1973; Russell and Beckhuis, 1976; Weingartner et al, 1981; Calev and Erwin, 1985). This suggests that depressed patients encode words in clusters less than controls do.

The findings of our experiments provide evidence and support for this proposal since there were significant differences in clustering scores between depressives and controls, though those differences were not high. This last factor (the low differences observed) can be explained by the fact that the subjects were day patients and not mostly hospitalised depressives, as in previous similar experiments.

So, it seems, as logically expected, the more depressed the persons, the more memory deficits they show and consequently the lower their clustering scores.

Additionally according to Watts and Cooper, the hypothesis that the memory performance of depressed patients shows a deficiency in the structuring of material is not novel and has already been moderately well established on word-list data, at least of clustering at recall is taken as an index of structuring at the encoding stage. By analogy, this proposal is also borne out by the findings of our first experiment, although the subjects in our experiment were less depressed.

Watts and Cooper also suggest that the structuring deficiency is not confined to word lists but is also demonstratable with prose.

Thus, from Watts et al's (1987) point of view, there is previous research indicating that depressed patients have poor memory for neutral material (see McAllister, 1981). This is probably another reason which partly explains why depressive subjects have higher scores on the experimental words than on neutral words in our first experiment although this reason is not enough since, as seen before, there are also other factors that influence the differences in recall between experimental and neutral words; on the other hand depressive subjects in our first experiment also show lower scores than other groups in experimental words with the exception perhaps of the depression list words which are considered as words which express their depressive mood.

Another factor which affected the patients' general recall of both experimental and neutral words was the auditory presentation that was used only in our second experiment when in the first experiment a visual presentation was used. In accordance with Watts et al's proposal auditory presentation is known to improve free recall (Murray, 1965).

Furthermore, there is also the possibility that depressives' memory deficit can be accounted for by conservative response biases, i.e. depressed people under-perform, not because memories are less accessible, but because they lack confidence in them (Watts et al, 1987). In Watts et al's opinion the experimental method that is relevant to exploring this question is a forced recall task. Using this, Leight and Ellis (1981) were able to demonstrate a decrement in recall in normal subjects who had been given a depressive mood induction procedure and excluded an explanation in terms of willingness to respond (Watts et al, 1987).

The question about depressives' confidence is also closely connected with the "false alarms" i.e. with the hypothesis that depressives show more "false alarms" than other groups because of lack of confidence. However this is not clear, since Silberman et al (1983) reported that false alarms were not affected by depression whereas Miller and Lewis (1977) and Dunbar and Lishman (1984) found that false alarms were reduced; also generalising from other works' results (i.e. Dunbar and Lishman (1984) and Zuroff et all (1983)), one might suggest that depressives show more false alarms than controls where procedures are used that require additional processing, but that in other conditions they show fewer false alarms.

Furthermore, there is another possibility that depressives' memory deficit can be accounted for by concentration problems, i.e. depressed people under-perform not because memories are less accesible, but because they lack concentration in them. Firstly among the cognitive symptoms of depression described by Beck et al (1979) are difficulties in concentration and memory (Watts et al, 1987). Those difficulties are found especially in the activities of (a) watching television, (b) reading and (c) working/doing household jobs (Watts et al, 1987).

As can be seen in the "Method" part, in our first experiment subjects should read each word of the memory test, as it appeared in the computer screen. Similarly, in our second experiment subjects were required to listen to each word list carefully. So, one possibility is that depressives' deficit to remember as many words as the other groups did is caused by substantial concentration problems about what they read and to what they listen. On the other hand, many clinicans assume, and probably correctly, that the memory problems of which depressed patients often complain are secondary to their concentration problems; also concentration problems have an adverse effect on mood and mood has an adverse effect on concentration (Watts et al, 1987). Meanwhile the relative lack of semantic clustering in the free recall of depressed patients (e.g. Weingartner et al, 1981) are also consistent with the hypothesis that their semantic processing is poor (Watts et al, 1987). In Watts et al's (1987) point of view, most laboratory research has been done on word lists, though there is evidence of their applicability to prose (e.g. Shallert, 1976); also most laboratory research has examined the effects of processing strategies on incidental recall rather than intentional learning (Watts et al, 1987).

It seems likely that day patient depressives in our experiments do not show the same memory and concentration deficits as the depressives in Watts et al's experiment (these depressives were hospitalised and some of them endogenous); this fact may answer the question why our experiments' depressives' scores were not much different from the scores of the other subject groups and especially from the controls. Another possibility is that, depressives in our experiments, since they were not severely affected, were able to use a kind of imagery formation technique (Watts et al, 1987) and that can be another cause of increasing their scores in our memory tests.

This can be based on Watts et al's findings that imagery formation substantially improved objective memory for a passage of prose, especially in non-endogenous depressives and also that visualisers would benefit most from the imagery formation (Watts et al, 1987).

However a multidisciplinary approach can and should be extended in research as well as it is in theory, to give evidence to the hypothesis if Watts et al's proposals are as valid for word list as for a passage of prose. Every relative approach in the future could be used to assess the effects of treatment, the degree of neurotic cognition, strength and quality of memory-imagery and so on.

The approach could be adapted for use with other clinical disorders, as well as distinguishing between them, in order to elucidate the interaction of these different schema. For instance, depressive patients might rate depressive words highly on an imagery value scale, and the same might be true for a prose or for situations.

Finally, the approach should increase our understanding of the nature of interaction of major variables in clinical disorders, and also to compare patients more with controls of a 'normal' nature to uncover where these two boundaries merge.

The present study also found differences in memory for anxious and agoraphobic patients, but these results were not as clear cut as those for depressed patients. However, given the relative lack of this kind of work with neurotic groups other than depressives, the present results suggest that here too this general approach could further our understanding of anxious and agoraphobic patients and not just depressives.

Appendix A : Test for Agoraphobia

NAME: _____ DATE: _____

Please indicate the degree to which you avoid the following places or situations because of discomfort or anxiety. Rate your amount of avoidance when you are with a trusted companion and when you are alone. Do this by using the following scale.

1 - Never avoid
2 - Rarely avoid
3 - Avoid about half the time
4 - Avoid most of the time
5 - Always avoid

(You may use numbers half-way between those listed when you think it is appropriate. For example, $3\frac{1}{2}$ or $4\frac{1}{2}$).

Write your score in the blanks for each situation or place under both conditions: when accompanies, and, when alone. Leave blank those situations that do not apply to you.

Places	when accompanied	when alone
Theatres	____	____
Supermarkets	____	____
Classrooms	____	____
Department Stores	____	____
Restaurants	____	____
Museums	____	____
Lifts	____	____
Auditoriums or stadiums	____	____
Parking garages	____	____
High Places	____	____
Enclosed spaces (e.g. tunnels)	____	____
Open spaces (A) Outside (e.g. fields, wide streets, courtyards)	____	____
(B) Inside (e.g. large rooms, lobbies)	____	____

Riding in:	when accompanied	when alone
Buses	____	____
Trains	____	____
Tube trains (Metro etc.)	____	____
Aeroplanes	____	____
Boats	____	____
Driving or riding in car (A) at any time	____	____
(B) on motorways	____	____

Situations	when accompanied	when alone
Standing in queues	____	____
Crossing bridges	____	____
Parties or social gatherings	____	____
Walking on the street	____	____
Staying at home alone	____	____
Being far away from home	____	____
Other (specify)	____	____

We define a panic attack as:

(1) a high level of anxiety accompanied by
(2) strong body reactions (heart palpitations, sweating, muscle tremors, dizziness, nausea) with
(3) the temporary loss of the ability to plan, think or reason and
(4) the intense desire to escape or flee the situation. (Note, this is different from high anxiety or fear alone).

Please indicate the total number of panic attacks you have had in the last seven days _____

_____ _____

Appendix B : The Anxiety and Depression Scale

Please answer all questions as correctly as you can. Please answer each question by putting a circle around the 'YES' or 'NO' following the question.

NAME: _____

DATE: _____

1. Are you often a moody person? ..... YES NO
2. Do you often feel sad for no apparent reason? ..... YES NO
3. If you feel sad, can people cheer you up? ..... YES NO
4. If you are told a funny joke, would you be able to laugh? ..... YES NO
5. Do you feel depressed? ..... YES NO

   If 'YES'

   a
   - (Are you most depressed in the evening? ..... YES NO
   - (Are you most depressed in the morning? ..... YES NO

   b
   - (Are you just a bit depressed? ..... YES NO
   - (Are you feeling very depressed? ..... YES NO

6. Are you normally a worrier? ..... YES NO
7. Are you normally easily hurt? ..... YES NO
8. Do you feel full of suffering? ..... YES NO
9. Do you normally find responsibility a problem? ..... YES NO
10. Would you say that you normally needed a lot of affection? ..... YES NO
11. Do you often do things that you later regret? ..... YES NO
12. Do you feel hopeful about the future? ..... YES NO
13. Do you feel you often can't get your breath? ..... YES NO
14. Have you lost a lot of confidence? ..... YES NO
15. Do you feel drained of energy? ..... YES NO
16. Do you cry a lot? ..... YES NO
17. Do you feel that life is meaningless? ..... YES NO

/Over .....

18. Do you feel so depressed that you can't cry? ..... YES NO

19. Do you often feel your pulse racing? ..... YES NO

20. Do you often have palpitations? ..... YES NO

21. Do you often nervously perspire or sweat? ..... YES NO

22. Do you feel restless and unable to relax? ..... YES NO

23. Do you feel like hiding away from everyone? ..... YES NO

24. Do you often get lonely? ..... YES NO

25. Are you now managing better than before? ..... YES NO

26. Do you feel absolutely useless? ..... YES NO

27. Do you feel you've changed for the worse? ..... YES NO

28. Do you have qualities that others like in you? ..... YES NO

29. Do you feel panicky in a crowd? ..... YES NO

30. Do you deserve to be punished? ..... YES NO

31. Can you plan ahead? ..... YES NO

32. Do you have to be pushed into doing something because you haven't got the will to do it on your own? ..... YES NO

33. Do you prefer to be on your own? ..... YES NO

34. Do you feel you can't care less whether you lived or died? ..... YES NO

35. Do you feel that you can cope with everyday work? ..... YES NO

36. Do you feel a friend to your friends? ..... YES NO

37. Are you disappointed in the person you are? ..... YES NO

38. Are you often troubled by constipation or diarrhoea? .. YES NO

39. Do you feel people despise and hate you? ..... YES NO

40. Have you lost all your interests? ..... YES NO

41. Do you feel everything is a great burden to you? ..... YES NO

42. Do you hate yourself? ..... YES NO

43. Are you tortured by feelings of guilt? ..... YES NO

44. Do you like to be happy? ..... YES NO

/Over .....

45. Do you have difficulty in sleeping? ..... YES NO

If 'YES' a) Do you have difficulty getting to sleep? .. YES NO

b) Do you wake up soon after getting to sleep? YES NO

c) Do you wake up earlier than usual and then can't get back to sleep? ..... YES NO

46. Do you feel abandoned, completely unwanted? ..... YES NO

47. Have you recently lost your appetite? ..... YES NO

48. Have you, over the last few months lost about one stone or more in weight? ..... YES NO

49. Is your mind normally crowded with thoughts when you go to bed? ..... YES NO

50. Do you feel riddled with sin? ..... YES NO

51. Do you have someone to turn to when you need help? .... YES NO

52. Are you normally troubled by thoughts you can't get out of your head? ..... YES NO

53. Do you often feel nervous and shaky? ..... YES NO

54. Have you been shy and reserved for many years? ..... YES NO

55. Do you get a lot of headaches? ..... YES NO

56. Does you mouth often feel dry? ..... YES NO

57. If things go wrong, do you usually lose your temper? .. YES NO

58. Do people say that you are often too emotional? ..... YES NO

59. Do you hear bad things said about you when no-one is there? ..... YES NO

60. Do you normally worry about your health? ..... YES NO

61. Do you feel you are a weakling, to be despised? ..... YES NO

62. Do you often feel giddy or faint? ..... YES NO

63. Do you have difficulty concentrating? ..... YES NO

64. Are you, or would you, be frightened of travelling on a bus? ..... YES NO

65. Do you feel that your thoughts are so slowed down you can't think? ..... YES NO

/Over .....

66. If you criticise someone for a good reason do you worry a lot about it afterwards? ..... YES NO

67. Do you feel a burden to your friends and relatives? ... YES NO

68. Do you think you will get well? ..... YES NO

Appendix C : E.P.Q. (Adult)

Occupation .....

Age ..... Sex .....

INSTRUCTIONS Please answer each question by putting a circle around the "YES" or the "NO" following the question. There are no right or wrong answers, and no trick questions. Work quickly and do not think too long about the exact meaning of the questions.

PLEASE REMEMBER TO ANSWER EACH QUESTION

1.	Do you have many different hobbies?	YES	NO
2.	Do you stop to think things over before doing anything?	YES	NO
3.	Does your mood often go up and down?	YES	NO
4.	Have you every taken the praise for something you knew someone else had really done?	YES	NO
5.	Are you a talkative person?	YES	NO
6.	Would being in debt worry you?	YES	NO
7.	Do you ever feel "just miserable" for no reason?	YES	NO
8.	Were you ever greedy by helping yourself to more than your share of anything?	YES	NO
9.	Do you lock up your house carefully at night?	YES	NO
10.	Are you rather lively?	YES	NO
11.	Would it upset you a lot to see a child or an animal suffer?	YES	NO
12.	Do you often worry about things you should not have done or said?	YES	NO
13.	If you say you will do something, do you always keep your promise no matter how inconvenient it might be? ..	YES	NO
14.	Can you usually let yourself go and enjoy yourself at a lively party?	YES	NO
15.	Are you an irritable person?	YES	NO
16.	Have you ever blamed someone for doing something you knew was really your fault?	YES	NO
17.	Do you enjoy meeting new people?	YES	NO
18.	Do you believe insurance schemes are a good idea?	YES	NO

19.	Are your feelings easily hurt?	YES	NO
20.	Are all your habits good and desirable ones?	YES	NO
21.	Do you tend to keep in the background on social occasions?	YES	NO
22.	Would you take drugs which may have strange or dangerous effects?	YES	NO
23.	Do you often feel "fed-up"?	YES	NO
24.	Have you ever taken anything (even a pin or button) that belonged to someone else?	YES	NO
25.	Do you like going out a lot?	YES	NO
26.	Do you enjoy hurting people you love?	YES	NO
27.	Are you often troubled about feelings of guilt?	YES	NO
28.	Do you sometimes talk about things you know nothing about?	YES	NO
29.	Do you prefer reading to meeting people?	YES	NO
30.	Do you have enemies who want to harm you?	YES	NO
31.	Would you call yourself a nervous person?	YES	NO
32.	Do you have many friends?	YES	NO
33.	Do you enjoy practical jokes that can sometimes really hurt people?	YES	NO
34.	Are you a worrier?	YES	NO
35.	As a child did you do as you were told immediately and without grumbling?	YES	NO
36.	Would you call yourself happy-go-lucky?	YES	NO
37.	Do good manners and cleanliness matter much to you? ...	YES	NO
38.	Do you worry about awful things that might happen?	YES	NO
39.	Have you ever broken or lost something belonging to someone else?	YES	NO
40.	Do you usually take the initiative in making new friends?	YES	NO
41.	Would you call yourself tense or "highly-strung"?	YES	NO
42.	Are you mostly quiet when you are with other people? ..	YES	NO
43.	Do you think marriage is old-fashioned and should be done away with?	YES	NO

44.	Do you sometimes boast a little?	YES	NO
45.	Can you easily get some life into a rather dull party?	YES	NO
46.	Do people who drive carefully annoy you?	YES	NO
47.	Do you worry about your health?	YES	NO
48.	Have you ever said anything bad or nasty about anyone?	YES	NO
49.	Do you like telling jokes and funny stories to your friends?	YES	NO
50.	Do most things taste the same to you?	YES	NO
51.	As a child were you ever cheeky to your parents?	YES	NO
52.	Do you like mixing with people?	YES	NO
53.	Does it worry you if know there are mistakes in your work?	YES	NO
54.	Do you suffer from sleeplessness?	YES	NO
55.	Do you always wash before a meal?	YES	NO
56.	Do you nearly always have a "ready answer" when people talk to you?	YES	NO
57.	Do you like to arrive at appointments in plenty of time?	YES	NO
58.	Have you often felt listless and tired for no reason? .	YES	NO
59.	Have you ever cheated at a game?	YES	NO
60.	Do you like doing things in which you have to act quickly?	YES	NO
61.	Is (or was) your mother a good woman?	YES	NO
62.	Do you often fell life is very dull?	YES	NO
63.	Have you ever taken advantage of someone?	YES	NO
64.	Do you often take on more activities than you have time for?	YES	NO
65.	Are there several people who keep trying to avoid you?	YES	NO
66.	Do you worry a lot about your looks?	YES	NO
67.	Do you think people spend too much time safeguarding their future with savings and insurances?	YES	NO
68.	Have you ever wished that you were dead?	YES	NO

69. Would you dodge paying taxes if you were sure you could never be found out? ..... YES NO

70. Can you get a party going? ..... YES NO

71. Do you try not to be rude to people? ..... YES NO

72. Do you worry too long after an embarrassing experience? ..... YES NO

73. Have you ever insisted on having your own way? ..... YES NO

74. When you catch a train do you often arrive at the last minute? ..... YES NO

75. Do you suffer from "nerves"? ..... YES NO

76. Do your friendships break up easily without it being your fault? ..... YES NO

77. Do you often feel lonely? ..... YES NO

78. Do you always practice what you preach? ..... YES NO

79. Do you sometimes like teasing animals? ..... YES NO

80. Are you easily hurt when people find fault with you or the work you do? ..... YES NO

81. Have you ever been late for an appointment or work? ... YES NO

82. Do you like plenty of bustle and excitement around you? ..... YES NO

83. Would you like other people to be afraid of you? ..... YES NO

84. Are you sometimes bubbling over with energy and sometimes very sluggish? ..... YES NO

85. Do you sometimes put off until tomorrow what you ought to do today? ..... YES NO

86. Do other people think of you as being very lively? .... YES NO

87. Do people tell you a lot of lies? ..... YES NO

88. Are you touchy about some things? ..... YES NO

89. Are you always willing to admit it when you have made a mistake? ..... YES NO

90. Would you feel very sorry for an animal caught in a trap? ..... YES NO

PLEASE CHECK TO SEE THAT YOU HAVE ANSWERED ALL THE QUESTIONS.

Appendix D : Overall Scores on the clinical tests

Agoraphobics

E.P.Q.	Test for Agoraphobia	Anxiety and Depression Scale			
N	Total	An	GD	PD	*ADS
14	8.36	8	11	5	3
6	9.41	8	5	3	3
20	11.27	16	33	14	6
21	7.13	11	20	10	5
23	6.46	11	24	12	4
21	8.85	14	29	13	4
21	6.42	12	21	14	3
20	6.41	16	13	12	6
17	6.22	1	1	7	0
20	12.90	14	42	10	5
22	13.84	16	31	19	6
10	12.06	8	6	5	2

Anxious

N	Total	An	GD	PD	*ADS
21	7.10	8	21	15	1
13	2.55	14	16	4	4
18	5.51	3	14	8	1
13	4.68	12	19	9	3
19	6.46	11	19	12	3
20	5.99	7	9	10	1
10	56.90	0	18	2	6
11	4.41	8	6	5	3
18	2.93	5	12	10	1
19	9.92	12	27	14	3
15	2.07	6	10	8	1
15	9.00	14	18	5	(3)

Depressives

N.	Total	AN	GD	PD	*ADS
17	7.31	9	26	12	2
22	7.27	10	29	11	3
21	3.63	5	20	15	1
22	6.83	7	33	14	0
17	3.07	9	22	8	2
20	9.99	15	35	16	6
22	7.70	13	36	14	3
23	5.78	16	32	12	5
22	5.98	14	26	14	5
23	11.71	15	30	16	4
23	9.25	12	35	14	4
21	6.04	12	26	14	3

Controls

N.	Total	AN	GD	PD	*ADS
14	3.96	4	3	5	1
13	3.03	4	4	3	0
3	2.04	3	3	3	0
6	2.44	1	1	4	0
8	2.30	0	0	0	0
14	4.99	3	4	10	0
4	3.58	2	2	6	1
19	6.94	10	14	10	4
9	3.04	2	0	7	0
17	6.79	0	0	0	3

*ADS is the Total score from 6 items on the Anxiety and Depression Scale which best predicts anxiety (items 13, 19, 20, 29, 62, 64)

N : Neuroticism scores

Total : Total agoraphobic scores

An : Anxiety scores

GD : General Depression scores

PD : Pre disposition scores

Appendix E : Total Recall Scores

(Experiment 1)

Agoraphobics

Depression List

T1		T2		T3		T4	
Exp. Words	Neutral Words	Exp. Words	Neutral Words	Exp. Words	Neutral Words	Exp. Words	Neutral Words
5	4	5	7	8	7	7	8
2	6	5	6	4	9	7	8
5	3	5	4	6	5	5	7
3	1	5	2	3	3	3	5
3	2	5	2	5	2	7	4
5	1	4	5	8	6	7	6
3	2	5	3	6	1	2	5
6	5	4	5	3	7	5	7
6	6	6	6	6	7	5	7
5	2	6	4	5	5	7	5
2	2	5	2	6	2	9	3
3	2	5	7	3	9	6	6

Anxiety List

T1		T2		T3		T4	
Exp. Words	Neutral Words	Exp. Words	Neutral Words	Exp. Words	Neutral Words	Exp. Words	Neutral Words
6	2	6	6	10	3	8	7
5	2	3	4	5	4	5	6
6	1	4	3	8	5	8	5
6	2	4	4	3	2	6	2
4	1	4	3	5	4	6	5
8	0	6	4	7	6	7	9
6	3	7	1	6	6	1	3
5	3	7	6	7	7	7	8
5	1	9	5	6	8	7	7
9	2	8	7	7	5	6	7
4	1	8	3	8	3	9	3
7	3	8	4	10	6	7	6

Phobic List

T1		T2		T3		T4	
Exp. Words	Neutral Words	Exp. Words	Neutral Words	Exp. Words	Neutral Words	Exp. Words	Neutral Words
6	5	10	4	12	7	10	6
5	3	7	9	8	7	9	8
3	2	6	2	7	6	7	3
4	1	3	6	4	2	4	0
4	1	5	4	6	5	6	8
4	3	7	6	7	6	10	5
6	1	4	4	6	6	3	3
6	4	6	7	7	8	9	7
5	5	8	9	10	10	9	10
7	1	11	6	14	6	14	8
3	1	7	3	6	6	10	4
6	4	6	8	6	10	6	9

Anxious

Depression List

T1		T2		T3		T4	
Exp. Words	Neutral Words	Exp. Words	Neutral Words	Exp. Words	Neutral Words	Exp. Words	Neutral Words
2	4	5	8	8	7	5	10
3	2	5	5	8	8	7	8
5	1	3	4	8	4	7	5
5	6	8	9	9	11	9	9
3	1	0	3	2	4	5	2
6	1	4	4	7	4	7	4
2	2	3	1	5	1	4	2
0	6	5	6	5	8	4	5
3	2	3	5	3	7	6	2
6	2	6	3	6	8	7	8
2	2	2	5	5	5	7	5
2	2	5	4	8	5	5	5

Anxiety List

T1		T2		T3		T4	
Exp. Words	Neutral Words	Exp. Words	Neutral Words	Exp. Words	Neutral Words	Exp. Words	Neutral Words
1	2	4	5	5	4	5	4
6	1	6	5	7	7	10	5
6	3	4	5	6	7	8	8
8	3	7	10	10	8	10	8
5	1	6	3	7	1	3	3
5	3	6	4	5	5	9	4
5	0	2	3	4	3	4	3
7	2	3	5	7	4	10	3
4	3	6	3	6	3	8	4
8	2	7	5	9	8	8	8
4	2	5	4	6	4	6	6
7	3	7	4	6	6	7	6

Phobic List

T1		T2		T3		T4	
Exp. Words	Neutral Words	Exp. Words	Neutral Words	Exp. Words	Neutral Words	Exp. Words	Neutral Words
7	1	7	6	8	6	10	8
6	4	5	7	7	8	6	7
4	2	8	5	7	7	6	8
7	5	7	11	9	12	11	10
2	2	4	2	5	4	5	2
7	3	7	7	7	5	7	7
2	2	3	1	5	7	6	5
6	1	7	8	7	7	5	11
3	3	5	4	8	3	9	4
6	2	8	9	7	10	9	10
3	3	3	5	8	4	9	6
8	3	8	8	10	4	10	9

Depressives

Depression List

T1		T2		T3		T4	
Exp. Words	Neutral Words	Exp. Words	Neutral Words	Exp. Words	Neutral Words	Exp. Words	Neutral Words
4	2	6	3	5	5	9	6
5	7	4	4	5	6	9	6
4	3	8	4	7	8	8	9
3	1	3	2	2	4	2	5
3	5	5	5	5	6	5	6
4	3	7	3	10	7	8	7
4	1	6	5	6	5	9	3
5	3	5	6	8	5	8	8
4	2	4	5	7	4	5	6
5	1	14	1	9	3	10	3
6	3	7	5	5	4	6	8
4	2	7	3	8	6	9	6

Anxiety List

T1		T2		T3		T4	
Exp. Words	Neutral Words	Exp. Words	Neutral Words	Exp. Words	Neutral Words	Exp. Words	Neutral Words
5	1	6	4	9	7	7	5
6	2	6	4	7	5	13	3
6	4	7	4	9	8	8	6
3	2	3	2	3	2	4	2
5	0	5	3	6	5	5	5
5	2	5	6	7	5	7	6
4	2	5	2	4	2	5	3
4	1	6	3	8	4	6	5
8	2	8	2	8	5	9	6
8	1	12	6	6	9	9	8
7	4	6	4	4	5	8	4
8	2	8	5	7	8	9	5

Phobic List

T1		T2		T3		T4	
Exp. Words	Neutral Words	Exp. Words	Neutral Words	Exp. Words	Neutral Words	Exp. Words	Neutral Words
3	2	8	2	7	4	10	6
5	2	3	6	6	7	4	8
4	2	7	6	7	6	5	9
1	2	2	4	4	1	2	3
6	4	4	7	8	7	8	6
3	3	8	8	8	6	8	8
5	2	7	4	4	6	6	2
3	4	8	6	6	6	6	6
3	3	6	5	8	6	8	5
8	0	5	7	5	12	8	7
9	3	6	4	8	6	7	8
5	3	7	4	8	6	6	9

Controls

Depression List

T1		T2		T3		T4	
Exp. Words	Neutral Words	Exp. Words	Neutral Words	Exp. Words	Neutral Words	Exp. Words	Neutral Words
8	4	7	5	10	6	7	9
4	3	7	2	4	3	5	4
2	1	4	4	6	5	7	7
4	2	6	7	10	7	8	7
2	2	4	5	7	7	5	5
6	2	5	4	6	4	7	7
5	4	3	3	6	6	2	7
5	3	5	5	4	6	5	7
6	4	6	4	7	7	8	7
4	1	3	2	4	3	5	6

Anxiety List

T1		T2		T3		T4	
Exp. Words	Neutral Words	Exp. Words	Neutral Words	Exp. Words	Neutral Words	Exp. Words	Neutral Words
7	4	7	6	7	11	10	10
5	1	4	1	8	2	6	1
4	2	5	4	4	6	5	6
8	3	9	7	7	11	8	7
4	6	8	3	9	3	6	5
4	1	3	5	4	6	7	3
3	1	3	5	8	5	5	4
5	2	5	3	4	5	4	5
5	3	6	5	7	3	9	4
6	3	6	5	6	4	7	3

Phobic List

T1		T2		T3		T4	
Exp. Words	Neutral Words	Exp. Words	Neutral Words	Exp. Words	Neutral Words	Exp. Words	Neutral Words
8	6	5	9	7	9	8	10
3	2	6	6	9	6	8	7
2	3	4	5	6	4	8	5
8	5	7	7	9	7	9	9
8	1	6	5	9	8	13	4
7	1	4	6	2	6	5	7
6	3	6	9	10	9	7	6
4	2	4	5	6	5	6	7
5	8	7	8	11	9	10	8
5	0	7	3	7	3	8	5

Appendix F : Clustering Scores (RR)

(Experiment 1)

Agoraphobics

Depression List

T1		T2		T3		T4	
Exp. Words	Neutral Words	Exp. Words	Neutral Words	Exp. Words	Neutral Words	Exp. Words	Neutral Words
.75	.67	.75	.67	.43	.67	.83	.71
1	.8	0	.4	.33	.75	.83	.71
.75	0	.75	.67	1	.75	.75	.83
.5	1	.75	0	1	.5	1	1
1	1	.5	0	1	1	.67	.33
.75	1	.67	.5	.57	.4	.17	0
1	1	.5	0	1	1	1	.75
.4	.25	.33	.5	.5	.83	.75	.83
.8	.6	.6	.4	.6	.67	.75	.67
.75	0	.6	.33	.5	.75	1	1
1	1	1	1	.6	0	.75	.5
1	1	.5	.5	.5	.75	.6	.6

Anxiety List

T1		T2		T3		T4	
Exp. Words	Neutral Words	Exp. Words	Neutral Words	Exp. Words	Neutral Words	Exp. Words	Neutral Words
1	1	.8	.6	.89	.5	.86	.83
.75	1	1	1	1	1	.75	.6
.8	1	1	.5	.57	.25	.71	.5
.8	1	1	.67	.5	0	.8	1
.67	1	.67	.5	.5	.67	.4	.5
1	0	.8	.33	.5	.4	.83	.75
.4	0	.83	1	.6	.6	1	1
.75	.5	.83	.8	.83	.67	.83	.86
.75	1	.63	.25	.8	.71	.83	.83
.88	0	.71	.5	.5	.25	.8	.67
1	1	1	1	.86	.5	.75	.5
0.5	0	.71	.67	.89	.8	.5	.4

Phobic List

T1		T2		T3		T4	
Exp. Words	Neutral Words	Exp. Words	Neutral Words	Exp. Words	Neutral Words	Exp. Words	Neutral Words
.8	.5	0.78	.67	.82	.67	.56	.4
.5	0	0.67	.63	.43	.33	.75	.71
1	1	.8	0	.67	0.4	.83	1
.67	1	.5	.6	.67	1	1	0
.67	1	1	.67	.4	.25	.6	.57
.67	.5	.33	.2	.33	.4	.78	.5
.8	1	.33	.33	.4	.6	.5	.5
.6	.67	.4	.5	.17	.43	.88	.83
.75	.75	.57	.63	.56	.56	.75	.89
.83	1	.7	.6	.69	.2	.69	.43
.5	1	.67	0	.8	.6	.78	.33
.8	.67	.6	.71	.4	.67	.4	.63

Anxious

Depression List

T1		T2		T3		T4	
Exp. Words	Neutral Words	Exp. Words	Neutral Words	Exp. Words	Neutral Words	Exp. Words	Neutral Words
1	1	.75	.71	.86	.83	.75	.78
.5	0	.25	.25	.57	.57	.33	.43
1	1	.5	.67	.71	.33	.67	.5
.25	.4	.86	.88	.38	.5	.63	.63
1	1	0	1	0	0.67	.75	0
1	1	.67	.67	.5	.33	.83	1
0	0	1	1	.75	1	.33	0
0	1	.25	.4	.25	.57	.33	.25
.5	0	1	.75	.5	0	.8	1
.6	0	.6	0	.6	.57	.17	.43
1	0	1	.75	.5	.5	.5	.25
1	1	.75	.67	.71	.75	.5	.75

Anxiety List

T1		T2		T3		T4	
Exp. Words	Neutral Words	Exp. Words	Neutral Words	Exp. Words	Neutral Words	Exp. Words	Neutral Words
1	1	.67	.5	.75	.33	.75	.67
1	1	.8	.75	.83	.67	.78	.5
.8	.5	.33	.25	.4	.33	.71	.71
.71	.5	1	.89	.89	.71	.78	.71
1	0	.8	.5	1	1	.5	0
.5	.5	.8	.67	1	.75	.75	.33
1	0	1	.5	1	.5	.33	.5
.83	0	.5	.5	.67	.33	.78	0
.5	1	.8	.5	.8	1	.71	0
.71	0	.83	.75	.63	.57	1	1
.33	0	.5	.67	.8	.67	.4	.6
.83	1	.67	.67	.8	.8	.67	.8

Phobic List

T1		T2		T3		T4	
Exp. Words	Neutral Words	Exp. Words	Neutral Words	Exp. Words	Neutral Words	Exp. Words	Neutral Words
.83	1	.67	.6	.57	.2	.56	.29
.2	0	.75	.67	.33	.29	.4	.67
0.67	0	.57	.25	.67	.4	.6	.71
.67	.5	.5	.6	.5	.55	.7	.56
0	0	1	1	.75	.33	1	1
.67	.5	.83	.67	.17	0	.67	.5
0	0	.5	1	.5	.67	.6	.25
.8	1	.67	.86	.5	.67	.25	.8
.5	.5	.75	.33	.85	1	.5	0
.6	0	.71	.63	.67	.67	.63	.56
.5	.5	.5	.5	.71	.67	.75	.8
.71	.5	.71	.57	.67	.33	.67	.63

Depressives

Depression List

T1		T2		T3		T4	
Exp. Words	Neutral Words	Exp. Words	Neutral Words	Exp. Words	Neutral Words	Exp. Words	Neutral Words
1	1	1	1	.75	.75	.75	.6
.75	.67	.67	.33	1	.8	.63	.6
.67	0	.86	.67	.67	.57	.57	.63
1	1	1	1	1	1	1	1
0	.5	.5	.5	.5	.6	.25	.4
.67	.5	.67	.5	.67	.5	.57	.5
1	1	.6	.5	.2	.25	.75	.5
.75	.5	.75	.8	.71	.5	.71	.57
1	1	.33	.5	.67	.67	.75	.8
.71	.25	.85	0	.75	.5	.89	1
.8	.5	.67	.5	.25	.33	.6	.71
.67	1	.67	.5	.57	.4	.63	.6

Anxiety List

T1		T2		T3		T4	
Exp. Words	Neutral Words	Exp. Words	Neutral Words	Exp. Words	Neutral Words	Exp. Words	Neutral Words
1	1	.8	.33	.75	.67	.83	.75
.6	0	.6	.33	.83	.75	.75	0
.6	.33	.67	.33	.75	.71	.86	1
1	1	.5	0	.5	0	.67	0
1	0	.75	.5	.6	.5	.5	.5
.75	0	1	.8	.5	.25	.67	.4
.67	1	.75	0	.67	0	1	1
1	1	.8	.5	.71	.33	.8	.5
.86	0	.71	0	.86	.75	.63	.4
.86	1	.82	.6	.4	.38	.63	.71
.33	0	.6	.33	.67	.75	.85	.67
.86	0	.43	.25	.5	.43	.63	.5

Phobic List

T1		T2		T3		T4	
Exp. Words	Neutral Words	Exp. Words	Neutral Words	Exp. Words	Neutral Words	Exp. Words	Neutral Words
.5	0	.86	0	.83	.67	.56	.4
.5	0	.5	.8	.6	.67	.33	.57
.67	0	.67	.4	.33	.4	.75	.63
1	1	0	.67	1	1	0	0
.6	.33	.67	.67	.71	.5	.57	.2
1	.5	.43	.57	.43	.2	.71	.57
.5	0	.83	.67	.67	.8	.6	0
.5	.67	.57	.2	.6	.6	.6	.8
1	1	.8	.5	.57	.6	.71	.25
1	0	.5	.67	.75	.82	.71	.67
.75	.5	.6	.67	.57	.4	.5	.57
.5	0	.5	.33	.57	.6	.0	.38

Controls

Depression List

T1		T2		T3		T4	
Exp. Words	Neutral Words	Exp. Words	Neutral Words	Exp. Words	Neutral Words	Exp. Words	Neutral Words
.43	0	.83	.75	.78	.8	.33	.5
1	1	.83	0	.67	0	1	.67
1	1	.33	0	.4	.5	.33	.33
1	1	.6	.5	.67	.5	.71	.5
0	0	.33	.25	.5	.67	.5	.5
.8	1	.75	.67	.8	.33	.83	.67
.75	.33	1	1	.6	.4	0	.67
.5	.5	.75	.5	.67	.8	.25	.67
.6	.67	.6	.33	.67	.67	.57	.33
.67	1	.5	0	.67	.5	.75	.8

Anxiety List

T1		T2		T3		T4	
Exp. Words	Neutral Words	Exp. Words	Neutral Words	Exp. Words	Neutral Words	Exp. Words	Neutral Words
.67	.33	.67	.6	.5	.7	.67	.67
.75	0	.67	0	1	1	.8	0
.67	0	.75	1	.67	.8	.5	.6
.86	.5	.75	.67	.67	.7	.86	.67
.67	.8	.71	0	.63	0	.8	.5
.67	1	0	.5	.67	.6	.67	.5
.5	1	.5	.5	.86	.5	.75	.67
.75	0	.75	1	1	.75	.33	.5
.5	.5	.4	.25	.83	.5	1	.67
.6	.5	.8	.75	1	1	.67	.5

Phobic List

T1		T2		T3		T4	
Exp. Words	Neutral Words	Exp. Words	Neutral Words	Exp. Words	Neutral Words	Exp. Words	Neutral Words
.57	.6	.25	.63	.5	.63	.57	.56
1	1	.4	.4	.5	.4	.43	.33
0	.5	.33	.5	.6	.67	.71	.5
.71	.5	.67	.67	.63	.67	.5	.63
.86	1	.8	.75	.75	.57	.83	.33
1	1	1	.8	0	.8	.25	.5
.6	.5	.6	.75	.44	.25	.67	.6
1	1	.67	.5	.8	.75	.8	.67
.5	.71	.5	.71	.5	.38	.44	.43
1	0	.83	.5	.5	0	.86	.75

Appendix G :

HOW MANY TIMES EACH WORD WAS RECALLED OVERALL FOR EACH TRIAL BY EACH GROUP OF SUBJECTS

Agoraphobics

		Trials					Trials				
	Words	1	2	3	4	Words	1	2	3	4	
Depr.	Failure	3	0	7	8	Panic	7	3	7	10	Anx.
list	Guilt	2	5	3	3	Shaking	7	6	8	5	list
	Disgust	6	4	2	1	Dizzy	5	7	8	6	
	Misery	5	4	7	8	Anger	2	7	8	6	
Exper.	Suicide	9	10	10	9	Breathless	9	7	6	5	
Words	Ugly	6	8	6	8	Trembling	4	7	5	8	
	Effort	3	2	2	1	Heartbeat	9	8	6	8	
	Sadness	3	7	6	9	Nervous	8	6	5	7	
	Wakeful	3	6	5	4	Worry	5	4	6	3	
	Crying	5	8	8	9	Tension	9	9	9	8	
	London	10	10	11	9	Autumn	3	6	7	8	
	Branch	3	3	6	4	Purple	5	8	9	7	
	Bargain	6	4	7	5	Curly	1	8	5	7	
Neut.	Novelist	2	6	6	8	Request	0	3	6	6	
Words	Scientist	6	6	7	7	Fertile	3	2	3	4	
	Hungry	0	2	5	3	Pointing	0	2	6	8	
	Ideas	1	3	5	6	Airmail	2	5	9	6	
	Gallon	3	3	2	4	Charming	0	4	2	5	
	Foggy	4	4	6	6	Welfare	1	4	4	4	
	Bathing	1	7	4	9	Budget	5	5	4	5	

Phobia	Words	Trials 1	2	3	4
list	Shopping	7	6	5	5
	Train	7	7	6	7
	Aeroplane	7	9	6	11
	Crowds	6	8	9	10
Exper.	Lifts	5	8	8	8
Words	Church	4	7	8	8
	People	5	7	8	10
	Party	3	8	11	10
	S.Markets	11	8	8	11
	H.dresser	3	8	10	6
	Mirror	3	7	7	6
	Drink	3	4	7	7
	Calendars	0	4	6	5
	Floors	3	9	9	10
Neut.	Heels	2	6	7	6
Words	Book	1	7	3	2
	Baby	7	11	12	8
	Music	0	3	6	6
	Adverts	6	7	9	8
	B.casters	5	6	10	6

Depressives

		Trials					Trials				
	Words	1	2	3	4	Words	1	2	3	4	
Depr.	Failure	7	5	3	5	Panic	9	8	7	9	Anx
list	Guilt	5	6	5	8	Shaking	6	8	9	10	list
	Disgust	5	6	5	2	Dizzy	2	7	6	6	
	Misery	3	7	7	7	Anger	5	6	4	6	
Exper.	Suicide	10	10	11	10	Breathless	6	5	5	6	
Words	Ugly	7	6	7	10	Trembling	6	5	7	11	
	Effort	5	4	2	7	Heartbeat	5	3	5	6	
	Sadness	3	5	6	5	Nervous	9	9	9	7	
	Wakeful	1	6	7	7	Worry	7	7	9	6	
	Crying	4	7	8	10	Tension	7	7	7	4	
	London	7	8	10	12	Autumn	3	7	9	7	
	Branch	4	2	6	6	Purple	5	7	8	9	
	Bargain	1	4	5	4	Curly	1	7	5	7	
	Novelist	4	8	6	8	Request	0	3	8	4	
Neut.	Scientist	5	8	5	7	Fertile	4	2	4	5	
Words	Hungry	0	2	6	3	Pointing	1	3	6	3	
	Ideas	5	2	4	8	Airmail	6	6	5	6	
	Gallon	0	2	4	4	Charming	1	1	4	10	
	Foggy	3	6	8	10	Welfare	1	3	6	3	
	Bathing	4	3	4	4	Budget	1	2	3	4	

Phobia	Words	1	2	3	4
list	Shopping	3	8	6	6
	Train	8	5	8	6
	Aeroplane	7	6	6	8
	Crowds	1	6	8	9
Exper.	Lifts	4	6	6	6
Words	Church	5	5	7	9
	People	3	6	8	8
	Party	7	7	5	9
	S. markets	9	9	11	9
	H.dresser	3	7	9	4
	Mirror	1	5	7	7
	Drink	2	6	5	7
	Calendars	1	4	2	2
	Floors	1	6	7	7
Neut.	Heels	0	4	8	8
Words	Book	3	6	6	8
	Baby	7	9	10	10
	Music	4	4	2	6
	Adverts	9	8	9	8
	B. casters	3	7	10	6

Anxious

	Words	Trials 1	2	3	4	Words	Trials 1	2	3	4	
Depr	Failure	5	3	6	6	Panic	4	5	8	6	Anx
list	Guilt	3	5	5	10	Shaking	8	5	8	10	list
	Disgust	5	3	6	3	Dizzy	5	7	7	6	
	Misery	0	5	7	7	Anger	1	4	3	8	
Exper.	Suicide	7	7	8	12	Breathless	4	6	8	6	
Words	Ugly	5	5	7	9	Trembling	7	7	7	8	
	Effort	3	2	4	4	Heartbeat	8	7	10	11	
	Sadness	1	3	6	3	Nervous	9	9	8	9	
	Wakeful	2	5	7	5	Worry	2	5	6	7	
	Crying	3	7	10	8	Tension	7	6	6	8	
	London	7	11	10	11	Autumn	4	10	7	8	
	Branch	3	6	7	7	Purple	3	9	6	9	
	Bargain	1	4	5	4	Curly	3	6	7	4	
	Novelist	2	5	9	5	Request	2	7	9	4	
Neut.	Scientist	1	9	10	8	Fertile	5	3	5	8	
Words	Hungry	3	4	5	3	Pointing	0	3	6	6	
	Ideas	2	4	5	5	Airmail	5	4	7	10	
	Gallon	1	2	3	7	Charming	1	3	5	8	
	Foggy	4	6	4	8	Welfare	0	2	4	1	
	Bathing	4	5	6	5	Budget	1	3	2	4	

Phobia	Words	1	2	3	4
list	Shopping	5	7	8	8
	Train	9	8	10	10
	Aeroplane	7	8	8	11
	Crowds	3	5	10	10
Exper.	Lifts	4	5	8	8
Words	Church	8	7	10	9
	People	5	7	6	8
	Party	4	4	6	6
	S.markets	8	9	9	8
	H.dresser	4	6	5	9
	Mirror	0	7	10	10
	Drink	2	5	5	6
	Calendars	2	7	4	7
	Floors	2	6	9	11
Neut.	Heels	2	7	6	9
Words	Book	3	9	6	7
	Baby	6	8	11	10
	Music	3	2	8	7
	Adverts	5	8	8	5
	B.casters	4	7	6	9

Controls

		Trials					Trials				
	Words	1	2	3	4	Words	1	2	3	4	
Depr	Failure	2	6	5	4	Panic	4	3	7	8	Anx
list	Guilt	4	5	5	5	Shaking	3	8	8	8	list
	Disgust	6	4	3	3	Dizzy	4	2	5	5	
	Misery	3	5	7	4	Anger	4	6	6	6	
Exper.	Suicide	8	7	8	9	Breathless	6	6	6	4	
Words	Ugly	6	3	6	8	Trembling	2	4	4	8	
	Effort	5	4	4	3	Heartbeat	5	3	2	4	
	Sadness	4	3	8	4	Nervous	6	6	6	4	
	Wakeful	4	6	6	5	Worry	6	7	7	8	
	Crying	2	7	6	9	Tension	6	7	7	8	
	London	4	7	6	10	Autumn	2	3	7	6	
	Branch	4	3	4	5	Purple	2	4	7	8	
	Bargain	1	2	4	4	Curly	4	4	6	5	
	Novelist	3	5	6	6	Request	0	5	6	2	
Neut.	Scientist	3	7	5	9	Fertile	3	5	2	2	
Words	Hungry	1	4	3	5	Pointing	2	3	4	5	
	Ideas	0	1	5	7	Airmail	2	9	4	7	
	Gallon	1	1	3	3	Charming	5	5	5	4	
	Foggy	3	2	7	7	Welfare	1	3	4	5	
	Bathing	4	6	6	5	Budget	4	3	4	4	

Phobia	Words	1	2	3	4
list	Shopping	9	5	7	5
	Train	4	5	8	7
	Aeroplane	4	7	9	9
	Crowds	5	8	9	7
Exper.	Lifts	4	5	6	7
Words	Church	4	4	6	7
	People	5	5	7	9
	Party	2	3	5	6
	S.markets	8	8	8	10
	H.dresser	6	6	8	7
	Mirror	2	5	5	6
	Drink	1	5	5	5
	Calendars	1	5	5	7
	Floors	2	8	6	7
Neut.	Heels	2	6	7	7
Words	Book	3	4	5	4
	Baby	6	9	9	9
	Music	4	5	3	8
	Adverts	6	8	7	7
	B.casters	3	5	8	7

Depr. list = Depression List
Anx. list = Anxiety List

Exper. Words = Experimental Words
Neut. Words = Neutral Words

Appendix H Analysis of Variance of Total Recall Scores (Including controls) (Experiment 1)

Source	Sum of Squares	Degrees of Freedom	Mean Squares	F Ratio	Probability
Subject Groups	8.393	3.	2.798	8.180	0.910
Error	653.824	42.	15.567		
Lists	145.812	2.	72.906	30.453	0.001
Groups & Lists	34.255	6.	5.709	2.385	0.035
Error	201.098	84.	2.394		
Trials	251.632	3.	83.877	46.564	0.001
Groups & Trials	24.032	9.	2.670	1.482	0.161
Error	226.969	126.	1.001		
Lists & Trials	22.447	6.	3.741	2.438	0.026
Groups,Lists & Trials	20.912	10.	1.162	0.757	0.749
Error	386.734	252.	1.535		

Appendix I Analysis of Variance of Clustering Scores (Including controls) (Experiment 1)

Source	Sum of Squares	Degrees of Freedom	Mean Squares	F Ratio	Probability
Subject Groups	0.771	3.	0.257	2.581	0.066
Error	4.184	42.	0.100		
Lists	0.848	2.	0.329	3.743	0.028
Groups & Lists	0.795	6.	0.133	1.507	0.186
Error	7.387	84.	0.088		
Trials	0.255	3.	0.085	0.884	0.403
Groups & Trials	1.414	9.	0.157	1.818	0.071
Error	10.887	126.	0.086		
Lists & Trials	0.481	6.	0.080	0.757	0.604
Groups, Lists & Trials	2.260	18.	0.126	1.185	0.274
Error	26.701	252.	0.106		
Word-type	3.581	1.	3.561	76.491	0.001
Groups & Word-type	0.254	3.	0.085	1.819	0.158
Error	1.955	42.	0.047		
Lists & Word-type	0.786	2.	0.393	7.185	0.001
Groups, Lists & Word-type	0.226	6.	0.038	0.888	0.660
Error	4.584	84.	0.055		
Trials & Word-type	0.259	3.	0.086	2.300	0.080
Groups, Trials & Word-type	0.419	8.	0.047	1.238	0.278
Error	4.734	126.	0.038		
Lists, Trials, Word-type	0.157	8.	0.026	0.584	0.735
Groups, Lists, Trials & Word-type	0.701	18.	0.039	0.885	0.587
Error	11.080	252.	0.044		

Appendix J Analysis of Variance of Total Recall Scores (Without controls) (Experiment 1)

Source	Sum of Squares	Degrees of Freedom	Mean Squares	F Ratio	Probability
Patient	1049.2072	35.			
Groups	2.6829	2.	1.3414	0.0423	0.95884
Error	1046.5243	33.	31.7129		
Lists	145.5162	2.	72.7581	27.0170	0.00000
Lists & Groups	21.4144	4.	5.3586	1.9880	0.10559
Error	177.7361	66.	2.6930		
Word-types	227.1400	1.	227.1400	58.2074	0.00000
Word-types & Groups	6.0440	2.	0.0220	0.7744	0.52690
Error	128.7743	33.	3.9023		
Trials	769.9738	3.	256.4579	139.4885	0.00000
Trials & Groups	18.1505	6.	3.0251	1.6454	0.14198
Error	182.0174	99	1.8386		
Lists & Word-type	58.1412	2.	29.0706	11.3512	0.00017
List, Word-types & Groups	9.4977	4.	2.3744	0.9271	0.54472
Error	169.0278	66.	2.5610		
Lists & Trials	25.8449	6.	4.3075	4.0611	0.00101
Lists, Trials & Groups	18.4745	12.	1.1229	1.0586	0.39724
Error	210.0139	198.	1.0607		
Word-types & Trials	74.5961	3.	24.8654	13.9524	0.00001
Word-types, Trials & Groups	13.5116	6.	2.2519	1.2636	0.28040
Error	176.4340	99.	1.7822		
Lists & Word-types & Trials	16.8310	6.	2.0052	1.4143	0.20987
Lists,Word-types,Trials,Groups	15.7801	12.	1.3150	0.6630	0.78631
Error	392.7222	198	1.9834		

Appendix K Analysis of Variance of Clustering Scores (Without controls) Experiment 1)

Source	Sum of Squares	Degrees of Freedom	Mean Squares	F Ratio	Probability
Sub J	4.2930	35.			
Patient Groups	0.7659	2.	0.3830	3.5831	0.03801
Error	3.5270	33.	0.1069		
Lists	0.8855	2.	0.4428	4.7436	0.01182
Lists & Groups	0.5741	4.	0.1435	1.5377	0.20048
Error	6.1602	66.	0.0933		
Trials	0.1381	3.	0.0460	0.4947	0.69102
Trials & Groups	1.3660	6.	0.2277	2.4470	0.02971
Error	9.2110	99.	0.0930		
Word-type	3.2426	1.	3.2426	98.5775	0.00000
Word-type & Groups	0.2032	2.	0.1016	3.0886	0.05753
Error	1.0855	33.	0.0329		
Lists & Trials	0.2441	6.	0.0407	0.3908	0.88464
Lists, Trials & Groups	1.7877	12.	0.1490	1.4310	0.15395
Error	20.6134	198.	0.1041		
Lists & Word-type	0.7474	2.	0.3737	6.7195	0.00258
Lists, Word-type & Groups	0.1515	4.	0.0379	0.6808	0.61055
Error	3.6708	66.	0.0556		
Trials & Word-type	0.3346	3.	0.1115	2.7873	0.04373
Trials, Word-type & Groups	0.3684	6.	0.0614	1.5344	0.17408
Error	3.9620	99.	0.0400		
Lists, Word-type & Trials	0.0569	6.	0.0095	0.2188	0.96917
List, Word-type, Trials & Groups	0.4790	12.	0.0399	0.9206	0.52762
Error	8.5847	198.	0.0434		

Appendix L : The Leeds Self-Assessment Scale

INSTRUCTIONS

Please read the sentences below and indicate how much they apply to you right now or within the last day or two, by circling one of the four alternatives. There are no right or wrong answers. Please work quickly and do not think too long about any of the statements.

I feel miserable and sad.	Definitely	Sometimes	Not much	Not at all
I find it easy to do the things I used to.	Definitely	Sometimes	Not much	Not at all
I get very frightened or panic feelings for no reason at all.	Definitely	Sometimes	Not much	Not at all
I have weeping spells, or feel like it.	Definitely	Sometimes	Not much	Not at all
I still enjoy the things I used to.	Definitely	Sometimes	Not much	Not at all
I am restless and can't keep still.	Definitely	Sometimes	Not much	Not at all
I can get off to sleep easily and without sleeping tablets.	Definitely	Sometimes	Not much	Not at all
I feel anxious when I go out of the house on my own.	Definitely	Sometimes	Not much	Not at all
I have lost interest in things.	Definitely	Sometimes	Not much	Not at all
I get tired for no reason.	Definitely	Sometimes	Not much	Not at all
I am more irritable than usual.	Definitely	Sometimes	Not much	Not at all
I wake early and then sleep badly for the rest of the night.	Definitely	Sometimes	Not much	Not at all
I have a good appetite.	Definitely	Sometimes	Not much	Not at all
I feel in some way to blame for the way I am.	Definitely	Sometimes	Not much	Not at all

I get bad headaches.	Definitely	Sometimes	Not much	Not at all
I feel life is not worth living.	Definitely	Sometimes	Not much	Not at all
I get palpitations, or a sensation of 'butterflies' in my stomach or chest.	Definitely	Sometimes	Not much	Not at all
I often think I have done wrong.	Definitely	Sometimes	Not much	Not at all
I feel sleepy during the day.	Definitely	Sometimes	Not much	Not at all
I get dizzy attacks or feel unsteady.	Definitely	Sometimes	Not much	Not at all
I feel scared or frightened.	Definitely	Sometimes	Not much	Not at all
I feel tense or wound up.	Definitely	Sometimes	Not much	Not at all

Appendix M : Depression Descriptiveness Scale

1. Describes a person who is very happy.

2. Describes a person who is happy.

3. Describes a person who is moderately happy.

4. Describes a person who is slightly happy.

5. Describes a person who is neither depressed nor happy.

6. Describes a person who is slightly depressed.

7. Describes a person who is moderately depressed.

8. Describes a person who is depressed.

9. Describes a person who is very depressed.

Appendix N : Anxiety Descriptiveness Scale

1. Describes a person who is very relaxed.

2. Describes a person who is relaxed.

3. Describes a person who is moderately relaxed.

4. Describes a person who is slightly relaxed.

5. Describes a person who is neither anxious nor relaxed.

6. Describes a person who is slightly anxious.

7. Describes a person who is moderately anxious.

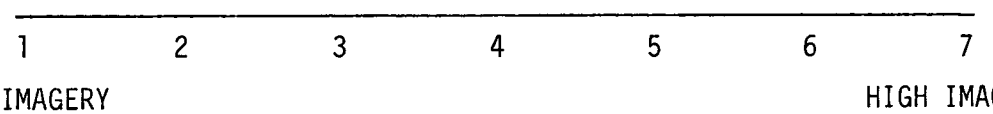
8. Describes a person who is anxious.

9. Describes a person who is very anxious.

Appendix O : Imagery Ratings - instructions

Adjectives differ in their capacity to arouse mental images of things, events or situations they describe. Some words arouse a sensory experience, such as a mental picture or sound very quickly and easily whereas others may do so only with difficulty (ie after a long delay) or not at all. The purpose of this experiment is to rate a list of words as to the ease or difficulty with which they arouse mental images. Any word which in your estimation arouses a mental image (ie a mental picture, or sound or other sensory experience) very quickly and easily should be given a high imagery rating; any word that arouses a mental image with difficulty or not at all should be given a low imagery rating. Think of the words "fiery" and "ingenious". Fiery would probably arouse an image relatively easily and would be rated as high imagery; ingenious would probably do so with difficulty and would be rated as low imagery.

Your ratings will be made on a seven-point scale, where one is the low imagery end of the scale and seven is the high imagery end of the scale. Choose your rating by saying the number from 1 to 7 that best indicates your judgement of the ease of difficulty with which the word arouses imagery. The words that arouse mental images most readily for you should be given a rating of 7, words that arouse images with the greatest difficulty or not at all should be rated 1; words that are intermediate in ease or difficulty of imagery, of course, should be rated appropriately between the two extremes. Feel free to use the entire range of numbers, from 1 to 7; at the same time, do not be concerned about how often you use a particular number as long as it is your true judgement.



Appendix P : Ratings - results of words selected for the Experiment

ANXIETY WORDS	D	A	I	G	NEUTRAL WORDS	D	A	I	G
UNCOMFORTABLE	5.75	7.75	5.25	18	SOLITARY	6.25	5.00	5.75	18
UNEASY	6.25	7.75	2.00	12	EXCESSIVE	3.50	4.25	2.75	12
UNCERTAIN	6.00	7.25	3.00	20	PRIMITIVE	4.75	5.00	5.75	20
FURIOUS	5.00	8.75	7.00	27	HORRIBLE	5.50	5.00	2.25	27
FRANTIC	6.75	9.00	7.00	12	GREEDY	5.00	5.50	6.00	11
WATCHFUL	5.75	8.75	2.50	13	UNJUST	5.25	5.50	1.50	13
TIMID	5.75	7.75	3.25	15	AWKWARD	5.50	5.75	3.52	14
INTENSE	5.50	7.25	4.00	15	HASTY	5.00	5.75	1.00	15
STORMY	5.00	8.00	5.50	21	CROOKED	4.50	4.75	5.00	18
SAVAGE	5.00	7.75	6.50	40	WICKED	4.75	4.50	6.50	36

BOTH (ANXIETY & DEPRESSION)	D	A	I	G	NEUTRAL WORDS	D	A	I	G
DESOLATE	9.00	7.25	3.00	16	OBSCURE	5.50	4.75	1.75	16
INFERIOR	7.50	7.25	4.25	17	DIZZY	2.25	4.00	6.50	10
DESPERATE	8.75	9.00	6.25	35	HIDEOUS	5.25	6.00	7.00	11
UNHAPPY	7.75	8.00	5.25	39	CONTRARY	4.75	2.75	5.50	46
DISMAL	8.75	7.25	5.25	13	CORRUPT	5.50	5.00	5.50	12
WORTHLESS	8.75	7.25	2.75	15	STUBBORN	5.00	4.50	3.00	14
HOPELESS	8.25	7.00	3.25	17	FRIGHTFUL	5.25	5.50	4.50	10
WRETCHED	9.00	9.00	4.75	21	STUPID	3.75	3.75	6.00	24
SHAK Y	6.75	8.75	5.00	25	DIRTY	5.75	5.00	7.00	31
ASHAMED	7.25	7.75	6.00	45	DREADFUL	6.00	5.00	5.50	43

DEPRESSION WORDS					NEUTRAL WORDS				
	D	A	I	G		D	A	I	G
PITIFUL	7.50	5.25	5.00	10	TREACHEROUS	5.00	6.50	5.50	11
LIMITED	6.50	5.00	2.25	18	CRITICAL	5.75	4.50	2.25	16
SULLEN	7.50	6.25	4.25	13	CHILDISH	4.50	3.75	4.75	13
DREARY	6.00	4.50	5.00	14	BREATHLESS	4.00	6.50	3.50	13
TRAGIC	8.75	6.50	5.50	16	HURRIED	5.00	6.75	3.00	16
GLOOMY	8.25	5.75	6.25	19	CLUMSY	5.00	5.75	5.75	10
BEATEN	7.75	6.50	2.25	28	VULGAR	5.00	4.50	2.75	11
HELPLESS	7.00	6.25	3.75	28	RECKLESS	4.75	3.75	4.75	33
LONELY	7.25	5.75	3.50	35	FOOLISH	4.25	3.50	5.50	36
GRIM	7.50	6.25	3.75	22	COARSE	5.00	3.75	3.50	28

D = Mean depression rating on a 9-point scale where 1 was "very happy" and 9 was "very depressed".

A = Mean anxiety rating on a similar 9-point scale.

I = Mean imagery rating on a 7-point scale where 1 was "low imagery" and 7 was "high imagery".

G = Thorn-dike-Lorge frequency count.

Appendix Q : Practise List Words

Prayer	Window
Daytime	Coalmine
Bashful	Haystack
Paradise	Snow
Bedroom	Bookcase
Aunt	Confident
Refusal	Clever
Enjoyment	Loud
Grateful	Dignity
Doorbell	Weekend

Appendix R : Consent Form

This is a study to investigate the way people remember information. You will be given some lists of words which you will be asked to remember, followed by some brief questionnaires. This is not part of your treatment. It is part of a study being conducted in association with Durham University. The information we obtain will be confidential and will not be included in your medical records. You are not obliged to take part in the study. If you do not wish to take part, please do not hesitate to say so.

If you do wish to take part, please sign the declaration below:

I have read the above description and fully understand what I have to do. I consent to take part in the study.

Signed .....

Witness .....

Investigator .....

Date .....

Appendix S : Subject Details and Self-Ratings Sheet

Name ..... Sex .....

Age ..... Occupation .....

Age left school .....

Type of school : Comprehensive Secondary Modern

Grammar Other (please specify)

ADJECTIVES

Crooked	Wretched	Hurried	Desolate
Shaky	Clumsy	Frightful	Greedy
Reckless	Beaten	Coarse	Awkward
Uncertain	Uncomfortable	Breathless	Stupid
Stubborn	Timid	Contrary	Dismal
Treacherous	Unjust	Frantic	Obscure
Furious	Watchful	Grim	Lonely
Solitary	Intense	Hideous	Dreadful
Dizzy	Tragic	Vulgar	Hasty
Dreary	Childish	Foolish	Savage
Hopeless	Uneasy	Sullen	Pitiful
Primitive	Unhappy	Inferior	Excessive
Ashamed	Limited	Desperate	Wicked
Dirty	Helpless	Corrupt	Gloomy
Horrible	Stormy	Critical	Worthless

Appendix T : Individual Questionnaire Scores

Subject Group	Leeds Self-Assessment Scores Anxiety	Depression	E.P.Q. Neuroticism
CONTROLS	5	7	11
	3	3	20
	7	6	23
	3	1	9
	7	1	10
	1	1	0
	3	0	3
PATIENTS	5	0	12
	12	0	20
	5	6	14
	13	9	21
	8	3	15
	14	7	21
	13	8	15
	10	17	23
	10	6	22
	3	2	17
	15	9	23

Appendix V : Total Recall Scores

Subject	i) Word List				ii) Word Category				iii) Trial			
Group	i) Both				Anxiety				Depression			
	ii) Neut		Exper		Neut		Exper		Neut		Exper	
	iii) T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
	3	5	4	3	2	4	2	3	3	1	2	3
	6	9	6	8	5	9	5	10	6	8	6	8
	3	3	5	7	2	4	6	5	2	4	5	5
	5	6	1	3	5	7	3	8	4	6	5	7
CONTROLS	4	8	3	6	3	4	4	9	4	6	4	3
	1	5	7	9	5	6	5	10	8	10	6	9
	3	3	4	6	1	7	5	3	3	4	5	3
	3	1	3	5	2	3	3	7	1	3	2	4
	3	4	3	7	0	4	4	2	1	3	3	3
	5	3	3	3	3	4	2	4	2	1	3	3
	0	3	1	2	1	6	2	3	1	1	1	2
	6	3	0	1	2	5	1	4	3	3	4	5
PATIENTS	2	3	2	4	2	1	2	3	3	4	1	3
	2	1	2	4	2	5	2	1	1	5	3	3
	2	2	2	1	0	2	1	1	0	1	2	1
	2	2	2	4	3	5	0	1	3	4	3	4
	2	1	2	4	5	4	2	5	4	4	0	3
	3	3	6	7	4	2	1	7	2	4	6	4
	7	7	5	9	5	7	5	7	4	8	6	9
	4	3	0	3	2	2	4	4	1	4	2	0

Appendix V : Clustering Scores (RR)

Subject	i) Word List				ii) Word Category				iii) Trials			
Group	i) Both				Anxiety				Depression			
	ii)	Neutral		Exper		Neutral		Exper		Neutral		Exper
	iii)	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
		0.00	0.50	0.33	0.00	0.00	0.67	0.00	0.50	0.50	0.00	0.00	1.00
		0.20	0.57	0.40	0.57	0.50	0.37	0.33	0.66	0.40	0.42	0.60	0.57
		0.50	0.00	0.50	0.66	0.00	0.33	0.60	0.50	1.00	0.67	0.75	1.00
CONTROLS		0.75	0.60	0.00	0.00	0.40	0.25	0.28	0.00	0.00	0.20	0.50	0.50
		0.30	0.85	0.50	0.80	0.00	0.00	0.33	0.50	0.33	0.60	0.67	0.50
		0.00	0.25	1.00	0.57	0.50	0.40	0.50	0.77	0.71	0.77	0.60	0.75
		0.50	0.50	0.30	0.60	1.00	0.50	0.00	0.50	0.50	1.00	0.75	0.50
		0.50	0.00	0.50	0.60	0.00	0.33	0.50	0.67	0.00	0.67	1.00	0.30
		0.00	0.00	0.00	0.14	0.00	0.33	1.00	0.00	0.00	0.50	0.50	0.50
		0.50	0.00	0.50	0.50	1.00	0.50	1.00	0.67	0.00	0.00	0.50	0.50
		0.00	0.50	0.00	0.00	0.00	0.60	1.00	0.00	0.00	0.00	0.00	1.00
PATIENTS		0.80	0.50	0.00	0.00	1.00	0.50	0.00	0.33	0.50	0.50	0.33	0.75
		0.00	0.00	0.00	0.67	1.00	0.00	1.00	0.50	1.00	0.67	0.00	0.00
		0.00	0.00	1.00	0.67	1.00	0.75	1.00	0.00	0.00	0.50	0.50	0.50
		0.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		0.00	1.00	0.00	0.67	0.50	0.25	0.00	0.00	0.00	0.00	0.00	0.67
		0.00	0.00	0.00	1.00	1.00	0.66	0.00	0.75	1.00	1.00	0.00	0.50
		1.00	0.00	0.40	0.50	1.00	0.00	0.00	0.83	0.00	0.33	0.75	0.00
		0.50	0.50	0.25	0.75	0.75	0.00	0.75	0.16	0.33	0.28	0.40	0.50
		1.00	0.50	0.00	0.50	0.00	0.00	0.33	0.66	0.00	0.66	0.00	0.00

Appendix W : Proportion of self-rated adjectives recalled

Subject	i) Word List	ii) Word Category				
Group	i) Both		Anxiety		Depression	
	ii) Neutral	Exper	Neutral	Exper	Neutral	Exper
	0.00	0.00	0.25	0.25	0.00	0.00
	0.21	0.00	0.20	0.40	0.11	0.08
	0.00	0.00	0.00	0.00	0.13	0.00
CONTROLS	0.08	0.17	0.27	0.54	0.08	0.31
	0.00	0.08	0.17	0.49	0.13	0.17
	0.50	0.11	0.65	0.60	0.71	0.00
	0.00	0.00	0.00	0.00	0.00	0.00
	0.67	0.00	0.00	0.07	0.63	0.00
	0.00	0.00	0.00	0.38	0.00	0.17
	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.21	0.42	1.00	0.00
PATIENTS	0.00	0.50	0.75	0.00	0.00	0.70
	0.00	0.63	0.00	0.17	0.13	0.33
	1.00	0.50	0.00	0.50	0.00	0.33
	0.00	1.00	0.00	0.00	0.00	0.25
	0.25	0.13	0.00	0.00	0.00	0.00
	0.00	0.30	1.00	0.33	0.00	0.00
	0.00	0.50	0.75	0.30	0.33	0.00
	0.00	-	-	0.30	0.25	0.00
	0.00	0.33	0.50	0.30	0.50	0.50

Appendix X Analysis of Variance of Total Recall Scores (Including controls) (Experiment2)

Source	Sum of Squares	Degrees of Freedom	Mean Squares	F Ratio	Probability
Groups	170.156	1.	170.156	7.053	0.016
Error	434.260	18.	24.126		
Lists	0.054	2.	0.027	0.013	0.987
Groups & Lists	2.655	2.	1.328	0.625	0.541
Error	78.480	36.	2.124		
Trials	16.685	1.	16.685	4.918	0.040
Groups & Trials	2.100	1.	2.100	0.619	0.442
Error	81.065	18.	3.393		
Lists & Trials	0.185	2.	0.093	0.038	0.963
Groups, Lists & Trials	6.516	2.	3.258	1.329	0.277
Error	88.216	36.	2.450		
Word-types	75.169	1.	75.169	23.437	0.001
Groups & word-types	22.751	1.	22.751	7.093	0.016
Error	57.732	18.			
Lists & Word-types	13.134	2.	6.567	5.034	0.012
Groups, Lists & Word-types	1.099	2.	0.550	0.421	0.659
Error	46.966	36.	1.305		
Trials & Word-types	1.055	1.	1.055	0.516	0.482
Groups, Trials & Word-types	1.406	1.	1.406	0.689	0.418
Error	36.758	18.	2.042		
Lists,Trials & Word-types	3.237	2.	1.618	0.648	0.529
Groups, Lists, Trials & Word-types	0.541	2.	0.271	0.108	0.898
Error	89.898	36.	2.497	0.108	0.898

Appendix Y Analysis of Variance of Clustering Scores (Including controls) (Experiment 2)

Source	Sum of Squares	Degrees of Freedom	Mean Squares	F Ratio	Probability
Subject Groups	0.555	1.	0.555	2.761	0.114
Error	3.616	18.	0.201		
Lists	0.264	2.	0.132	0.927	0.405
Groups & Lists	1.323	2.	0.661	4.652	0.016
Error	5.118	36.			
Trials	0.132	1.	0.132	1.168	0.294
Groups & Trials	0.172	1.	0.172	1.523	0.233
Error	2.033	18.	0.113		
Lists & Trials	0.035	2.	0.018	0.117	0.890
Groups, Lists & Trials	0.002	2.	0.001	0.008	0.992
Error	5.392	36.	0.150		
Word-type	0.140	1.	0.140	1.560	0.228
Groups & Word-type	0.062	1.	0.062	0.689	0.417
Error	1.616	18.	0.090		
Lists & Word-types	0.336	2.	0.168	2.951	0.065
Groups, Lists & Word-types	0.660	2.	0.330	5.796	0.007
Error	2.049	36.	0.057		
Trials & Word-types	0.000	1.	0.000	0.001	0.981
Groups, Trials & Word-types	0.085	1.	0.085	0.630	0.438
Error	2.418	18.	0.134		
Lists, Trials & Word-types	0.197	2.	0.098	0.610	0.549
Groups, Lists, Trials & Word-types	0.085	2.	0.043	0.264	0.769
Error	5.799	36.	0.161		

Appendix Z Analysis of Variance on Proportion of Correctly Recalled Adjectives Self-Rated (Including controls)

(Experiment 2)

Source	Sum of Squares	Degrees of Freedom	Mean Squares	F Ratio	Probability
Groups	0.061	1.	0.061	0.593	0.451
Error	1.835	18.	0.102		
Lists	0.155	2.	0.078	1.258	0.296
Groups & Lists	0.047	2.	0.024	0.385	0.683
Error	2.219	36.	0.062		
Word-type	0.000	1.	0.000	0.000	0.984
Groups & Word-type	0.104	1.	0.104	1.654	0.215
Error	1.133	18.	0.063		
Lists & Word-type	0.069	2.	0.034	0.528	0.584
Groups, Lists & Word-type	0.304	2.	0.152	2.341	0.111
Error	2.338	36.	0.065		

Appendix Z1 Analysis of Variance of Total Recall Scores (Without controls) (Experiment 2)

Source	Sum of Squares	Degrees of Freedom	Mean Squares	F Ratio	Probability
Error	604.417	19.	31.811		
Lists	0.033	2.	0.017	0.008	0.992
Error	79.133	38.	2.082		
Trials	15.000	1.	15.000	4.512	0.047
Error	63.166	19.	3.325		
Lists & Trials	0.100	2.	0.050	0.020	0.980
Error	94.734	38.	2.493		
Word-types	62.017	1.	82.017	14.840	0.001
Error	80.483	19.	4.236		
Lists & Word-types	12.433	2.	6.217	4.915	0.013
Error	48.067	38.	1.265		
Trials & Word-types	1.667	1.	1.667	0.830	0.374
Error	38.162	19.	2.009		
Lists, Trials & Word-types	3.733	2.	1.867	0.784	0.464
Error	90.438	38.	2.380		

Appendix Z2 Analysis of Variance of Clustering Scores (Without controls) (Experiment 2)

Source	Sum of Squares	Degrees of Freedom	Mean Squares	F Ratio	Probability
Error	4.170	19.	0.219		
Lists	0.112	2.	0.056	0.332	0.720
Error	6.441	38.	0.170		
Trials	0.082	1.	0.082	0.705	0.412
Error	2.205	19.	0.116		
Lists & Trials	0.037	2.	0.018	0.129	0.879
Error	5.394	38.	0.142		
Word-types	0.110	1.	0.110	1.241	0.279
Error	1.678	19	0.088		
Lists & Word-types	0.573	2.	0.286	4.016	0.026
Error	2.709	38.	0.071		
Trials & Word-type	0.005	1.	0.005	0.036	0.851
Error	2.502	19.	0.132		
Lists, Trials & Word-types	0.154	2.	0.077	0.498	0.611
Error	5.884	38.	0.155		

Appendix Z3 Analysis of variance of proportion of correctly recalled adjectives Self-Rated (Without conrols) (Experiment 2)

Source	Sum of Squares	Degrees of Freedom	Mean Squares	F Ratio	Probability
Error	1.896	19.	0.100		
Lists	0.135	2.	0.068	1.135	0.332
Error	2.267	38.	0.060		
Word-types	0.005	1.	0.005	0.078	0.783
Error	1.237	19.	0.065		
Lists & Word-types	0.085	2.	0.042	0.608	0.550
Error	2.642	38.	0.070		

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