An Investigation of Attentional Bias in Chronic Pain Patients using the Emotional Stroop Task

and Research Portfolio.

By

Lyndia Mary Green

Submitted in partial fulfilment of the degree of Doctor of Clinical Psychology within the Faculty of Medicine in the University of Glasgow.

August, 1998.

ProQuest LLC.
789 East Eisenhower Parkway
P.O. Box 1346
Ann Arbor, MI 48106 – 1346

Acknowledgements

I would like to thank Dr Elizabeth Campbell for her supervision and good humoured tolerance throughout. The co-operation of the Consultant Anaesthetists at The Pain Relief Clinic, Gartnavel General Hospital is gratefully acknowledged. I would also like to thank the participants who generously gave their time. The support of fellow researchers was invaluable. Finally I would like to thank Harry and Nicolas for the computer support and tolerance of domestic chaos during the last two years.

Table of Contents. **P age.**

Acknowledgements. **2**

Table of Contents. **3**

1. Literature Review : **5**

Information Processing Biases in Chronic Pain Patients : A Review.

2. Research Proposal : **27**

An Investigation of the Cognitive Biases of Chronic Pain Patients using the Emotional Stroop Task.

3. Main Research Paper : **43**

An Investigation of Attentional Bias in Chronic Pain Patients using the Emotional Stroop Task.

4. Service Related Research : **68**

Consultant Anaesthetists' Views on the need for Clinical Psychology Services to Pain Relief Services in Glasgow.

5. Single Case Research Study 1. **90**

Cognitive-Behaviour Therapy for Bulimia Nervosa associated with Alcohol Abuse. Does the inclusion of Alcohol Consumption Management improve the treatment outcome of Cognitive-Behaviour Therapy for Bulimia Nervosa?

6. Single Case Research Study 2. **92**

An investigation of the Use of The Emotional Stroop Task as a probe measure of Clinical Change in a Case of Medical Phobia.

7. Single Case Research Study 3. **94**

The Treatment of a Masked, Chronic Posttraumatic Stress Disorder and the Effect on Persistent Depression.

8. Appendices.

I **Literature Review**:
1 Instructions to Authors, J. Psychosomatic Research. **96**

A **Research Proposal**: **98**
1 Pain Words List.
2. Neutral Un-categorised Words List.
3. Negative Words List.
4. Neutral Categorised Words List.
5. Consent Form.

B **Main Research Paper**: **103**
1. Task Instructions.
2. Sites of Pain.
3. Summary of Correlations.
4. Statistics Results.
5. Instructions to Authors, Pain.

C. **Service Related Project:** **109**
1. Pain Clinic Resources Questionnaire.
2. Anaesthetist Questionnaire.
3. Transcript of Responses re Psychological Treatments.
4. Instructions to Authors, Health Bulletin.

D. **Single Case Research** Project 1: **116**
1. Treatment Schedule
2. Instructions to Authors.

E. **Single Case Research Project 2:** **120**
1. Threat Words List.
2. Neutral Words List.
3. Systematic Desensitisation Programme Tasks.
4. Information to Contributors, Behaviour Research and Therapy.

F. **Single Case Research Project 3:** **125**
1. Instruction to Authors, Behavioural and Cognitive Psychotherapy.

Information Processing Biases in Chronic Pain:

A Review.

Lyndia Green. M.App.Sci.
Clinical Psychology Department
Gartnavel Royal Hospital
Glasgow G12

INFORMATION PROCESSING BIASES IN CHRONIC PAIN : A REVIEW.

INTRODUCTION.

Theoretical models of information processing and pain are considered in this paper, along with the effect of emotion and temperament. In addition, investigations of processing bias and particularly of attentional focus, in chronic pain populations are reviewed.

Pain has been defined by Merskey et al [1] as,

"An unpleasant sensation and emotional experience which is associated with actual or potential tissue damage or is described in terms of such damage."

This definition was derived from the Gate-Control Theory of Pain, which is currently the most influential and comprehensive theory of pain [2]. The pain experience is described as a complex interaction of sensory-discriminative, affective-motivational and cognitive-evaluative systems. The theory emphasised for the first time, the important role the higher centres of the brain play in the interpretation of pain and in the feedback loop of information which open and close the "gate" in the dorsal horn of the spinal cord. The effect of cognitive, affective, motivational and socio-cultural information is passed through the descending pathways form the brain and influences the amount of pain experienced or whether pain is experienced at all. The theory helps to explain the lack of correspondence between injury/pathology and level of pain reported, which frequently occurs [3].

The basis of individual differences in response to painful stimuli, especially where the pain persists, has been investigated. Cortical elaboration of perceptual sensation may be an important source of individual difference because it results in the amplification or minimisation of symptoms [4]. Psychological constructs such Trait Anxiety; Negative Affectivity and Neuroticism have been found to be more strongly and consistently related to health complaints,

including pain, than any objective indicators of health [5]. In situations of high arousal and ambiguity, both the individual's cognitive schemata and the environmental situation can determine the label an individual applies to particular physiological sensation [6, 7]. The basis of individual response to chronic pain is complex and difficult to establish, but important because of the implications for diagnosis and treatment.

PAIN AND EMOTION

The relationship between pain, emotion and cognition is a close and complex one. The most commonly described emotional states associated with chronic pain are; depression, fear, anger and frustration [8]. In the Gate Control Theory of pain, emotion is described as an integral part of the pain experience and not seen merely as a reaction to the sensory stimulus. So that pre-existing emotions such as anxiety and depression may influence perception of pain as well as the response to it. Emotional distress may increase pain by precipitating activity in the autonomic, visceral and skeletal systems. Anxiety about pain tends to direct attention to the pain, influencing muscle tension which leads to a stronger pain response [9]. Researchers looking at two psychological processes, thought to mediate the influence of anxiety on pain (ie. attentional processes and attributional processes) found that attentional processes explained their results [10]. The importance of anxiety in pain varies according to the stage in the pain process and may be more relevant in the acute pain stage. More enduring influences of anxiety however have also been reported. Jones and Hollandsworth [11] found that subjects with high trait anxiety, reported more physical symptoms under stress. The increased reporting however, was not due to more accurate identification of measured physiological features, but they suggested reflected a perceptual bias.

Although it is accepted that at times emotional distress may be of aetiological significance in chronic pain, Gamsa [12] reviewing the literature, suggests that more commonly pain has been found to be the cause rather than the consequence

of emotional distress. The failure to find relief for chronic pain, particularly if there is a lack of an adequate diagnosis for the pain and increasing functional impairment, may contribute to feelings of helplessness and increase the individual's risk of becoming depressed [13]. Various levels of depression have been reported in pain populations [14]. A British study using more rigorous criteria (ie. P.S.E.) reported that 21% of a pain clinic population met the criteria for a depressive disorder [15].

The Cognitive- Behavioural Mediation Model [16] offers an explanation of why some chronic pain patients become depressed. According to the model, chronic pain is not in itself enough to lead to depression but the cognitive appraisal of functional impairment and loss of control because of pain, may lead on to a depressive illness. In experiments, subjects' inability to control their environment has been shown to increase the report of physical symptoms [17]. A further finding which may help to explain the development of depression in chronic pain patients is Seltzer and Yarzower [18] finding that experimentally induced pain, inhibited the encoding of positive material and had the opposite effect for negative material. Emotional factors influence pain and may bias pain related information processing.

PAIN AND TEMPERAMENT,

Measured personality traits such as "Neuroticism" and "Extroversion" have been found to have a marked influence on perception, recall and reporting of bodily symptoms [19]. Eysenck's [20] personality theory attempted to link these two personality dimensions to a physiological basis in the brain and the nervous system. He incorporated Pavlov's [21] notion of "Excitation" and "Inhibition" refining the latter with Hull's [22] concept of "Reactive Inhibition". So that underlying Eysenck's dimension of "Introversion" - "Extroversion", is the balance of "Inhibition" (with a physiological basis in the downward inhibitory pathway from the cortex to the reticular system) and "Excitation" (with a physiological basis in the upward arousing pathway from the reticular system

to the cortex). Claridge [23] maintains that this balance of "Arousability" can be viewed as a stable biological characteristic of the individual. From his hypothesis Eysenck, predicts for example, that "Extroverts" tend to build up "reactive inhibition" more quickly than "Introverts" and that this is reflected in their behaviour so that they are therefore less vigilant on repetitive tasks. The physiological base for "Neuroticism-Stability" dimension of personality was the Autonomic Nervous System, later amended by Eysenck to be the Limbic System [24].

Gray [25] developed Eysenck's theory and suggested that there were two systems in the brain, namely the Behaviour Activation System (B.A.S.) and the Behavioural Inhibition System (B.I.S.) which influence most fundamental personality differences. These systems influence the tendency to experience positive or negative affect, so that the B.A.S. is especially active in Neurotic Extroverts and the B.I.S. in Neurotic Introverts. This finding, was confirmed in a study by Larsen et al [26] on a non-clinical sample. Grays's theory, like Eysenck's attempts to link the physiological, emotional and behavioural aspects of personality and helps elucidate the impact of personality traits on the suffering associated with pain. Wade et al [27] using a four stage model of the pain process, suggest that personality variables have no impact on nociception but that Neuroticism augments the immediate affective evaluation of nociception. They suggest that both Neuroticism and Extroversion traits affect the cognitive evaluation and behavioural response to the pain. Temperamental factors are therefore a further source of bias in pain cognition.

PAIN AND COGNITION.

a) INTRODUCTION.

Melzack [28] maintains that cognitive activity (such as attention, past learning, beliefs, situational meaning) has been recognised since the 1960's as an integral part of neural mechanisms involved in pain. Cognitive activity is seen as having an active role prior to pain perception and,

" a role in modulating afferent inputs in ascending pathways." (p. 172)

There has been therefore an increasing interest in the investigation of cognitive aspects of chronic pain. At the same time, there has been a lack of a general conceptual framework which means that much of the experimental and clinical data is confusing and therefore has had limited utility [29].

An Information Processing Approach may provide an explanatory framework in which nociceptive and other physical sensations are seen as cognitive-perceptual phenomenon influenced by complex psychosocial processes. Rudy [29] maintains that it therefore provides a framework for the cognitive processes which may be involved in,

"recognising, appraising, mediating and responding to chronic nociception." (p. 176)

b) INFORMATION PROCESSING THEORIES.

In general, human perception depends on the constant monitoring of a barrage of internal and external stimuli and on the filtering of this information, in order to attend to salient features. Attention can be said to have two main functions, firstly to select "important" information for further processing. Secondly attention involves intensive processing of information, in order to control response or to take action.

Early Filter theorists such as Broadbent [30] suggested that where two stimuli were presented together, one would be attended to immediately (on the basis of its physical attributes) and the other remain in a buffer for later processing. He suggested this filter mechanism was essential to prevent the overloading of the system. The theory assumed that the unattended message was rejected at an early stage, but this is not the case if the two inputs are dissimilar [31]. The Filter Theory also assumed there was no processing of the unattended input, but Von Wright et al [32] produced G.S.R. responses to words on an unattended list and they concluded that were was partial processing (ie. sound and meaning) of unattended input. Treisman [33] suggested that the amount of processing of the unattended input is reduced but the extent of the reduction is flexible, depending on the task demand.

The nature of a task or process influences the amount of cognitive processing capacity required. Shiffrin & Schneider [34] made a distinction between automatic and controlled processing. Automatic processes are fast, inflexible, not conscious, unavoidable and do not reduce the capacity to perform other tasks. Controlled processes on the other hand need attention, have limited capacity, are slow but flexible. Norman & Shallice [35] suggested three levels of processing from automatic (controlled by schemas) to semi-automatic (contention scheduling) to controlled (supervisory attentional system). With repetition many tasks may become automatic but input which is aversive, ambiguous or novel may produce an attentional bias. Resistance to extinction (or automacity) may also occur if an input is complex and variable.

Connectionist models of attention [36] reject the idea of a separate attentional system filtering stimuli. These models suggest that attentional processes are supported and controlled by a network of elementary processing units operating in parallel.

The clinical application of Information Processing theory requires some integration of the various models. Wells and Matthews [37] maintain that

abnormality or biasing of attentional processing can occur at the selection or intensive processing stage of attention. Jerome [38] suggests that the complex, erratic and aversive nociception found in chronic pain conditions demands recognition and processing. So that Eccleston [39] has called persistent pain, that varies unpredictably, the "ultimate control task". Equally, Wells and Matthews [37] maintain that strongly held beliefs and attitudes may influence involuntary attentional selection of stimuli, in for example people with Hypochondriases.

c) EMOTION AND COGNITION THEORIES.

Some Information Processing theories ignore the role of emotion and its effect on attention and yet Wells & Matthew [37] maintain that there is ample evidence of emotion related bias in attention . Chronic pain, as discussed earlier, is frequently associated with negative emotional states. It is therefore important to consider how affective states may alter the cognitive processing of nociception.

Bower's Network Model [40] of emotion and cognition (extended from Anderson &Bower's Human Associative Memory model, [41]; predicts cognitive bias, due to the enhanced availability of mood congruent information from memory. The network of semantic concepts has related elements or "nodes" sharing associated connections. When a "node" is activated there is a spread of effect and associated nodes are partially activated as a result. He maintains that emotional states partially activate or prime mood congruent information so that there is a bias in accessibility for cognitive operations, including perception and selective attention. Some evidence [eg. 42] is not fully supportive of Bower's Model because for example, there appears to be an increased priority for emotionally threatening information which cannot be explained by the Model. Mathews & MacLeod [43] in their Prioritisation Model suggest that attentional bias can be overridden in some situations, where new processing "nodes" are activated because of environmental demands. They suggest that emotionally threatening stimuli will be given processing priority, particularly in states of high emotional arousal.

Oatley & Johnson-Laird [44] suggest that emotional states may serve primitive control functions in the cognitive system. They view the cognitive systems as a set of relatively independent process modules which have to be organised in order to meet task demands. The organisation of the modules may be planned or intentional, but at times basic emotions may be triggered at critical points in the processing and function to set the cognitive system into a more automatic mode of response to meet particular demands.

Models dealing with higher level cognitive operations such as that of Beck et al [45] suggests that schemata, which he describes as organising structures for encoding, structuring and retrieving information, formed from past experience guide the selective encoding of emotionally congruent information. The Beck, Bowers and Oatley & Johnson-Laird models assume that cognitive biases mediated by emotion are automatic in that they are unintentional and the individual is unaware of them.

Information processing theories, if applied to chronic pain populations, need to take account of the unique quality of the sensory and emotional aspects of nociception. Eccleston [39] suggests that pain makes unique demands for central attentional resources and that any task competing against it must be one that also demands higher controlled attention.

THE STROOP TASK.

The Stroop Task has been used to investigate cognitive bias and the Stroop effect has been robust over 50 years of experimentation, so that it is considered a hallmark measure of attention [46]. In the classic Stroop Task, the naming of the different colours in which words are printed, is slowed by using colour names as the words and the interference is most marked when the print colour and the colour word are incongruent [47]. There have been two major

theoretical explanations for the Stroop Effect, namely relative speed of processing and automacity of reading. The relative speed of processing view, is that both word reading and colour naming are processed in parallel but at different speeds. Reading is the more automatic of the two and therefore needs less attention and as a result is processed faster. As there is a limited response channel (bottleneck) there is competition for access to it and the priority is determined by speed. The automacity view on the other hand suggests that the latency effect on the Stroop, is due to the fact that one task requires more attention and therefore more processing than the other. Reading is automatic and inevitable whereas colour naming is much less so. A more automatic process can interfere with a less automatic task but not vice versa. Within this theory, interference and priming effects are part of the same mechanism.

More recently a Parallel Distributed Processing Model has been developed [48] which attempts to explain crucial experimental results from the Stroop Task not accommodated by previous models, while incorporating features from both the speed of processing model and automacity of reading. Processing for a task (like the Stroop) occurs by activation along pathways of different strengths. It is the strength of the pathway and not speed that is critical for task performance. The strength of the pathway determines the speed and accuracy of activation flow in and out. The pathways are non-linear and individual units can send and receive information from several other units and therefore participate in several different pathways. Within the model, interference occurs when dissimilar patterns of activation converge on a single point of an intersection, at any stage in processing, after initial sensory registration. Attention is seen as the modulation of processing, producing a change in the responsiveness of the units in competing processing pathways.

THE EMOTIONAL STROOP TASK.

An adapted form of the Stroop Task, the Emotional Stroop Task, has been used to study some cognitive processes associated with emotional disturbance.

In particular, it has been used to examine attentional bias. Emotionally charged words, with particular salience for the psychological condition being studied, are paired with neutral words and participants required to name the colour of print as in the classic Task. The salience of the words are presumed to activate relevant schemata. The underlying assumption is that the need to inhibit the more automatic response, in order to carry out the overt task, reduces attentional capacity and produces slower response times [49]. The Emotional Stroop Task is therefore thought to be an indirect way of accessing cognitive biases without the difficulties inherent in self-report measures. Explanation within the Parallel Distributed Processing Model; would suggest that sensitivity to, or pre-occupation with particular concerns, results in prolonged exposure which in turn increases the strength of the relevant processing pathway or increased level of resting activation for that concern.

a) EMOTIONAL DISORDERS.

Studies of participants with Anxiety Disorders, demonstrate greater Stroop interference for emotionally threatening words compared to "normal" controls [50]. Mogg et al, [51] found that, in a sample of people with Generalised Anxiety Disorder, the interference was highly specific and linked to the individual's specific worry domain. Quite specific interference was also found with Spider Phobics [52]; Panic Disorder [53] and Post Traumatic Stress Disorder [54, 55] suggesting selective encoding of salient threat words may then predispose or exacerbate Anxiety Disorders. Gotlib & McCann [56] found bias to depressed words in a mildly depressed non-patient sample. Williams & Nulty [57] replicated this result and suggested that the effect reflected a stable bias rather than a temporary mood state. Subsequent research with clinically depressed patients, has not supported the earlier work Contrary therefore to Bower's Network Theory of cognition and emotion , which predicts cognitive bias for emotionally congruent information at every level of processing, investigations using the Emotional Stroop suggest that cognitive biases operate at

specific stages of processing[58]. In Anxiety Disorders, there is an attentional bias orienting the individual to threatening stimuli but there is no evidence of facilitation of recall for similar items. In Depressive Disorders, results on the whole favour the cognitive bias operating at a later elaborative stage, facilitating recall particularly of personally oriented, negative information. Wells & Matthews [37] however caution against this specificity conclusion suggesting that:

"the evidence is far from decisive", p 89.

b) PAIN DISORDERS.

Chronic pain patients are likely to have elaborated schemas for pain because of their experience. The organisation of such sensory information, influences perception and expectation and in turn will affect the encoding of such sensory information. There is evidence for cognitive biases in chronic pain patients. They have been shown to have a recall bias for pain related stimuli [59, 60, 61, 62]. There is also evidence that chronic pain patients do process ambiguous information as pain related [63, 64].

Studies looking at attentional focus on pain have virtually all been laboratory studies. Arntz et al.,[9] & Arntz et al., [10] for example, found clear evidence for the role of attentional focus in the influence of anxiety on pain. There has however been virtually no experimental study of attentional processes in patients with naturally occurring chronic benign pain. Only two studies have been found in the literature which have investigated attentional biases in chronic pain patients using the Emotional Stroop Task. The first, Pearce & Morley [65] whose main aim was to investigate the construct validity of the McGill Pain Questionnaire, found a selective attentional bias in a sample of chronic pain patients. The bias was towards sensory and affective pain words. However, Pearce and Morley did not adequately assess depression and anxiety, therefore did not eliminate the possibility that the attentional bias found was not specifically due to anxiety. In addition, they used a fixed order of presentation of conditions and the pain related conditions were last to be presented, so that

the possibility that a fatigue effect was responsible for the increased latency cannot be ruled out. Finally there is no information about the nature of the chronic pain sample in terms of the type of pain suffered. Pincus et al. [66] attempted to replicate the Pearce and Morley study but included the Hospital Anxiety and Depression Scale to assess mood state. They also included a second computerised study but found no evidence of attentional bias in their sample. This study again used the fixed presentation order and there was no information about the nature of the pain problem. A further study [67] using a dot probe task, which involved reading one word in a pair and pressing a space bar if a dot appeared on the screen, failed to find an attentional bias to pain related cues (words) in their chronic pain sample with musculoskeletal problems.

CONCLUSION.

There are very few studies looking at the cognitive biases in clinical populations of individuals with chronic pain. Only three have systematically investigated attentional aspects of cognitive functioning in such populations. Pain has some unique qualities which ensure that it resists automacity and makes ongoing demands for central attentional resources. People who seek treatment for chronic pain have increased monitoring of physical sensation [68]. Attentional focus also increases subjective pain ratings [10]. Further investigation of different pain populations, looking at attentional focus and its relationship to emotional states is necessary. Some forms of psychological treatment for chronic pain have been based on evidence from laboratory studies of experimentally induced pain. The functioning of people with chronic pain is likely to be quite different, if only from the point of view that emotional states may be different. Systematic study of cognitive processing in people with chronic pain is therefore needed and the Emotional Stroop Task (particularly in card form) provides a simple way of doing so. It may be that the Emotional

Stroop Task has limitations as a means of determining actual locus of attention processing within the system [69], but it has still yielded important information about consistent biases in other disorders.

An Information Processing approach may make an important contribution to our understanding of how people perceive, assess, make sense of and respond to pain. Such models do however have to be able to encompass the powerful influence of factors such as emotional state and temperament. Improved knowledge of the central processing of pain, is necessary to produce better treatment for people who suffer chronic pain.

REFERENCES.

1. Merskey, H; Albe-Fessard, DG; Bonica, JJ; Carmen, A; Nathan, PW; Noordenbos, W; Pagnie, CA; Renaer, MJ; Sternabach, RA & Sutherland, S I.A.S.P.sub-committee on taxonomy. Pain 1979; **6**: 249-252.

2. Melzack, R & Wall, PD. Pain mechanisms: a new theory. Science 1979; **50**: 971-979.

3. Melzack, R & Wall, P. The Challenge of Pain. Harmondsworth: Penguin, 1982.

4. Barsky, AJ & Klerman, GL. Overview: hypochondriasis, bodily complaints and somatic styles. American Journal of Psychiatry 1983; **140**: 273- 283.

5. Watson, D. & Pennebaker, JW. Situational, dispositional, and genetic basis of symptom reporting. In Mental Representation in Health and Illness. (Edited by Skelton, JA & Croyle, RT). New York: Springer Verlag, 1991.

6. Robbins, JM & Kirmayer, LJ. Attributions of common somatic symptoms. Psychological Medicine 1991; **21:** 1029-1045.

7. Skevington, S.M. Psychology of Pain. Chichester: Wiley, 1995.

8. Craig, KD. Emotional aspects of pain. In Textbook of Pain. 3rd Edition. (Edited by Wall, P & Melzack R.) Edinburgh: Churchill Livingstone, 1994.

9. Arntz, A; Dreessen, L. & Merckelbach, H. Attention, not anxiety, influences pain. Behaviour Research and Therapy 1991; **29:** 41-50.

10. Arntz, A; Dreessen, L & De Jong, P. The influence of anxiety on pain: attentional and attributional mediators. Pain 1994; **56:** 307-314.

11. Jones, SE & Hollandsworth, JG. Heart rate discrimination before and after exercise-induced augmented cardiac activity. Psychophysiology 1981; **18**: 252-257.

12. Gamsa, Ann. Is emotional disturbance a precipitator or a consequence of chronic pain? Pain 1990; **42:** 183-195.

13. Abramso, LY; Seligman, MEP & Teasdale, JD. Learned helplessness, in humans. Critique and Reformulation. Journal of Abnormal Psychology 1978; **87:** 49-74.

14. Romano, JM & Turner, JA. Chronic pain and depression; does the evidence support a relationship? Psychological Bulletin 1985; **97:** 18-34.

15. Tyrer, SP; Capon, M; Peterson, DM; Charlton, JE & Thomson, JW. The detection of psychiatric illness and psychological handicaps in a British pain clinic population. Pain 1989; **36**: 63-74.

16. Rudy, TE; Kerns, RD & Turk, DC. Chronic pain and depression: toward a cognitive behavioural mediation model. Pain 1988; **35:** 129-140.

17. Pennebaker, JW; Burnam, MA; Schaeffer, MA & Harper, DC. Lack of control as a determinant of perceived physical symptoms. Journal of Personality and Social Psychology 1977; **35:** 167-174.

18. Seltzer, SF & Yarczower, M. Selective encoding and retrieval of affective words during exposure to aversive stimulation. Pain 1991; **47:** 47-51.

19. Costa, PT & McCrae, RR Neuroticism, somatic complaints and disease: Is the bark worse than the bite? Journal of Personality 1987; **55:** 299-316.

20. Eyseck, HJ. The Biological Basis of Personality. Springfield: Charles C. Thomas, 1967.

21. Pavlov, IP. Conditioned Reflexes: an investigation of the physiological activity of the cerebral cortex. London: Oxford University Press, 1927.

22. Hull, CL. Essentials of Behaviour. New Haven: Yale University Press, 1951.

23. Claridge, G. Personality and Arousal. Oxford: Pergamon, 1967.

24. Eysenck, HJ (1979) The conditioning model of neurosis. Behavioural and Brain Sciences 1979; **2:** 155-199.

25. Gray, JA. A critique of Eysenck's theory of personality. In A Model of Personality (Edited by Eysenck, HJ) New York: Springer, 1981.

26. Larsen, RJ & Ketelaar, T. Personality and susceptibility to positive and negative emotional states. Journal of Personality and Social Society 1991; **61:** 132-140.

27. Wade, JB; Dougherty, LM; Hart, RP; Rafi, A. & Price, DD. A canonical correlational analysis of the influence of Neuroticism and Extraversion on chronic pain, suffering and pain behaviour. Pain 1992; **51:** 67-73.

28. Melzack, R. Pain and the brain. A.P.S. Journal 1993; **2:** 172-174.

29. Rudy, TE. Information Processing and chronic pain Can uncertainty be organised? A.P.S. Journal 1993; **2:** 175-178.

30. Broadbent, DE. Perception and Communication. London: Pergamon Press, 1958.

31. Eysenck, MW & Keane, MT. Cognitive Psychology. A Students Handbook. London: Erlbaum, Taylor & Francis, 1995.

32. Von Wright, JM; Anderson, K & Stenman, U. Generalisation of conditioned G.S.R.'s in dichotic listening. In Attention and Performance V. (Edited by Rabbitt PMA & Dornic S) London: Academic Press, 1975.

33. Treisman, AM. Verbal cues, language and meaning in selective attention. American Journal of Psychology 1964b; **77:** 206-219.

34. Shiffrin, R & Schneider, W. Controlled and automatic human information processing: perceptual learning, automatic attending and a general theory. Psychology Review 1977; **84:** 127-190.

35. Norman, DA & Shallice, T. Attention to action. Willed and automatic control of behaviour. In Consciousness and Self Regulation Vol. 4. (Edited by Davidson, RJ; Schwartz, GE & Shapiro, D) New York: Plenum, 1986.

36. Cohen, J.D., Servan-Schreiber, D. & McClelland, J.L. A parallel distributed approach to automaticity. American Journal of Psychology, 1992: **105**, 239-269.

37. Wells, A. & Matthews, G. Attention and Emotion. A Clinical Perspective. Hove: Lawrence Erlbaum Associates, 1994.

38. Jerome, J. Transmission or transformation. Information Processing Theory of chronic human pain. APS Journal 1993; **2:** 160-171.

39 Eccleston, C. Chronic pain and distraction: an experimental investigation into the role of sustained and shifting attention in the process of chronic persistent pain. Behaviour Research and Therapy 1995; **33:** 391-405.

40. Bower, G.H. Mood and Memory. American Psychologist 1981; **36:** 129-148.

41. Anderson, JR and Bower, GH. Human Associative Memory. New York: Wiley, Halstead Press, 1973.

42. MacLeod, C & Mathews, A. Biased cognitive operations in anxiety: Accessibility of information or assignment of processing priorities? Behaviour Research and Therapy 1991; **29:** 599-610.

43. Mathews, A. & MacLeod, C. (1994) Cognitive approaches to emotion and emotional disorders. Annual Review of Psychology 1994; **45:** 25-50.

44. Oatley, K & Johnson-Laird, PN. Towards a cognitive theory of emotions. Cognition and Emotion 1987; **1**: 29-50.

45. Beck, AT; Emery, C & Greenberg, TL. Anxiety Disorders and Phobias: A Cognitive Perspective. New York : Basic Books Inc. 1985.

46. MacLeod, CM. Half a century of research on the Stroop effect: An integrative review. Psychological Bulletin 1991; **109:** 163-203.

47. Stroop,J.R. (1935) Studies of interference in serial verbal reactions. Journal of Experimental Psychology 1935; **18**: 643-662.

48. Cohen, JD; Dunbar, K & McClelland, JL. (1990) On the control of automatic processes: A parallel distributed pprocessing account of the Stroop Effect. Psychological Review 1990; **97:** 332-361.

49. Kahneman, D & Treisman, A. Changing views of attention and automacity. In Varieties of Attention (edited by Parauroman, R & Davies DR) New York: Academic Press, 1984.

50. MacLeod, CM; Mathews, A & Tata, P. Attentional bias in emotional disorders. Journal of Abnormal Psychology 1986; **95:** 15-20.

51. Mogg, K.; Mathews, A. & Weinman, J. Selective processing of threat cues in anxiety states: A replication. Behaviour Research and Therapy 1989; **27:** 317-323.

52. Watts, FN; McKenna, FP; Sharrock, R & Treize, L. Colour naming of phobia - related words. British Journal of Psychiatry 1986; **77:** 97-108.

53. McNally, RJ; Kaspi, SP; Riemann, BC & Zeitlin, SB. Selective processing of threat cues in post-traumatic stress disorder. Journal of Abnormal Psychology 1990; **99:** 398-402.

54. Foa, EB; Feske, U; Murdoch, RB; Kozak, MJ & McCarthy, PR. Processing of threat-related information in rape victims. Journal of Abnormal Psychology 1991; **100:** 156-162.

55. Williams, JMG; Mathews, A & MacLeod, C. The Emotional Stroop Task and psychopathology. Psychological Bulletin 1996; **120:** 3-24.

56. Gotlib, IH & McCann, CD. Construct accessibility and depression. An examination of cognitive and affective factors. Journal of Personality and Social Psychology 1984; **47:** 427-439.

57. Williams, JMC & Nulty, DD. Construct accessibility, depression and the Emotional Stroop Task: Transient mood or stable structure? Personality and Individual Differences 1986; **7:** 485-491.

58. Williams, J.M.G, Watts, F.N., MacLeod, C. & Mathews, A. Cognitive psychology and emotional disorders. Chichester: John Wiley, 1988.

59. Pearce, SA; Isherwood, S; Hrouda, D; Richardson, PH; Erskine, A & Skinner, J. Memory and pain: tests of mood congruity and state dependent learning in experimentally induced and clinical pain. Pain 1990; **43**: 187-193.

60. Edwards, L; Pearce, S; Collett, BJ & Pugh, R. Selective memory for sensory and affective information in chronic pain and depression. British Journal of Clinical Psychology 1992; **31:** 239-248.

61. Pincus, T; Pearce, S; McClelland, A & Turner-Stokes, L. Self-referential selective memory in pain patients. British Journal of Clinical Psychology 1993; **32:** 365-374.

62. Pincus, T; Pearce, SA & McClelland, A. Endorsement and memory bias of self-referential pain stimuli in depressed pain patients. British Journal of Clinical Psychology 1995; **34:** 267-277.

63. Pincus, T; Pearce, SA; McClelland, A; Farley, S & Vogel, S. Interpretation bias of ambiguous stimuli in chronic pain patients. Journal of Psychosomatic Research 1994; **38:** 347-353.

64. Pincus, T; Pearce, S & Perott, A. Pain patients bias in the interpretation of ambiguous homophones. British Journal of Medical Psychology 1996a; **69:** 259-266.

65. Pearce, J & Morley, S. An experimental investigation of the construct validity of the McGill Pain Questionnaire. Pain 1989; **39:** 115-121.

66. Pincus, T; Fraser, L & Pearce, S. Do chronic pain patients "Stroop" on pain stimuli? British Journal of Clinical Psychology 1998; **37:** 49-58.

67 Asmundso, GTG; Kuperos, JL & Norton, GR. Do patients with chronic pain selectively attend to pain-related information?: preliminary evidence for the mediating role of fear. Pain 1997; **72:** 27-32.

68. Pennebaker, JW & Skelton, JA. Selective monitoring of bodily sensations. Journal of Personality and Social Psychology 1981; **41:** 213-223.

69. De Ruiter, C & Brosschot, JF. The Emotional Stroop effect in anxiety: Attentional bias or cognitive avoidance? Behaviour Research and Therapy 1994; **32:** 315-319.

Research Project Proposal.

Applicant: Lyndia Green
Chartered Clinical Psychologist
Psychology Department
Gartnavel Royal Hospital
Glasgow.

Supervisor: Dr. E. Campbell.

Title: **AN INVESTIGATION OF THE COGNITIVE BIASES OF CHRONIC PAIN PATIENTS USING THE EMOTIONAL STROOP TASK.**

SUMMARY

Pain and particularly chronic pain is a complex experience with sensory, affective and cognitive components, which operate and interact at different levels. Understanding of the higher order factors involved in the pain experience, is therefore important for effective treatments to be developed, particularly for those pain patients who have no obvious organic cause for their pain and who fail to respond to existing treatments.

The perception of and attentional focus on symptoms, plays an important part in the pain experience. Augmentation or minimisation of sensory stimuli is thought to be an important source of variance in individual response to pain conditions. The Emotional Stroop Task is a useful means of investigating the cognitive processes and in particular the attentional biases of chronic pain patients. The Stroop will be used to examine the cognitive biases for pain related words in two different groups of pain patients from a Pain Relief Clinic.

INTRODUCTION.

Pain has been defined as, "An unpleasant sensation and emotional experience which is associated with actual or potential tissue damage or is described in terms of such damage" (Merskey et al, 1979). This definition was derived from the Gate-Control Theory of Pain, which is currently the most influential and comprehensive theory of pain (Melzack & Wall, 1965). According to the theory, the pain experience is described as a complex interaction of sensory-discriminative, affective-motivational and cognitive-evaluative systems. The theory emphasised for the first time, the important role the higher centres play in the interpretation of pain and in the feedback loop of information which open and close the "gate" in the dorsal horn of the spinal chord. The effects of cognitive, effective, motivational and socio-cultural information is passed through the descending pathways from the brain and influences the amount of pain experienced or whether pain is experienced at all. The theory helps to explain the lack of correspondence between degree of injury/pathology and level of pain reported, which frequently occurs (Melzack & Wall, 1982).

Patients referred to Pain Relief Clinics, for the treatment of chronic benign pain, include those with clear evidence of organic pathology and those with none. They also include patients with a significant level of psycho-pathology and psychological distress (Tyrer et al, 1989; Williams et al, 1996) The failure to find relief for chronic pain; particularly if there is a lack of an adequate diagnosis for the pain and increasing functional impairment, may all contribute to feelings of helplessness and increase the risk of patient's becoming depressed (Seligman, 1975). In experiments, the failure to control an individual's environment, for example has been shown to increase the report of physical symptoms (Pennebaker et al, 1977). Seltzer and Yarczower (1991) found that experimental pain inhibited the encoding of positive material and vice versa for negative material which again may explain the development of depression in some chronic pain patients.

Some patients referred to Pain Relief Clinics meet the criteria for specific disorders, such as Somatization Disorder; Pain Disorder and Hypochondirasis. (DSM-1V) People with such disorders can be said to amplify somatic symptoms (Barsky & Klerman, 1983). So that the cortical elaboration of perceptual sensation is an important source of individual difference because it results in the amplification or minimisation of symptoms.

A further source of variability is individual difference in physiological reactivity. Eysenck (1967) has linked Neuroticism, or general emotional reactivity, to autonomic arousal, developing the concept of cortical inhibition from the learning theories of Pavlov and Hull. Eysenck suggests that there are stable, personality features which influence conditionability and habituation to stimuli and therefore perception and response to somatic symptoms. In situations of high arousal and ambiguity ; both the individual's cognitive schemata and the environmental situation, can determine the label an individual attaches to particular physiological sensations (Skevington, 1995). Robbins and Kirmayer (1991) have suggested that symptom attributional style may contribute to misdiagnosis and resulting poor treatment outcome for some patients.

The cognitive components of pain have therefore been of increasing interest, including the study of pain as perceptual phenomena. The concepts of figure-ground from Gestalt psychology, signal noise from Signal Detection Theory and information uncertainty from Information Theory have all contributed to our understanding of the central, organisational processes of perception. In general, human perception depends on the constant monitoring of a barrage of internal and external stimuli and in the filtering of this information, in order to attend to salient features. There is limited processing capacity therefore attention has to be an active process and has to be selective. Selective attention results from a filtering process which blocks competing or redundant messages. This process is automatic and functions spontaneously with a minimum of conscious attention. There are biases which give priority to stimuli with high

information value, such as novel information. We attend to relevant information in order to for example, meet an immediate need; achieve a goal or become aware of threat or harm. With repeated stimuli, habituation usually occurs and the processing becomes automatic. Pain, along with other aversive senses, appears to have a particular ability to claim attention (Chapman, 1978). It has been suggested that vigilance to pain may become a perceptual habit because of selective reinforcement of nociception in the past (Fordyce, 1976).

Cognitive models of cognition and emotion are also relevant. Beck et al's (1985) view that emotionally disturbed people have biased schemata, which he defines as organising structures for encoding, structuring and retrieving information. The schemata filters stimulus information, so that attention is selectively focused on emotionally congruent information. Bower's (1981) Network theory suggests that attention to , encoding and retention of information is facilitated if it matches the individual's emotional state. Matthews and MacLeod (1994) in their Prioritization model suggest that attentional bias can be over-ridden in some situations, where new processing modes are activated because of environmental demands.

Leventhal et al (1982) have developed a model which attempts to integrate the cognitive and affective components of pain, and views the situation as a dynamic interaction of a multifaceted process operating at several different levels. It is suggested that, as a stimulus such as pain, leaves the peripheral sensory system, separate but simultaneous processing of informational, emotional and motivational systems occurs before the stimulus enters the perceptual field. The patient over time constructs their own model in order to make sense of the pain experience and this forms the basis of illness perception; compliance with treatment, emotional distress and functional disability. McDermid et al (1996) argue that in a condition such as fibromyalgia, there may be augmentation of attention on somatic symptoms because patients lack a clearly identified organic cause for their pain. They suggest that this may arise

because of the ambiguity of the diagnosis and the patient's fears that significant pathology has been missed.

The Stroop Task has been described as the "hallmark" measure of attention (MacLeod, 1991). In the original experiment, the automatic processing of the meaning of the word interfered with the competing, intentional task of naming the colour and led to greater response latency in the incongruent condition (Stroop, 1935). Stroop explained the phenomenon by suggesting that it was due to the greater "strength" of reading compared to naming colours. Explanations have altered over the subsequent fifty years with increased knowledge from experimental cognitive psychology and further experiments with the Task (MacLeod, 1991). Subsequent, but closely related views to explain the effect, are the "Relative speed of Processing" and "Automaticity" views. The former suggesting that the analysing systems operate in parallel but then have to compete for entry into a limited exit channel. The second explanation is that automatic processes require much less attention and therefore less processing capacity than the less automatic task. The more automatic task could then interfere with the less automatic task but not vice versa. More recently parallel processing models are felt to provide a more accurate account of the Stroop effect (MacLeod, 1991).

The Concept of response interference has also been used to access other cognitive biases. An adapted form of the Stroop Task has been used, The Emotional Stroop Task, to study the cognitive processing associated with emotional disturbance. Words, with particular salience for the psychological condition being studied, are paired with neutral words and subjects required to name the colour of the words. The technique has the advantage of avoiding some of the difficulties inherent in using self-report measures.

The Emotional Stroop Task has been used with a number of patients with anxiety based disorders such as Generalised Anxiety Disorder (Matthews & MacLeod, 1986); Specific Phobias (Watts et al, 1986; Muris et al, 1995) and

Post Traumatic Stress Disorder (Foa et al, 1991). Williams and Nulty (1986) also found interference effects in colour naming for negative words in depressed patients. The anxiety and depressive disorders share a common feature, namely a sensitivity and pre-occupation with stimuli in the suffers' environment which causes them concern (Williams et al, 1996). In cognitive models of psycho-pathology, this attentional bias is not simply an effect of the disorder but plays a role in its aetiology and maintenance.

The Emotional Stroop Task has provided new information about the nature of cognitive processing in different disorders. It seems likely that bias operates early at a pre-attentional stage (Muris et al, 1995). In addition, the bias is quite specific and operates for predictable fears and concerns of the individual (Eysenck, 1992). This elaboration hypothesis suggests that more elaborate structures exist for fear/threat words which require more processing capacity and compete for the capacity needed to name the colours. Personal salience however, is not a sufficient explanation for the experimental effect, but requires to be linked to a neuromodulatory effect thought to be due to an associated history of threat or loss (Williams et al, 1996).

AIMS AND RESEARCH QUESTION.

The Stroop Task has been shown to be sensitive to difference between different types of psycho-pathology. It is potentially a useful method to examine the cognitive processing of chronic pain patients. Only one study has been found which used the Stroop Task with pain patients and the purpose of the study was to examine the construct validity of a Pain Questionnaire (Pearce & Morley, 1989). They found that pain patients were more susceptible to interference effects from pain words than neutral words but the single pain group was not described. From clinical experience, attentional focus appears to be one important source of individual difference evident in chronic pain patients, which may help maintain the disorder in the absence of physical findings..

In this study the aim is to examine whether or not there is evidence of attentional bias for pain related words in two different groups of chronic pain patients. (i.e. Those with identified organic pathology and those with none) Both groups will be compared to a non-pain control group.

The Research questions:

1) Do chronic pain patients show a greater response latency to personally relevant stimuli (Pain Words) compared to 'Negative Words' or 'Neutral Words'?
2) Do chronic pain patients, with no clear organic diagnosis show a greater response latency on 'Pain Words' than chronic pain patients with clear organic pathology?
3) Do chronic pain patients with no clear organic diagnosis show a greater response latency to 'Negative Words' than chronic pain patients with clear organic pathology?
4) Are there differences in personality variables, as measured by the Eysenck Personality Questionnaire, between the groups?
5) Are there differences in beliefs about pain, as measured by the Pain Beliefs Questionnaire, between the groups?

PLAN OF INVESTIGATION

SUBJECTS.

A minimum of 60 subjects will be included in the study:

1) 20 consecutive referrals to a pain unit with no diagnosed organic pathology.
2) 20 consecutive referrals to a pain unit with clear organic pathology.
3) 20 matched controls with no history of chronic pain.

Exclusion Criteria.

1) Patients with malignant conditions.
2) Patients who cannot read
3) Patients who do not speak English.
4) Patients who are colour blind.

Matching Criteria.

1) Age (Groups 1 & 2)
2) Sex (Groups 1 & 2)
3) Chronicity of Pain. (Groups 1 & 2)

Source of Subjects

The Pain Relief Clinic, Gartnavel General Hospital.

DESIGN.

The experimental design is a between group comparison with repeated measures on the different experimental conditions. The four conditions are:

1) Pain related words.
2) Neutral control words (Uncategorised)
3) Negative words.
4) Neutral control words (Categorised - Landscape words)

MATERIALS

The words will be printed on four white A4 cards, a separate card for each experimental condition. The words will be 5mm in height and printed in five colours; red; blue; green; orange and brown. Each set of words will be repeated once, giving fifty words per card in five columns. The words will be randomly allocated in the lists. The print colour will also be randomly presented but ensuring that each colour will be repeated ten times per card.

The words for the four conditions are given in Appendices A1 to A4. 'Pain Words' were descriptors selected from all sections of The McGill Pain Questionnaire and 'Negative Words' from a thesaurus. The basis of their selection was that they were readily perceived as pain words and negative words by a group of non-patients. The third type of words were control words matched in terms of syllable length and frequency of occurrence in the English language according to Thorndike & Lorge, 1944.

MEASURES

Cognitive Processing.

Response latency.

Psycho-pathology.

1) **The National Adult Reading Test.** (NART)
   This will be used to provide a quick estimate of cognitive ability in order to eliminate the possibility of any experimental effect being due to differences in verbal intelligence.

2) **The Beck Depression Inventory.** Revised Version. (Beck, 1978)
   This will provide a measure of depressed mood.

3) **The Spielberger State/Trait Anxiety Scale.** Form Y. (Spielberger, et al 1983) This is a valid measure of state and trait anxiety, which is an important variable in both experimental situations and for pain patients.

4) **The Eysenck Personality Scale - Short Form.** (Eysenck & Eysenck, 1991) Will provide a measure of personality variables thought to influence attentional aspects of symptom perception.

5) **The Pain Beliefs Questionnaire.** (Edwards et al, 1992)
   A Brief questionnaire which investigates subjects' beliefs in the causes and consequences of pain. Two scales can be computed, namely the Organic Belief Scale and the Psychological Belief Scale.

6) **The Oswestry Pain Disability Questionnaire**. (Fairbank et al, 1980)
A brief self-report measure of the effect of pain on nine activities of daily living. The scale provides an index of handicap due to pain.

PROCEDURES.

Subjects will be given a copy of the Patient Information and Consent Form (Appendix A5) and if they agree to take part, will be asked to sign the form. They will be given an introduction to the Stroop task and allowed a brief practice to ensure that they have understood the instructions. They will be asked to name the colours quickly but accurately and both the time to complete the task and number of errors recorded. The order of presentation of the cards will be systematically varied to reduce bias due to practice, medication or fatigue effects. A brief break will be taken between card presentations in order to reduce possible fatigue effects. The Questionnaires will then be administered. Subjects will be debriefed before leaving and further explanation about the purpose of the study given.

SETTING AND EQUIPMENT.

Subjects will be seen in the Pain Clinic outpatient area in Gartnavel General Hospital; The Lansdowne Clinic; Drumchapel Health Centre or at home.

A Smiths stop watch will be use to record time.

DATA ANALYSIS.

The data from the study will be subjected to statistical analysis using SPSS 6.1 or updated version of the same.

IMPLICATIONS.

It has been suggested that the Stroop Task is a robust method of assessing subjects' current concerns, because it allows access to automatic cognitive processes and resulting perceptual biases. (Mogg et al, 1989) It may therefore be a useful means of understanding the nature of cognitive dysfunction associated with chronic pain particularly for those patients with no evidence of organic pathology or those who do not respond to medical intervention. It may be particularly useful for those psycho-pathological conditions where there may be a denial of psychological difficulties.

This exploration of the "higher order" processes in chronic pain is useful because it may lead to improved psychological treatment methods for chronic pain patients. (Blitz & Dinnestein, 1975; Weinman & Petrie, 1997). In addition it may also provide a valid outcome measure for cognitive therapeutic interventions, which aim to alter dysfunctional beliefs about pain and illness.

TIME SCALE FOR DATA COLLECTION.

Proposed time scale is May 1997 to December 1997.

ETHICAL APPROVAL FOR PROJECT.

Ethical approval for the project, has been applied for, from The Community and Mental Health NHS Trust's Ethical Committee.

REFERENCES

Barsky, AJ & Klerman, GL. (1983) Overview: hypochondriasis, bodily complaints and somatic styles. American Journal of Psychiatry. 140, 273-283.

Beck, AT. (1978). The Beck Depression Inventory - Revised. San Antonia: The Psychological Corporation.

Beck, AT; Emery, C & Greenberg, RL. (1985) Anxiety Disorders and Phobias: A Cognitive Perspective. New York: Basic Books Inc.

Blitz, B & Dinnerstein, AJ. (1975) Role of attentional focus in pain perception. Manipulation of response to noxious stimulation by instructions. From M. Weisenberg (Ed.) Pain Clinical and Experimental Perspectives. Saint Louis: CV Mosby & Co.

Bower, GH. (1981) Mood and memory. American Psychologist. 36, 129-148.

Chapman, CR. (1978) Pain: The perception of Noxious events. From R.A. Sternbach (ed.) The Psychology of Pain. New York: Raven Press.

Edwards, LC; Pearce, SA; Turner-Stokes, L & Jones, A. (1992) The Pain Beliefs Questionnaire: an investigation of beliefs in the causes and consequences of pain. Pain. 51, 267-272.

Eysenck, HJ. (1967) The Biological Basis of Personality. Springfield: Charles C. Thomas.

Eysenck, HJ. & Eysenck, SBG. (1991) Manual of the Eysenck Personality Scales. London: Hodder & Stoughton.

Eysenck, MW. (1992) Anxiety, The Cognitive Perspective. Hillsdale: Lawrence Earlbaum.

Fairbank, JCT. (1980) The Oswestry Low Back Pain and Disability Questionnaire. Physiotherapy. 66, 271-273.

Foa, EB; Feske, U; Murdoch, TB; Kozak, MJ & McCarthy, PR. (1991) Processing of threat-related information in rape victims. Journal of Abnormal Psychology. 100, 156-162.

Fordyce, WE. (1976) Behavioural Methods for Chronic Pain and illness. St. Louis : CV Mosby.

Leventhal, H; Nerenz, DR & Straus, A. (1982) Self-regulation and the mechanisms for symptom appraisal. From David Mechanic. (ed.) Symptoms, Illness Behaviour and Help-seeking. New York : Prodist.

MacLeod, CM. (1991) Half a century of research on the Stroop effect: An integrative Review. Psychological Bulletin. 109, 163-203.

MacLeod, C; Mathews, A & Tata, P. (1986) Attentional bias in emotional disorders. Journal of Abnormal Psychology. 95, 15-20.

McDermid, AJ; Rollman, GB & McCain, GA. (1996) Generalised hyper-vigilance in fibromyalgia: evidence of perceptual amplification. Pain. 66, 133-144.

Mathews, A. & MacLeod, C. (1994) Cognitive approaches to emotion and emotional disorders. Annual Review of Psychology. 45, 25-50.

Melzack, R. & Wall, P. (1965) Pain mechanisms: a new theory. Science. 50, 971-979

Melzack, R. & Wall, PD. (1982) The Challenge of Pain. Harmondsworth: Penguin.

Merskey, H; Albe-Fessard, DG; Bonica, JJ; Carmen, A; Nathan, PW Noordenbos, W; Pagni, CA; Renaer, MJ; Sternbach, RA & Sunderland, S. (1979) I.A.S.P. sub-committee on taxonomy. Pain. 6, 249-252.

Mogg, K: Mathews, AM & Weinman, J. (1989) Selective processing of threat cues in anxiety states: A replication. Behaviour Research and Therapy. 27, 317-323.

Muris, P; Merckelbach, H & de Jongh, A. (1995) Colour naming of dentist related words: role of coping style, dental anxiety and trait anxiety. Personality and Individual Differences. 18, 685-688.

Pearce, J & Morley, S. (1989) An experimental investigation of the construct validity of the McGill Pain Questionnaire. Pain. 39, 115-121.

Pennebaker, JW; Burnam, MA; Schaeffer, MA & Harper, DC (1977) Lack of control as a determinant of perceived physical symptoms. Journal of Personality and Social Psychology. 35, 167-174.

Robbins, JM & Kirmayer, LJ. (1991) Attributions of common somatic symptoms. Psychological Medicine. 21, 1029-1045.

Seligman, MEP. (1975) Helplessness: On Depression, Development and Death. San Francisco: W H Freeman.

Seltzer, SF & Yarczower, M. (1991) Selective encoding and retrieval of affective words during exposure to aversive stimulation. Pain. 47, 47-51.

Skevington, SM (1995) Psychology of Pain. Chichester: Wiley.

Spielberger, CD; Gorsuch, RL; Lushene, R; Vagg, PR & Jacobs, GA. (1983) Manual for The State-Trait Anxiety Inventory. (form Y) Palo Alto: Consulting Psychology Press.

Stroop, JR. (1935) Studies of interference in serial verbal reactions. Journal of Experimental Psychology. 18, 163-662.

Thorndike, EL & Lorge, I. (1944) The Teacher's Word Book of 30,000 Words. New York: Columbia University.

Tyrer, SP; Capon, M; Peterson, DM; Charlton, JE & Thomson, JW. (1989) The detection of psychiatric illness and psychological handicaps in a British pain clinic population. Pain. 36, 63-74.

Watts, FN; McKenna, FP; Sharrock, R & Treize, L. (1986) Colour naming of phobia-related words. British Journal of Psychology. 77, 97-108.

Weinman, J & Petrie, KJ. (1979) Illness perceptions: A new paradigm for psychosomatics. Journal of Psychosomatic Research. 42, 113-116.

Williams, JMG.; Mathews, A & MacLeod, C. (1996) The Emotional Stroop Task and psychopathology. Psychological Bulletin. 120, 3-24.

Williams, JMC & Nulty, DD. (1986) Construct accessibility . Depression and the Emotional Stroop Task: Transient mood or stable structure? Personality and Individual Differences. 7, 485-491.

An Investigation of Attentional Bias in Chronic Pain Patients using the Emotional Stroop Task

Lyndia Green
Clinical Psychology Department
Lansdowne Clinic
Gartnavel Royal Hospital
Glasgow G12.

SUMMARY.

The Emotional Stroop Task was used in this study to investigate a possible attentional bias to pain stimuli in two distinct groups of pain patients (No Diagnosis Group and Diagnosed Group) referred to a tertiary Pain Relief Clinic and a no pain Control Group. The No Diagnosis Group had no physical findings to account for their pain despite intensive investigation whereas the Diagnosed Group had clear evidence of physical pathology in keeping with their pain complaint. There were 60 participants in the study, with 20 in each group.

The No Diagnosis Group demonstrated a bias to pain words but not to negative words in the Stroop Task. There was no similar bias in the other two groups. The No Diagnosis Group had higher Beck Depression Inventory and Trait Anxiety Scores than the other two groups but this did not account for the bias on the Stroop Task. The No Diagnosis group also had greater subjective functional impairment because of pain and held more emphatically affirmative beliefs in the organic basis of pain. This study confirms the existence of an attentional information processing bias but in only one of two chronic pain groups.

TABLES.

1. Group Characteristics.

2. Characteristics of the Pain Groups.

3. Response Times (in seconds)for Group in each Condition.

4. Interference Variable Summary Statistics.

5. Mean State/Trait Anxiety and BDI Scores.

6. Mean Pain Beliefs Questionnaire Subscale Scores.

FIGURES.

1. BDI "Caseness" with Adapted Criteria.

INTRODUCTION.

Current models of pain (Melzack, 1993; Leventhal, 1984) emphasise the role of cognitive and affective factors in addition to the purely neurophysiological aspects of the pain experience. An Information Processing Approach has been seen as a useful conceptual framework within which nociception as cognitive-perceptual phenomenon can be investigated (Rudy, 1993). Jerome (1993) has suggested that the nature of nociception in chronic pain (i.e. complex, erratic and aversive) means that it resists automacity and therefore makes disproportional demands on the limited processing capacity available. This in turn will influence attention, appraisal and response to the nociception.

The nature of cognitive biases in chronic pain patients has begun to be investigated. Chronic pain patients have been shown to have a recall bias for pain related stimulus (Pearce et al., 1990; Edwards et al., 1992; Pincus et al., 1993; Pincus et al., 1995). There is also evidence that chronic pain patients process ambiguous information as pain related (Pincus et al., 1994; Pincus et al. 1996). In addition, it is known that people who seek treatment for chronic pain have increased monitoring of physical sensation (Pennebaker & Skelton, 1981). Cortical elaboration of perceptual sensation may be an important source of individual difference leading to amplification of symptoms such as pain. In laboratory studies, attentional focus increases subjective pain ratings (Arntz et al., 1994). There have however, been very few experimental studies looking at attentional processes in naturally occurring chronic pain.

The Stroop Task is a robust measure of attention (MacLeod, 1991). In a modified version, the Emotional Stroop Task, the automatic processing of word meaning interferes with colour naming. The task has been used to study some cognitive processes associated with emotional disturbance, particularly Anxiety Disorders, Phobias, Panic Disorder and Post Traumatic Stress Disorders (MacLeod et al., 1986; Mogg et al., 1989; Watts et al., 1986; McNally et al., 1990; Williams, et al., 1996). Emotionally salient words typically produce

interference or selective attentional processing and therefore increased response latency on the Stroop Task. The Emotional Stroop Task is therefore thought to be an indirect way of accessing cognitive bias, without the difficulties inherent in self-report measures.

Two published studies have been found in the literature which have investigated attentional bias, using the Emotional Stroop Task, in chronic pain patients and they provide contradictory results. Pearce & Morley (1989) found a selective attentional bias to pain words in a sample of chronic pain patients but not in non-pain controls. However, they did not adequately assess depression and anxiety in their sample and therefore did not eliminate the possibility that the bias found was due specifically to anxiety for example. In addition, they used a fixed order of presentation of experimental conditions and the pain related conditions were last to be presented, so that the possibility that a fatigue effect was responsible for the increased latency cannot be eliminated. In the second study, Pincus et al. (1998) attempted to replicate the Pearce & Morley (1989) experiment but included measures of mood state . They found no evidence of attentional bias in their sample on the replication or in a second computerised version of the Task.

Apart from the contradictory findings, there was little information in these studies about the chronic pain sample in terms of the type of pain suffered or the basis of their selection. In addition, neither appeared to have imposed an upper age limit for their sample (i.e. they included individuals up to 85 years) which is problematic as there is a known decline in the Stroop effect over the age of 60 years (Williams et al., 1996).

The purpose of the present study, was to use the Emotional Stroop Task, to investigate the possibility of attentional bias to pain stimuli in two distinct groups of chronic pain patients referred to a tertiary Pain Relief Clinic. The first group had no physical findings, despite intensive investigation, which might explain their chronic pain. The second group had clear evidence of physical

pathology, which could explain the nature and degree of their chronic pain. In addition to the investigation of possible attentional bias, emotional state, personality and pain beliefs were also measured.

METHOD

Design.

A 3 x 4 factorial design, with one between subjects factor (Group) and one within subjects factor (Word Category).The four experimental conditions were:

1. Pain Words
2. Neutral, un-categorised Words
3. Negative Words
4. Neutral, categorised Words.

The order of presentation of the conditions was systematically varied to reduce bias due to practice effects. The dependent variable was response latency.

Subjects.

There were 60 participants included in the study, 20 in each of the following groups:

Group 1. **No Diagnosis Group**.
Consecutive referrals to a Pain Unit, suffering chronic benign pain with no diagnosed organic pathology.

Group 2. **Diagnosed Group**.
Consecutive referrals to a Pain Unit, suffering chronic benign pain with clear organic pathology.

Group 3. **No Pain Control Group**.

Non-patient control group with no history of chronic pain. The group was matched with Group 1 for age, sex and socio-economic status.

The selection for the Groups 1 and 2 was made by the Consultant Anaesthetists working in the Pain Unit. One person, identified for Group 1, refused to participate in the study. In addition the following exclusion criteria applied:

1) Those with known malignant conditions.
2) Those who could not read.
3) Those who did not speak English.
4) Those outwith the 18 - 65 age band.
5) Those with deuteranopia, protanopia or tritanopia (Colour-blindness).

Materials

There were four white A4 cards, laminated for easy handling, one for each experimental condition. The words were 5mm. in height and printed in five colours: red; blue; green; yellow and brown. Each set of words on a card was repeated once, giving fifty words per card in five columns. The words were randomly allocated in the lists. The print colour was also randomly presented, but ensuring that each colour was repeated ten times per card.

The words used for the four conditions are shown in Appendices (A1to A4). Pain Words were descriptors selected from all sections of the McGill Pain Questionnaire (Melzack, 1975). Negative Words were taken from a Thesaurus. The basis of their selection was that they were readily perceived as pain words and negative words by a random group of non-patients. Negative words were

included to measure the potential latency effect to negativity or emotionality (Martin et al., 1991). The remaining two cards were control words matched in terms of syllable length and frequency of occurrence in the English language (Thorndike & Lorge, 1944). One set was of random neutral words (un-categorised) and the other set were all words related to features of the landscape (categorised). The categorised condition was included because is has been suggested that categorisation may affect latency (Mogg et al. 1991).

A Casio, electronic stop watch was used to record time taken on Stroop Task.

Measures.

1. COGNITIVE PROCESSING.

a) Response Latency on the **Stroop Task.** The stop watch was activated from the naming of the first (word) colour to the last one on the card.

b) **The National Adult Reading Task. (NART).** 2nd Ed. (Nelson & Willison, 1991). Provided a quick estimate of verbal intelligence.

2 PSYCHOPATHOLOGY.

a) **The Beck Depression Inventory.** Revised version (Beck, 1978). The B.D.I. is reported to have good sensitivity and specificity classifying depressed and non-depressed pain patients (Romano & Turner, 1985; Karoly & Jensen, 1987; Tyrer et al. 1989).

b) **The Spielberger State/Trait Anxiety Scale.** Form. Y. (Spielberger, et al., 1983). A valid measure of state and trait anxiety, an important variable in both experimental situations and for pain patients.

3 PAIN VARIABLES.

a) **The Oswestry Pain Disability Questionnaire.** (Fairbank et al., 1980).
A brief self-report measure of the effect of pain on nine activities of daily living. The scale provides an index of handicap due to pain. Reported to have satisfactory reliability and validity (Deyo, 1986).

b The Pain Beliefs Questionnaire. (Edwards et al., 1992)
A reliable and valid measure of beliefs about the causes and consequences of pain. Two scales can be computed, namely the Organic Belief Scale and the Psychological Scale, which reflect lay views about pain.

c) **The Eysenck Personality Scale - Short Form.** (Eysenck & Eysenck, 1991)
To provide a measure of personality variables thought to influence attentional aspects of symptom perception.

Procedures.

Participants were given a copy of the Patient Information and Consent Form (Appendix A5) and asked to sign it, if they wished to participate. They then completed Form Y1 of Spielberger. The Stroop Task (ie. naming the ink colour in which words are printed) was explained and they were asked to complete the Practice Card to ensure that they had understood the task and could identify the colours correctly. The instructions for the task (Appendix B1) were given and the cards then presented. A brief break between cards was made to reduce the possibility of a fatigue effect. The remaining questionnaires were administered. The participants were debriefed before leaving and further information about the purpose of the study was given.

RESULTS.

The three groups did not differ significantly in terms of age, gender or verbal intelligence as measured by the NART.

Table 1. Group Characteristics.

Group	No Diagnosis	Diagnosed	Control	
Age (SD)	38.4 (10.6)	37.6 (11.7)	41.4 (10.6)	F = .732 N.S.
Gender M/F	4 / 16	6 / 14	4 / 16	x^2 = .73 N.S.
NART (SD)	105.7 (9.6)	107.3 (8.1)	109.1 (7.7)	F = .800 N.S.

The Pain Groups were both heterogeneous in respect of site of pain and site was classified according to the International Association for the Study of Pain Codes, Axis 1 (Merskey et al., 1979 : see Appendix B2). The Pain Groups did not differ significantly in terms of the chronicity of their pain. The No Diagnosis

Group however did report significantly more functional impairment due to pain than the Diagnosed Group (Table 2).

Table 2. Characteristics of Pain Groups.

	No diagnosis Group		Diagnosed Group	
	Mean	SD	Mean	SD
Chronicity (Months) *	69.1	± 79.4	61.8	± 79.0
Functional Impairment (%) **	57.4	± 13.5	33.7	± 18.0

*** Mann Whitney. U = 165.5 (2 tailed) N.S.**
**** T Test . t = 4.6 df = 36 (2 tailed) P < 0.001**

The mean raw scores for the Stroop Task are shown in Table 3.

Table 3. Response Times (in seconds) for Groups on each condition.

Group	No Diagnosis	Diagnosed	Control
	Mean ± S.D.	Mean ± S.D.	Mean ± S.D.
Stroop Words			
Pain	52.84 ± 24.70	46.25 ± 23.23	34.07 ± 5.00
Control Uncat.	43.20 ± 6.17	47.18 ± 23.30	34.60 ± 5.86
Negative	44.22 ± 7.79	48.97 ± 28.08	34.34 ± 5.52
Control Categ.	42.49 ± 6.67	49.69 ± 27.84	36.56 ± 5.00

An Interference Score for Pain Words and Negative Words was calculated for each participant as undernoted:-

1) The times for card 2 and card 4 (the two control cards) was combined and then divided by two to provide an average **Control Word Time (CWT).**

2) The CWT. was then subtracted from Card 1 (Pain Words) time to give a **Pain Words Interference Score (PWIS).**

3) The CWT. was then subtracted from Card 3 (Negative Words) time to give a **Negative Words Interference Score (NWIS).**

Table 4. Interference Variables Summary Statistics.

Group	PWIS (Seconds)	NWIS (Seconds)
	Mean ± S.D.	Mean ± S.D.
No Diagnosis	3.07 ± 5.20	1.37 ± 5.51
Diagnosed	-1.06 ± 4.12	-0.60 ± 4.01
Control	-1.51 ± 2.20	-1.24 ± 2.18

Prior to using ANOVA/MANOVA to analyse the Stroop data, it was necessary to screen for extreme scores because of ANOVA's sensitivity to such "outliers". Within the distribution of PWIS and NWIS, those scores which were more than two standard deviations above or below the mean were treated as outliers. Four outliers were identified in PWIS and one in NWIS. The effect of the outliers was reduced by transforming the raw scores of the identified outliers. The transformation method used was to assign the outlying case a raw score which was one unit (a second) larger or smaller than the next most extreme score in the distribution (Tabachnick & Fidell, 1996).

Results of the MANOVA indicated that the three groups did differ with respect to Stroop Interference in the Pain Words condition but not on the Negative Word condition. (PWIS, $\mathbf{F = 7.83, p < .001}$; NWIS, $\mathbf{F = 2.17}$, **N.S.**)

Following the significant F-Ratio for PWIS a planned pairwise comparison was made using the Scheffe procedure in order to evaluate mean differences between the three groups.

The results showed that there were significant group differences in PWIS between the No Diagnosis Group and the Diagnosed Group ($p < .01$) and also between the No Diagnosis Group and the Control Group ($p < .01$). There was no significant difference in PWIS between the Diagnosed Group and the Control Group.

The results of self-report measures of Anxiety and Depression are shown for each group in Table 5.

Table 5. Mean State/Trait Anxiety and BDI Scores.

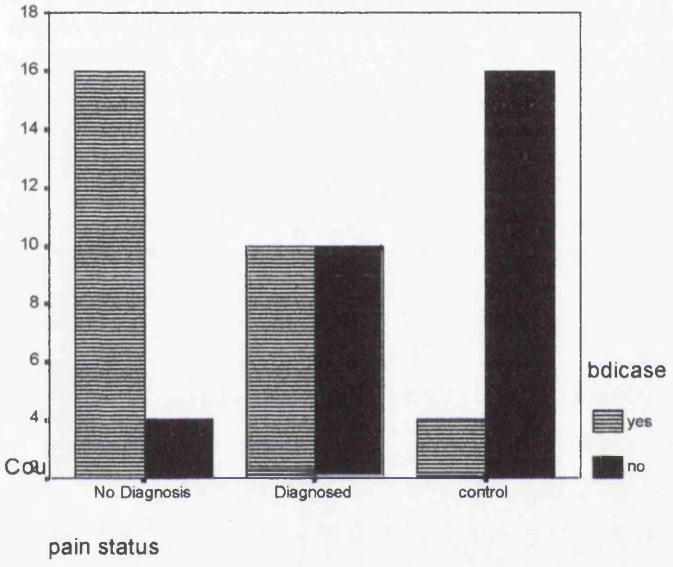
Group	State Anxiety *	Trait Anxiety**	BDI***
	Mean ± S.D.	Mean ± S.D.	Mean ± S.D.
No Diagnosis	51.3 ± 12.5	53.4 ± 11.4	22.0 ± 10.4
Diagnosed	42.8 ± 14.3	44.3 ± 11.9	13.3 ± 7.9
Control	33.4 ± 7.1	37.2 ± 7.4	5.6 ± 4.3

* ANOVA $F = 11.99$ $df = 2$ $p < .001$
** ANOVA $F = 12.02$ $df = 2$ $p < .001$
*** ANOVA $F = 21.23$ $df = 2$ $p < .001$

Following the significant F Ratios for Anxiety and Depression Scores a planned pairwise comparison was made using the Scheffe procedure in order to evaluate the mean differences between groups. The only significant difference in State Anxiety Scores was between the No Diagnosis Group and the Control Group ($p < .001$). The No Diagnosis Group had significantly higher Trait Anxiety Scores compared to both the Diagnosed Group ($p < .05$) and the Control Group ($p < .001$). The No Diagnosis Group had significantly higher BDI Scores than both the Diagnosed Group ($p < .01$) and the Control Group ($p < .001$). The Diagnosed Group had significantly higher BDI Scores than the Control Group ($p < .05$). The possibility that either Anxiety or Depression measure might be confounding the results of PWIS was examined. The correlations for Anxiety/Depression measures and PWIS were **not** significant however and the correlations for each group are reported in Appendix B3.

The BDI contains items relating to somatic functioning and therefore may overestimate prevalence of depression in a pain population (Williams & Richardson, 1993). The higher threshold of 13 for "caseness", recommended by Turner & Romano (1984), has been used for the two pain groups in this study. The threshold for the control group was 10. The number of subjects who meet this adapted criteria for depression is shown in Chart 1.

Figure 1. BDI "Caseness" with adapted criteria.



The results of the two subscales (Organic Belief Scale [OBS] and the Psychological Belief Scale [PBS]) from the Pain Belief Questionnaire are reported in Table 6.

Table 6. Mean Pain Belief Questionnaire Subscale Scores.

Group	OBS *	PBS **
	Mean±S.D.	Mean±S.D.
No Diagnosis	34.7 ± 5.7	16.5 ± 4.9
Diagnosed	31.1 ± 5.9	15.4 ± 4.0
Control	27.2 ± 3.8	17.1 ± 3.4

* **ANOVA F = 10.88 df = 2 p< .001**

** **ANOVA F = .86 df = 2 N.S.**

A planned stepwise comparison of OBS using Scheffe procedure, indicated that the No Diagnosis Group had significantly higher scores than the Control Group (**p< .001**). There were no other significant differences between groups. (see Appendix B5) . There was a significant correlation between OBS and PWIS (**r = .260, p< .05**). However when OBS was covaried with PWIS and Group, OBS had no significant effect on the previously reported differences (see Appendix B4). There were significant correlations between OBS and BDI scores (**r = .514, p< .001, 2-tailed**); OBS and Trait Anxiety (**r = .479, p < .001, 2-tailed**) and OBS and Oswestry scores (**r = .622, p < .001, 2-tailed**).

There were no significant differences between groups on any of the EPQ subscales scores shown in Appendix B4 . The subscale Neuroticism most clearly differentiated the three groups but failed to reach significance (See Appendix B4).

DISCUSSION.

Overall Stroop Task times were slower for the two pain groups than for the control group. There was evidence of selective attentional processing of pain related words in one of the two pain groups (ie. No Diagnosis Group) in this study. The result confirms Pearce & Morley's (1989) finding of attentional bias to pain words but not to negative words in their sample of pain patients. Pincus et al (1998) found a similar response latency in a group of pain patients but when BDI scores were taken into account the response latency disappeared. There was **no** significant correlation in this study between BDI scores and the latency scores for pain words in the No Diagnosis Group. Similarly despite the No Diagnosis Group having higher mean Trait Anxiety scores than the other two groups there was no significant correlation between either State or Trait Anxiety and Pain Word Interference. The selective attentional processing of pain words was not therefore confounded by the greater depression or anxiety reported. Nor was it part of a general response to negativity or emotionality because there was no parallel bias to negative words.

No selective attentional bias to pain words was found in the second chronic pain group in this study (Diagnosed Group). This group was significantly more depressed than the Control Group but there was no significant difference in Anxiety measures between the two. There was no significant bias to Pain Words or Negative Words in either the Diagnosed pain group or the Control Group. The two pain groups did not differ significantly on measures of State Anxiety assessed immediately prior to the Stroop performance. The Diagnosed Group reported significantly less Trait Anxiety and significantly less depression than the No Diagnosis Group but again correlation with pain word interference was not significant and therefore cannot explain the differences in pain word interference .

There was significantly greater subjective functional impairment due to pain reported by the No Diagnosis Group compared to the Diagnosed Group despite the lack of organic findings for pain in the former group. The effect to some

extent could be attributed to the ambiguity of this situation and the need to emphasise the effect of their pain. However the evidence of attentional bias to pain stimuli, which is not thought to be open to conscious manipulation, suggests that cognitive bias could partially explain the maintenance of pain in the absence of further injury or known pathology. This bias particularly if linked to other proven cognitive biases in pain patients (ie. in interpretation of ambiguous information as pain related and in recall) may lead to increased rumination about pain and influence pain beliefs. In Cohen's Parallel Distributed Procesing Model (1990) this would be reflected in increased pathway strength which is critical for the attentional bias to occur.

The differing results for the two chronic pain groups in this study may help to explain the conflicting results in the literature. Neither Pearce & Morley (1989) or Pincus et al. (1998) clearly define their chronic pain groups and their differing results may therefore be a function of the nature of their particular pain groups.

Pain beliefs are thought to be an important influence on how patient's present to health professionals (Edwards et al., 1992); on levels of distress (Jensen et al, 1991) and response to treatment (Jensen et al., 1994). In this study there were no differences between groups in beliefs about how personal/psychological factors affect pain but there was a trend in beliefs about the importance of organic factors. The Diagnosed Group had greater belief in the importance of organic factors than the Control Group and the trend was even greater for the No Diagnosis Group. However only the difference between the Control Group and the No Diagnosis Group reached significance. The Organic Belief Scale (OBS) includes items reflecting the belief that powerful others have the responsibility for managing pain and therefore perhaps not surprising that it is emphasised by patients at a Pain Relief Clinic visit. However, it has been suggested that such beliefs may be longer standing and predispose individuals to dysfunctional adjustment to pain (Edwards et al., 1992) and have a profound effect on treatment outcome and activity levels (Jensen & Karoly, 1991). There was a significant correlation in this study between OBS and subjective functional

impairment as measured by the Oswestry Disability Questionnaire. This result confirms Wells & Matthews (1994) assertion that strongly held beliefs and attitudes may influence involuntary attentional selection.

The question of why there should be evidence of an attentional bias to pain stimuli in only one of the two pain groups in this study cannot be explained fully by the results of the study. Both groups have chronic pain, therefore both should have elaborated and constantly activated pain schemas (Pearce & Morley, 1989; Eccleston, 1995) and therefore should be subject to similar bias effects. A possible explanation lies in individual differences mediating the effect of pain on information processing. There are considerable individual differences in the extent to which individuals are known to monitor physical sensation including pain (Pennebaker & Skelton, 1981). Watson & Pennebaker (1991) report that Neuroticism and "Negative Affectivity" are more strongly and consistently related to physical complaint including pain than objective indicators of illness. Individuals with such a preoccupation with physiological sensation may be over-represented in the pain group with no organic findings. No significant differences in Neuroticism was found in this study (as measured by the short form of the EPQ-R) contrary to findings such as those of Costa & Macrae (1987) or Harkins et al. (1989). A more specific measure of somatic focus such as Miller et al's (1981) Body Consciousness Scale, may have provided a clearer trait measure of self-focusing. Degree of self-focusing is known to be associated with Neuroticism and to have a mediating effect in psychopathology (Watson & Pennebaker, 1989). The concept of self-focusing might provide a useful explanatory link between attentional bias and some chronic pain conditions.

There may also be a greater degree of fear of pain within the No Diagnosis Group, partly because of the uncertainty caused by the lack of a clearly understood diagnosis. Mathews & MacLeod (1994) in their Prioritisation Model suggest that emotionally threatening stimuli will have processing priority in

certain situations or emotional states. Although there were higher Trait Anxiety Scores for this group compared to the other pain group this was not related to pain word interference. There may have been a specific fear of pain which was not measured by the State/Trait Anxiety Inventory which is a very general measure of anxiety. Asmundso (1997) found that participants in a study with a low fear of pain and those with a high fear of pain operated differently on related cognitive tasks. A more salient measure of fear of pain may therefore have shown an association with pain word interference and perhaps explained some of the difference between the two pain groups.

The attentional bias effect on the Emotional Stroop Task which was evident in one of the two pain groups in this study has been consistently demonstrated in a number of emotional disorders and may depend on several independent processes (Wells & Matthews, 1994). To what extent cognitive beliefs, individual traits or clinical condition may mediate the effects of pain on information processing is still unclear. It would have been useful to compare the groups on other information processing tasks, such as a recall task, to see if the cognitive bias to pain stimuli was more general. The replication of this study with other clearly defined pain groups and the use of more refined measures would perhaps answer some of the questions raised by this study.

In summary, this study found that chronic pain group with no clear diagnosis for their pain showed significant bias to pain words on the Emotional Stroop Task. There were no biases evident for the pain group with a clear organic diagnosis or the control group. Differences in depression and anxiety scores did not account for the difference. The group showing the Stroop effect reported greater functional impairment because of pain and also endorsed statements which placed greater emphasis on the organic factors in pain.

REFERENCES.

Arntz, A.; Dreesen, L. & De Jong, P., The influence of anxiety on pain: attentional and attributional mediators. Pain, 56 (1994) 307-314.

Asmundson, G.T.G.; Kuperos, J.L. & Norton, G.R., Do patients with chronic pain selectively attend to pain-related information? : preliminary evidence for the mediating role of fear. Pain. 72 (1997) 27 - 32.

Beck, A.T., The Beck Depression Inventory - Revised, San Antonia: The Psychological Corporation, 1978.

Cohen, J.D.; Dunbar, K. & McClelland, J.L., On the control of automatic processes: A parallel distributed processing account of the Stroop Effect. Psychol. Rev. 97 (1990) 332 - 361.

Costa, P.T. & McCrae, R.R. Neuroticism, somatic complaints and disease: Is the bark worse than the bite? J. Person. 55 (1987) 299 - 316.

Deyo, R.A., Comparative validity of the Sickness Impact Profile and shorter scales for functional assessment in low back pain, Spine. 11 (1986) 951 - 954.

Eccleston, C., Chronic pain and distraction: an experimental investigation into the role of sustained and shifting attention in the process of chronic persistent pain. Behav. Res. Ther. 33 (1995) 391 - 405.

Edwards,L.C.; Pearce, S.A.; Turner-Stokes, L. & Jones, A., The Pain Beliefs Questionnaire: an investigation of beliefs in the causes and consequences of pain, Pain. 51 (1992) 267-272.

Eysenck, H.J. & Eysenck, S.B.G., Manual of the Eysenck Personality Scales, London: Hodder & Stoughton, 1991.

Fairbank, J.C.T., The Oswestry Low Back Pain and Disability Questionnaire. Physiotherapy, 66 (1980) 271-273.

Harkins S.W.; Price, D.D. & Braith, J. Effects of extraversion and neuroticism on experimental pain, clinical pain and illness behaviour. Pain 36 (1989) 209-218.

Jensen, M.P.; Karoly, P. & Harris, P. Assessing the affective component of chronic pain, development of the pain discomfort scale. J. Psychosom. Res. 35 (1991) 149 - 154.

Jensen, M.P.; Turner, J.A.; Romano, J.M. & Lawler, B.K. Relationship of pain specific beliefs to chronic pain adjustment. Pain 57 (1994) 301 - 309.

Jerome, J., Transmission or transformation. Information Processing Theory of chronic human pain. APS Journal 2 (1993) 160-171.

Karoly, P & Jensen, M.P., Multimethod Assessment of Chronic Pain. Oxford, Pergamon Press, 1987.

Leventhal, H., A perceptual-motor theory of emotion. In L. Berkowitz (Ed.) Advances in Experimental Social Psychology, Orlando: Academic Press, 1984.

MacLeod, C.M., Half a century of research on the Stroop effect: An integrative review. Psychol. Bulletin 109 (1991) 163-201.

MacLeod, C.M.; Mathews, A. & Tata, P., Attentional bias in emotional disorders. J. Abnorm. Psychol. 95 (1986) 15-20.

McNally, R.J.; Kaspe, S.P.; Riemann, B.C. & Zeitlin, S.B., Selective processing of threat cues in post-traumatic stress disorder. J. Abnorm. Psychol. 99 (1990) 398-402.

Martin, M.; Williams, R.M. & Clark, D.C. Does anxiety lead to selective processing of threat-related information. Behav. Res. Ther. 29 (1991) 147 - 160.

Mathews, A. & MacLeod, C. Cognitive approaches to emotion and emotional disorders. Ann. Rev. Psychol. 45 (1994) 25 - 50.

Melzack, R., The McGill Pain Questionnaire: major properties and scoring method, Pain 1 (1975) 277 -299.

Melzack, R., Pain and the brain. APS Journal. 2 (1993) 172-174.

Merskey, H; Albe-Fessard, DG; Bonica, JJ; Carmen, A; Nathan, PW; Noordenbos, W; Pagni, CA; Renaer, MJ; Sternbach, RA & Sunderland, S. IASP sub-committee on taxonomy, Pain 6 (1979) 249-252.

Miller, L.C.; Murphy, R. & Buss, A.H., Consciousness of body: private and public. J. Person. Soc. Psychol. 41 (1981) 397 - 406.

Mogg, K.; Mathews, A.; Eysenck, M. & May, J., Biased cognitive operations in anxiety: artefact, processing, priorities or attentional search? Behav. Res. Ther. 29 (1991) 459-467.

Mogg, K.; Mathews, A. & Weinman, J., Selective processing of threat cues in anxiety states: A replication, Behav. Res. Ther. 27 (1989) 317-323.

Nelson, H.E. & Willison, J.R. National Adult Reading Test (NART) Test Manual. 2nd Ed. NFER-Nelson, 1991.

Pearce, J. & Morley, S., An experimental investigation of the construct validity of the McGill Pain Questionnaire, Pain. 39 (1989) 115-121.

Pearce, S.A.; Isherwood, S.; Hrouda, D.; Richardson, P.H.; Erskine, A. & Skinner, J., Memory and pain: tests of mood congruity and state dependent learning in experimentally induced and clinical pain, Pain. 43 (1990) 187-193.

Pennebaker, J.W. & Skelton, J.A., Selective monitoring of bodily sensations. J. Pers. Soc. Psychol. 41 (1981) 213-223.

Pincus, T.; Fraser, L. & Pearce, S.A., Do chronic pain patients "Stroop" on pain stimuli? Brit. J. Clin. Psychol. 37 (1998) 49-58.

Pincus, T.; Pearce, S.A. & McClelland, A., Endorsement and memory bias of self-referential pain stimuli in depressed pain patients, Brit. J. Clin. Psychol. 34 (1995) 267-277.

Pincus, T.; Pearce, S.A.; McClelland, A.; Farley, S. & Vogel, S., Interpretation bias of self-referential pain stimuli in depressed pain patients. J. Psychosom.Res. 38 (1994) 347-353.

Pincus, R.; Pearce, S.A.; McClelland, A. & Turner-Stokes, L., Self-referential selective memory in pain patients. Brit. J. Clin. Psychol. 32 (1993) 365-374.

Pincus, R.; Pearce, S.A. & Perott, A., Pain patient's bias in the interpretation of ambiguous homophones. Brit. J. Med. Psychol. 69 (1996) 259-266.

Romano, J.A. & Turner, J.A., Chronic pain and depression: does the evidence support a relationship? Psycho. Bull. 97 (1985) 18-34.

Rudy, T.E., Information Processing and chronic pain. Can uncertainty be organised? APS Journal.2 (1993) 175-178.

Spielberger, C.D.; Gorsuch, R.L.; Lushene, R.; Vagg, P.R. & Jacobs, G.A., Manual for the State-Trait Anxiety Inventory. (Form Y.) Palo Alto. Consulting Psychology Press, 1983.

Tabachnick, B.G. & Fidell, L.S., Using Multivariate Statistics. 3rd Edition. Harper Collins College Publishers, 1996.

Thorndike, E.L. & Lorge, I., The Teacher's Word Book of 30,000 words. New York, Columbia University Press, 1944.

Turner, J. & Romano, J. Self-Report screening measures for depression in chronic pain patients. J. Clin. Psychol. 40 (1984) 909 - 913.

Tyrer, S.P.; Capon, M.; Peterson, D.M.; Charlton, J.E. & Thompson, J.W., The detection of psychiatric illness and psychological handicaps in a British pain clinic population, Pain 36 (1989) 63 - 74.

Watson, D. & Pennebaker, J.W. Situational, dispositional and genetic basis of symptom reporting. In J.A. Skelton & R.T. Croyle (Eds.) Mental Representation in Health and Illness. New York: Springer Verlag, 1991.

Watts, F.; McKenna, F.P.; Sharrock, R. & Treize, L., Colour naming of phobia - related words. Brit. J. Psychiatry 77 (1986) 97-108.

Wells, A. & Matthews, G., Attention and Emotion A Clinical Perspective. Hove: Lawrence Erlbaum, 1994.

Williams, A.C. & Richardson, P.H. What does the BDI measure in chronic pain? Pain 55 (1993) 259 - 266.

Williams, J.M.G.; Mathews, A. & MacLeod, C., The Emotional Stroop Task and psychopathology. Psychol. Bull. 120 (1996) 3-24.

Consultant Anaesthetists' Views on the need for Clinical Psychology Services to Pain Relief Services in Glasgow.

Lyndia Green
Clinical Psychologist
Lansdowne Clinic
Gartnavel Royal Hospital
Great Western Road
Glasgow G 12.

TABLES.

1. Estimated Numerical Data.

2. Current Pain Relief Clinic Staffing.

3. Clinical Psychology Input.

4. Overall Staff Requirement.

5. Priority Staff Requirement.

6. Preferred Location for Psychologists.

7. Volume of Current Referrals to Psychology (Per Annum).

8. Estimated Future Referrals to Psychology.

9. Estimated Psychology Sessions Required.

10. Level of knowledge about Psychology and Estimated Future Referral Rate.

11. Level of Knowledge and Prioritisation of Psychology.

12. Preferred Method of Information Presentation.

FIGURES.

1. Percentage of Total Staff Sessions by Profession.

2. Treatment Outcome.

3. Estimates of Emotional Distress and Depression.

4. Estimates of Abnormal Functional Impairment and Illness Behaviour.

5. Estimates of Patients' Addiction to Prescribed Drugs.

6. Anaesthetist Rating of Conditions Appropriate for Psychological Intervention.

ABSTRACT

Chronic pain is a significant problem. This survey establishes that existing services in Glasgow fail to approximate the inter-disciplinary service recommended for this group of patients with severe and complex problems. The views of all 13 Consultant Anaesthetists, working in the Pain Relief Services in Glasgow, was sought about their perceived need for clinical psychology input to their service and about what they thought the clinical psychology service might provide this patient group. The amount of knowledge displayed by each Anaesthetist, about psychological approaches to pain management, was directly related to their perceived need for the service. The information obtained will be useful for service planning and training.

INTRODUCTION

Chronic, unrelieved pain is widespread and apart from the individual suffering involved, has a considerable economic impact because of the social and occupational consequences. A British population survey, established a chronic pain prevalence rate of 70 per 1,000 (Bowsher et al., 1991). Of those with chronic pain, 63% had experienced pain in each of the seven days prior to the survey and 55% were unable to lead a "normal life" because of the pain. A large number (70%) were taking analgesics but were still in pain. The authors concluded that resources, devoted to symptomatic pain relief, were inadequate.

The complex nature of chronic pain and a recognition of the interaction of physical and psychological factors in its aetiology and maintenance, has been increasingly accepted by clinicians since Melzack & Wall (1965) first proposed the Gate Control Theory of pain. Levels of psychopathology in pain clinic populations of 40 - 60 % (Turk et al 1987) and 54% (Tyrer et al. 1989) have been reported. Early pain clinics in the United Kingdom, tended to provide largely anaesthetic and surgical methods of pain relief only. Many patients however, are not responsive to specific medical or surgical treatments (Turk, 1990).

Psychological research is recognised as having made significant advances in the understanding of pain mechanisms, and the assessment and treatment of pain (Gamsa, 1994). Over the last twenty years Behavioural (Fordyce, 1976) and Cognitive Behavioural (Turk et al. 1983) therapeutic interventions have developed so that they are,

"the recognised standard in the rehabilitation of the chronic pain patient"

(Royal Colleges report, 1995. P 78)

Psychology is one of the core disciplines on the staff of most pain clinics and pain management programmes in countries where they have been developed (Keefe, 1988).

The Pain Society Report (1995) found that no pain treatment facility in the UK could be designated a Multi-disciplinary Pain Centre according to agreed international criteria. They maintained that no single professional can possess all the skills required to care for this patient group and that an inter-disciplinary team was required to deal with the complex problem of chronic pain management. A Scottish Office Advisory Committee (S.O.A.C. 1994), which reviewed services to chronic pain patients in Scotland also recommended that Pain Relief Clinics should no longer be the province of a single speciality (i.e. Anaesthetics) but should become multi-disciplinary. The S.O.A.C. suggested that existing clinics should continue to

"provide first line consultation, advice and treatment for patients with chronic pain problems." (P. 60)

The staffing of the clinics was to be expanded to include a nurse and administrative staff and to have rapid access to physiotherapy and pharmacists. In addition, clinical psychologists were to be part of the basic staff complement of each pain relief clinic and employed at the rate of 1 w.t.e. per 200,000 of the population. (P.60)

Early intervention is considered important to stop the process of entrenched, maladaptive pain behaviour and the resulting chronic invalidism. A key function of the expanded Pain Relief Clinics, according to the S.O.A.C., was to be the early identification of likely intractable pain problems and referral of these patients to Regional Pain Management Centres. Four or five such centres were felt to be required in Scotland, based in teaching hospitals and having both in-patient and out-patient facilities. They would offer a Pain Management Programme which would be a psychologically based rehabilitative treatment for those whose pain has not been resolved by medical or other physically based treatment. Clinical psychologists would therefore have a major role in such centres. To date, none of the recommendations of the S.O.A.C. have been implemented by the Pain Relief Clinics in the G.G.H.B. area.

There are five Pain Relief Clinics in the Greater Glasgow Health Board Area based in Gartnavel General Hospital; The Royal Infirmary; Southern General Hospital, Stobhill Hospital and The Victoria Infirmary. The present study had two parts. The first was a clinic survey and covered each of the five clinics above. The second was a survey of the twelve Consultant Anaesthetists working in these clinics.

The Aims of the Survey were:

A. Clinic Survey.

1. To collect basic numerical data from each clinic about referrals, attendance and outcome.
2. To ascertain current staffing levels and composition.
3. To find out about current clinical psychology input to clinics.
4. To look at current referrals to Pain Management Programmes.

B. Individual Anaesthetist Survey.

1. To obtain individual views about clinic staffing requirements and in particular, the need for clinical psychology input.
2. To obtain individual estimates about the level of psycho-pathology in their patients.
3. To obtain estimates of current treatment efficacy.
4. To obtain information about current understanding about appropriate referrals to clinical psychology and types of treatment offered.
5. To assess the need for further information about psychological approaches to pain management.

The information obtained would be useful in service planning and in the preparation of a stated case for clinical psychology posts. In addition, it would identify the possible need for training about psychological approaches to pain management to existing clinic staff.

METHOD.

Measures.

Two questionnaires were produced, the first to record clinic data and the second to record each clinicians' views. (Appendix 1 & 2) Although the main aim was to canvas views about clinical psychology input to the Pain Clinics, other professional groups were included to reduce the possibility of response bias.

Procedure.

Each clinic was contacted by telephone to explain the purpose of the survey; check their willingness to participate and to obtain the names of all the consultant anaesthetists working in that clinic. One copy of questionnaire 1 was sent to the contact person in each clinic and a copy of questionnaire 2 sent to each clinician.

Results.

A. **Clinic Survey**

Information from all five Pain Clinics was obtained via the contact Consultant Anaesthetist and individual information from the twelve Consultant Anaesthetists working in the service. The **estimated** number of new referrals to the Pain Relief Clinics in Glasgow, for one year, and their source is shown in Table 1. Overall, ninety-five per cent of patients referred have chronic benign pain.

Table 1. Estimated Numerical Data.

Clinic	Referrals	C. Benign Pain	Referral Source. %	
			G.P	Hospital
1	200	200	50	50
2	250	240	85	15
3	400	390	50	50
4	400	380	60	40
5	400	360	60	40
Total	1650	1570		

Information about default rates was missing from one clinic. On average, across the remaining clinics, the initial default rate was reported to be 23% and a further 19% of patients terminated treatment prematurely. Outcome for those patients who do complete treatment, is assessed clinically in each clinic and in

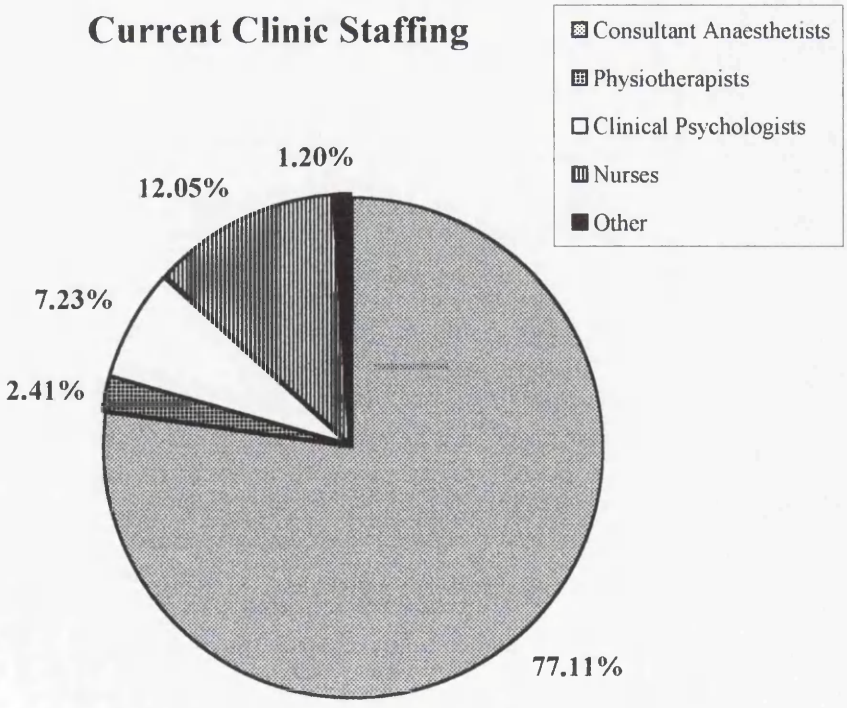
two clinics a simple outcome scale is used routinely. No clinic uses standardised measures of outcome.

The current staffing across all five clinics is shown in Table 2 and Figure 1.

Table 2. Current Pain Relief Clinic Staffing.

Profession	Number	Sessions
Consultant Anaesthetists	13	32
Physiotherapists	1	1
Clinical Psychologists	2	3
Nurses	2	5
Psychiatrists	1	0.25
Other	1	0.25

Figure 1. Percentage of Total Staff Sessions by Profession.



Four of the five Pain Clinics have made referrals to Pain Management Programmes (PMP) which are purchased out-with the Health Board area in

Edinburgh and Ayr. A total of twenty patients have been referred, in the last year and the majority of Anaesthetists report that they would refer more patients to a PMP if one were available locally.

Current Clinical Psychology input is provided as detailed in Table 3 and none is funded directly by the General Hospital Trusts. Resources are therefore taken from the Community and Mental Health Trust budget, a situation which is difficult to sustain when there are unfilled psychology posts in that sector and a pressure to reduce waiting lists.

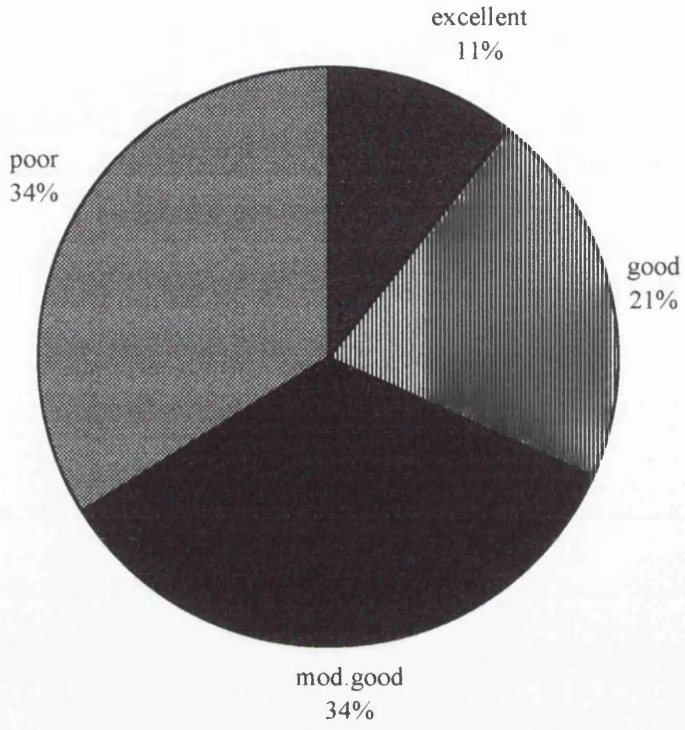
Table 3. Clinical Psychology Input.

Method of Input	**Number of Clinics**
Integral	0
Named Psychologist agreed sessions	2
Local Psychology Dept.	1
Request G.P. to refer to Psychology	1
None	1

B. **Individual Anaesthetist Survey.**

As there is no common outcome measure across clinics in place, individual anaesthetists were asked to estimate overall treatment outcome for their patients on a four category scale. The average outcome for all the anaesthetists is shown in Figure 2.

Figure 2. Treatment Outcome.



Each anaesthetist was asked to identify the core staff required, for their clinic, in addition to existing staff. The number choosing each profession is shown in Table 4 and their first two priorities is shown in Table 5.

Table 4. Overall Staff Requirement.

Profession	**%**	
Clinical Psychologist	83	(10)
Nurse	75	(9)
Physiotherapist	58	(7)
Junior Medical Staff	50	(6)
Consultant Anaesthetist	33	(4)
Psychiatrist	25	(3)
Other	25	(3)
Administration	0	(0)

Table 5. Priority Staff Requirement

Profession	%	N
Nurse	73	(8)
Clinical Psychologist	64	(7)
Physiotherapist	27	(3)
Consultant Anaesthetist	18	(2)
Other	9	(1)

Table 6. Preferred Location for Psychologists.

Location of Psychology Input	N
Integral to pain relief service	10
Named Psychologist in Dept.	2
Referral to Psychology Dept.	0
None required	0

The volume of individual referrals to Clinical Psychology in the previous twelve months was estimated and the number ranged from 0 - 20 . The individual figures were amalgamated into totals for each clinic, and are shown in Table 7.

Table 7. Volume of Current Referrals to Psychology. (Per annum)

Clinic	Number
1	5
2	7
3	0
4	34
5	40

Anaesthetists were asked to estimate the percentage of their clinic population they would refer to clinical psychology annually, if there was an increase in service provision. These estimates are shown in Table 8. The estimated number of clinical psychology sessions they required is shown in Table 9.

Table 8. Estimated Future Referrals to Psychology.

Clinicians	%
3	<10
1	15
3	20
3	30
2	D.K.

Table 9. Estimated Psychology Sessions Required.

Sessions per week	**No**
Occasional	1
½ - 1	1
1	1
1 - 2	2
2	6
D.K.	1
Total	12

Each anaesthetist was asked to estimate the percentage of their clinic population with the following conditions:

a) Significant emotional distress.

b) Depression

c) Abnormal levels of functional impairment

d) Abnormal illness behaviour

e) Addiction to prescribed drugs

and the results are shown in the Figures 3, 4 and 5.

Figure 3. Estimates of Emotional Distress and Depression.

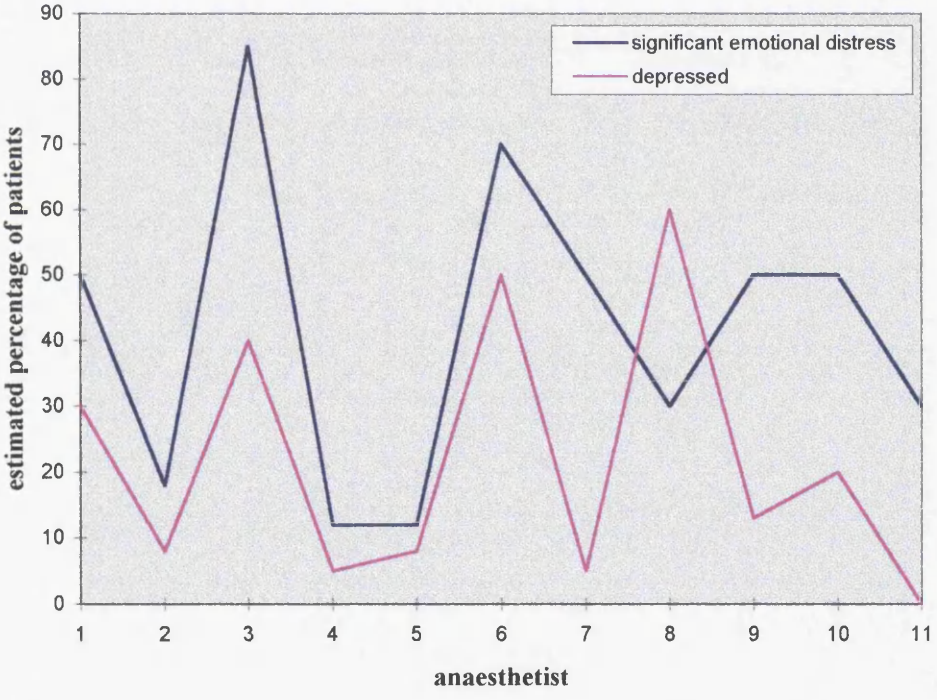


Figure 4. Estimates of Abnormal Functional Impairment and Illness Behaviour.

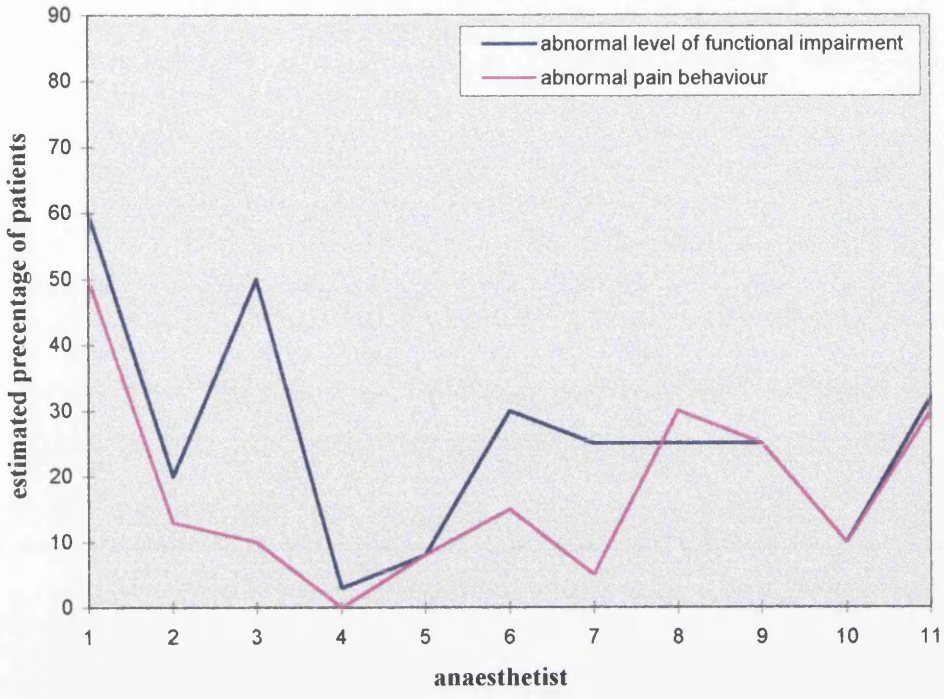
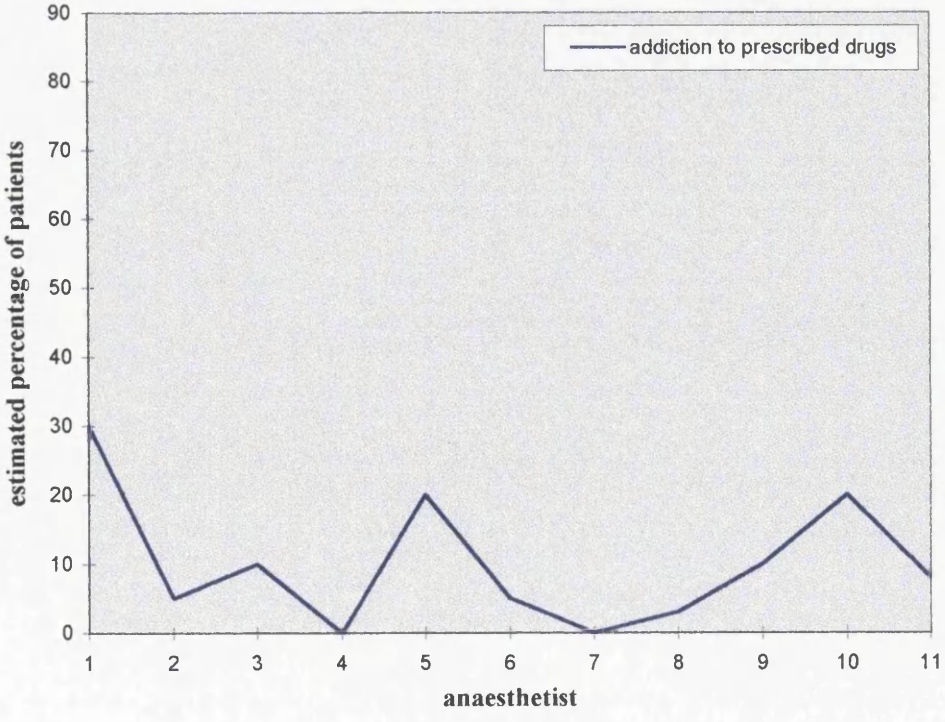
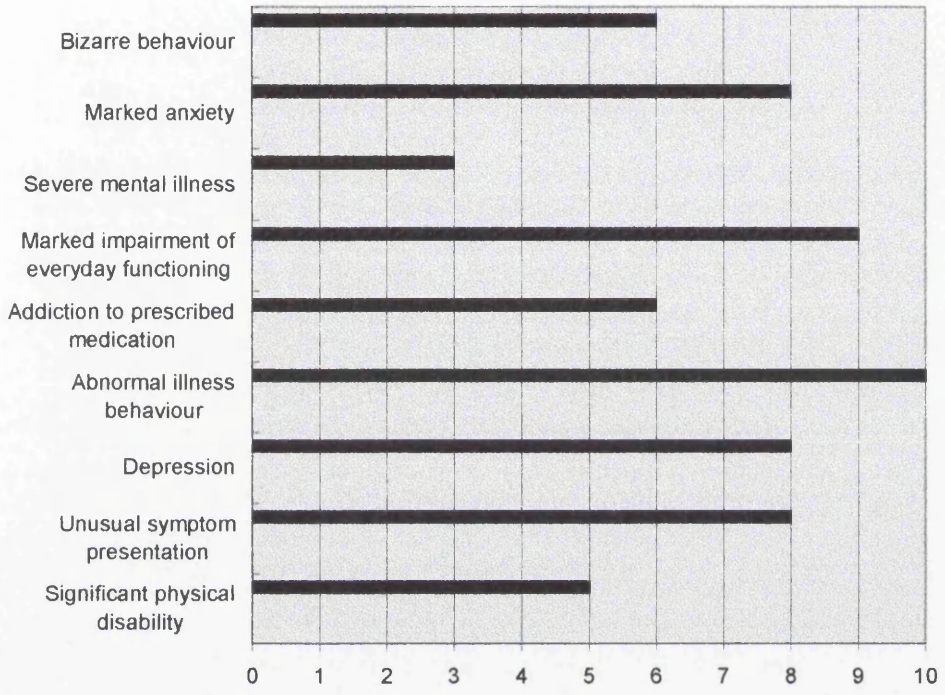


Figure 5. Estimates of Patients' Addiction to Prescribed Drugs.



Anaesthetists were given a list of conditions patients might present with and asked whether or not a Clinical Psychologist's input would be appropriate for that condition. The results are shown in Figure 6.

Figure 6. Anaesthetists Rating of Conditions Appropriate for Psychological Intervention.



Number of Clinicians. (N = 12)

Each anaesthetist was asked to list the types of treatment a clinical psychologist might offer a chronic pain patient and the lists are transcribed in Appendix 3. There was quite marked differences in the level of knowledge reported. In order to establish whether or not these differences influenced perception of need for clinical psychology services in the future, individual responses were split into two groups on the following basis:

Group 1: Less knowledge : < four specific psychological approaches given.

Group 2. More knowledge: at least four specific psychological approaches given.

These groups were then compared to see if they differed in estimates of future referral to clinical psychology and whether or not they considered obtaining clinical psychology input as a priority. The results are give in Tables 10 and 11.

Table 10. Level of Knowledge about Psychology and Estimated Future Referral Rate.

Group	Number	Future Referrals to Psychology
Less Knowledgeable	5	8%
More Knowledgeable	7	23%

Table 11. Level of Knowledge and Prioritisation of Psychology.

Group	Number	Psychology seen as Priority
Less Knowledgeable	5	0%
More Knowledgeable	7	86%

Eleven of the twelve clinicians indicated that they would like more information about psychological approaches for chronic pain. Their preferred choice about how the information might be delivered is shown in Table 12.

Table 12. Preferred Method of Information Presentation.

Method	**No.**
Formal Presentation	5
Written Information	9
Informal Discussion	5
Joint Working/ Case Discussion	5

The information option "Joint working/ Case discussion" is the option which denotes most active participation by the recipients. All five of the anaesthetists who chose this as one of their options, belonged to the group with more knowledge of psychological approaches to pain management.

DISCUSSION.

The percentage of people referred to the Pain Relief Clinics in G.G.H.B. area, is only 2.5% of the number suffering chronic pain, if Bowsher et al's prevalence rates are applied. The referrals to the Clinics, are skewed to the severe and intractable end of the population of chronic pain patients. It is likely therefore that within the referred population, there will be a significant level of psycho-pathology (Tyrer et al. 1989; Turk et al. 1987). The population in fact, that is most likely to require an inter-disciplinary approach to assessment and treatment, as recommended by The Pain Society Report (1995).

In contrast to the patient population that they have to treat, the existing Pain Relief Clinics in the G.G.H.B. area have been staffed as if they were treating acute, relatively straightforward physical conditions. The Pain Relief Clinics in Glasgow have been staffed almost exclusively from inception by consultant anaesthetists with some input from junior medical staff in training. Input from other professions is sparse and random so that, for example, one clinic has one physiotherapy session and two have some nursing and clinical psychology input. The anaesthetists clearly report the need for additional professional input to the clinics. They cite additional nursing and clinical psychology input as the two priorities.

At present, approximately twenty patients a year are referred to Pain Management Programmes in Edinburgh and Ayr. Many more patients seen in Pain Relief Clinics would benefit from such programmes but are currently unable to travel to these out-patient facilities or are not assessed as requiring the service. The experience of an in-patient Pain Management Programme which

operated in Glasgow from 1984 to 1989 suggests that many more patients, in addition to those seen in Pain Relief Clinics, would be referred by General Practitioners and others to such a facility. The costs of running a Pain Management Programme should be more than offset by the reduction of continuing treatment costs (Coote et al. 1986).

The Clinics currently fail to meet the minimum standard, as far as clinical psychology input is concerned, of two sessions per week. If the S.O.A.C. (1994) recommendation of 1 w.t.e. per 200,000 of the population were applied then there would be five full-time equivalent clinical psychologists dedicated to working with chronic pain patients in Glasgow. The resulting fifty sessions of input is in marked contrast to the three currently in place. In fact, none of these three sessions are funded directly by the General Hospital Trust. The poor level of staffing means that clinical psychologists cannot offer a comprehensive, rehabilitative approach working closely with other professionals, to chronic pain patients.

The current referral rate to clinical psychology varies from clinic to clinic but significantly more referrals are made by the two clinics, who have a named psychologist providing regular sessions. It seems reasonable to infer, that if psychology input was provided to the other three clinics, their referrals to psychology would increase. No psychology input is provided as an integral part of the Pain Relief Service but this is the preferred option for the future . There was considerable variation in estimates for future referral rates to clinical psychology ranging from less than ten percent of clinic patients to thirty per cent. If based on current referral rates to the Pain Clinics, this represents 165 to 498 patients per year.

Estimates of the prevalence rate of conditions seen in the Pain Clinics, which might be amenable to psychological intervention, varied considerably between anaesthetists. This variation may contribute to the anaesthetists' perceived level of need for clinical psychology services although no clear evidence of this

emerges from the data obtained. The anaesthetists did, on the whole, name those conditions patients present with, in a pain clinic, where clinical psychology input might be of benefit. Their response to an open ended question about the type of treatment a clinical psychologist might offer pain patients, demonstrated considerable variation in level of that knowledge between clinicians. There was a clear relationship between this level of knowledge and estimated future referral rate to psychology. Those clinicians with more detailed knowledge of psychological treatments (Group 2) had higher estimated referral rates and vice versa. There was also a clear relationship between level of knowledge about psychological treatments and whether or not the need for a clinical psychologist was seen as a priority or not. None of the Group (1) with less knowledge saw obtaining a psychologist as a priority whereas 86% of the more knowledgeable group thought that it was. There was a demand expressed for more information about psychological approaches to pain management to be provided in a variety of formats. The option which required most active involvement of the anaesthetists themselves (i.e. Joint working/ case discussion) was chosen only by those demonstrating more knowledge of psychological treatments. The provision of such information, particularly in the format of joint working is likely, from the evidence of this survey, to increase demand for clinical psychological input from the Pain Relief Clinics in Glasgow.

CONCLUSION

The Survey has revealed that the existing services to chronic pain patients, in the G.G.H.B. area, fail to approximate the inter-disciplinary service recommended for this group of patients with severe and complex problems. Clinical Psychology input is not readily available to the majority of clinics and inadequately funded where it is available, despite it being seen as a core discipline by the Advisory Bodies. The need for clinical psychology input is seen as a priority by the majority of consultant anaesthetists working in the Glasgow area, particularly by those with more knowledge of psychological approaches for chronic pain. Since this survey was completed, there has been an audit by G.G.H.B. of Pain Relief Services in Glasgow. The main conclusion

of the audit was to identify the need for dedicated clinical psychology sessions to the Pain Relief Clinics and a proposal is being prepared for this service and the establishment of a Pain Management Programme.

REFERENCES.

Bowsher, D; Riggr, M and Sopp, L. Prevalence of chronic pain in the British population: a telephone survey of 1037 households. *The Pain Clinic.* 1991: 4, 223 - 230.

Coote, J.C.; Hughes, A.M.; McKane, J.P.; Green, L.M. & Bond, M.R. Drug consumption in chronic pain patients. *British Journal of Pharmaceutical Practice.* 1986: 7, 193-198.

First Stage Report of Greater Glasgow Health Board Area Wide Working Group - Chronic Pain. Audit of the Structure of Chronic Pain Provision in Glasgow. 1997.

Fordyce, W.E. (1972) *Behavioural Methods for Chronic Pain and Illness.* St Louis: C.V. Mosby.

Gamsa, ANN The Role of psychological factors in chronic pain. 1. A half century of study. 2. A critical Appraisal. *Pain.* 1994; 57, 5 - 29.

Janeti, J & Liebeskind, J C. Guest Editorial : A call for national initiatives on pain. *Pain.* 1994; 59, 5 - 6.

The Psychological care of medical patients. Recognition of need and service provision. *A report of the Royal College of Physicians and the Royal College of Psychiatrists.* 1995. Salisbury: Royal College of Physicians Publication Unit.

Report of a Working Party of The Pain Society. Desirable Criteria for Pain Management Programmes. *Journal of The Pain Society.* 1995: 12, 12 - 17.

Scottish Office Home and Health Department. Scottish Health Advisory Council. A Report of a Work Group of the National Medical Advisory Committee. 1994. Edinburgh: HMSO.

Sternbach, R.A. (1982) The Psychologist's role in the Diagnosis and Treatment of Pain Patients". From J. Barber, & C. Adrian. (Eds.) *Psychological Approaches to the Management of Pain.* New York:Brunner/Mazel.

Turk, D.C. Customizing Treatment for Chronic Pain Patients: who, what and why. *The Clinical Journal of Pain.* 1990: 6, 255 - 270.

Turk, D.C.; Meichenbaum, D & Genest, M. (1983) *Pain and Behavioural Medicine.* New York: Guilford Press.

Tyrer, S.P; Capon, M; Peterson, D.M; Charlton, J.E. & Thompson, J.W. The Detection of psychiatric illness and psychological handicaps in a British pain clinic population. *Pain.* 1989; 36, 63 - 74.

Cognitive-Behaviour Therapy for Bulimia Nervosa associated with Alcohol Abuse.

Does the inclusion of Alcohol Consumption Management improve the treatment outcome of Cognitive-Behaviour Therapy for Bulimia Nervosa?

Lyndia Green
Clinical Psychology Department
Gartnavel Royal Hospital
Glasgow G12

ABSTRACT.

The comorbidity of Bulimia Nervosa and Alcohol dependence has been noted in the literature. Published treatment studies of Bulimia Nervosa tend to exclude those with significant alcohol consumption. In this study, the effects of treating Bulimia Nervosa alone and then with additional focus on the reduction of alcohol consumption, was compared. Significant improvement in outcome, from Cognitive-Behavioural treatment, occurred when alcohol consumption was also a focus of treatment.

An Investigation of the Use of The Emotional Stroop Task as a Probe Measure of Clinical change in a case of Medical Phobia.

Lyndia Green
Clinical Psychology Department
Gartnavel Royal Hospital
Glasgow G12
U.K.

SUMMARY.

Invasive medical treatment may occasionally lead to the development of a phobic disorder. The epidemiology and treatment of medical phobias is however poorly described and existing assessment instruments may not be particularly relevant. In this study the Emotional Stroop Task was used as a probe measure to investigate the attentional bias to salient threat words during treatment. Change on response time to salient words reflected clinical progress and provided a more pertinent measure of treatment outcome than general self-report measures.

Key Words: Medical Treatment, Phobia, Emotional Stroop, Outcome Measure.

The Treatment of a Masked, Chronic Posttraumatic Stress Disorder and the Effect on Persistent Depression.

Lyndia Green
Clinical Psychology Department
Lansdowne Clinic
Gartnavel Royal Hospital
Glasgow G12.

ABSTRACT.

Emergency personnel may not be exempt from the pathological effects of exposure to trauma. Those with repeated exposure, personal vulnerability and inadequate support may develop Posttraumatic Stress Disorder (PTSD). Associated comorbidity is common in PTSD, complicating the recognition and treatment of the disorder. In this study treatment of the primary disorder of PTSD, did lead to improvement in a man with a moderately severe depressive illness which had previously been resistant to treatment.

APPENDICES

Journal of Psychosomatic Research

INSTRUCTIONS FOR AUTHORS

Papers must be written in English. They will be acknowledged on receipt, and then reviewed. The decision on acceptance will usually be conveyed to the authors within two months.

Full Length Papers. Full length research will not normally be more than 4000 words in length and will preferably be shorter. Submission of a paper to the *Journal of Psychosomatic Research* will be held to imply that it represents original research not previously published (except in the form of an abstract or preliminary report), that it is not being considered for publication elsewhere, and that if accepted by the *Journal of Psychosomatic Research* it will not be published elsewhere in the same form in any language without the consent of the Publisher. Major papers of topical content will be given priority in publication.

Short Reports. The Journal welcomes short reports, which may be either preliminary communications or brief accounts of original research. Case reports will be published only if they illustrate important issues. The text must not exceed 1500 words. Short reports will normally be published more quickly than full length papers.

Editorials. The Editors welcome suggestions for editorials that give personal and topical views on subjects within the Journal's area of interest. They should not normally exceed 1500 words.

Review Articles. Review papers are normally 4000–5000 words. Authors are advised to consult one of the Editors with an outline before submitting a review.

Letters to the Editors. These normally refer to articles previously published in the Journal. The Editors are also willing to consider letters on subjects of direct relevance to the Journal's interest.

Book Reviews. These are normally submitted by the Book Review Editors, but suggestions concerning books to be considered are welcome.

Other Papers. The Editors welcome suggestions for other types of papers, such as conference reports, accounts of major research in progress and interviews with senior research workers. These should not be submitted without prior consultation.

MANUSCRIPT REQUIREMENTS

Manuscripts should conform to the uniform requirements known as the 'Vancouver style' (International Steering Committee of Medical Editors. Uniform requirements for manuscripts submitted to biomedical journals. Br Med J 1979; 1:532–535; also published in: Huth EJ. Medical style & format: an international manual for authors, editors, and publishers. Baltimore: Williams and Wilkins, 1987). *The Editors and Referees attach considerable importance to a succinct and lucid prose style and well organized tables. Authors whose native language is not English are advised to seek help before submission. Statistical procedures should be clearly explained.*

Manuscripts should be typed with wide margins, double-spaced on one side of standard A4 or 8½ × 11″ papers. The format should be as follows:

Title page. This should contain (a) the **title** of the article: (b) a short **running head**: (c) name of **department** where the work was conducted: (d) **names of each author** with highest academic degree; (e) name, address, phone and fax of **author responsible for correspondence** and to whom requests for reprints should be addressed; (f) up to six **keywords** should be listed in alphabetical order after the abstract. These terms should optimally characterize the paper.

Abstract. This should not exceed 150 words.

Text. This should be divided into sections with main headings: Introduction, Method, Results and Discussion. Accepted papers will usually be between 2000 and 4000 words in length.

Acknowledgments. These must include mention of any source of funding outside the basic funding of the host institution.

References. These should be numbered consecutively in the text in the order in which they are first mentioned and be so denoted in the list. Their form should be that adopted by the US National Library of Medicine, as used in the Index Medicus and as recommended in *Huth EJ, Medical Style & Format:*

1. Ingham JC, Miller P McC. Self-referral to primary care: symptoms and social factors. J Psychosomatic Res 1986;30:49–56.
2. Berkenbosch F. Corticotrophin-releasing factor and catecholamines: a study on their role in stress-induced immunomodulation. In: Schneiderman N, McCabe P, Baum A, eds. Perspectives in behavioral medicine. Hillsdale, New Jersey: Erlbaum 1992:73–91.

Tables. Each should be on a separate sheet, numbered consecutively in Roman numerals.

Figures. A glossy photograph or clear ink drawing of each should be sent. Each figure should be numbered on the back and the top should be marked. A photocopy should be attached to each copy of the manuscript. Captions should be on a separate sheet. The number of illustrations should be kept to a minimum. Color illustrations are not normally acceptable. Authors may be asked to support the costs of color reproduction.

Letters to the Editors should not exceed 1000 words, and where appropriate, must begin with the reference to the published article about which the author is commenting.

Authors are encouraged to submit a computer disk (5.25'' or 3.5'' HD/DD disk) containing the final version of their papers along with the final manuscript to the editorial office. Please send disk only after manuscript has been accepted for publication. Please observe the following criteria: (1) Specify what software was used, including which release (e.g., WordPerfect 6.0); (2) Specify what computer was used (either IBM compatible PC or Apple Macintosh); (3) Include both the text file and ASCII file on the disk; (4) The file should be single-spaced and should use the wrap-around end-of-line feature (i.e., no returns at the end of each line). All textual elements should begin flush left, no paragraph indents. Place two returns after each element such as title, headings, paragraphs, figure and table callouts, etc.; (5) Keep a back-up disk for reference and safety.

SUBMISSION OF MANUSCRIPTS

Each manuscript should be accompanied by a covering letter in which: (1) all authors must give signed consent to publication; (2) relationship of the submitted paper to any other published, submitted or proposed papers reporting the same study is explained. Three high quality copies are required. Authors from the United Kingdom and Europe should send manuscripts to PROF. RICHARD MAYOU, University Department of Psychiatry, Warneford Hospital, Warneford Road, Oxford OX3 7JX, UK. Authors from North America, Australia and the Far East should send manuscripts to PROF. COLIN SHAPIRO, Department of Psychiatry, University of Toronto, The Toronto Hospital, ECW-3D, 399 Bathurst Street, Toronto, Ontario, Canada M5T 2S8; (416) 603-5388; FAX: (416) 603-5036.

Rejected manuscripts and correspondence will be destroyed six months after receipt.

PROOFS AND REPRINTS

The corresponding author will receive page-proofs for checking. Corrections must be restricted to printing errors. Any other alterations may be charged to the author.

Reprints may be ordered when the proofs are returned.

piercing	wretched	crushing	dreadful	nagging
punishing	hurting	tender	burning	pounding
searing	stabbing	sickening	wretched	punishing
dreadful	aching	sore	aching	blinding
dull	gnawing	exhausting	exhausting	sore
nagging	agonising	unbearable	piercing	killing
sharp	burning	hurting	searing	sharp
killing	tiring	crushing	dull	gnawing
unbearable	blinding	agonising	tender	sickening
pounding	throbbing	stabbing	tiring	throbbing

haste	driving	moisture	thinking	peer
compartment	linking	descending	walking	charming
thinking	piping	deserve	speaking	rattling
listening	determining	walking	thanking	reaping
sport	baking	advancing	turning	descending
flowing	speaking	admired	determining	piping
thanking	admired	compartment	advancing	moisture
turning	rattling	linking	baking	deserve
peer	reaping	driving	flowing	sport
charming	plaything	listening	haste	plaything

harshly	irritable	wrong	destructive	negative
depressing	downfall	hopeless	guilty	forget
forget	lonely	negative	harshly	depressing
destructive	fault	neglect	hopeless	neglect
disgust	grief	tearful	downfall	irritable
dismal	nervous	defeat	tearful	dismal
defeat	worried	lonely	calamity	sorrow
disaster	failure	disaster	nervous	disgust
guilty	calamity	loss	worried	wrong
sorrow	loss	fault	failure	grief

desert	hedge	riverside	wilderness	volcano
sunset	channel	rural	beach	sunset
ripple	waterfall	rambling	garden	crater
tropical	wilderness	garden	desert	mountain
slope	mountain	shore	tornado	limestone
beach	volcano	rambling	slope	ripple
peninsula	limestone	hedge	peninsula	channel
tornado	blossom	riverside	tropical	shore
hollow	crater	harbour	hollow	rural
harbour	grass	blossom	grass	waterfall

Patient Information and Consent Form.

Research Study:

We are undertaking a study of the effects of chronic pain and would appreciate your help, if you are willing to take part in it. The aim of the research study is to increase our understanding of chronic pain.

If you want to take part, you will be asked to take part in a task where you will have to name the colour of words printed on a paper. You will also be asked to complete a number of questionnaires. These will ask about what your thoughts about pain are; how it affects your everyday life; how you are feeling at the moment and what kind of person you are.

The information obtained will not have your name on it and will be treated as strictly confidential. The forms will be destroyed at the end of the study. The overall findings of the study can be made available to, to you, if you wish.

Your participation in the study, may be of benefit to you and will benefit others through better understanding and treatment of chronic pain. You are under no obligation to take part in the study and if you do give consent, you can withdraw at any time. Refusal or withdrawal of consent will not affect the treatment that you receive.

.....

Consent Form:

I am willing to take part in the above study.
I understand that the information obtained from me will be treated in the strictest confidence.

Signed.

Date

TASK INSTRUCTIONS.

I AM GOING TO GIVE YOU A CARD, WHICH HAS LISTS OF WORDS PRINTED IN DIFFERENT COLOURS.

I WANT YOU TO NAME THE COLOUR OF EACH WORD, WORKING DOWN EACH LIST.

DO IT AS QUICKLY AS YOU CAN BUT WITHOUT MAKING MISTAKES.

WE ARE GOING TO START WITH A PRACTICE CARD.

PLEASE TURN THE CARD OVER WHEN I TELL YOU TO BEGIN.

APPENDIX

SITE OF PAIN. (Axis 1. Region)*	GROUP 1		GROUP 2	
	N	%	N	%
Head, face and mouth.	1	5	2	10
Cervical region.	4	20	1	5
Upper shoulder and upper limbs.	1	5	1	5
Thoracic region.	2	10	1	5
Abdominal region.	1	5	0	0
Lower back, lumbar spine, sacrum and coccyx.	5	25	5	25
Lower limbs.	2	10	2	10
Pelvic region.	0	0	3	15
Anal, perineal and genital region.	1	5	1	5
More than three major sites.	1	5	2	10
Missing.	2	10	2	10
TOTAL	20	100	20	100

* IASP codes.

SUMMARY OF CORRELATIONS.

Pain Word Interference Score (PWIS) and BDI score.

No Diagnosis	r = -.266	Sig. .256	N.S.
Diagnosed	r = -.238	.312	N.S.
Control	r = -.	.067	N.S.

Pain Word Interference Score and State Anxiety.

No Diagnosis	r = -.047	Sig. .844	N.S.
Diagnosed	r = -.324	.205	N.S.
Control	r = -.061	.800	N.S.

Pain Word Interference Score and Trait Anxiety Score.

No Diagnosis	r = -.222	Sig. .347	N.S.
Diagnosed	r = -.408	.074	N.S.
Control	r = -.067	.788	N.S.

STATISTICS RESULTS

Group Differences for the Organic Belief Scale using Scheffe Test.

Group Compared	Mean Difference	Sig.
No Diagnosis v Diagnosed.	3.65	.088
No Diagnosis v Control	7.55	.000 *
Diagnosed v Control	3.90	.063

STATISTICS RESULTS cont.

Summary Table - ANOVA Pain Word Interference Scores and Group.

PWIS	SS	df	MS	F	Sig.
OBS	2.65	1	2.65	.161	NS
Group	177.77	2	88.89	5.38	p< .01

EPQ-R Scores (Ranks) by Group.

Group	P	E	N	L
No Diagnosis	31.60	26.27	37.67	28.20
Diagnosed	30.55	32.15	29.25	36.45
Control	29.35	33.08	24.58	26.85

Summary of Test Statistics for EPQ-R (Kruskall-Wallis)

	P	E	N	L
$\times 2$	.17	1.80	5.84	3.60
df	2	2	2	2
Sig.	.406	.166	.917	.054

Table 12. Mean Group Scores for EPQ-R Subscales.

Group	P	E	N	L
	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD
No Diagnosis	2.10 ± 2.22	6.45 ± 4.03	8.50 ± 2.74	4.85 ± 2.83
Diagnosed	1.85 ± 1.81	7.90 ± 3.08	6.80 ± 3.66	6.30 ± 2.66
Control	1.70 ± 1.81	8.05 ± 3.44	6.00 ± 3.18	4.60 ± 2.30

PAIN

SCOPE AND PURPOSE

This journal is the official publication of the International Association for the Study of Pain (IASP) and it publishes original research on th nature, mechanisms and treatment of pain. The journal provides a forum for the dissemination of research in the basic and clinical science of multidisciplinary interest.

TYPES OF PAPERS

1. *Topical Reviews* or plans for reviews should be submitted to Dr. Gary J. Bennett, Department of Neurology, Allegheny University of th Health Sciences, Broad & Vine Street (Mail Stop 423), Philadelphia, PA 19102-1192, USA.

2. *Clinical and Basic Science Research Reports.* Original research reports of not more than 2–3000 words will be published. Depending o their geographic origin, they should be sent to the Editor-in-Chief Outside the Americas, Prof. P.D. Wall, The Royal College of Anaes thetists, 48/49 Russell Square, London WC1B 4JY, UK, or the Editor-in-Chief Within the Americas, Prof. R. Dubner, Department of Ora and Craniofacial Biological Sciences, Dental School, University of Maryland at Baltimore, 666 West Baltimore Street, Baltimore, MI 21201-1586, USA.

3. *Clinical Notes.* Brief reports on clinical cases will be published. They should be sent to Dr. J.E. Charlton, Department of Anaesthesia Pain Management Clinic, Royal Victoria Infirmary, Queen Victoria Road, Newcastle upon Tyne, NE I 4LP, UK.

4. *Letters to the Editor* are invited and should be submitted to Prof. Wall or Prof. Dubner.

5. *Cover material.* Suggestions for future photographs or diagrams of clinical or basic research data are invited. The illustration may b from a manuscript submitted for publication, a previous paper published in *PAIN*, or in another journal, or material not publishe previously. Photographs of historical interest would also be welcome.

Announcements will not be published in the journal and should be sent to: Ms. L.E. Jones, Executive Officer IASP, 909 N.E. 43rd Street Suite 306, Seattle, WA 98105, USA, for possible inclusion in the IASP Newsletter.

INSTRUCTIONS TO AUTHORS

Submission of manuscripts should be *in quadruplicate* and complete in all respects. Submission of a paper to *PAIN* is understood to impl that it has not previously been published (except in abstract form) and that it is not being considered for publication elsewhere. Manuscript submitted under multiple authorship are reviewed on the assumption that (1) all authors listed concur with the submitted version of th manuscript and with the listing of the authors; (2) authorship credit is based on important contributions in one or more of the followin areas: conception and design, analysis and interpretation of data, drafting of the manuscript or making intellectual contributions to it content; (3) the final manuscript has been tacitly or explicitly approved by the responsible authorities in the laboratory or institution wher the work was carried out. If illustrations or other small parts of articles or books already published elsewhere are used in papers submitted t *PAIN*, the written permission of author and publisher concerned must be included with the manuscript. The original source must b indicated in the legend of the illustration in these cases. The letter accompanying the manuscript should include a statement of any financia or other relationships that might lead to a conflict of interest.

The Publisher and Editors-in-Chief regret that they are unable to return copies of submitted manuscripts.

The manuscript should be in English, typed with double spacing with at least 4 cm margin on pages of uniform size. They should include brief summary on a separate page, and should be in the usual form: Introduction, Methods, Results, Discussion, Acknowledgements Reference List; not more than 6 key words.

Authors' full names, academic or professional affiliations and *complete addresses* should be included on a separate title page. The name address, telephone, fax numbers and e-mail address of the author to whom proofs and correspondence are to be sent should be given.

Literature references cited at the proper point in the text should be included in parentheses and should be by author(s) and year i chronological *not* alphabetical order. When papers written by more than two authors are cited in the text, the abbreviation 'et al.' should b used following the name of the leading author, even if the subsequent authors are not the same in all references. All references cited in th text must be listed at the end of the paper, should be typed double-spaced, and arranged alphabetically by author. References must b complete, including initial(s) of author(s) cited, year of publication, title of paper referred to, journal, volume and page numbers. If mor than two references with the same year and author(s) are cited, use lowercase letters after the year (Cousins 1982a,b; Melzack et a 1984a,b). Journal titles should be abbreviated according to *Index Medicus, List of Journals indexed,* latest edition. For citations of books the following uniform sequence should be maintained: author(s), title of article, editor(s), complete title of book, publisher, place c publication, year and page numbers. Manuscripts in preparation and submitted but not accepted as well as 'personal communications' should not appear in the reference list but should be cited at the appropriate place in the text.

Examples:

Adams, C.W.M., Neurohistochemistry, Elsevier, Amsterdam, 1965, 67 pp.

Goldenberg, D.L., Psychiatric and psychological aspects of fibromyalgia syndrome, Rheum. Dis. Clin. N. Am., 15 (1989a) 105–115.

Goldenberg, D.L., Fibromyalgia and its relation to chronic fatigue syndrome, viral illness and immune abnormalities, J. Rheumatol., 1 (1989b) 91–93.

Turner, J.A., Coping and chronic pain. In: M.R. Bond, J.E. Charlton and C.J. Woolf (Eds.), Pain Research and Clinical Management, Vo 4, Proc. VIth World Congress on Pain, Elsevier, Amsterdam, 1991, pp. 219–227.

Figures should be submitted in quadruplicate in a form and condition suitable for reproduction either across a single column (=8.4 cm) or a whole page (=17.6 cm). Authors are requested to use bold horizontal, vertical and diagonal lines, or other such symbols in figures, instead of computer generated grey shading, as these can be reproduced more clearly. Lettering should be clear and of adequate size to be legible after reduction. Photomicrographs and other halftone material should be supplied as originals, rather than copies. *Reproduction in colour* will have to be approved by the Editors. The extra costs of colour reproduction will be charged to the author(s). The authors' names and the number of the Figure should be placed on the back of each photograph. Legends for Figures should be numbered consecutively in arabic numerals and should appear on a separate page at the end of the manuscript. All symbols and abbreviations used in the Figure must be explained.
Tables of numerical data should be typed (also with double spacing) on a separate page, numbered in sequence in arabic numerals (Table 1, 2, etc.), provided with a heading, and referred to in the text as Table 1, Table 2, etc.
Acknowledgements should be placed at the end of the text before the Reference List and should specify: (1) contributions that need acknowledging but do not justify authorship; (2) acknowledgements of technical help; (3) acknowledgements of financial and material support, specifying the nature of the support; (4) financial arrangements that may represent a possible conflict of interest.
Electronic manuscripts. The preferred storage medium is a $5^1/_4$ or $3^1/_2$ inch disk in MS-DOS format, although other systems are welcome. Please **do not split** the article into separate files (title page as one file, text as another, etc.) and do not use a 'justified' layout. If your wordprocessor features the option to save files 'in flat ASCII', please do not use it. Only the relevant file (one complete article only) should be on the disk. Also, specify the type of computer and wordprocessing package used and label the disk with your name and the name of the file on the disk.

Further information may be obtained from the Publisher, Elsevier Science Ireland Ltd., Bay 15K, Shannon Industrial Estate, Co. Clare, Ireland. Tel.: +353 61 471944; fax: +353 61 472144.

Proofs. Authors should keep a copy of their manuscripts, as page proofs will be sent to them without the manuscript. In order to avoid a delay in publication, authors are requested to please return proofs within 48 hours by fax or express mail.
Offprints. There will be no page charges. A total of 50 offprints of each paper will be provided free of charge to the author(s). Additional copies can be ordered at prices shown on the offprint order form which will be sent to the author with the page proofs.

Ethics of animal experiments. Authors will be required to show that they have paid attention to the proposals of the Committee for Research and Ethical Issues of IASP published in *PAIN*, 16 (1983) 109–110. Authors should indicate if the experimental work was reviewed by an institutional animal care and use committee or its equivalent.
Ethics of human experiments. Authors reporting on experimental work on humans should, where relevant, submit evidence that the work has been approved by an institutional clinical research panel or its equivalent.

The instructions can also be found on the World Wide Web: access under http://www.elsevier.nl or http://www.elsevier.com

PUBLICATION INFORMATION
PAIN (ISSN 0304-3959). The Journal *Pain* is published by Elsevier for the International Association for the Study of Pain. For 1998 volumes 73–77 are scheduled for publication. Subscription prices are available upon request from the publisher. Subscriptions are accepted on a prepaid basis only and are entered on a calendar year basis. Issues are sent by surface mail except to the following countries where air delivery via SAL mail is ensured: Argentina, Australia, Brazil, Canada, Hong Kong, India, Israel, Japan, Malaysia, Mexico, New Zealand, Pakistan, PR China, Singapore, South Africa, South Korea, Taiwan, Thailand, USA. For all other countries airmail rates are available upon request. Claims for missing issues must be made within 6 months of our publication (mailing) date.

Please address all requests regarding orders and subscription queries to: Elsevier Science B.V., Journal Department, P.O. Box 211, 1000 AE Amsterdam, The Netherlands. Tel.: (31-20) 4853-642; FAX: (31-20) 4853-598.

Orders, claims, and product enquiries: please contact the Customer Support Department at the Regional Sales Office nearest you:

New York
Elsevier Science
P.O. Box 945
New York, NY 10159-0945
USA
Tel. (+1)212-633-3730
[Toll free number for North American customers:
1-888-4ES-INFO (437-4636)]
Fax (+1)212-633-3680
e-mail usinfo-f@elsevier.com

Amsterdam
Elsevier Science
P.O. Box 211
1000 AE Amsterdam
The Netherlands
Tel. (+31)20-4853757
Fax (+31)20-4853432
e-mail nlinfo-f@elsevier.nl

Tokyo
Elsevier Science
9-15 Higashi-Azabu 1-chome
Minato-ku, Tokyo 106
Japan
Tel. (+81)3-5561-5033
Fax (+81)3-5561-5047
e-mail info@elsevier.co.jp

Singapore
Elsevier Science
No. 1 Temasek Avenue
#17-01 Millenia Tower
Singapore 039192
Tel. (+65)434-3727
Fax (+65)337-2230
e-mail asiainfo@elsevier.com.sg

INTERNATIONAL ASSOCIATION FOR THE STUDY OF PAIN
Applications for membership should be sent to L.E. Jones, Executive Officer, International Association for the Study of Pain, 909 N.E. 43rd Street, Suite 306, Seattle, WA 98105, USA. E-mail: iasp@locke.hs.washington.edu; http://weber.u.washington.edu/~ere/IASP.html; Fax: +1 206 547-1703.
Change of address. Society Members please note that changes of address should be sent to the IASP at the address indicated above.
The paper used in this publication meets the requirements of ANSI/NISO Z39.48-1992 (Permanence of Paper).

PAIN CLINIC RESOURCES QUESTIONNAIRE. Version 1

CLINIC code number. ____

REFERRALS.

1. How many new patients were referred to your clinic last year? (Defined as last calendar year.) _____

2. How many of the referrals at 1. were of patients with chronic benign pain? _____

3. What percentages of referrals came from the following sources:

   A. General Practitioners _____
   B. General Hospital Specialities _____
   C. Other (State) _____

CLINIC PERSONNEL

4. Who works in your Pain Relief Clinic?

	Yes/No
A. Consultant Anaesthetist	____
B. Junior Staff (Anaesthetist)	____
C. Physiotherapist	____
D. Clinical Psychologist	____
E. Psychiatrist	____
F. Nurse	____
G. Administrative/Secretarial	____
H. Other	____

5. How many sessions does each member of staff provide to the Pain Clinic?

   A. Consultant Anaesthetists ____
   B. Junior Staff (Anaesthetists) ____
   C. Physiotherapists ____
   D. Clinical Psychologists ____
   E. Psychiatrists ____
   F. Nurses ____
   G. Administrative/Secretarial ____
   H. Other ____

6. How is the Clinical Psychology input provided to your Clinic?

   A. Psychologist works in the Clinic. ____
   B. Referrals made to a named Psychologist with agreed sessions. ____
   C. Referrals made to a named Psychologist. ____
   D. Referrals made to local Psychology Dept. ____

7. How many patients have you referred to a Pain Management Programme last year? ____

8. Which Pain Management Programme were they referred to?
   A. Astley Ainslie ____
   B. Ayrshire ____
   C. Other ____

9. How many patients fail to attend their first appointment? _____

10. How many patients end treatment prematurely - excluding initial DNAs _____

11. How do you measure outcome?

    A. Clinical assessment only

    B. Simple scale method

    C. Standardised measure

PAIN RELIEF CLINIC RESOURCES - ANAESTHETIST QUESTIONNAIRE.

1. Which of the following do you require, for your Pain Relief Clinic, in addition to existing staff?

a) Consultant Anaesthetist	yes / no
b) Junior medical staff.	yes / no
c) Physiotherapist	yes / no
d) Clinical Psychologist	yes / no
e) Psychiatrist	yes / no
f) Nurse	yes / no
g) Administrative	yes / no
h) Other (Please state)	

2. Which two of the above would you regard as a priority? (Please state)

3. How many clinical psychology sessions do you require? ____

4. How many referrals to clinical psychology, did you make last year? ____
(Last year = last calendar year)

5. How do you think psychology input might be best provided to your patients?

a) As an integral part of the Pain Relief Service?	____
b) By a named psychologist in local Psychology Dept.	____
c) By general referral to the local Psychology Dept.	____
d) None required.	____

6. What percentage of your referrals do you think you would refer to Psychology if additional input was provided? ____

7. Which of the under-noted would you think might benefit from clinical psychology input.

Patients with

a) Significant physical disability	yes / no
b) Unusual symptom presentation	yes / no
c) Depression	yes / no
d) Abnormal illness behaviour	yes / no
e) Addiction to prescribed medication	yes / no
f) Marked impairment of everyday functioning	yes / no
g) Severe mental illness	yes / no
h) Marked anxiety	yes / no
I) Bizarre behaviour	yes / no
j) Other - please state underneath	

8. Do you know the type of treatment a clinical psychologist might offer a pain patient? Please list below.

9. Would you like more information about clinical psychological approaches for chronic pain? yes / no

10. How would this information be best provided to you?

a) Formal Presentation ____
b) Written information ____
c) Informal discussion ____
d) Through joint working/Case discussion ____
e) Not required ____

PLEASE PROVIDE AN ESTIMATE FOR Q11 - Q16

11. What percentage of patients, referred to your clinic, are suffering significant emotional distress? ____

12. What percentage of patients, referred to your clinic, do you think are depressed? ____

13. What percentage of your patients report more functional impairment than you would expect from their physical condition? ____

14. What percentage of your patients demonstrate abnormal pain behaviour? ____

15. What percentage of your patients are addicted to prescribed drugs? ____

16. If assessing treatment outcome for your patients with chronic benign pain, what percentage would you put in the following categories:

a) Excellent ____
b) Good ____
c) Moderately good ____
d) Poor ____

Transcripts of Responses about psychological treatments for chronic pain.

1. No Data.
*

2. Psychological Assessment
* Psychotherapy
Referral to Psychiatry

3. Behavioural approach - trying to alter behaviour of patient to adapt more normal lifestyle. e.g. Lifestyle may have been altered as patient feels that pain makes them an invalid, even though this may not be the case.
Explaining how pain can affect mood and similarly that mood can affect level of pain that they feel.
Giving patients some control over their pain so that they no longer feel that the pain is controlling them.
Teaching relaxation techniques and coping strategies.

4. Cognitive Behaviour therapy with emphasis on coping skills.
Use of pain diaries.
Assistance in acquiring pacing and targeting skills.
Relaxation techniques.

5. No Data.
*

6. Self Hypnosis
* Relaxation
Coping Strategies

7. Cognitive Behaviour Therapy
Stress Management
Alcohol counselling
Biofeedback
Drug addiction counselling

8. Cognitive Behaviour Treatment.
*

9. Assessment
Counselling
Coping Strategies
Relaxation
Pain Management Programme

10. Psychotherapy
    Hypnotherapy
    Relaxation Therapy
    Biofeedback
    Psychometric Testing
    Coping Mechanism Development.

11. Explanation of normal and abnormal responses to chronic pain.
    Coping Strategies
    Relaxation Training
    Diversion Therapy
    Goal setting and pacing
    Transference Training

12 Assessment
    Biofeedback
    Pain Management Programme
    Counselling re coping ability.

* = Group 1

Notes for Contributors

Papers, articles and other contributions should be sent to the Editor, Health Bulletin, Scottish Office Department of Health, Room 143, St Andrew's House, Edinburgh EH1 3DE. They must be submitted exclusively for Health Bulletin. Acceptance is on the understanding that editorial revision may be necessary. All papers are reviewed by the Editor and by peer review, referees being drawn from a panel of appropriate professionals in the NHS in Scotland. No correspondence can be entered into about articles found unsuitable and returned to authors.

Material submitted for publication must be typewritten on one side of the paper only, in double spacing and with adequate margins and each page should be numbered. The top typed copy should be submitted, with four other copies. All papers should be prefaced by a structured Abstract, of about 250 words in length. It should normally contain 6 clearly headed sections entitled Objective, Design, Setting, Subjects, Results and Conclusion. The name, appointment and place of work of the authors should be supplied on a separate title page. This same page should include the full postal address of one author, to whom correspondence and reprints will be directed. There should be adequate references to any relevant previous work on the subject; these references should appear at the end of the material on a separate page or pages, using the Vancouver style, which in the case of papers in journals includes:

Surname and initials of author(s)
Title of paper
Full name of Journal
Year published
Volume number
Opening and closing page numbers

Reference to books should similarly include author's name and initials, full title, edition (if necessary), place of publication, publisher's name, year, and if required volume number, chapter number or page number.

Short Communications. The Bulletin now publishes short communications (not exceeding three pages in length) as a separate section, and we aim to offer speedier publication for these. Material intended for this section should be submitted in the above form, and the covering letter should state the intention.

Proofs

Contributors will receive one set of proofs. It should be read carefully for printer's errors, and any tables, figures and legends should be checked. Alterations should be kept to a minimum, and the proofs should be promptly returned.

Reprints

One hundred reprints will be supplied free of charge. A limited extra number (for which a charge will be made) may be ordered from the Editor when the proofs are returned.

TREATMENT SCHEDULE.

A. PRE-TREATMENT PHASE. (3 Sessions)

a) **Diary Monitoring** of eating behaviour and associated cognitions. Ms Y. was not an introspective person and the aim was to increase self-awareness in relation to her eating behaviour.

b) **Education** about the need to establish a normal eating pattern; information about basic nutrition and the physical effects of food deprivation.

B. TREATMENT PHASE 1. (10 Sessions)

a) Aim: **Establish Normal Eating Pattern**. Agreed amounts of food to be eaten at regularly spaced intervals, approximating three meals a day. Reduce eating speed with the aim of increasing the pleasure in eating and reducing the "guilty stuffing" of food. Evidence that Bulimics eat faster when bingeing. (Walsh, 1993) Reducing the speed of eating can produce early evidence of the possibility of control over eating behaviour.

b) Aim: **Reduction in Bingeing**. (Management of External Triggers.) The temporary avoidance of shops where snacks were bought, by altering routes or walking on the opposite side of the street . Reducing the number of times she shopped for food during the week and being accompanied in food shops whenever possible. Reducing the amount of food prepared when cooking and chewing gum during food preparation.

c) Aim: **Reduction in Vomiting Episodes.** Using an exposure and response prevention approach. (Rosen & Leitenberg, 1983) Attempt to eat three meals a day regularly. Make a decision not to vomit and adjust portion accordingly. Put in place before eating a mechanism to avoid the opportunity

to vomit. (eg. Micturate before eating; reduce fluids taken during meals; ask anyone present to help distract and avoid going to the bathroom or go out immediately after eating.)

d) Aim: **Stress Reduction.** Some general anxiety management training. Identifying the source of stress in her life which was mainly work related. Use of problem solving approach to improve time management and haphazard organisation to reduce "hastles" from customers.

C. **TREATMENT PHASE 2.** (12 Sessions)

a) Aim: **Continue the four aspects of treatment** started in Phase 1.

b) Aim: **Reduction in Alcohol Consumption.** Education about alcohol use and safe drinking levels. Particular emphasis on mood and motivational disturbance with significant alcohol use and it's contribution to her chaotic work practices and resulting stress. Identification of the four types of situations where alcohol was consumed, namely work; home, meeting friends and social events. Selective ban on alcohol in three situations - work, home after work and meetings with friends before evening. Reduction in volume of alcohol at other times by slowing drinking rate, alternating soft drinks with alcohol etc. Set drinking norms at safe levels and in view of her eating disorder.

c) Aim: **Examine thinking in relation to self and alcohol.** In particular, her need to conform to the drinking norms of others namely her father, boyfriend and friends. Also her social role as the "clown" or "life and soul of the party" when she frequently no longer felt like that.

d) Aim: **Focus on use of Alcohol in relation to her Bulimic Behaviour.** There were three main areas of focus. Firstly the fact that beer was providing a significant amount of her calorie intake and the resulting deficits in essential

nutrients. Secondly the fact that alcohol was interfering with her motivation to establish a regular eating pattern and undermining her efforts not to binge and vomit by it's disinhibitory effects. Thirdly alcohol increased the physical ease of vomiting.

D. **MAINTENANCE AND RESPONSE PREVENTION PHASE.** (Ongoing)

a) **Reduction of Vomiting Episodes to Zero.** Continuing aim to reduce vomiting further.

b) **Consolidation of Progress**. Focus on areas of current difficulties as in Treatment phases I and 2.

c) **Preparation for Future Difficulties.** Managing stressful situations without resorting to alcohol or bingeing. Emphasis on independent competence and reducing frequency of contact.

d) **Relapse Prevention Procedures.** Planned infrequent but relatively longer term supportive contact to reduce possibility of relapse. (Lacey, 1983)

Instructions to Authors

1. Submission. Articles written in English and not submitted for publication elsewhere, should be sent to Paul Salkovskis, Editor, *Behavioural and Cognitive Psychotherapy*, Department of Psychiatry, University of Oxford, Warneford Hospital, Oxford OX3 7JX, UK.

2. Manuscript preparation. Four complete copies of the manuscript must be submitted. Original figures should be supplied at the time of submission. Articles must be typed double-spaced throughout on standard sized paper (preferably A4) allowing wide margins all round. Where unpublished material, e.g. behaviour rating scales, therapy manuals, etc. is referred to in an article, copies should be submitted to facilitate review.

Manuscripts will be sent out for review exactly as submitted. Authors who want a blind review should mark two copies of their article "review copy" omitting from these copies details of authorship.

Abbreviations where used must be standard. The Système International (SI) should be used for all units; where metric units are used the SI equivalent must also be given. Probability values and power statistics should be given with statistical values and degrees of freedom [e.g. $F(1,34) = 123.07$, $p<.001$], but such information may be included in tables rather than the main text.

Spelling must be consistent within an article, either using British usage (*The shorter Oxford English dictionary*), or American usage (*Webster's new collegiate dictionary*). However, spelling in the list of references must be literal to each original publication.

Details of style not specified here may be determined by reference to the *Publication manual of the American Psychological Association* or the style manual of the British Psychological Society.

Articles should conform to the following scheme:

(a) *Title page*. The title should phrase concisely the major issues. Author(s) to be given with departmental affiliations and addresses, grouped appropriately. A running head of no more than 40 characters should be indicated.

(b) *Summary*. This should summarize the article in no more than 200 words.

(c) *Text*. This should begin with an introduction, succinctly introducing the point of the paper to those interested in the general area of the journal. *Attention should be paid to the Editorial Statement which appears in the January and July issues at the back of the Journal.* References within the text should be given in the form Jones and Smith (1973) or (Jones & Smith, 1973). When there are three or up to and including five authors the first citation should include all authors; subsequent citations should be given as Williams et al. (1973). Authors with the same surname should be distinguished by their initials. The approximate positions of tables and figures should be indicated in the text. Footnotes should be avoided where possible.

(d) *Reference note(s).* A list of all cited unpublished or limited circulation material, numbered in order of appearance in the text, giving as much information as possible about extant manuscripts.

(e) *References.* All citations in the text should be listed in strict alphabetical order according to surnames. Multiple references to the same author(s) should be listed chronologically, using a, b, etc., for entries within the same year. Formats for journal articles, books and chapters should follow these examples:

BECKER. M. R. & GREEN, L. W. (1975). A family approach to compliance with medical treatment: A selective review of the literature. *International Journal of Health Education, 18*, 173–182.

THORP, R. G. & WETZEL, R. J. (1969). *Behaviour modification in the natural environment.* New York: Academic Press.

ROSKIES, E. & LAZARUS, R. S. (1980). Coping theory and the teaching of coping skills. In P. O. Davidson & S. M. Davidson (Eds), *Behavioural medicine: Changing health lifestyles*. New York: Brunner/Mazel.

(f) *Footnotes*. The first, and preferably only, footnote will appear at the foot of the first page of each article, and subsequently may acknowledge previous unpublished presentation (e.g. dissertation, meeting paper) financial support, scholarly or technical assistance, or a change in affiliation. A concluding (or only) paragraph must be the name and full mailing address of the author to whom reprint requests or other inquiries should be sent.

(g) *Tables*. Tables should be numbered and given explanatory titles.

(h) *Figure captions*. Numbered captions should be typed on a separate page.

(i) *Figures*. Original drawings or prints must be submitted for each line or half-tone illustration. Figures should be clearly labelled and be camera-ready wherever possible.

3. Proofs, Reprints and Copyright. Proofs of accepted articles will be sent to authors for the correction of printers' errors; author's alterations may be charged. Authors submitting a manuscript do so on the understanding that if it is accepted for publication exclusive copyright of the paper shall be assigned to the Association. In consideration of the assignment of copyright, 25 copies of each paper will be supplied. Further reprints may be ordered at extra cost; the reprint order form will be sent with the proofs. The publishers will not put any limitation on the personal freedom of the author to use material contained in the paper in other works.

doctor	uterus	kidney	appointment	examination
hospital	injection	nurse	theatre	pain
drip	clinic	needle	uterus	hospital
appointment	urethra	leakage	urethra	blood
tumour	internal	wound	wound	leakage
examimation	stents	tubes	doctor	operation
lift	theatre	injection	drip	lift
operation	gynaecologist	kidney	tumour	internal
tubes	blood	stents	nurse	needle
pain	stitches	clinic	gynaecologist	stitches

baker	view	visual	international	practical
families	outlook	maps	committee	remuneration
international	child	global	shop	stadium
run	mirror	committee	caddy	seams
introduction	sunset	chair	telephone	maps
song	shop	jumper	mirror	child
caddy	jumper	families	chair	visual
telephone	stadium	outlook	sunset	global
practical	seams	view	song	introduction
remuneration	dialogue	run	baker	dialogue

SYSTEMATIC DESENSITIZATION PROGRAMME TASKS.

Tasks Completed:	**Number.**
	*
Coffee Bar in Hospital (accompanied).	2
Coffee Bar in Hospital (alone).	2
Lifts in Hospital (accompanied)	3
Lifts in Hospital (alone)	3 *
Hospital Appointment - Pain Clinic	1
Visits to mother in hospital (alone)	4
Visit to Renal Ward (accompanied)	
Single Room	1
Bathroom	1
Visit to friend in Renal Ward (alone)	2
Routine OP Treatment visit. (alone)	1 *

Tasks still to be Completed.

Consultation with a Gynaecologist.

Physical Examination by a Gynaecologist.

* Emotional Stroop Meaures