Verbal Learning and Transfer of Function in Anxiety

and Research Portfolio

PART ONE

(Part two bound separately)

Kathleen McHugh

August 2000

Submitted in partial fulfilment of the requirements for the degree of Doctor of

Clinical Psychology

ProQuest Number: 13833967

ProQuest 13833967

Table of Contents

Part 1 (this bound copy)

Table of Contents (cont.)

Acknowledgements

Thankyou to my supervisor Dr Paul Fleming for help, guidance and feedback. Thanks also to everyone who helped recruit participants, especially the Department of Clinical Psychology in Carsewell House, Glasgow. Last, but not least, thankyou to all my classmates for their much needed support across the past three years.

Chapter 1: Small Scale Service Evaluation

An Evaluation of Clinical Psychology Service Provision

to South Ayrshire and Arran Trust

Small Scale Service Evaluation submitted in partial fulfilment of the requirements for the

degree of Doctor of Clinical Psychology

Prepared in accordance with requirements for submission to The Health Bulletin

(Appendix 1.1)

Address for correspondence:
Kathleen McHugh
Department of Psychological Medicine
Gartnavel Royal Hospital
1055 Great Western Road
Glasgow, G12 0XH

Abstract

Objective: To evaluate the clinical psychology service provided to South Ayrshire and Arran Trust, to gain an in-depth and accurate analysis of service usage in order to assist future planning and organisation of such a service.

Design: Part I involved a casenote review of all patients referred to clinical psychology in year January - December 1997. Part II of the study used a postal questionnaire to survey staff opinions on the service.

Setting: Ayr Hospital, South Ayrshire and Arran Trust.

Subjects: The casenotes of seventy-eight patients were reviewed for the first part of the study. All potential referrers were surveyed in Part II, including medical consultants & associated specialities, nursing specialists and heads of department of professions allied to medicine.

Results: Casenote review revealed the majority of patients are referred for somatoform complaints, although this did not necessarily correspond with the psychologist's diagnosis and formulation following assessment. Questionnaire responses revealed that the majority of referrers were satisfied with the quality of service but dissatisfied with the length of waiting lists and resultant problems in accessing clinical psychology generally.

Conclusion: Expansion to the Clinical Psychology service is desirable and this should preferably take the form of dedicated clinical psychology time to specific services, with allocated sessions for indirect work which is currently neglected. The lack of priority attached to such a service, however, means expansion is unlikely to take place in the foreseeable future.

Introduction

Background

It is now generally accepted that a definition of health should encompass physical, mental and social well-being, and not simply involve an absence of disease, illness or injury (WHO, 1948; Sarafino, 1998). In this regard, the importance of psychological interventions in the treatment of illness has become widely recognised and appreciated over the past two decades, leading to the development of health psychology as a field in its own right in the late 1970s.

Traditionally, the medical model has dominated health care and provision. This influence has pervaded theoretically and clinically, so that traditionally, psychological aspects of illness and health have been largely ignored. Illness was seen as resulting from physical causes and the common response was simply to "fix" or cure the physical deficits and problems. A number of factors have led to development of more expansive models.

One of the most influential factors on models of health and illness has been the change in disease aetiology attributable to medical advances over the course of the past century. Such advances have led to a decline in infectious, single cause diseases like influenza and pneumonia, tuberculosis and gastro-enteritis with the result that the biggest health problems facing Western civilisations today are chronic illnesses including heart disease and cancer (Banyard, 1996). It is now generally recognised that clinical psychologists have a vital role to play in the management of such serious illnesses, and in the

prevention of secondary problems which may develop as a result of the primary diagnosis (Nichols, 1994).

Cognitive appraisal processes are now commonly considered central to conceptualisations of psychological adjustment to disease, and in particular, perceived threat to one's well-being in relation to perceived availability of coping resources (both internal and external) is important (Lazarus & Folkman, 1984b). The belief that illness can affect one's personality is now widely accepted (Cohen & Rodriguez, 1995), and health psychology has developed to the extent that many consider psychological input vital, as expressed in The Lancet: *"counselling in the acute phase of disease and psychological support in the chronic may be as important to outcome as many other therapeutic measures now undertaken"* (Editorial, 1985).

This expansion in outlook has been accompanied by a rise in health care costs which, in an environment of ever-decreasing budgets, has resulted in greater emphasis on prevention of illness and health promotion. The main aims of the government's Health of the Nation document (DoH, 1992) were defined as "adding years to life" and "adding life to years" (Banyard, 1996). Correspondingly, the complications and implications of diagnosis and treatment options for diseases such as cancer, diabetes and coronary heart disease, within the context of a cost-efficient environment, means that the role of a clinical psychologist covers a broad spectrum which can include health promotion and illness prevention.

Health psychology can be defined then as: "*the aggregate of the specific educational, scientific, and professional contributions of the discipline of psychology to the promotion and maintenance of health, the prevention and treatment of illness, the identification of etiologic and the diagnostic correlates of health, illness, and related dysfunction, and to the analysis and improvement of the health care system and health policy formation*" (Matarazzo, 1982). The range of areas in which clinical psychologists can offer their expertise as outlined in this definition is wide, the scope of this research allowing me to mention just some of these briefly.

The area of pain management is one in which the beneficial role of psychology is well recognised. Patients with chronic pain who demonstrate belief in an internal locus of control are less likely to develop depressive symptoms and distress in relation to their pain (see Jensen et al., 1991, for review). Increasing coping ability through pre-operative psychological intervention can substantially reduce post-operative recovery times in patients undergoing invasive surgical interventions (Anderson & Masur, 1983; Johnston & Vogele, 1993).

The efficacy of clinical psychology can be seen in the Diabetes Control Complications Trial Research Group (1993) which found interventions focusing on long-term support, particularly information provision, led to a reduction in common microvascular complications such as retinal and kidney damage resulting from improper blood sugar control (in Nichols, 1994). In psychosocial oncology research, psychological interventions have been found to effectively increase emotional and functional

adjustment, and decrease both treatment and disease related symptoms in cancer patients (Greer et al., 1992; Meyer & Mark, 1995).

It can be concluded then, that the efficacy of psychological interventions has been proven in relation to a wide range of physical problems. This has led some authors to conclude that psychological interventions should not be an optional extra but an integral part of each patient's management plan (Fallowfield, 1995).

Ayr Hospital

Ayr Hospital is a district general hospital which provides a service to the whole of South Ayrshire. It employs 1899 staff (Annual Report, 1997) with around 60 medical consultants. Table 1 shows appointment figures for South Ayrshire & Arran Trust.

Insert Table 1 About Here

Since October 1995 a clinical psychology service has been available on site to staff, patients, their families and carers at the Ayr Hospital, providing 0.1 WTE service to the pain clinic and 0.1 WTE 'ad hoc' referral service to other specialities within the hospital. The service was initially intended to provide predominantly direct psychological assessment and intervention for both out-patients and in-patients. There is scope for a negotiated indirect service including advice, training, consultancy and evaluation. Realistically though, the service is so heavily over-subscribed that the indirect psychological input is almost non-existent. Furthermore, demand for input was so great that direct service had to be restricted to out-patients only, except for emergencies.

Extensive waiting lists require that the limited session time available must be devoted to more direct psychological interventions with out-patients.

Table 2 shows activity levels contracted for in the year April 1995 - March 1996 between Clinical & Consulting Psychology Service (CCPS) and South Ayrshire & Arran Trust (SAAT). These figures are in sharp contrast to the results of an audit conducted in February 1996 which suggested that referrers to the service felt there was scope for up to 70 new referrals a month (White, 1996). Furthermore, during the year 1995 - 1996, volume activity was actually +53% for new patients. With waiting lists standing at 9 weeks for the pain clinic and 6 months for the 'ad hoc' service, there is high pressure to see as many patients as possible in the allocated sessions. This has resulted in the psychology service seeing more patients than were originally contracted and paid for.

Insert Table 2 About Here

The aforementioned audit was conducted to elicit the views of consultant medical staff, specialist nursing staff and paramedical departments on the potential use of, and needs for such a service. It was quite clear from the response that increased access to Clinical Psychology service would be desirable for the majority of specialities (86% respondents). Furthermore, 71% respondents stated an interest in the expansion of an 'indirect' clinical psychology service. An increased Clinical Psychology service was perceived to hold a wide range of benefits for overall quality of care on offer to patients, which were in line with benefits identified in the literature and included a resulting decrease in the number

of unnecessary physical investigations, provision of a more holistic service, and improvements in overall psychological care for patients.

Current Study

Despite the staff views that increased Clinical Psychology service provision would be desirable, support from the trust management, and that two service development proposals have been submitted to Ayrshire and Arran Health Board, there has been no expansion to the service. As mentioned earlier, waiting lists have increased and the original contract is regularly exceeded. An in-depth and accurate analysis of the current service usage was considered necessary to assist in future planning and organisation of the service.

The aims of this study are twofold. Part I focused on a full review of all patient activity during the year January - December 1997. The purpose of this was to assess the range of current referrals to Clinical Psychology and the outcome of any psychological assessment and/or interventions.

Part II of the study acted as a follow-up to the audit conducted in February 1996 in that it elicited the views of all potential referrers to the Clinical Psychology service. The focus here was to elicit staff opinions on the benefits of a Clinical Psychology service, possible improvements to the service and the perceived obstacles to service development.

Method

Part 1

Details of patients' names were obtained from the diary of the chartered clinical and health psychologist who provides the service to SAAT, and a list was compiled of all patients who were referred to the clinical psychology service and appointed during the year January - December 1997. The number of sessions offered, and subsequent attendance at appointments was not considered at this point. Providing someone had been offered at least one appointment, they were included.

A short proforma (Appendix 1.2) was devised and used in a systematic case note review of all patients on the list. Patient demographics, referring speciality and reasons for referral, and resulting psychological involvement were all examined.

Part 2

A list of all potential referrers was obtained from the secretary to the Medical Director of Ayr Hospital. Potential referrers were medical consultants and associated specialists (49), nursing specialists (8) and heads of department of professions allied to medicine (7). A full list can be seen in Appendix 1.3. In total there were 64 potential referrers, many of whom would not typically refer to psychology, but, in order to obtain a broad overview of opinions it was considered appropriate to also seek their view.

Following a literature survey and research into scale construction, a short questionnaire (Appendix 1.4) was devised which aimed to gain staff opinions on three broad areas: current service and possible benefits of such a service, potential improvements, and

perceived obstacles to service development. The questionnaire was designed such that both qualitative and quantitative information were elicited to provide a fuller picture of the service. Furthermore, it was felt that clear figures relating to the service would be beneficial in the case of any future consultations with the health board on service development. The opinion of several clinical psychologists was sought in the development of the questionnaire, including the psychologist providing the service to Ayr Hospital, and the Director of CCPS. The questionnaire was sent directly to referrers, with a short letter of explanation which included a contact number should more information be required.

The Statistical Package for Social Sciences package was used for both qualitative and quantitative review of all data.

Results

Part 1

Patients

Within the patient group the gender distribution was 27 males and 51 females. The mean age of patients referred was 43 with distribution of ages ranging from 17 to 79.

Over the course of the year January - December 1997, a total of 78 patients were offered at least one appointment. Of these, 61 were classed as 'new' i.e. processed for the first time that year, while the remaining 17 were classed as 'return' i.e. processing occurred prior to 1997, with treatment ongoing during that year. All referrals were made on an out-patient basis, except one which was initially an emergency in-patient referral but

commenced treatment as an out-patient. The average waiting time for a first appointment was 15 weeks.

Due to the high demand for appointments, an opt-in system was introduced half way through the year 1997, yet, despite this, there were still 14 failed contacts in the group of 61 new patients. Following non-response to subsequent letters, these patients were immediately discharged. This left 47 new patients who were seen on at least one occasion. As a result of the first appointment, 31 patients were offered treatment, 4 were seen for assessment only and a further 12 were discharged. In this latter category, discharge resulted either because the patient felt psychological help was not required (n = 6) or because the psychologist did not consider psychological interventions necessary (n = 6). It is notable that those patients (n = 6) who declined psychological help did not differ in terms of psychological problems from the overall patient group. This breakdown is shown in Table 3 and includes the 17 patients who were classed as returns for that year.

Insert Table 3 About Here

At the time of casenote analysis (April 1998) 20 of the 48 patients offered intervention were still in treatment, 18 had been discharged as treatment was successful (mean treatment time 30.66 weeks), 3 had had their care transferred to another psychologist, and 7 patients had requested discharge as they felt they had progressed as far as they could in treatment (mean treatment time 30.4 weeks).

Referrers

The distribution of the 78 patients referred to Clinical Psychology from individual specialities is shown in Figure 1. In order to look at the spread of reasons given for referral, the principal reason for which help was sought was noted and collapsed into one of the major DSM-IV (APA, 1994) categories. Inspection of the referral pattern showed that the greatest number of referrals were from the pain clinic, and, furthermore, significantly more people refer for pain than for any other reason (Figure 2) regardless of speciality (*chi* = 21.090, p = 0.001).

Insert Figure 1 About Here

Insert Figure 2 About Here

Psychology

The same classification system was used to explore the outcome of referral in terms of the psychologist's diagnosis and formulation following assessment and/or intervention. Unlike reason for referral, somatoform and pain disorders were not diagnosed significantly more. The lack of significance is accountable to the fact that many patients originally referred for pain were subsequently diagnosed as suffering from mood and/or anxiety disorders (Figure 3).

Insert Figure 3 About Here

Included in the analysis was a review of psychometric tests used. This was incorporated primarily at the request of the psychologist providing the service who used a cognitive-behavioural approach with patients and wished to see how often this involved use of formal measures. It was found the majority of patients had formal psychometric tests included in their assessment. Although less than half ever had such tests repeated, four of the overall patient group were only seen for assessment (Table 4).

Insert Table 4 About Here

Part II

Of the questionnaires distributed, 35 were returned, yielding a response rate of 54.69%. One further reply was received from the orthoptics department to say as a non-referrer it was felt any response made to the questionnaire would be "invalid". The percentage distribution of responses is shown in Table 5. A full copy of the questionnaire can be seen in Appendix 1.4.

Insert Table 5 About Here

Some of the most notable results were that over half of all respondents believed clinical psychology intervention increased overall patient choice and furthermore, aided compliance with any medical interventions required. The majority of referrers felt clinical psychology improved health outcomes, with nearly three-quarters noting that it improved a patient's overall quality of life, and 80% noting that it enhanced a patient's coping strategies. Many referrers indicated that information given to them by Clinical

Psychology had some influence on both their management and understanding of physical and psychological aspects of their patient's illness. Forty percent felt this may also affect their approach to other patients in their care.

In terms of service development, just over 70% felt the current service could be improved, while more than half of all respondents believed the lack of development so far could be attributed to the fact that Clinical Psychology is not perceived as a high priority service.

One further point of note is that many of the "don't know" responses were traced back to those respondents who very rarely refer to the Clinical Psychology service and subsequently noted on their questionnaires that they could not answer conclusively. The responses to the two Likert scales at the end of the questionnaire are shown below in Table 6.

Insert Table 6 About Here

Discussion

Overall, the results suggest a high level of satisfaction with the quality of service being provided, but a general feeling that the current level of service provided is failing to meet demands. It seems clear that Clinical Psychology intervention is believed to have a number of beneficial effects in terms of patient health outcomes, and it would seem any expansion in this service would be considered quite appropriate.

Furthermore, a substantial number of referrers indicated that information provided to them by Clinical Psychology helped not only in management and understanding of particular patients, but also affected their approach to other patients in their care. However, this was tempered by some referrers' comments that due to long waiting lists, this information is often received too late. An important point to note is that while an overwhelming majority (90.9%) of referrers saw Clinical Psychology as a concurrent treatment option, the casenote review revealed that patients were often only referred after all possible physical explanations had been explored and discounted. This would suggest that Clinical Psychology is seen as more of a "last option", but consideration of comments made by referrers would suggest this is more as a consequence of the general opinion that the Clinical Psychology service is overprescribed, understaffed, and has very long waiting lists (see Appendix 1.5 for comments).

The high number of referrals both from the pain clinic and for pain/somatoform complaints can be explained by a number of reasons. Firstly, the presence of a dedicated service to pain would suggest there is a greater understanding of the psychologist's role as a result of close liaison between the psychologist and consultant medical staff. Consultancy and closer inter-disciplinary working was an area which was highlighted by many referrers as one they would like to see expanded. Secondly, the fact there are protected sessions for the pain clinic means the length of the waiting list is not as big a concern here as it may be for other disciplines. Finally, the greater number of referrals for pain may simply be a consequence of the existence of a dedicated session, with the result that people have learned this is the quickest way to refer to psychology. This

would also explain the differences between the pattern of reasons for referral and the psychologist's diagnosis and formulation.

The dedicated pain service provides a model for how the referral pattern may look if dedicated and more integrated services were introduced for other areas, e.g. oncology, plastic surgery and stroke. As mentioned in the introduction, there is an abundance of research which testifies to the advantages of applying clinical psychology to general medical problems (cf. Jensen et al., 1991; Meyer & Mark, 1995). Furthermore, the most recent government white paper "Designed to Care" highlights mental health issues and physical health problems such as cancer as priorities over the coming years (DoH, 1997). Given that previous Department of Health documents have highlighted integration of care and emphasised illness prevention (DoH, 1992), it would seem sensible, then, to increase resources at Ayr Hospital to allow a more integrated service overall.

These results are consistent with previous audits. Any previous service development proposals submitted have been rejected, however. It would seem logical to conclude that the expansion of the Clinical Psychology service is not viewed as a priority, a fact that 57.1% of referrers indicated they believed. Why it is not viewed as a priority is another matter altogether, although if one considers that increased funding for Clinical Psychology services would result in a reduction of funding to another service, this may partly explain the stance SAAT have chosen to take so far. Considered in this light, the expansion of the Clinical Psychology service may not seem as urgent or as necessary to purchasers and possibly even patients too. This could be seen as a narrow, short-term approach, however, as there is some evidence to suggest that patients whose physical

problems include psychological illnesses have an increased length of stay in hospital (Fullop et al., 1997). A sample of views from patients and purchasers would be valid to determine opinions here and guide future proposals for service development.

Although these results suggest demand and perceived need for an expanded Clinical Psychology service among referrers, it may be that a full needs assessment will be required to be conducted in order to actually increase the service provided. When, and if, this happens it would seem best to allocate dedicated sessions for individual services, concentrating not simply on direct service but also ensuring provision of indirect work through consultancy, support and training.

Increased consultancy and staff training could consolidate the response that 40% of referrers feel that information given to them by Clinical Psychology influenced their approach to other patients in their care. One could aim for the situation whereby other disciplines may become more confident handling minor problems, and feel happy that their referrals were appropriate. This would subsequently help waiting lists as hopefully, it would eradicate non-suitable referrals i.e. the six patients discharged after one meeting as the psychologist considered intervention unnecessary.

The casenote review pointed to a couple of areas to which attention should be focused. Firstly, the failed attendance rate, while not exceedingly high, still accounts for 23% of all referrals. There were no obvious difference between patients in this category and all other patients in the group in terms of reason for referral and psychological diagnosis. It may be valid to investigate further the pattern of failed attendance to see whether this

could be reduced, although the opt-in system now consistently used may reduce this, and an information leaflet which is now sent to all patients on appointment (Appendix 1.6) will hopefully help to reduce this further.

Another area which requires some modification is the use of formal psychometric assessments. There appeared to be no systematic use of such, although this might be expected as use of tests is tailored to the individual's problems. However, it may be that the introduction of a core battery of tests for all patients referred to psychology, coupled with standards for re-admission could be a worthwhile strategy to adopt. One benefit of this would be the collection of quantifiable information which could be included in feedback to the health board and may help raise the priority of the clinical psychology service.

Conclusions

There is generally satisfaction with the Clinical Psychology service being provided, but an overwhelming feeling that this is not enough and considerable expansion of the service is required. This should preferably be done through the allocation of dedicated clinical psychology time to specific services, allowing sessions for indirect work including clinical consultancy and staff training. The lack of priority attached to Clinical Psychology services was seen as the primary obstacle to service development.

References

Anderson, K.O., & Masur, F.T. Psychological preparation for invasive medical and dental procedures. *Journal of Behavioural Medicine* 1983; 6: 1-40.

A.P.A. *Diagnostic & Statistical Manual of Mental Disorders*, Revised, 4th edn., Washington, DC: American Psychiatric Association, 1994.

Banyard, P. *Applying psychology to health.* London: Hodder & Staughton, 1996.

Cohen, S., & Rodriguez, M.S. Pathways linking affective disturbances and physical disorder. *Health Psychology* 1995; 14: 374-380.

Department of Health. The Health of the Nation. London: HMSO, 1992.

Department of Health. Designed to Care. London: HMSO, 1997.

Diabetes Control and Complications Research Group. The effect of intensive treatment of diabetes on the development and progression of long-term complications in insulin dependent diabetes mellitus. *New England Journal of Medicine* 1993; 329: 977-986, in Nichols, K (1994).

Fallowfield, L. Psychosocial interventions in cancer. *British Medical Journal* 1995; 311: 1316-1317.

Fullop, G., Strain, J.J., Vita, J., Lyons, J.S., & Hammer, J.S. Impact of psychiatric co-morbidity on length of hospital stay for medical/surgical patients: a preliminary report. *American Journal of Psychiatry* 1987; 144: 878-882.

Greer S., Moorey, S., Baruch, J.D.R., Watson, M., Robertson, B.M., Mason, A., Rowden, L., Law M.G., Bliss, J.M. Adjuvant psychological therapy for patients with cancer: A prospective randomised trial. *British Medical Journal* 1992; 304: 675-680.

Jensen, M.P., Turner, J.A., Romano, J.M., & Karoly, P. Coping with chronic pain: A critical review of the literature. *Pain* 1991; 47: 249-283.

Johnston, M., & Vasele, C. Benefits of psychological preparation for surgery: A meta-analysis. *Annals of Behavioural Medicine* 1993; 15: 245-256.

The Lancet. *Editorial.* 1985; 1: 133-134.

Matarazzo, J.D. Behavioural health's challenge to academic, scientific and professional psychology. *American Psychologist* 1982; 37: 46-51.

Meyer, T.J., & Mark M.M. Effects of psychosocial interventions in adult cancer patients: A meta-analysis of randomised experiments. *Health Psychology* 1995; 14(2): 101-108.

Nichols, K. Preventive psychological care for the physically ill. *Journal of Mental Health* 1994; 3: 443-455.

Sarafino, E.P. *Health Psychology: Biopsychosocial interactions (3rd edn.)*. New York: Wiley, 1998.

South Ayrshire Hospitals NHS Trust. Annual Report, 1996/1997.

White, C. Audit report: Increased psychology service provision at Ayr Hospital. *South Ayrshire Hospital NHS Trust Audit* 1996.

World Health Organisation (1948) in Banyard, P. (1996).
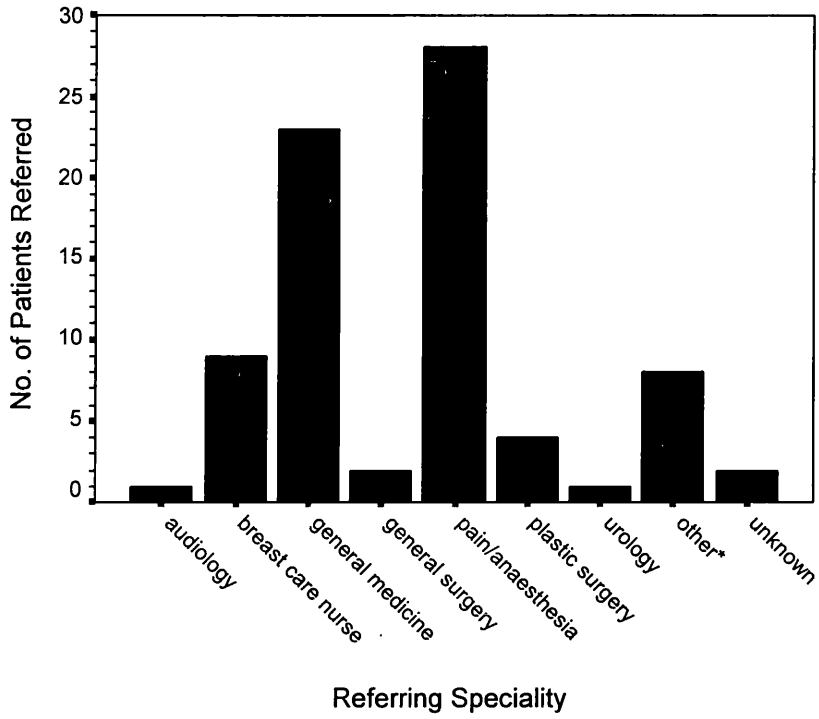
other: ENT (1), GP (1), impotence clinic (2), orthopaedics (3), stoma nurse specialist (1)

Figure 1: Distribution of Patients Referred to Clinical Psychology Service by Referrers' Speciality (n = 78).
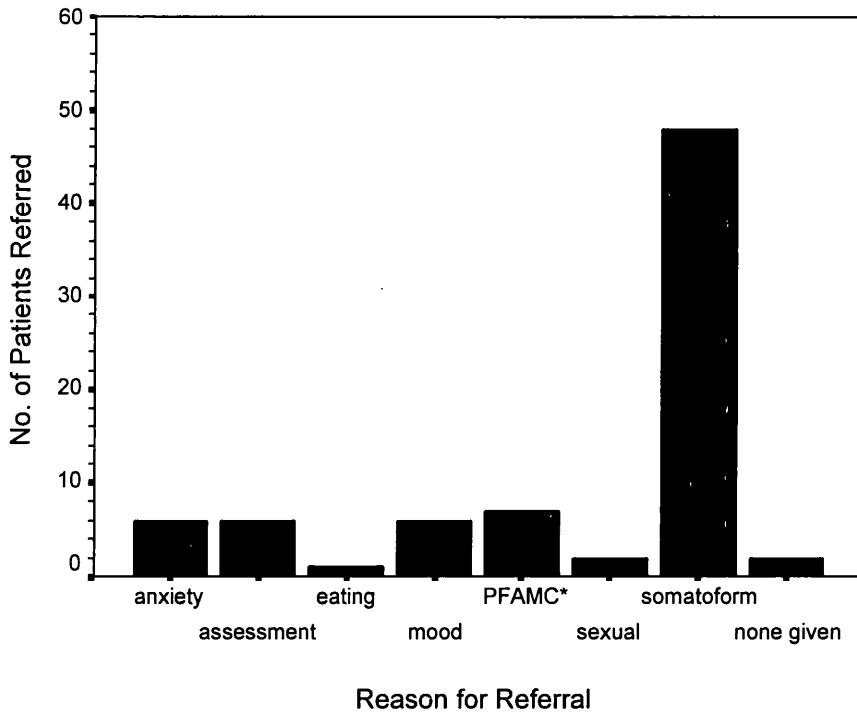
Psychological Factors Affecting Medical Condition

Figure 2. Distribution of Patients Referred to Clinical Psychology Service by Reason for Referral (n = 78).
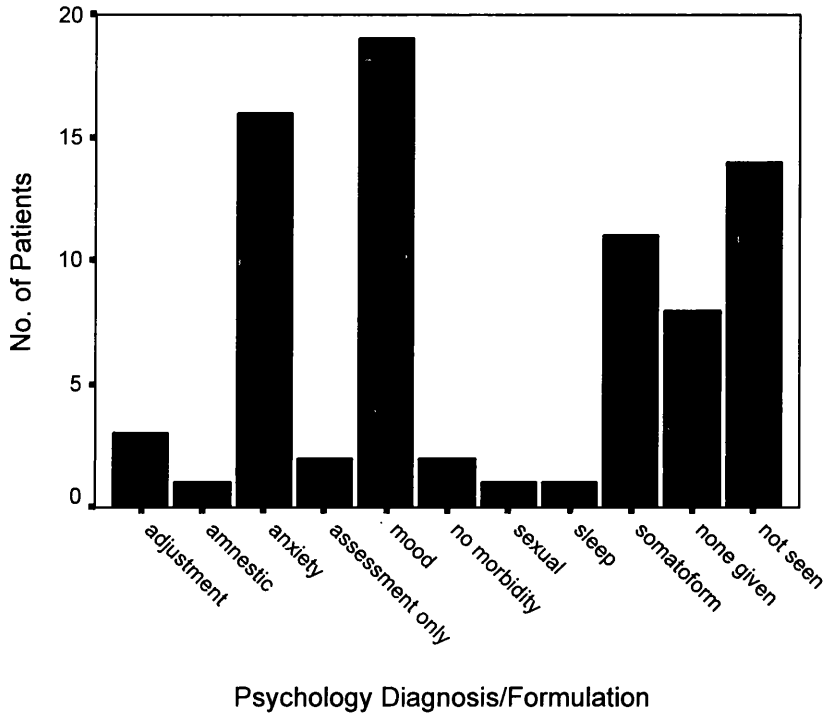
Figure 3. Distribution of Patients Referred to Clinical Psychology Service by Opinion of Psychologist After Assessment Interview (n = 78).

Table 1

Appointment Figures for South Ayrshire and Arran Trust, 1996 - 1997

Status of patient	*N*
in-patients	22,654
day-patients	14,219
out-patients	190,326

Table 2

Contracted Activity Levels Between CCPS and SAAT for the year April 1995 – March 1996

	Patients +/- 10%	
Service provided for	*New*	*Return*
Pain	30	150
'Ad hoc'	30	150

Table 3

Outcome of First Appointment with Clinical Psychologist

Treatment offered		48
Assessment only		4
Discharged:	patient's choice	6
	psychologist's choice	6
	patient opted out	3
	DNA	11
Total		78

Table 4

Psychometric Tests Used in Course of Psychological Intervention

Test used	n	n had test repeated
Beck Anxiety Inventory	3	1
Beck Depression Inventory	10	5
Hospital Anxiety & Depression Scale	5	2
PAIS	7	3
Pain Coping Strategies Questionnaire	5	0
Other*	12	7
Total	42	18

* *Anxious Thoughts Questionnaire, Beck Hopelessness Scale, Beliefs about your Relationship, Dysfunctional Attitude Scale, General Health Questionnaire, Generalised Anxiety Disorder Scale, Inventory of Marital State, Metacognitions questionnaire, Multi-modal Life History Inventory, National Adult Reading Test, Penn Inventory, Stoma Cognitions Questionnaire, Thought Control Questionnaire, Wechsler Adult Intelligence Scale-Revised, Wechsler Memory Scale-Revised.*

Table 5
Percentage distribution of replies to questionnaire administered to all referrers

Question	Yes	No	Don't Know	No Reply
Clinical Psychology				
Increases patient choice	54.3	8.6	37.1	-
Decreases medical involvement	17.1	42.9	37.1	2.9
Increases compliance	60.0	8.6	31.4	-
Improved Health Outcomes				
Symptom control	68.6	5.7	25.7	-
Patient coping strategies	80.0	5.7	14.3	-
Functional status	62.9	5.7	31.4	-
Rate & success of recovery	60.0	5.7	31.4	2.9
Overall quality of life	74.3	0.0	25.7	-
Influences				
Management of physical health problems	34.3	25.7	28.6	11.5
Understanding of psychological aspects	60.0	8.6	20.0	11.5
Management of psychological aspects	48.6	17.1	22.9	11.5
Management/approach to other patients	40.0	22.9	22.9	14.3
Could current service improve?	71.4	0.0	25.7	2.9
Which of the following could lead to improvement				
Greater allocation of resources	60.0	*n/a*	*n/a*	*n/a*
Increased awareness of role	60.0	*n/a*	*n/a*	*n/a*
Increase consultancy time	60.0	*n/a*	*n/a*	*n/a*
Ever not refer due to waiting time?	45.7	20.0	25.7	8.6
Possible obstacles to service development				
Not high priority	57.1	*n/a*	*n/a*	*n/a*
Believed to be no evidence of effectiveness	34.3	*n/a*	*n/a*	*n/a*
Professional role uncertainty	8.6	*n/a*	*n/a*	*n/a*
Alternative treatment option	11.4	*n/a*	*n/a*	*n/a*
Concurrent treatment option	90.9	*n/a*	*n/a*	*n/a*
Interested in the provision of				
Staff support	48.6	14.3	28.6	8.6
Staff training	42.9	14.3	26.7	11.4
Research advice	25.7	20.0	31.4	22.09
Clinical consultancy	54.3	2.9	28.6	14.3

Note: where *n/a* – these questions were simply 'tick box for yes'

Table 6

Referrer's Responses to Opinion Scales (n = 35)

	not at all satisfied	*slightly satisfied*	*satisfied*	*fairly satisfied*	*very satisfied*	*no response*
Rate overall satisfaction	3	11	7	4	0	10

	strongly disagree	*disagree*	*uncertain*	*agree*	*strongly agree*	*no response*
Believe there is need for improvement?	1	0	7	12	10	5

Chapter 2: Literature Review

Stimulus Equivalence and Transfer of Function in Relation

to Psychopathological Anxiety

Literature Review submitted in partial fulfilment of the requirements for the degree
of Doctor of Clinical Psychology

Prepared in accordance with requirements for submission to The Psychological Record
(Appendix 3.1)

RUNNING HEAD: STIMULUS EQUIVALENCE AND ANXIETY

Address for correspondence:
Kathleen McHugh
Department of Psychological Medicine,
Gartnavel Royal Hospital
1055 Great Western Road
Glasgow, G12 0XH

Abstract

Stimulus equivalence is a phenomenon which can account for the emergence of novel behaviour in the absence of direct training. While there is a general consensus that it is in some way connected to verbal behaviour (Horne & Lowe, 1996) there is ongoing debate as how exactly to account for stimulus equivalence and this paper briefly reviews the main theoretical perspectives. The aspect of equivalence which holds most interest for researchers is in relation to the so-called transfer of function which occurs when properties and functions related to one particular stimuli become associated with another stimuli, simply through membership of an equivalence class. Therefore, stimulus equivalence holds potential to provide an explanation for the development and progression of psychopathology in anxiety disorders, and this forms the main focus of this paper, with discussion including the relevance of prior learning and the shortcomings of the literature as it currently stands.

Introduction

Despite the fact that behaviour therapies were the first psychological treatments to substantially effect change in anxiety disorders (Lindsay, 1997) the behaviour analytic view of anxiety has come to be criticised for failing to provide an empirically based explanation for the fact that many patients report no obvious precipitant to their anxiety (e.g. Rachmann, 1977; 1991). Furthermore, many people experience traumatic events and do not go on to develop psychopathology while others seem to acquire their fears through simple observation of others (Davey, 1996). These shortcomings led in part to the upsurge in cognitive models of psychopathology which have become central to recent psychological interventions. However, more recently, behavioural analytical research has focused on the phenomenon of stimulus equivalence, which may offer a more substantial and empirically supported account of development and generalisation processes in anxiety disorders than traditional conditioning theories.

Stimulus Equivalence

Stimulus equivalence occurs when an individual is taught a series of related conditional discriminations and the component stimuli of the discriminations become related to each other in new ways not explicitly taught in training. The phenomenon was first described by Sidman (1971) when he discovered the emergence of reading comprehension in a boy with severe learning disabilities without formal teaching. Initially, this boy could match spoken words to pictures and name pictures (e.g. cat), and, after being taught to match spoken to written words, he then demonstrated an ability to match spoken words to pictures and to name printed words (Figure 1). Stimulus equivalence, then, was held to account for the emergence of this novel, untrained behaviour and since then, it has been

confirmed in a number of experiments (e.g. Eikeseth & Smith, 1992; Lazar, Davis-Lang & Sanchez, 1984) and, more specifically, in further tests of reading comprehension (Sidman & Cresson, 1973; Sidman, 1977); to teach name-face matching to adults with brain injuries (Cowley, Green & Braunling-McMorrow, 1992); and with musical stimuli (Hayes, Thompson & Hayes, 1989).

Insert Figure 1 About Here

For stimulus equivalence to occur the three requirements of reflexivity, symmetry and transitivity must be met. That is, the elements involved in a relation must demonstrate identity matching, with any one element holding the same conditional relationship to itself as it does to the other stimuli (e.g. digit to digit, word to word, picture to picture, etc.); be reversible in nature (e.g. 1 = one and one = 1); while the emergence of a third untrained relationship demonstrates transitivity (e.g. if A = B and B = C, then A = C). These three elements are demonstrated pictorially in Figure 2. In a typical experimental paradigm, an individual is taught several A to B relationships via a matching-to-sample procedure in which either A_1, A_2, or A_3 are presented as sample stimuli, with B_1, B_2, and B_3 presented as comparison stimuli and contingent reinforcement given in response to correct matches (e.g. choosing B_1 in response to sample A_1). Once mastery has been demonstrated, a second matching-to-sample procedure is taught in the same way with the 'B' stimuli as samples and a third group of C_1, C_2, and C_3 as comparison stimuli, again repeatedly presented with positive feedback until mastery is evident. To demonstrate the formation of a new equivalence class between the stimuli, a test can be conducted by presenting a member of the 'C' group as the sample stimuli with the 'A' group as

comparisons (Figure 3). To control for prior experience and previous learning, the sample and comparison stimuli typically consist of novel three-letter nonsense syllables which will be meaningless and ought, therefore, to hold no pre-determined significance for people.

Insert Figure 2 About Here

Insert Figure 3 About Here

The term stimulus equivalence is really only a description of outcome and not an explanation of the phenomenon (Barnes & Holmes, 1991). There continues to be ongoing debate in the literature as to how it should be accounted for, although there is a general agreement that the phenomena studied are closely bound up with verbal behaviour in some way (Horne & Lowe, 1996). The main theories postulated will be considered briefly below.

Equivalence as a Basic Stimulus Function

As noted, stimulus equivalence was first described by Sidman (1971) who asserts that it underpins language and behaviour such that words and other 'symbols' (both verbal and non-verbal) become equivalent to objects and events in our environment, and he notes that we often react to words and symbols (e.g. national flags) as if they actually are what they refer to (Sidman, 1994). Sidman's stance that equivalence relations are an unanalysable product of evolution and not derivable from more basic behavioural processes leads him to define equivalence relations as the emergence of new and

predictable units of behaviour from previously demonstrated units, e.g. reinforcement contingencies, rather than something which actually 'exists' in and of itself, in theory or reality (e.g. see Sidman, 1990; Sidman, 1994). For him, there is no logical necessity for relations to be equivalent, and he asserts the common findings from equivalence experiments that people can name stimuli and describe rules to explain the emergent performances is not evidence of their necessity in the emergence of equivalence relations. Sidman points out that subjects are not taught common names for stimuli - begging the question of where these names come from. Similarly, if rules are a pre-requisite for equivalence relations, the same question of primacy and origin needs to be answered. According to Sidman (1990), exposure to the verbal contingencies that govern naming and rule-following behaviour allows for experimental testing of equivalence relations, which themselves actually precede verbal behaviour.

However Sidman's theories have been criticised for their general disparity with the empirical evidence (Horne & Lowe, 1996). So far it has proven impossible to demonstrate equivalence relations in non-humans, and there is also some evidence to suggest that language-disabled humans are unable to learn equivalence relations (Devany, Hayes & Nelson, 1986; Hayes, 1989). It would also seem that non-language disabled children are only able to develop equivalence relations once a basic level of language has been attained (Barnes, McCullagh & Keenan, 1990; Devany et al., 1986). Such research is incongruous with Sidman's view that the phenomenon is an unanalysable given.

Relational Frame Theory

The relational frame theory of equivalence (Hayes & Hayes, 1989) attributes success in equivalence tests to a person's prior learning history, particularly in terms of what has been called *arbitrarily applicable relational responding*, which basically involves responding to one event in terms of another (i.e. in terms of a relational frame, for example of "sameness" or "opposite"), depending on contextual cues as opposed to physical form. A relational frame is, in fact, "an overarching class of instrumental behaviour" (Hayes, 1992, p.109). Hence their arbitrary nature as such patterns of responding can, theoretically, be brought to bear on any set of stimuli (Barnes, 1994). From this perspective, equivalence is the process that allows us to distinguish between verbal and non-verbal behaviour (Wulfert & Hayes, 1988) and relational frame theory considers language and equivalence equally representative of the derived behavioural process of arbitrarily applicable relational responding (Barnes, 1994). However, the theory fails to specify what the behavioural principles are which govern the establishment of these relational frames, nor is it clear in explaining what a person's prior learning history should comprise. A further problem is that the theory requires that in the course of developing equivalence relations, a child should hear names before they can actually say them with no explanation of why this should be so (see Horne & Lowe, 1996). Therefore, although relational frame theory clarifies the role of verbal contingencies in the development of equivalence classes, like Sidman's theory it does not really elucidate any further as to whether equivalence precedes or parallels verbal behaviour.

The Role of 'Naming' in Equivalence

A third major theory attempts to clarify this question of primacy through consideration of the role of naming in the development of equivalence relations. This account asserts naming is a prerequisite for successfully forming equivalence classes and attempts also to explain how the verbal behaviour of naming arises (Horne & Lowe, 1996). Naming is a learned behaviour which, like most aspects of language, is socially reinforced (see Skinner, 1957). Words come to act as symbols and the child learns to develop symbolic referents for the world of physical objects or events and the relations which develop between such objects and their referents, plus the relations that develop between different referents. Children may learn, through naming, that classes of stimuli are connected, overlapping and even interchangeable. A simple example of this is the immediate generalisation that occurs once a child has correctly learned the word "dog", he or she can expand the name to include all species in that class. The individual is conceptualised as a "speaker-listener" (Horne & Lowe, 1996) in this analysis which describes naming as a circular relation as it involves a speaker also responding as a listener to his/her own verbal behaviour.

In other words, through naming, the child begins to develop meaning and build concepts, thus verbally ultimately regulating his/her experience. Whether or not naming is integral to formation of stimulus classes is still to be unequivocally proven but it certainly offers an interesting possibility. The naming explosion seems to occur either at the same time, or just after, children first show spontaneous categorisation of mixed sets of objects (Gopnick & Meltzoff, 1987; 1992), and it may be that meaning attributable to one set of stimuli could, through a process of stimulus equivalence, assisted by language and

naming, transfer to an entirely unrelated set of stimuli. There is certainly support for this hypotheses from the studies which demonstrate that teaching name relations can lead subjects to pass tests of stimulus equivalence which they had previously failed (see Horne & Lowe, 1996, for a review).

Stimulus Equivalence and Generalised Anxiety Disorder

The particularities of the relationship between language and equivalence are still to be defined. However, studying anxiety disorders using a behaviour analytic approach which emphasises the phenomenon of stimulus equivalence offers exciting prospects in that it directs attention to the particular conditions under which such learning occurs or can be influenced (Dougher, 1998). This in turn may enhance our understanding of the development of beliefs, categories and expectancies in cognitive theories generally and in this instance, with reference to anxiety.

More specifically, the linguistic element of equivalence means that it may be especially pertinent to Generalised Anxiety Disorder (GAD) as the cardinal feature of this disorder is worry (DSM-IV; APA, 1994), which itself is now commonly held to be a predominantly verbal, conceptual activity (Borkovec & Inz, 1990). The unique characteristics of worry itself have received considerable research attention in recent years although there is not scope for full discussion of the topic here and there are adequate reviews elsewhere (e.g. Davey, 1993; 1994; Wells, 1995; 1997; Wells & Butler, 1997; Wells & Morrison, 1994) to which the reader is referred.

Stimulus equivalence and its relation to the naming account (Horne & Lowe, 1996) encapsulates symbolic behaviour as equivalence classes are formed between words and their "representations" in the world. Borkovec postulates worry is a form of active cognitive avoidance which restricts imagery and prevents emotional processing through concentrated affective suppression (Borkovec & Inz, 1990). It may be that stimulus equivalence could account for the development, maintenance and incubation of fear and anxiety through the expansion of anxiety related equivalence classes which affect emotional processing. Similarly, Butler, Wells & Dewick (1995) found worriers tended to use verbal strategies which included the retrieval of associated information from memory which, again, could be mediated through the accessing of an equivalence class, explaining how people can 'learn' to be anxious or fearful of something without direct experience. Once one member of a class elicits a fear response, other class members inherently do too - simply by belonging to the same class, without any further requirement for direct exposure and experience.

In addition to these findings, it has been well established that stimulus equivalence is a highly efficient method of learning in that, as the number of class members increase, the number of emergent relationships expands much more. For example, teaching four relationships (e.g. A to B, B to C, C to D, D to E) results in a five member class plus 21 further emergent relationships (Fields & Verhave, 1987). This potentially means equivalence classes could easily expand to include a vast number of sample stimuli, all of which will share the same function, e.g. to induce fear and anxiety.

Such 'transfer of function' is the crux of stimulus equivalence and the area which holds greatest implications for the development and maintenance of psychopathology.

Transfer of Function

Therefore, one of the main applications of stimulus equivalence could be to provide an explanation for the development and progression of psychopathology in anxiety disorders, in the absence of direct experience either as a precipitating or maintaining factor. Transfer of function has been empirically demonstrated for a number of behaviours including response control (e.g. Barnes & Keenan, 1993; Gatch & Osborne, 1989), autonomic responding in the form of classically conditioned sexual arousal (Roche & Barnes, 1997), stimulus control over drug use (DeGrandpre & Bickel, 1993), avoidance responding (Augustson & Dougher, 1997) and classically conditioned fear (Dougher, Augustson, Markham, Greenway & Wulfert, 1994). This latter study used mild shock in an aversive classical conditioning procedure with eight students, seven of whom demonstrated clear evidence of conditioning as measured by skin conductance. Of these seven, the authors reported six showed transfer of the originally conditioned fear response. A further replication of this study obtained similar results and also demonstrated subsequent extinction and reconditioning responses could be transferred among members of an equivalence class (Dougher et al., 1994). To enhance clinical relevance, the authors then explored an individual's avoidance reactions to a conditioned stimulus and found clear evidence that control over avoidance responding in relation to mild shock could transfer via stimulus equivalence classes (Augustson & Dougher, 1997). They do caution, however, that levels of conditioned responding failed to attain clinical significance which somewhat restricts application of these results (Augustson &

Dougher, 1997), as well as highlighting a need to replicate such experiments with a clinical population.

The Influence of Prior Learning and Equivalence Class Formation

As noted earlier, it has so far proven impossible to elicit the formation of equivalence classes (and therefore transfer of function) in non-humans, and humans with language disabilities. More recently, however, attention has turned to the circumstances under which language-competent human adults fail to demonstrate equivalence. There is increasing evidence that prior learning interferes with the development of new equivalence classes that are in opposition to an individual's previous experience, although the literature is small given the developing nature of this field.

One of the first studies to demonstrate this anomaly explored equivalence responding in the political, social and historical context of Northern Ireland with subjects grouped by religious denomination along with a control group of English students (Watt, Keenan, Barnes & Cairns, 1991). Their results clearly demonstrated failure by the experimental groups to form equivalence classes which consisted of socially loaded stimuli (e.g. linking Catholic names to Protestant symbols) and the authors concluded this failure arose as the experimentally trained conditions were in direct opposition to previously established relations formed by social history and experience.

Similar effects have subsequently been found in a study looking at sex discrimination and gender-role stereotyping (Moxon, Keenan & Hine, 1993) which again found prior socially trained relations interfered with the formation of new equivalence classes

between stimuli of female names and traditional male occupations (e.g. builder) with subjects more likely to opt for traditionally female occupations (e.g. secretary) regardless of prior experimental training. Likewise, Barnes, Lawlor, Smeets & Roche (1996) found children with mild learning disabilities were significantly less successful in forming equivalence relations between their own name and the word "Able" in comparison to non-disabled children who readily formed the class. Their findings also seem attributable to the interfering effect of previously socially learned equivalence relations.

From a more clinical perspective, Leslie, Tierney, Robinson, Keenan and Watt (1993) found the presence of a clinically diagnosable anxiety disorder interfered with learning equivalence relations amongst verbally 'loaded' stimuli. They compared the performance of eight anxious and eight non-anxious subjects in developing equivalence classes with three stimulus groups of (a) anxiety provoking situations, (b) nonsense syllables and (c) adjectives describing pleasant states. Anxious subjects failed on the equivalence tasks and the authors attributed this to subjects' previously determined knowledge of, and experience with, anxiety–related stimuli; though they do concede the possibility that it may even be that the clinical group were, for some reason, unable to form any equivalence relations, irrespective of the association with anxiety. Moreover, they note that it was not possible to determine precisely how prior experiences with anxiety affected their subjects' performance so detrimentally, and they highlight the need for further research to attend to such questions.

These studies explored emergence of equivalence classes with prior learning experiences already established. In an effort to increase experimenter control and understand more

clearly how prior learning can disrupt new learning, Peoples, Tierney, Bracken, and McKay (1998) experimentally induced interference through a paired-associates learning task in which they presented either positive or negative adjectives immediately after presentation of three-letter nonsense syllables. Initially they confirmed transference of meaning to the nonsense syllables, then demonstrated that some individuals failed to develop transitive links and equivalence classes when the elements involved came from oppositional classes. They concluded that if paired-associates procedures can interfere with equivalence class formation, then other procedures may have similar repercussions. Obviously, further empirical evidence is required before any firm conclusions can be drawn here, exploring the interaction between prior learning and equivalence class formation in relation to emergence of new equivalence relations and possible interference with new learning. There is a paucity of research in the area with clinical populations and this must be rectified if such a paradigm is to realistically proffer an explanation for the development and maintenance of psychopathological behaviour.

The findings will have ramifications not just for understanding of the development and maintenance of GAD, but also treatment and management of anxiety disorders generally. If it can be proven unequivocally that prior learning can disrupt new learning, especially in anxious individuals, then this would complement current knowledge of effective treatment techniques.

Current Study

The present study aims to extend these findings outlined above and plans to explore the emergence of equivalence classes between a group of clinically anxious individuals and a

group of controls. This in itself is important as the majority of research to date has been with non-clinical populations. In addition, it appears there are two major questions which have not been answered by the research to date and which are pertinent to a behavioural analysis of the development and maintenance of anxiety disorders. Namely, can individuals with a clinically diagnosable anxiety disorder form equivalence classes under any circumstances, and, can a successful transfer of anxiety as demonstrated by the work of Dougher et al. (1994) be replicated with a clinical population.

In summary, then, the principle aims of the study are twofold:

1.   To explore whether a clinical diagnosis of anxiety affects the formation of equivalence classes.   Leslie et al. (1993) found anxious people unable to form equivalence classes but, they used emotive stimuli which may have considerably influenced their results. This study controls for group differences by initially exploring equivalence formation across sets of neutral stimuli.

2.   To explore whether or not a transfer of function occurs across members of an equivalence class in anxiety as reported by Dougher et al. (1994). The speed and extent of this transfer of function will also be considered.

The main hypotheses of the study are as follows:

- The presence of a clinically diagnosable anxiety disorder will not influence development of equivalence classes for neutral stimuli composed of three-letter nonsense words.

- There will be no significant between-group differences in speed or rate of learning of these equivalence classes.

- There will be individual differences within groups in speed and rate of learning of these equivalence classes.

- Transfer of function across members of an equivalence class in anxiety will be affected by the presence of a clinically diagnosed anxiety disorder in that a positive diagnosis will increase extent and speed of transfer.

References

American Psychiatric Association. (1994). *Diagnostic and Statistical Manual of Mental Disorders*, 4th edition. Washington.

Augustson, E.A., & Dougher, M.J. (1997). The transfer of avoidance evolving functions through stimulus equivalence classes. *Journal of Behavior Therapy and Experimental Psychiatry*, 28(3), 181-191.

Barnes, D. (1994). Stimulus equivalence and relational frame theory. *The Psychological Record*, 44, 91-124.

Barnes, D., & Holmes, Y. (1991). Radical Behaviorism, Stimulus Equivalence, and Human Cognition. *The Psychological Record*, 41, 19-31.

Barnes, D., & Keenan, M. (1993). A transfer of functions through derived arbitrary and nonarbitrary stimulus relations. *Journal of the Experimental Analysis of Behavior*, 59, 61-81.

Barnes, D., Lawlor, H., Smeets, P.M., & Roche, B. (1996). Stimulus equivalence and academic self-concept among mildly mentally handicapped and non-handicapped children. *The Psychological Record*, 46, 87-107.

Barnes, D., McCullagh, P.D., & Keenan, M. (1990). Equivalence class formation in non-hearing impaired and hearing impaired children. *The Analysis of Verbal Behaviour*, 8, 19-30.

Borkovec, T.D., & Inz, J. (1990). The nature of worry in generalised anxiety disorder: A predominance of thought activity. *Behaviour Research and Therapy*, 28, 153-158.

Butler, G., Wells, A., & Dewick, H. (1995). Differential effects of worry and imagery after exposure to a stressful stimulus: A pilot study. *Behavioural and Cognitive Psychotherapy*, 23, 45-56.

Cowley, B.J., Green, G., & Braunling-McMorrow, G. (1992). Using stimulus equivalence procedures to teach name-face matching to adults with brain injuries. *Journal of Applied Behavior Analysis*, 25, 461-475.

Davey, G.C.L. (1993). Worrying, social problem-solving abilities and social problem-solving confidence. *Behaviour Research and Therapy*, 32(3), 327-330.

Davey, G.C.L. (1994). Pathological worry as exacerbated problem-solving. In G.C.L. Davey & F. Tallis (Eds.), *Worrying: Perspectives on theory, assessment and treatment* (pp. 35-59). Chichester, England: Wiley.

Davey, G.C.L. (1996). A conditioning model of phobias. In G.C.L. Davey (Ed.), *Phobias: A handbook of theory, research and treatment* (pp.301-322). Chichester, England: Wiley.

DeGrandpre, R.J. & Bickel, W.K. (1993). Stimulus control and drug dependence. *The Psychological Record*, 43, 651-666.

Devaney, J.M., Hayes, S.C. & Nelson, R.O. (1986). Equivalence class formation in language-able and language-disabled children. *Journal of the Experimental Analysis of Behavior*, 46, 243-257.

Dougher, M.J. (1998). Stimulus equivalence and the untrained acquisition of stimulus functions. *Behavior Therapy*, 29, 577-591.

Dougher, M.J., Augustson, E.M., Markham, M.R., Greenway, D. & Wulfert, E. (1994). The transfer of respondent eliciting and extinction functions through stimulus equivalence classes. *Journal of the Experimental Analysis of Behavior*, 50, 125-144.

Eikeseth, S. & Smith, T. (1992). The development of functional and equivalence classes in high-functioning autistic children: The role of naming. *Journal of the Experimental Analysis of Behavior*, 58, 123-133.

Fields, L. & Verhave, T. (1987). The structure of equivalence classes. *Journal of the Experimental Analysis of Behavior*, 48, 317-332.

Gatch, M.B. & Osborne, J.G. (1989). Transfer of consequential stimulus functions via equivalence class development. *Journal of the Experimental Analysis of Behavior*, 51, 369-378.

Gopnick, A. & Meltzoff, A. (1987). The development of categorization in the second year and its relation to other cognitive and linguistic developments. *Child Development*, 58, 1523-1531.

Gopnick, A. & Meltzoff, A. (1992). Categorization and naming: Basic-level sorting in eighteen-month-olds and its relation to language. *Child Development*, 63, 1091-1103.

Greenway, D.E., Dougher, M.J., & Wulfert, E. (1996). Transfer of consequential functions via stimulus equivalence: Generalisation to different testing contexts. *The Psychological Record*, 46, 131-144.

Hayes, S.C. (1989). Non-humans have not yet shown stimulus equivalence. *Journal of the Experimental Analysis of Behavior*, 51, 385-392.

Hayes, S.C. (1992). Verbal relations, time, and suicide. In S.C. Hayes & L.J. Hayes (Eds.), *Understanding verbal relations* (pp.109-118). Reno NV: Context Press.

Hayes, S.C. & Hayes, L.J. (1989). The verbal action of the listener as the basis for rule-governance. In S.C. Hayes (Ed.), *Rule-governed behavior: Cognition, contingencies and instructional control* (pp.153-190). New York: Plenum-Press.

Hayes, L.J., Thompson, S. & Hayes, S.C. (1989). Stimulus equivalence and rule following. *Journal of the Experimental Analysis of Behavior*, 52, 275-291.

Horne, P.J. & Lowe, C.F. (1996). On the origins of naming and other symbolic behavior. *Journal of the Experimental Analysis of Behavior*, 65, 185-241.

Lazar, R.M., Davis-Lang, D. & Sanchez, L. (1984). The formation of visual stimulus equivalences in children. *Journal of the Experimental Analysis of Behavior*, 41, 251-266.

Leslie, J.C., Tierney, K.J., Robinson, C.P., Keenan, M. & Watt, A. (1993). Differences between clinically anxious and non-anxious subjects in a stimulus equivalence training task involving threat words. *The Psychological Record*, 43, 153-161.

Lindsay, S.J.E. (1997). Fears and Anxiety: Investigation. In S.J.E.Lindsay & G.G.Powell (Eds.), *Handbook of Clinical Adult Psychology*. London: Routledge.

Moxon, PD, Keenan, M & Hine, L. (1993). Gender role stereotyping and stimulus equivalence. *The Psychological Record*, 43, 381-394.Peoples, M., Tierney, K.J., Bracken, M. & McKay, C. (1998). Prior learning and equivalence class formation. *The Psychological Record*, 48, 111-120.

Rachman, S.J. (1977). The conditioning theory of fear acquisition: A critical examination. *Behaviour Research and Therapy*, 15, 375-387.

Rachman, S.J. (1991). Neo-conditioning and the classical theory of fear acquisition. *Clinical Psychology Review*, 11, 155-173.

Roche, B. & Barnes, D. (1997). A transformation of respondently conditioned sexual arousal functions in accordance with arbitrary relations. *Journal of the Experimental Analysis of Behavior*, 68, 143-160.

Sidman, M. (1971). Reading and auditory-visual equivalences. *Journal of Speech and Hearing Research*, 14, 5-13.Sidman, M. (1977). Teaching some basic prerequisites for reading. In M Sidman, (Ed.), *Equivalence Relations and Behavior: A Research Story* (pp. 68-80). Boston: Authors Cooperative Inc.

Sidman, M. (1990). Equivalence relations: Where do they come from? In D.E. Blackman & H. Lejeune (Eds.), *Behavior analysis in theory and practice: Contributions and controversies* (pp.93-114). Hillsdale, NJ: Lawrence Erlbaum Associates.

Sidman, M. (1994). *Equivalence relations and behavior: A research story.* Boston: Authors Cooperative Inc.

Sidman, M. & Cresson, O., Jr. (1973). Reading and cross-modal transfer of stimulus equivalence in severe retardation. *American Journal of Mental Deficiency*, 77, 515-523.

Skinner, B.F. (1957). *Verbal Behavior.* New York: Appleton-Century-Crofts.

Watt, A., Keenan, M., Barnes, D. & Cairns, E. (1991). Social categorization and stimulus equivalence. *The Psychological Record*, 41, 33-50.

Wells, A. (1995). Meta-cognition and worry: A cognitive model of generalised anxiety disorder. *Behavioural and Cognitive Psychotherapy*, 23, 301-320.

Wells, A. (1997). *Cognitive Therapy of Anxiety Disorders: A Practice Manual and Conceptual Guide*. Chichester: John Wiley & Sons.

Wells, A. & Butler, G. (1997). Generalised Anxiety Disorders. In D.M. Clarke & C.G. Fairburn (Eds.), *Science and practice of cognitive-behavioural therapy* (pp. 155 - 177). Oxford: Oxford University Press.

Wells, A. & Morrison, T. (1994). Qualitative dimensions of normal worry and normal intrusive thoughts: A comparative study. *Behaviour Research and Therapy*, 32, 867-870.

Wulfert, E. & Hayes, SC. (1988). Transfer of conditional sequencing through conditional equivalence classes. *Journal of the Experimental Analysis of Behaviour*, 50, 125-144.
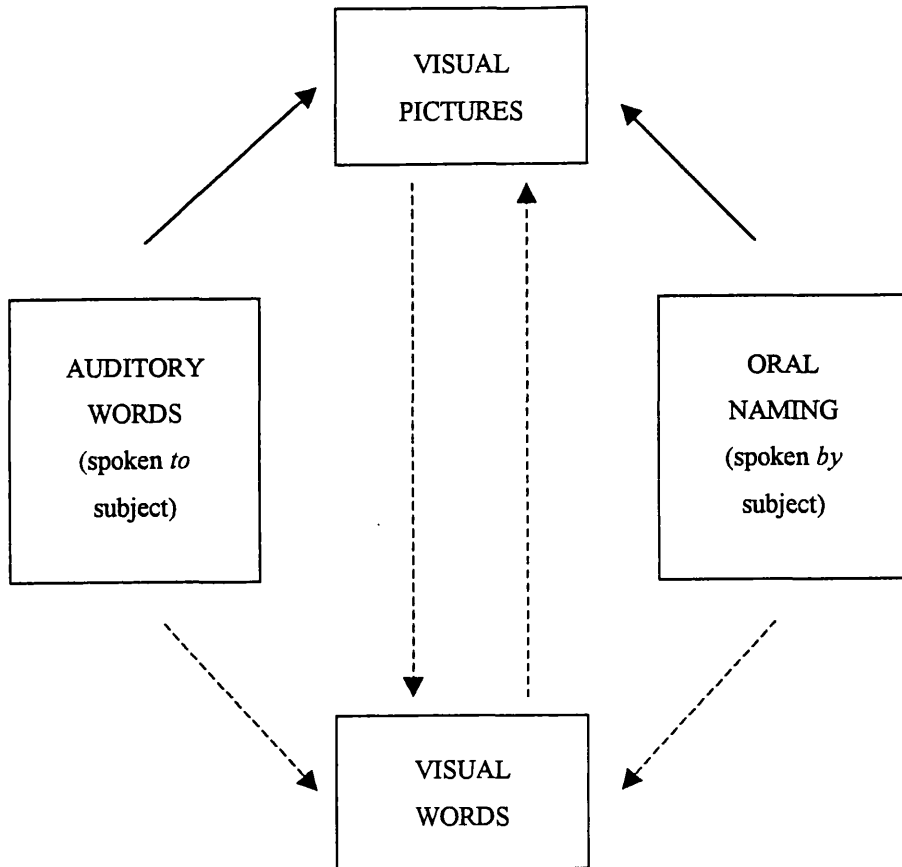
Figure 1

The emergence of reading comprehension via formation of a stimulus equivalence class. Solid lines represent explicitly taught relations. Dotted lines represent emergent relations that were not explicitly taught.
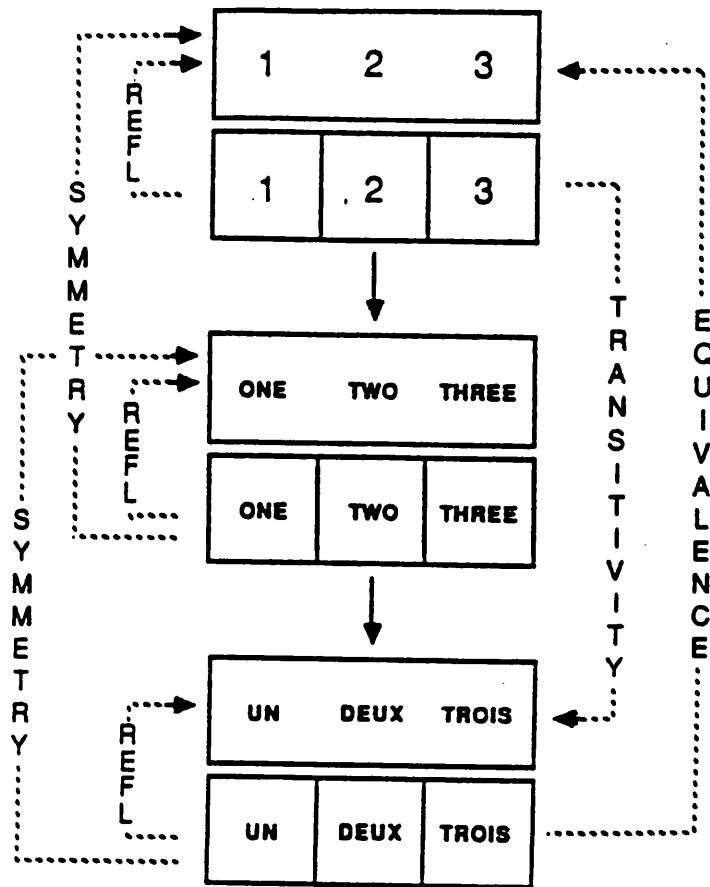
Figure 2

Pictorial representation of the elements involved in an equivalence relation. Solid lines represent the conditional discriminations that were explicitly taught. The dotted lines represent emergent conditional relations that were not explicitly taught, and illustrate the tests for relexivity (REFL), symmetry, transitivity and equivalence. (Adapted from Sidman, 1990).

$$C_1$$

$$A_1 \qquad\qquad A_3$$
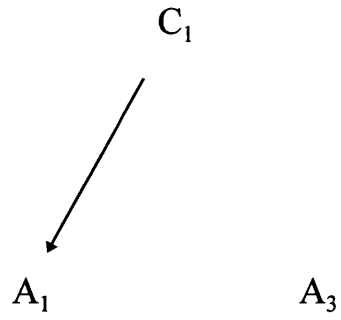
Figure 3

Example of equivalence test - arrow indicates a choice consistent with the formation of an equivalence class.

Chapter 3: Proposal for Major Research Paper

Verbal Learning and Transfer of Function in Anxiety

Major Research Proposal submitted in partial fulfilment of the requirements for the

degree of Doctor of Clinical Psychology

Prepared in accordance with guidelines (see Appendix 2.1)

Address for Correspondence:
Kathleen McHugh
Department of Psychological Medicine
Gartnavel Royal Hospital
1055 Great Western Road
Glasgow, G12 0XH

Summary

This study aims to explore the development of two, three-member equivalence classes in a group of individuals with a primary diagnosis of Generalised Anxiety Disorder (n = 15), and compare their performance with a group of matched controls (n = 15). Group differences will be controlled for by initially using sets of neutral stimuli. The second part of the study will attempt to replicate the findings of Dougher et al. (1994) that anxiety can be transferred through equivalence class membership in a process known as transfer of function. This will involve associating one member of one class with an aversive auditory stimuli, and testing for a transfer of function (i.e. anxiety) to other members of that class, as measured by physiological change (heart rate - bpm) and subjective rating scales. Participants will be recruited through adult clinical psychology departments in the Greater Glasgow area and also through the University of Glasgow. The research will be conducted in local adult clinical psychology departments. The methodology and design are discussed in full in the main text, with practical applications and timescales identified.

Introduction

Traditional behavioural accounts of psychopathology are often criticised for their failure to adequately account for the fact that anxiety disorders develop in the absence of an aversive precipitant (e.g. see Rachman, 1977; 1991). An interesting possibility that may account for this shortcoming, and which has become the focus of a substantial body of research in behaviour analysis over the past two decades, is the phenomenon of stimulus equivalence.

Stimulus equivalence occurs when an individual is taught a series of related conditional discriminations and the component stimuli of those relations become related to each other in ways not explicitly taught in training. It was first noted by Sidman (1971) when he discovered the emergence of reading comprehension in a boy with severe learning disabilities without formal teaching. Initially, this boy could match spoken words to pictures and name pictures (e.g. cat), and, after being taught to match spoken to written words, he then demonstrated an ability to match spoken words to pictures and to name printed words. Stimulus equivalence, then, was held to account for the emergence of this novel, untrained behaviour and since then, it has been confirmed in a number of experiments (e.g. Eikeseth & Smith, 1992; Lazar, Davis-Lang & Sanchez, 1984) and, more specifically, in further tests of reading comprehension (Sidman & Cresson, 1973; Sidman, 1977); to teach name-face matching to adults with brain injuries (Cowley, Green & Braunling-McMorrow, 1992); and with musical stimuli (Hayes, Thompson & Hayes, 1989).

For stimulus equivalence to occur the three requirements of reflexivity, symmetry and transitivity must be met. That is, the elements involved in a relation must demonstrate identity matching (e.g. digit to digit, word to word, picture to picture, etc.), be reversible (e.g. 1=one and one=1) and the emergence of a third untrained relation demonstrates transitivity (e.g. if A=B and B=C, then A=C) (Figure 1). While there is ongoing debate in how to account for stimulus equivalence there is general agreement among the main theoretical perspectives that the phenomenon is related to verbal behaviour in some manner (Horne & Lowe, 1996). Thus far, it has proved impossible to demonstrate the formation of equivalence classes in non-humans and there is also some evidence to suggest that language-disabled humans are unable to learn equivalence relations (Devany, Hayes & Nelson, 1986). This suggests that linguistic ability is a pre-requisite if stimulus equivalence is to occur.

Insert Figure 1 About Here

Furthermore, a widely noted finding in the empirical study of equivalence is the importance of naming. It has been postulated that the development of naming in the child, which is often offered as an explanation of the rapid vocabulary growth that occurs around 24 months (Fenson, Dale, Reznick, Bates, Thal & Pethick, 1994) may also account for stimulus generalisation and development of equivalence classes (Horne & Lowe, 1996). Children may learn, through naming, that classes of stimuli are connected, overlapping and even interchangeable. An example of this is the immediate generalisation that occurs in a child who learns the word "chair" in relation to a particular piece of furniture, and can then extend that name to include all pieces of furniture which

fulfil the function of allowing one to sit down. This process has been called 'transfer of function'.

Whether or not naming is integral to formation of stimulus classes and transfer of function is still to be unequivocally proven but it certainly offers an interesting possibility. Meaning attributable to one set of stimuli could, through a process of stimulus equivalence, supported by verbal behaviour and perhaps specifically naming, transfer to an entirely unrelated set of stimuli. Therefore, one of the main applications of stimulus equivalence could be to provide an explanation for the processes of development and generalisation of psychopathological anxiety, in the absence of direct experience either as a precipitating or maintaining factor. Transfer of function has been empirically demonstrated for a number of behaviours including autonomic responding in the form of classically conditioned sexual arousal (Roche & Barnes, 1997), stimulus control over drug use (deGrandpre & Bickel, 1993), avoidance responding (Augustson & Dougher, 1997) and classically conditioned fear (Dougher, Augustson, Markham, Greenway & Wulfert, 1994). Furthermore, there is some evidence to suggest that prior learning can interfere with the development of equivalence classes (Leslie, Tierney, Robinson, Keenan & Watt, 1993; Watt, Keenan, Barnes & Cairns, 1991) with the implication that new learning may be hampered in anxious individuals.

The present study aims to extend these findings and plans to explore the emergence of equivalence classes between a group of clinically anxious individuals and a group of controls. This study controls for group differences by initially exploring equivalence formation across sets of neutral stimuli, and, it is hoped to then examine whether anxiety

can be transferred across equivalence classes, as this may augment a behavioural analysis of the development and progression of psychopathological anxious behaviour.

Aims & Hypotheses

In summary, then, the principle aims of the study are twofold:

1. To explore whether a clinical diagnosis of anxiety affects the formation of equivalence classes. Leslie et al. (1993) found anxious people unable to form equivalence classes but, they used emotive stimuli which may have considerably influenced their results. Hence, the initial use of neutral stimuli in this study.

2. To explore whether or not a transfer of function occurs across members of an equivalence class in anxiety as reported by Dougher et al. (1994) with a non-clinical population. The speed and extent of this transfer of function will also be considered.

The main hypotheses of the study are as follows:

*   The presence of a clinically diagnosable anxiety disorder will not influence development of equivalence classes for neutral stimuli composed of three-letter nonsense words.

*   There will be no significant between-group differences in speed or rate of learning of these equivalence classes.

*   There will be individual differences within groups in speed and rate of learning of these equivalence classes.

- Transfer of function across members of an equivalence class in anxiety will be affected by the presence of a clinically diagnosed anxiety disorder in that a positive diagnosis will increase extent and speed of transfer.

Plan of Investigation

Participants

It is hoped to have two main groups of participants:

1. Individuals with a primary diagnosis of Generalised Anxiety Disorder (GAD).

2. Matched controls with no diagnosis of GAD or other psychiatric disorder.

Initially, written consent will be gained from heads of departments in all the main adult clinical psychology services in the Greater Glasgow area to contact people currently attending the department who have been identified as suffering from an anxiety disorder. These individuals will then be sent letters inviting them to participate in the study, plus information sheets providing them with further details and a contact address should they have any questions. It will be highlighted at this stage that involvement in the study will in no way influence, or interfere with, an individual's treatment. Once an individual agrees to participate, their consent will be obtained in writing.

The GAD section of the Anxiety Disorders Interview Schedule for DSM-IV (ADIS-IV; Brown, DiNardo & Barlow, 1994) will be conducted with the clinical sample to confirm they warrant such a diagnosis. Individuals will also be asked to complete the Speilberger State-Trait Anxiety Inventory (Speilberger, Gorsuch & Lushene, 1970), and the Hospital

and Anxiety Depression Scale (Zigmond & Snaith, 1983). Individuals will be required to meet clinical caseness in order to participate in the study, regardless of point in treatment. Where possible, it is intended to recruit individuals who are not on any form of psychotropic medication. There are no exclusion criteria for variables such as age and sex and, as participants will be drawn from a primary care sample they will fall within the age range 18 - 65.

Controls will be volunteers recruited through the University of Glasgow and through personal contact. The control group will be matched with the patient sample for age and sex and will also complete the assessments outlined above.

It is hoped to have approximately 15 people in each group. Using means and standard deviations of the percentage of correct choices on tests for equivalence from Leslie et al. (1993) two 2-sample, unequal variance, power calculations were carried out. The UCLA power calculator indicated a sample size of ten would be required for the anxious group, with a control group size of five (p = 0.05, power > 0.7). A second power calculation from stats@aol.com website indicated nine subjects would be needed for each group (p = 0.05, power > 0.7).

Measures

In addition to the measures outlined above, the National Adult Reading Test (Nelson, 1982) will be administered. As the research is exploring verbal learning it is felt this would be a relevant measure to ensure groups are matched. A very brief semi-structured interview will be used during the debriefing session to identify participants' expectations

and beliefs of the aims behind the study and also to consider their overall personal experience of the experiment (Appendix 2.2). A visual analogue scale will be used to monitor anxiety during the experimental procedure. (Appendix 2.3).

Design

Participants will be seen at local clinical psychology departments, although participants in the control group will be interviewed in the Academic Centre of the Department of Psychological Medicine or a similar venue in which office space will have been acquired to run the experiment and each participant will be seen individually.

Two, three-member equivalence classes will be used (e.g. $A_1B_1C_1$, $A_2B_2C_2$) which will be presented to subjects via a standard computer monitor, initially as a series of conditional relations to be learned. Once participants have demonstrated learning, the test for equivalence will be conducted (Table 1). At all times during the experiment participants will be required to make their answer by pressing one from a choice of two keys on the computer keyboard - all other keys will be covered to facilitate responding.

Insert Table 1 About Here

The design of the second part of the experiment has been modelled on that of Dougher et al. (1994) given it is the only study so far to successfully demonstrate transfer of anxiety. This part of the study would involve associating one member of one class (e.g. A_1) with

anxiety by pairing that member with an aversive sound played through a personal stereo[1]. To ensure the aversiveness of the stimulus, participants will be asked to select "the most unpleasant" from a choice of three. The individual would be warned in advance that at some points they will hear a short burst of the selected sound during this part of the experiment, albeit at a much louder level. Following this conditioning phase, presentation of the aversive sound will cease and the remaining members of that class (B_1C_1) would be presented to test for a transfer of anxiety. It is expected to find changed autonomic arousal at this stage, as measured by the heart monitor (bpm), which would be indicative of a transfer of function across members of the equivalence class. Furthermore, the second class would be tested ($A_2B_2C_2$) and it would be expected that no change in autonomic arousal would be observed as no members of this class will have been conditioned with anxiety. Participants will also be asked to rate aversiveness of each presented word to compare self-reported response with autonomic response.

In order to obtain physiological measures of anxiety, participants will be required to wear a small heart monitoring device throughout the experimental procedure. This will consist of a thin plastic belt fixed comfortably on the wrist and a plastic belt worn around the chest. One measure of physiological arousal is considered sufficient as this is standard in the relevant literature (e.g. Dougher et al., 1994).

Participants will be debriefed and a short semi-structured interview conducted to assess their opinions and experiences of the study.

---

[1] Dougher et al. (1994) used electrical shock in their study but it is felt this would not be acceptable to an ethics committee given the study intends to involve a patient population.

This procedure will be piloted initially and unless any problems arise, the research shall proceed as outlined above. It is hoped that participants for the pilot study will be Trainee Clinical Psychologists in the second year of the D.Clin.Psy. course at Glasgow University who will volunteer for the procedure.

Data Analysis

Kolmogorov-Smirnov tests will initially be conducted to assess the spread of the data, and, depending on the results of these, a series of unrelated t-tests or Mann-Whitney *U* tests will be used to explore between group variability on formal assessment measures; number of trials needed to complete initial training; overall rate and speed of transfer of function; and physiological differences between groups. The data will be collated, analysed and stored on the SPSS/PC+ package.

Practical Applications

The results from this study would be beneficial for both patients with anxiety disorders and clinicians who work in this area. The results would allow us to expand on existing models of behaviour and learning, understand the development and progression of psychopathology, and adapt treatment strategies appropriately. The results would assist clinicians to ensure their practice is evidence based, and that the most appropriate treatment strategies are implemented.

Timescales

Timescales for the project are listed below:

Piloting of procedure:	June 1999
Initial screening interviews with patients:	July - September 1999
Data collection from experimental procedure:	July - October 1999
Data Analysis:	October - December 1999
Report of experiment and results:	completed by March 2000

Timescales for individual participants:

It is anticipated that the whole procedure should take no longer than one and a half hours for each patient; this includes time for both the initial screening interview and the experimental procedure and debriefing session. People can take breaks if they wish although this will not be possible during the learning procedure.

Ethical Approval

Greater Glasgow Primary Care Health NHS Trust Ethics Committee has granted ethical approval for the study (Appendix 2.4).

References

Augustson, E.A., & Dougher, M.J. (1997). The transfer of avoidance evolving functions through stimulus equivalence classes. *Journal of Behavior Therapy and Experimental Psychiatry*.

Brown T.A., Di Nardo, P.A., & Barlow, D.H. (1994). *Anxiety Disorders Interview Schedule for DSM-IV*. New York: Graywind Publications Inc.

Cowley, B.J., Green, G., & Braunling-McMorrow, D. (1992). Using stimulus equivalence procedures to teach name-face matching to adults with brain injuries. *Journal of Applied Behavior Analysis*, 25, 461-475.

DeGrandpre, R.J., & Bickel, W.K. (1993). Stimulus control and drug dependence. *The Psychological Record*, 43, 651-666.

Devaney, J.M., Hayes, S.C. & Nelson, R.O. (1986). Equivalence class formation in language-able and language-disabled children. *Journal of the Experimental Analysis of Behavior*, 46, 243-257.

Dougher, M.J., Augustson, E.M., Markham, M.R., Greenway, D., & Wulfert, E. (1994). The transfer of respondent eliciting and extinction functions through stimulus equivalence classes. *Journal of the Experimental Analysis of Behavior*, 50, 125-144.

Eikeseth, S., & Smith, T. (1992). The development of functional and equivalence classes in high-functioning autistic children: The role of naming. *Journal of the Experimental Analysis of Behavior*, 58, 123-133.

Fenson, L., Dale, P.S., Reznick, J.S., Bates, E., Thal, D.J., & Pethick, S.J. (1994). Variability in early communicative development. *Monographs for the Society for Research in Child Development*, 59 (5, serial no. 242).

Hayes, L.J., Thompson, S., & Hayes, S.C. (1989). Stimulus equivalence and rule following. *Journal of the Experimental Analysis of Behavior*, 52, 275-291.

Horne, P.J., & Lowe, C.F. (1996). On the origins of naming and other symbolic behavior. *Journal of the Experimental Analysis of Behavior*, 65, 185-241.

Lazar, R.M., Davis-Lang, D., & Sanchez, L. (1984). The formation of visual stimulus equivalences in children. *Journal of the Experimental Analysis of Behavior*, 41, 251-266.

Leslie, J.C., Tierney, K.J., Robinson, C.P., Keenan, M., & Watt, A. (1993). Differences between clinically anxious and non-anxious subjects in a stimulus equivalence training task involving threat words. *The Psychological Record*, 43, 153-161.

Nelson, H.E. (1982). *National Adult Reading Test*. Oxford: NFER-Nelson.

Rachman, S. (1977). The conditioning theory of fear acquisition: A critical examination. *Behaviour Research and Therapy*, 15, 375-387,

Rachman, S. (1991). Neo-conditioning and the classical theory of fear acquisition. *Clinical Psychology Review*, 11, 155-173.

Sidman, M. (1971). Reading and auditory-visual equivalences. *Journal of Speech and Hearing Research*, 14, 5-13.

Roche, B., & Barnes, D. (1997). A transformation of respondently conditioned sexual arousal functions in accordance with arbitrary relations. *Journal of Experimental Analysis of Behavior*, 67, 275-301.

Sidman, M. (1977). Teaching some basic prerequisites for reading. In M Sidman, (Ed.) (1994). *Equivalence Relations and Behavior: A Research Story* (pp. 68 – 80). Boston: Authors Cooperative Inc.

Sidman, M., & Cresson, O., Jr. (1973). Reading and cross-modal transfer of stimulus equivalence in severe retardation. *American Journal of Mental Deficiency*, 77, 515-523.

Speilberger, C.D., Gorsuch, R.L., & Lushene, R.E. (1970). *Manual for the State-Trait Anxiety Inventory*. Consulting Psychologists Press: Palo Alto, CA.

Watt, A., Keenan, M., Barnes, D., & Cairns, E. (1991). Social categorization and stimulus equivalence. *The Psychological Record*, 41, 33-50.

Zigmond, A. S., & Snaith, R. P. (1983). The hospital anxiety and depression scale. *Acta Psychiatrica Scandinavica*, **67**, 361 - 370.
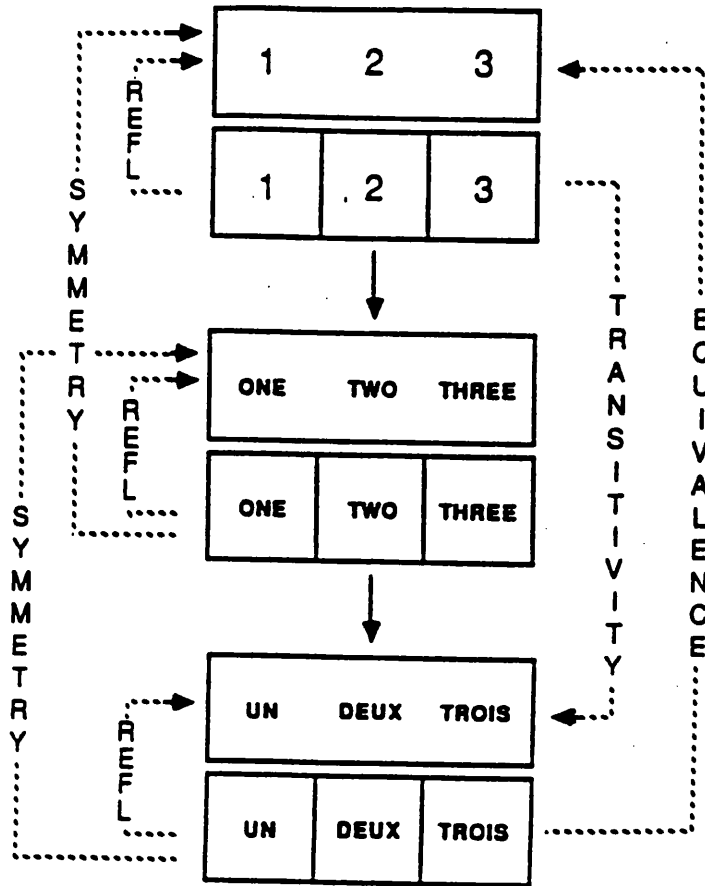
Figure 1

Pictorial representation of the elements involved in an equivalence relation. Solid lines represent the conditional discriminations that were explicitly taught. The dotted lines represent emergent conditional relations that were not explicitly taught, and illustrate the tests for reflexivity (REFL), symmetry, transitivity and equivalence. (Adapted from Sidman, 1990).

Table 1

Conditional relations to be tested and taught in equivalence procedure

Teach	Test
A_1B_1, A_1C_1	B_1C_1, $C_1 B_1$
A_2B_2, A_2C_2	$B_2 C_2$, C_2B_2

Chapter 4: Major Research Paper

Stimulus Equivalence and Transfer of Function in Anxiety

Major Research Paper submitted in partial fulfilment of the requirements for the degree of Doctor of Clinical Psychology

Prepared in accordance with requirements for submission to The Psychological Record (Appendix 3.1)

RUNNING HEAD: STIMULUS EQUIVALENCE AND ANXIETY

Address for correspondence:
Kathleen McHugh
Department of Psychological Medicine
Gartnavel Royal Hospital
1055 Great Western Road
Glasgow, G12 0XH

Abstract

The emergence of two, three member equivalence classes was compared between a group of 12 clinically anxious people and 12 non-anxious controls. Following the stimulus equivalence training and testing procedure, one member of one class was classically conditioned with an aversive auditory sound. Transfer of function from the conditioned stimulus to other members of that group was then explored. All subjects attained mastery criterion (100%) in relation training although there were highly significant differences between the two groups in time taken and number of trials required to reach mastery. Six participants in the anxious group and seven participants in the non-anxious group passed equivalence tests at greater than chance level and there were no significant between-group differences on this measure. All subjects demonstrated evidence of conditioning as measured by a change in heart rate (bpm) and subjective verbalisation. There was no discernible evidence of a transfer of function across trained equivalence classes although there was evidence of a possible formation of two new stimulus classes as a result of the classical conditioning procedure. Results are discussed in relation to the nature of anxiety and reasons for its detrimental effect on equivalence class formation, training structures in equivalence training procedures, and the expansion of current behavioural accounts of anxious psychopathology.

Introduction

Stimulus equivalence, first noted by Sidman (1971), is a phenomenon that accounts for new learning in the absence of direct training. Typically, a person will be taught a number of conditional discriminations e.g. A = B and B = C, following which, tests to explore emergent relationships are conducted including tests for symmetry (B = A, C = B), and tests for transitivity (A = C, C = A). The presence of the three requirements of reflexivity, symmetry and transitivity is seen as proof that an equivalence class has been formed between the stimuli. What has been most striking about equivalence relations to date is that they appear to be a phenomenon that is unique to language competent humans (see, for example, Barnes, McCullagh, & Keenan, 1990; Devany, Hayes, & Nelson, 1986; Hayes, 1989) leading to the conclusion that they are in someway linked to verbal phenomena (Horne & Lowe, 1996) although the exact nature of this relationship remains to be clarified (see McHugh, 2000, for full discussion).

Another aspect of equivalence relations which has generated considerable research interest is the so-called 'transfer of function' which occurs when an equivalence class has been formed. That is, if one member of an equivalence class holds, or attains a particular function, other members of the same class also acquire that function without the need for direct training. To date, transfer of function has been demonstrated for a number of functions including response control (e.g. Barnes & Keenan, 1993; Gatch & Osborne, 1989), autonomic responding in the form of classically conditioned sexual arousal (Roche & Barnes, 1997) and stimulus control over drug use (DeGrandpre & Bickel, 1993).

The phenomenon of stimulus equivalence and the transfer of function hold great promise in their apparent ability to offer a behaviour-analytical explanation of the development and maintenance of anxiety responding. Traditionally such theories have failed to provide a robust account, particularly in relation to anxiety which may develop in the absence of any aversive precipitating or maintaining event (e.g. see Rachman, 1977; 1991). The published research to date has been small, but holds promise. In relation to anxiety disorders, transfer of function has been demonstrated for classically conditioned fear (Dougher, Augustson, Markham, Greenway, & Wulfert, 1994) and avoidance responding (Augustson & Dougher, 1997). This latter study demonstrated clearly that control over avoidance responding in relation to mild electric shock could transfer via stimulus equivalence classes, although this did not reach clinical significance and was with a non-clinical population causing the authors to caution a need for replication of their results (Augustson & Dougher, 1997).

A concurrent body of research in the equivalence literature has explored the conditions under which language competent humans fail to form equivalence classes. There is increasing evidence that prior learning interferes with the development of new equivalence classes that are in opposition to one's previous experience. This has been demonstrated in relation to social history and experience (Watt, Keenan, Barnes, & Cairns, 1991), sex discrimination and gender-role stereotyping (Moxon, Keenan, & Hine, 1993), academic self concept (Barnes, Lawlor, Smeets, & Roche, 1996), and the diagnosis of a clinical anxiety disorder (Leslie, Tierney, Robinson, Keenan, & Watt, 1993). In the latter study, the authors found a positive diagnosis prevented the formation of equivalence classes with verbally 'loaded' stimuli consisting of anxiety provoking

situations and adjectives describing pleasant states, plus nonsense syllables. Peoples, Tierney, Bracken, and McKay (1998) carried such findings a step further when they demonstrated experimentally induced interference also prevented success on equivalence tasks.

The primary aim of the present study, therefore, was to extend the findings briefly outlined above and explore the emergence of equivalence classes between a group of clinically anxious individuals and a group of controls. This in itself was felt important as the majority of research to date has been with non-clinical populations. In addition it appears there are two main questions which have not been answered by research to date and which are pertinent to a behavioural analysis of the development and maintenance of anxiety disorders. Namely, can individuals with a clinically diagnosable anxiety disorder form equivalence classes under any circumstances given the finding of Leslie et al., (1993), and, can a successful transfer of anxiety as demonstrated by the work of Dougher et al. (1994) be replicated within a clinical population. In relation to the first question, group differences and possible effects of prior learning are controlled for in this study by initially exploring equivalence formation across sets of neutral stimuli.

Method

Participants

The clinical sample was recruited through the adult clinical psychology departments of Greater Glasgow Primary Care NHS Trust. Twenty-four individuals with a primary diagnosis of Generalised Anxiety Disorder, as determined by their own clinical psychologist, volunteered to take part in the study. The GAD section of the Anxiety

Disorders Interview Schedule for DSM-IV (ADIS-IV, Brown, DiNardo & Barlow, 1994) was used to confirm the primary diagnosis, as identified by the clinical psychologist responsible for their care. Two subjects were excluded: one due to previous history of head injury, and one whose co-diagnosis was bipolar disorder and for which she was receiving psychotropic medication. Both these points had been set as exclusion criteria. A further five people failed to attend their appointments, three formally withdrew from the study and two were excluded for reasons given below. This resulted in a total of twelve participants, two men and ten women, with a mean age of 37.08 years with a range of 20 to 60 years.

The control sample was recruited through Glasgow University and through personal contacts. A total of thirteen people were recruited though one was excluded for reasons given below. This left twelve participants, four men and eight women, with a mean age of 29.33 years with a range of 18 to 52 years.

All subjects in both groups had normal language competence, were literate, and had no visual or auditory deficits that may have interfered with the experimental procedure. A standardised reading test (the National Adult Reading Test; NART, Nelson, 1982) was administered in order to ensure groups were matched.

Experimental Setting, Apparatus and Materials

All subjects were seen individually in a small room, empty except for desk, chairs and experimental equipment. A Viglen computer and monitor were used to present the experimental stimuli which appeared as bright green characters on a dark green

background. The computer automatically recorded all responses during Phase 1 of the experiment. A standard keyboard was placed in front of participants in order that they could make their responses, however, this had been modified so that only the two keys necessary for responding were visible and accessible. Stimuli consisted of six, three letter nonsense words arbitrarily allocated an alphanumerical designation in one of two groups (Table 1). The actual 'words' themselves were randomly sampled from published literature which also used such stimuli. Participants were not made aware of the alphanumerical designation at any time during the experimental procedure.

Insert Table 1 About Here

During Phase 2 of the experiment white noise served as the unconditioned stimulus. Participants were presented with three different noises created with Wavelab (Version 2) and played through a Sony Walkman and personal headphones. They were asked to select the noise they found most distressing and which made them feel the most uncomfortable. Piloting of the experimental procedure confirmed this was efficacious as an aversive stimuli. All participants except one selected the same noise as the most aversive stimulus.

Throughout the experiment heart rate in beats per minute (bpm) was measured and recorded by a Polar Vantage NV heart rate monitor. This consisted of a wristwatch receiver worn around the wrist, and a Polar Coded Transmitter - a plastic belt with adjustable elastic strap that was worn around the chest. The Polar Advantage Interface

with Polar Precision Performance Software Version 2.0 for Windows was used to download the recorded heart information into analysable databases.

Immediately before the experimental procedure all participants completed the Hospital Anxiety and Depression Scale (Zigmond & Snaith, 1983) and the Speilberger State-Trait Anxiety Inventory (Speilberger, Gorsuch & Lushene, 1970). As mentioned earlier the NART was used and this was also administered at this time as was the GAD section of the ADIS-IV. It had been decided the non-clinical sample would only complete this interview if the other assessments noted above indicated the possible presence of an anxiety disorder or other psychiatric problem and it proved to be unnecessary to conduct the ADIS-IV with any of the control group. A visual analogue scale assessed level of anxiety before and after the experimental procedure to ensure the study did not leave participants in a state of elevated anxiety (Appendix 2.3). Finally a short semi-structured interview was conducted immediately following the experimental procedure to debrief and elicit participants' opinions and views of their personal experience of the experiment (Appendix 2.2).

The computer packages Statistical Procedures for Social Sciences (SPSS) Version 7.0 and Microsoft Excel Version 7.0 were used to analyse all recorded data.

Design and General Procedure

The experiment consisted of five phases and the overall procedure was granted ethical approval from Greater Glasgow Primary Care NHS Trust Ethics Committee. As

indicated above, participants initially completed a number of psychometric assessments before the experimental procedure was introduced, one phase at a time.

Phases 1-3: Stimulus Equivalence Training and Testing

All participants received standardised instructions presented via the computer monitor (Appendix 3.2). Initially, participants were familiarised with the study through five trial runs which instructed them to "press the right key" or "press the left key". Following this subjects received further written instructions (Appendix 3.2) presented on the computer monitor, informing them the experimental procedure was about to commence. The sample stimulus was presented to subjects in the middle of the screen at the top with two comparative stimuli below, on the bottom left and right sides of the screen. Subjects selected the word they thought 'went with' the sample word by pressing the corresponding key on the specially adapted keyboard. The screen only cleared after a subject had completely released the key pressed to select their answer, at which point the written feedback of either "Correct!" or "Wrong!" appeared for three seconds before the screen would clear and the next set of stimuli would be presented.

In Phase 1 of the experimental procedure subjects were asked to complete matching-to-sample tasks (identity training) in which each of the six stimuli were presented in randomised blocks of three, with a performance criterion of 100% correct responding adopted. Thus there were a minimum of eighteen matching-to-sample identity trials presented. Phase 2 involved the teaching of a number of conditioned discriminations (4) through presentation of stimuli in exactly the same manner outlined above. This time, however, stimuli from each relation were randomly presented and a performance criteria

of 90% e.g. participants had to get eighteen out of a total block of twenty trials correct in order to have reached 90% accuracy for a particular relation. This meant there were a minimum of eighty trials presented. An error rate greater than 10% for any particular relation led to a further block of twenty trials, again randomly presented, this being repeated until the mastery criterion of 90% was achieved for all four relations. During this training period the stimuli designated as A1 (VEK) and A2 (ZAG) always acted as samples, while the B and C stimuli acted as comparisons.

In both the matching-to-sample phase and the conditional discrimination training phase the order of trial types and position of comparison stimuli was randomised to prevent the generation of any correlations between a particular stimulus and its position on screen. Feedback, whether positive or negative was also given for each trial in these phases.

Phase 3 involved testing for emergent symmetrical relations via twelve presentations of the reversed trained relations, and testing for emergent untrained relations, namely the tests for transitivity and equivalence which was conducted by six presentations of each trial type. No feedback was given during this phase. All trained and tested relations are presented in Table 2.

Insert Table 2 About Here

Phase 4: Classical Conditioning

A delayed classical conditioning procedure based on that successfully used by Augustson and Dougher (1997) was implemented to establish a relationship between the CS+ and

the aversive auditory stimulus. It was hoped the noise would induce an anxious reaction. The A2 stimulus (ZAG) acted as CS+ while the CS- was the A1 stimulus (VEK). Powerpoint (Version 4.0) was used to present either A1 or A2 for a total of six presentations each, in a semi-random order, with the qualification that no more than two A1 or A2 presentations could occur in sequence. Stimulus duration was ten seconds, the interstimulus interval was also ten seconds and presentation of the aversive noise varied between five and eight seconds. Participants were not required to press any keys or do anything during this phase other than watch the computer monitor and listen to the noise, when it was presented, through headphones.

Phase 5: Test for Transfer

The final part of the experiment explored whether or not the conditioned response established in Phase 4 had differentially transferred to the other members of the group the CS+ belonged to, namely B2 (ROL) and C2 (TEP). Again, using Powerpoint (Version 4.0) all of the stimuli were randomly presented to participants one at a time over three trial blocks. At no time was the aversive noise played to participants although they continued to wear the headphones. During this phase participants were also asked to mark on a scale of 0-100 their response to the question *"How unpleasant is this word?"* A separate scale was used for each word across each trial, providing a total of eighteen word ratings (three for each stimulus). Immediately following this, participants were asked to rate each of the six stimuli as either *positive, neutral* or *negative*, and, finally, also for each of the six stimuli circle *'yes'* or *'no'* in response to the question "Does this word make you feel tense?"

Participants were then debriefed and informed of the rationale behind the experiment. The procedure was concluded by completion of the semi-structured interview to ascertain each individual's beliefs and opinions held during and after the experiment, particularly in relation to the strategies they employed to determine which stimuli belonged together, and what criteria they were aware of employing when asked to rate the words at the end of the procedure. It was also established that participants had not been left in any way anxious by the overall procedure.

Results

In the first instance, the Kolmogorov-Smirnov test was applied to all the data to explore the distribution of results in order to subsequently select appropriate parametric or non-parametric tests. Power calculations conducted by entering results from the relation training phase into the UCLA power calculator indicated power > 0.8921, $p = 0.05$ for the sample size of $n = 12$ in each group.

Psychometric Tests

The mean scores on the HADS Anxiety and Depression scale were 12.5 and 17.29 respectively for the clinical group; corresponding scores for the control group were 5.67 and 7.71. Independent samples t-test (HADS-A) and Mann-Whitney U (HADS-D) tests were carried out to compare differences and found significant differences between the two groups for scores on both the HADS-A ($t = 5.029$, df = 22, $p < 0.0005$) and the HADS-D (MW-$U = 14.5$, $p < 0.0005$). Similarly, independent t-tests showed significant differences between mean raw scores for the Speilberger State Anxiety scale: 45.00 for the clinical sample and 29.33 for the control group ($t = 3.781$, df = 22, $p < 0.001$), and for

the Speilberger Trait Anxiety scale with the same samples scoring 57.67 and 35.58 (t = 6.655, df = 22, p < 0.0005). There were no significant differences between the groups in relation to performance on the NART and its three subscales (PFS-IQ, PV-IQ and PP-IQ) indicating all participants were matched in this respect.

Stimulus Equivalence Training and Testing

All participants reached mastery criterion (100%) during the identity training, and except for two, did so within the minimum number of trials possible (18). The remaining two participants, one from each sample, did so within 21 and 24 trials. There were no significant differences between groups or within groups in time taken to complete identity training.

Mastery criterion (90%) on the conditional discriminations task (relation training) was reached by all except for two of the clinically anxious sample and one of the control sample who were subsequently excluded[1]. The remaining 24 participants displayed significant between group differences in relation to number of trials taken to attain mastery (Table 3) and, consequently, the clinically anxious group also took significantly longer time to reach performance criterion with an overall mean of 2205.17 seconds compared to the control group mean of 1343.67 seconds (t = 3.367, df = 22, p <0.003).

Insert Table 3 About Here

---

[1] These subjects may have eventually reached mastery criterion with continued training but in this experiment they were unable to do despite generous time limits. It is not known why some people fail to learn taught relations in equivalence experiments but it seems to be attributable to a combination of low motivation and the development of idiosyncratic rules which directly contravene the taught relations (Dougher - *pers. comm.*).

The emergence of combined transitivity and symmetry is generally assumed to be a direct indication of equivalence (Sidman, 1996). Percentage levels of correct responding for the clinically anxious group and the control group are shown in Table 4 and Table 5. Differences between groups on this measure were not significant.

Insert Table 4 About Here

Insert Table 5 About Here

Conditioning

The results in Figure 1 and Figure 2 show that eleven people in the control group and ten in the clinically anxious group evidenced a discernible drop in heart rate during the conditioning phase in comparison to baseline responding, which demonstrates the delayed classical conditioning procedure was successful. While deccelaration in heart rate is a common response in classical conditioning procedures such as this (Andreassi, 2000), acceleration has also been noted (Andreassi, 2000) as demonstrated by the twelfth member of the control group and two members of the anxious group (Figures 1 and 2) and Hare (1972) points out that individual differences will largely determine whether one notes cardiac acceleration or deceleration. Therefore, it can be seen that all subjects in the study showed evidence of conditioning.

Insert Figure 1 About Here

Insert Figure 2 About Here

Further proof of conditioning was gained by noting the physical and verbal responses of participants when they were exposed to the aversive auditory stimulus. All participants in the study exhibited a startle response for at least the first two conditioning trials. Many people made verbal comments both during the procedure itself and on completion of the experiment, for example, calling it an "awful noise", "unpleasant" and even noting "it made me jump". Furthermore, everyone was able to name the specific stimulus (A2 or ZAG) that accompanied the noise.

Transfer of Function

Figures 1 and 2 show that there was no clear physiological evidence of a transfer of function, in relation to the classically conditioned anxious responding. Participants generally demonstrated change in heart rate (bpm) that tended towards baseline levels. Although there were individual differences in magnitude of change, these were neither significant nor indicative of any distinct pattern.

The results of participants' word ratings recorded during the transfer phase are shown in Table 6. The mean score of each person's response in relation to the question *'How unpleasant is this word?'* for each word across three presentations was taken to gain a representative picture. A higher score represents a higher rating of 'unpleasantness'. These results support the physiological evidence of conditioning as ZAG scores are highest, and similarly, concur with the lack of physiological evidence of a transfer of function as the other two members of that equivalence class (ROL and TEP) do not have

significantly higher scores. Interestingly, the stimulus VEK was also rated as more unpleasant than other words and possible reasons for this will be discussed later. A Friedman test applied to the data showed these differences were significant ($Xr^2 = 23.675$, df = 5, p < 0.005).

Insert Table 6 About Here

On completion of the experimental procedure, participants were asked to rate each of the stimuli as *positive*, *neutral* or *negative*, and indicate whether or not a particular stimulus made them feel tense. Responses are detailed in Table 7.

Insert Table 7 About Here

As part of the semi-structured debriefing interview, participants were asked how they had come to their particular judgements of words. Only two participants, both from the clinically anxious group (anx1 and anx2) explicitly noted they rated ZAG both negative and tense "because of the noise" and only participant anx2 rated any member of that equivalence class similarly (ROL), giving the reason "it goes with ZAG so the unpleasant feelings from the noise carry over". Both these people quite independently chose the word "apprehensive" to describe how they felt on being presented with the stimulus ZAG after the conditioning phase, and, furthermore, participant anx2 also noted she used active coping strategies (breathing exercises) to help her cope with her observed increased tension at this time.

Otherwise, participants most commonly cited their judgements and ratings of the stimuli were made by relating each stimulus to common words they already knew (e.g. YIZ "sounds like" yes; LUD "made me think of" luddites; ZAG "is like zig-zag"), or more generally, on the pronunciation of the word and its component letters with n = 15 highlighting this as the basis for their ratings (9 non anxious and 6 anxious). There emerged a consistent pattern of responding here with people typically referring to words as "soft" (usually ROL and/or TEP) or "harsh" (e.g. YIZ, VEK and/or ZAG) due to phonetic properties. One member of this sub-group (anx7) rated all words 'negative' because "they're all nonsense words so don't mean anything". Several more people expressed views in line with participant nona2 who noted "I know I shouldn't like ZAG because of the noise, but I can keep them separate and base the ratings on the way it sounds in my head and the word-shape".

Finally, seven participants (n = 3 control sample, n = 4 anxious sample) were unable to give any rationale as to what criteria they employed in making word ratings. Three members of this sub-group (nona7, anx4, anx10) rated all words neutral and answered 'no' to the tension question which would suggest they had been able to keep a clear distinction between the experimental stimuli and any anxiety or tension felt. Of the remaining four people, despite being unable to give reasons why, one person rated both ZAG and VEK negative and tense (nona1) and another (nona3) rated ZAG and ROL negative and ZAG also tense. The two clinically anxious participants (anx5 and anx8) had no discernible pattern to their responding (see Table 7).

Discussion

There are a number of pertinent findings to emerge from this study. First, individuals with a clinical diagnosis of anxiety disorder can form equivalence classes although there were significant between-group differences in the number of trials, and therefore overall time taken, to learn the conditional discriminations, with the clinically anxious group taking much longer. Second, despite all participants ultimately reaching mastery criterion during the relation training phase, only seven of the control group and six of the clinically anxious group could be said to have passed the equivalence tests (as defined by a criteria of at least 75% correct responding). Third, despite successful conditioning of one stimulus with an aversive auditory sound, there was no conclusive evidence of a transfer of function in terms of anxious responding across equivalence classes taught in Phases 1-3. These three points will be discussed in turn and in relation to the main aims and hypotheses of the study.

One of the main aims of this study was to explore whether or not the presence of a clinical diagnosis of anxiety affected the formation of equivalence classes given previous research which suggested a positive diagnosis may hinder success (see, for example, Leslie et al., 1993). Using neutral stimuli to control for any effects of prior learning, this study demonstrated that clinically anxious people can form equivalence classes; there were no significant differences between the two groups in terms of overall percentage correct responding on equivalence tests (Tables 4 and 5). However, an unexpected finding was that the anxious group took a significantly greater number of trials, and therefore a significantly longer time to attain mastery in the relation training phase. While this was somewhat of a surprise, it is not that illogical a finding given the very

nature of that group's diagnosis, and confirmed by significantly higher scores on measures of state and trait anxiety.

This highly significant difference could be accounted for by the difference in state anxiety between the two groups as highlighted by the Speilberger State Anxiety assessment. Information processing models have highlighted a pre-attentive threat bias in worriers which negatively affects subjective interpretation of both internal and external cues (Mathews, 1990) and therefore could lead to a higher incidence of negative self verbalisation which may have had a detrimental effect on performance. In addition, worry is predominantly a verbal, conceptual activity (Borkovec & Inz, 1990; Wells & Morrison, 1994) which requires the sustained and focused attention of the worrier (Wells & Morrison, 1994) and this necessity to attend to one's anxiety and worry may also prevent one from effectively attending to other information, in this case, the experimental task. This may have implications for treatment especially when intervention involves new verbal learning and/or perhaps increases a person's state anxiety.

The second noteworthy finding from this study was the failure of some participants in both groups to pass equivalence tests despite successfully attaining mastery criterion in the training phase. Failure to pass equivalence tests despite substantial training is not unusual and can be seen as a failure to have adequately established the equivalence class during initial training. Teaching participants to apply labels or name the stimuli during training has been found to positively influence subsequent equivalence responding (Dugdale & Lowe, 1990; Lowe & Beasty, 1987) and certainly in this study some participants appeared to have spontaneously adopted such a strategy during the relation

training phase. When asked at the end of the study how they had differentiated between the two groups, many people reported they had, in effect, 'named' the stimuli, e.g. by running two nonsense words together to form one larger 'word' (ZAGROL). However, as this was not the focus of this study, no systematic exploration of the relationship between such strategies employed and subsequent performance on equivalence tests was undertaken. Indeed, the relationship of naming to stimulus equivalence is a highly debated subject in its own right and the reader is referred to the substantial literature that exists on this topic (e.g. see Horne & Lowe, 1996)

More recently, failure to pass equivalence tests has become a methodological issue centring around the question of how training should be structured in order to maximise success (e.g. see Saunders & Green, 1999). This current study used what has been called a "one-to-many" training structure, that is a single sample was presented (e.g. A1), with multiple comparisons from which to select a response (e.g. B1 or B2). The downfall of this style of training is that is does not require presentation of all simple discriminations that are later called on when drawing the conditional discriminations necessary to pass equivalence tests. An alternative training structure would have been "many-to-one" (e.g. sample B1, C1 with comparison A1 or A2) which does present all possible simple conditional discriminations that will appear in all later equivalence tests and so, in this regard, may be considered more conducive to successful equivalence responding (Barnes, 1994; Saunders & Green, 1999). The difference between the two training structures in producing two, three-member equivalence classes as used in this current study is summarised in Table 8.

Insert Table 8 About Here

However, despite the apparent superiority of the many-to-one training structure, support for it is not clear cut, especially in studies involving a small number of classes, with successful equivalence responding using one-to-many training reported in a number of studies (e.g. Arntzen & Holth, 1997; Innis, Lane, Miller & Critchfield, 1998; Green & Saunders, 1999 for review), hence the reason why such a style of training was employed in this study. Given that the literature is inconsistent, though, a practical follow-up to this current study would be to again compare anxious and non-anxious populations, but using a randomised, mixed one-to-many and many-to-one design in order to consider possible effects of the different training structures.

The third finding, contrary to expectations and aims, was that there was no definite evidence of a transfer of function across members of an equivalence class in anxiety, regardless of group status. Only one anxious participant seemed to show transfer of function as following the conditioning procedure she noted the aversiveness of a stimuli due to its "going with" the CS+. Therefore, this study was unable to replicate the findings of Dougher et al. (1994) who did successfully demonstrate such a transfer with a student population. However, the aversive stimulus in that study was mild electric shock which may have been a more powerful negative discriminant thereby facilitating transfer of function. There is also an alternative explanation worth considering.

The physiological evidence of conditioning highlighted in Figures 1 and 2 demonstrates the classical conditioning procedure was successful and so emphasises the aversive

nature of the stimulus used in this study. Similarly, this is confirmed by the physical and verbal responses of participants during the conditioning phase as highlighted in the results section. Furthermore, the stimulus paired with the aversive noise (ZAG) was given significantly higher ratings of 'unpleasantness' by participants (Table 6) and, more subjects answered in the affirmative to the question 'Does this word make you feel tense?' in relation to ZAG than for any other stimulus (see Table 7). However, the stimulus VEK was also rated significantly more unpleasant than all the other stimuli (Table 6) despite being in a separate equivalence class to ZAG. Had there been a successful transfer of function across trained equivalence classes one would have expected to find VEK, and other members of its class YIZ and LUD significantly lower than ZAG, ROL and TEP. However, as VEK acted as CS- during the conditioning phase, it would seem then that by its very inclusion in this phase, this stimulus was also subject to negative classical conditioning and attained similar properties to the CS+ which was, of course, ZAG. This effect may have been facilitated by the fact these two stimuli also both acted as samples during the original training procedure so in some respects had already been made distinct from other stimuli. One may even draw the conclusion that two new stimulus classes may have been formed: ZAG and VEK in an 'unpleasant' class, and the four remaining stimuli in a 'not unpleasant' class.

While the word ratings made by participants seem to clearly support this, it is interesting to note that only two of the 24 participants explicitly noted they disliked ZAG because of the aversive sound, and no-one explicitly related VEK to the sound. The majority of participants (n = 15) appeared to make sense of the 'nonsense' words by likening them to known words and using these to make their word ratings, although a further seven were

unable to give any reason. Therefore it is not clear precisely what mechanisms may account for the noted significantly higher 'unpleasant' ratings given to ZAG and VEK. A useful follow-up to this study, in conjunction with above noted changes to the training procedure would be to repeat the procedure changing the conditioning phase to ensure only one stimulus is being conditioned to the aversive stimulus.

Further exploration is warranted here as clarification would expand behavioural accounts of the development and maintenance of psychopathological anxiety. As noted in the introduction, transfer of function has been successfully demonstrated for a number of functions including anxiety (Dougher et al., 1994) and avoidance responding (Augustson and Dougher, 1997). However, in this latter study the authors themselves caution that the conditioned responding they observed was not at clinically significant levels. Stimulus equivalence and transfer of function can account for the emergence of novel, untrained behaviours; further research is required if they are to expand our understanding of anxiety disorders generally, and GAD in particular.

References

Andreassi, J.L. (2000). *Psychophysiology: human behavior and physiological response.* Hillsdale, NJ: Lawrence Erlbaum Associates.

Arntzen, E., & Holth, P. (1997). Probability of stimulus equivalence as a function of training design. *The Psychological Record,* 47, 309-320.

Augustson, E.A., & Dougher, M.J. (1997). The transfer of avoidance evolving functions through stimulus equivalence classes. *Journal of Behavior Therapy and Experimental Psychiatry.*

Barnes, D., & Keenan, M. (1993). A transfer of functions through derived arbitrary and non-arbitrary stimulus relations. *Journal of the Experimental Analysis of Behavior,* 59, 61-81.

Barnes, D., Lawlor, H., Smeets, P.M., & Roche, B. (1996). Stimulus equivalence and academic self-concept among mildly mentally handicapped and non-handicapped children. *The Psychological Record,* 46, 87-107.

Barnes, D., McCullagh, P.D., & Keenan, M. (1990). Equivalence class formation in non-hearing impaired and hearing impaired children. *The Analysis of Verbal Behavior,* 8, 19-30.

Borkovec, T.D., & Inz, J. (1990). The nature of worry in generalised anxiety disorder: A predominance of thought activity. *Behaviour Research and Therapy*, 28, 153-158.

Brown T.A., Di Nardo, P.A., & Barlow, D.H. (1994). *Anxiety Disorders Interview Schedule for DSM-IV*. New York: Graywind Publications Inc.

DeGrandpre, R.J., & Bickel, W.K. (1993). Stimulus control and drug dependence. *The Psychological Record*, 43, 651-666.

Devaney, J.M., Hayes, S.C., & Nelson, R.O. (1986). Equivalence class formation in language-able and language-disabled children. *Journal of the Experimental Analysis of Behavior*, 46, 243-257.

Dougher, M.J. (1998). Stimulus equivalence and the untrained acquisition of stimulus functions. *Behavior Therapy*, 29, 577-591.

Dougher, M.J., Augustson, E.M., Markham, M.R., Greenway, D., & Wulfert, E. (1994). The transfer of respondent eliciting and extinction functions through stimulus equivalence classes. *Journal of the Experimental Analysis of Behavior*, 50, 125-144.

Dugdale, N., & Lowe, C.F. (1990). Naming and stimulus equivalence. In D.E. Blackman & H. Lejeune (Eds.), *Behavior analysis in theory and practice: Contributions and controversies* (pp. 115-138). Hillsdale, NJ: Erlbaum.

Gatch, M.B., & Osborne, J.G. (1989). Transfer of consequential stimulus functions via equivalence class development. *Journal of the Experimental Analysis of Behavior*, 51, 369-378.

Hare, R.D. (1972). Cardiovascular components of orienting and defensive responses. *Psychophysiology*, 9, 606-614.

Hayes, S.C. (1989). Nonhumans have not yet shown stimulus equivalence. *Journal of the Experimental Analysis of Behavior*, 51, 385-392.

Horne, P.J., & Lowe, C.F. (1996). On the origins of naming and other symbolic behavior. *Journal of the Experimental Analysis of Behavior*, 65, 185-241.

Innis, A., Lane, S.D., Miller, E.R., & Critchfield, T.S. (1998). Stimulus equivalence: Effects of a default-response option on emergence of untrained stimulus relations. *Journal of the Experimental Analysis of Behavior*, 70, 87-102.

Leslie, J.C., Tierney, K.J., Robinson, C.P., Keenan, M., & Watt, A. (1993). Differences between clinically anxious and non-anxious subjects in a stimulus equivalence training task involving threat words. *The Psychological Record*, 43, 153-161.

Lowe, C.F., & Beasty, A. (1987). Language and the emergence of equivalence relations: A developmental study. *Bulletin of the British Psychological Society*, 40, A42.

Mathews, A. (1990). Why worry? The cognitive function of anxiety. *Behaviour Research and Therapy*, 28, 455-468.

McHugh, K. (2000). Stimulus equivalence and the transfer of function in relation to psychopathological anxiety. *Unpublished D.Clin.Psy. thesis*. University of Glasgow

Moxon, P.D., Keenan, M., & Hine, L. (1993). Gender role stereotyping and stimulus equivalence. *The Psychological Record*, 43, 381-394.

Nelson, H.E. (1982). *National Adult Reading Test*. Oxford: NFER-Nelson.

Peoples, M., Tierney, K.J., Bracken, M., & McKay, C. (1998). Prior learning and equivalence class formation. *The Psychological Record*, 48, 111-120.

Rachman, S. (1977). The conditioning theory of fear acquisition: A critical examination. *Behaviour Research and Therapy*, 15, 375-387,

Rachman, S. (1991). Neo-conditioning and the classical theory of fear acquisition. *Clinical Psychology Review*, 11, 155-173.

Roche, B., & Barnes, D. (1997). A transformation of respondently conditioned sexual arousal functions in accordance with arbitrary relations. *Journal of the Experimental Analysis of Behavior*, 67, 275-301.

Saunders, R.R., & Green, G. (1999). A discrimination analysis of training-structure effects on stimulus equivalence outcomes. *Journal of the Experimental Analysis of Behavior*, 72, 117-137.

Sidman, M. (1971). Reading and auditory-visual equivalences. *Journal of Speech and Hearing Research*, 14, 5-13.

Sidman, M. (1996). *Equivalence Relations and Behavior: A Research Story*. Boston: Authors Cooperative Inc.

Speilberger, C.D., Gorsuch, R.L., & Lushene, R.E. (1970). *Manual for the State-Trait Anxiety Inventory*. Consulting Psychologists Press: Palo Alto, CA.

Watt, A., Keenan, M., Barnes, D., & Cairns, E. (1991). Social categorization and stimulus equivalence. *The Psychological Record*, 41, 33-50.

Wells, A., & Morrison, T. (1994). Qualitative dimensions of normal worry and normal intrusive thoughts: A comparative study. *Behaviour Research and Therapy*, 32, 867-870.

Zigmond, A.S., & Snaith, R.P. (1983). The hospital anxiety and depression scale. *Acta Psychiatrica Scandinavica*, 67, 361 - 370.

Figure 1
Heart Rate Change Across Experimental Phase
Control Group
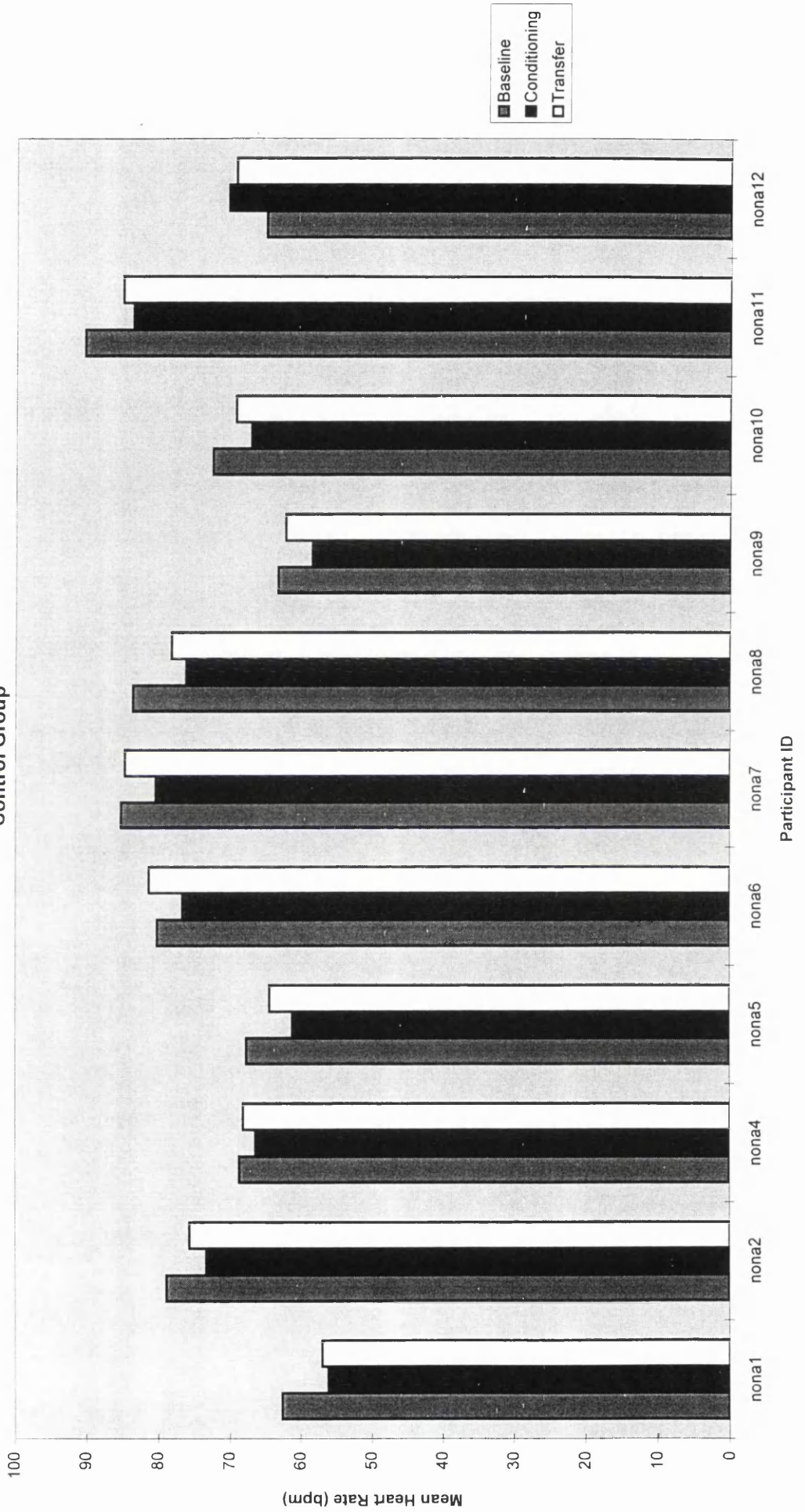
Figure 2
Heart Rate Change Across Experimental Phase
Anxious Group
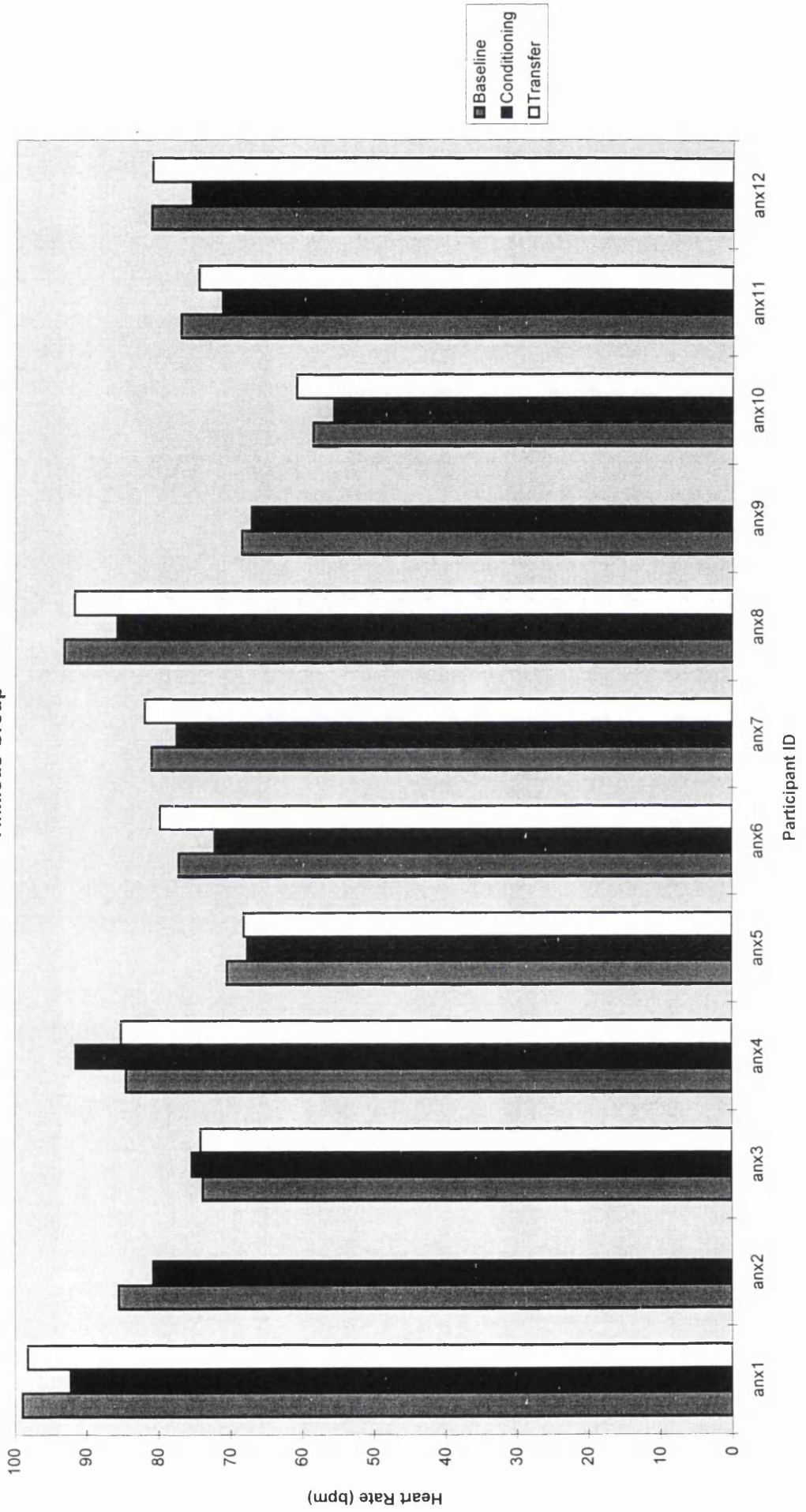
Table 1

Stimuli used to form equivalence classes during experiment

	Word	Alphanumerical designation
Group 1	VEK	A1
	YIZ	B1
	LUD	C1
Group 2	ZAG	A2
	ROL	B2
	TEP	C2

Table 2

Trained and tested relations in equivalence procedure

Identity training	Trained conditional Discriminations	Symmetry tests	Transitivity and equivalence tests
(Phase 1)	(Phase 2)	(Phase 3)	(Phase 3)
A1-A1	A1-B1	B1-A1	B1-C1
B1-B1	A1-C1	C1-A1	B2-C2
C1-C1	A2-B2	B2-A2	C1-B1
A2-A2	A2-C2	C2-A2	C2-B2
B2-B2			
C2-C2			

Table 3
Between group differences for number of trials taken to reach
mastery criteria during relation training phase

Subject	A1B1	A1C1	A2B2	A2C2
*nona1	40	100	60	100
nona2	60	60	40	60
nona3	40	40	40	20
nona4	40	60	40	60
nona5	40	60	40	40
nona6	20	20	20	40
nona7	40	20	40	20
nona8	40	40	20	40
nona9	40	40	60	40
nona10	20	40	20	40
nona11	60	40	60	40
nona12	20	60	40	60
Mean	38.33	48.33	40.00	48.33
*anx1	40	40	40	40
anx2	40	80	80	80
anx3	80	80	60	60
anx4	140	140	100	140
anx5	60	60	80	60
anx6	100	100	20	120
anx7	100	80	160	100
anx8	40	60	40	80
anx9	20	40	40	20
anx10	40	60	40	40
anx11	160	160	140	180
anx12	120	80	120	100
Mean	78.33	81.67	76.67	85.00
Significance levels for between group differences (Mann-Whitney U Test)	0.024	0.010	0.039	0.033

* *'nona' denotes member of nonclinical sample, 'anx' denotes member of clinically anxious sample*

Table 4

Non-anxious participants percentage correct responding on equivalence tests

Subject	B1C1	B2C2	C1B1	C2B2	All Trials
*nona1	0	67	0	0	16
nona2	100	100	100	100	100
nona3	33	100	0	100	58
nona4	0	100	0	33	33
nona5	0	0	0	0	0
nona6	100	67	100	100	92
nona7	100	100	100	100	100
nona8	0	100	100	0	50
nona9	100	100	100	100	100
nona10	100	100	100	100	100
nona11	100	100	100	100	100
nona12	100	100	100	100	100
Mean	61.08	86.17	66.67	69.42	70.75

* 'nona' denotes member of nonclinical sample

Table 5

Clinically anxious participants percentage correct responding on equivalence tests

Subject	B1C1	B2C2	C1B1	C2B2	All Trials
*anx1	33	0	0	100	33
anx2	33	100	0	100	58
anx3	100	100	100	100	100
anx4	100	100	33	67	75
anx5	0	0	0	0	0
anx6	100	100	100	100	100
anx7	0	0	0	0	0
anx8	33	67	100	100	75
anx9	0	100	0	100	50
anx10	100	100	100	100	100
anx11	33	100	0	100	58
anx12	100	100	100	100	100
Mean	52.67	72.25	44.42	80.58	62.42

* 'anx' denotes member of clinically anxious sample

Table 6

Participants' ratings of stimuli during Phase 5: Test for transfer

	Mean Score	Minimum Score	Maximum Score
VEK	31.67	0	90
YIZ	21.60	0	100
LUD	21.53	0	89
ZAG	37.33	0	100
ROL	20.67	0	77
TEP	19.67	0	66

Table 7

Participants' ratings of stimuli on completion of experimental procedure

	VEK	YIZ	LUD	ZAG	ROL	TEP
nona1	*neg	pos	pos	*neg	neut	neut
nona2	*neg	*neg	neut	*neut	pos	neut
nona3	neut	pos	neut	*neg	neg	neut
nona4	*neut	*neg	*neg	*pos	pos	neut
nona5	neg	pos	neut	neut	neut	neg
nona6	neg	pos	neg	neut	neut	neut
nona7	neut	neut	neut	neut	neut	neut
nona8	neut	*neg	neut	neut	neut	*neg
nona9	neg	pos	neg	neut	neut	neut
nona10	neut	neut	pos	neut	pos	neut
nona11	*neg	neg	neut	*neg	pos	pos
nona12	neg	neg	neut	neut	pos	neut
anx1	neut	neut	neut	*neg	neut	neut
anx2	neut	neut	neut	*neg	*neg	neut
anx3	*neg	*neut	*neut	*neg	pos	neut
anx4	neut	neut	neut	neut	neut	neut
anx5	*pos	neg	neut	neut	neg	neg
anx6	*pos	neg	neut	*neg	neut	*neg
anx7	neg	neg	neg	neg	neg	neg
anx8	neg	*neg	*neut	*neut	pos	neut
anx9	*neg	*neut	pos	*neg	pos	pos
anx10	neut	neut	neut	neut	neut	neut
anx11	neg	*neut	neg	neut	*pos	*neut
anx12	neg	*pos	*neg	*pos	*neg	neut

†Key: 'neg' = negative, 'pos' = positive, 'neut' = neutral. * denoted person also replied

'yes' to the question "Does this word make you feel tense?"

Table 8

Simple discriminations in two different training structures

designed to produce two, three-member equivalence classes

Structure	Grand Total	Number not presented in training/Total	Number not presented in training but presented on equivalence tests	Number not presented in training but presented on symmetry tests
one-to-many	15	4/15	4	4
many-to-one	15	0/15	0	0

adapted from Saunders & Green (1999), pp. 126

Clinical Case Research Study:

An Evaluation of Psychological Therapy for Insomnia

Clinical Case Research Study Submitted in partial fulfilment of the requirements for the degree of Doctor of Clinical Psychology

Prepared in accordance with guidelines for contributors to Behavioural and Cognitive Psychotherapy (see Appendix A, Part 2)

RUNNING HEAD: PSYCHOLOGICAL INTERVENTION FOR INSOMNIA

Address for Correspondence:
Kathleen McHugh
Department of Psychological Medicine
Gartnavel Royal Hospital
1055 Great Western Road
Glasgow, G12 0XH

Abstract

The past two decades have witnessed a growth in research and development of psychological interventions to manage chronic insomnia such that the general efficacy of such treatments is well established (e.g. see Morin et al., 1999). However, the efficacy of individual treatment components remains less clear cut. This study used a multiple baseline design to tailor psychological intervention in a patient with chronic insomnia who was also dependent on hypnotic medication. In this case study, psychological techniques found to be most helpful were sleep restriction, stimulus control measures, education and sleep diaries, in that order.

Key words: insomnia, tailored treatment, sleep restriction, stimulus control

Chapter 6: Appendices

Appendix 1: Small Scale Service Evaluation

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.

Copyright.   The material in Health Bulletin is copyright. Items may be freely reproduced in professional journals, provided that suitable acknowledgment is made and that reproduction is not associated with any form of advertising material. In other cases, permission to reproduce extracts should be sought through the Editor from The Stationery Office Publishing Division (Copyright Section), which controls the copyright.

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.

DOB:_____ **AGE:**_____   **GENDER**   □ M   □ F
EPIC:_____

SPECIALITY REFERRED FROM:

plastic surgery	□ 1	*vascular surgery*	□ 9
palliative care	□ 2	*orthodontics*	□ 10
urology	□ 3	*general surgery*	□ 11
stroke rehabilitation	□ 4	*physiotherapy*	□ 12
general medicine	□ 5	*audiology*	□ 13
oncology	□ 6	*speech & language therapy*	□ 14
pain - anaethesist	□ 7	*breast care nurse*	□ 15
diabetes	□ 8	*other*	□ 16

STATUS IN 1997:   □ new □ return   **WHEN REFERRED:**_____

REASON FOR REFERRAL:

_____

_____

PHYSICAL HEALTH PROBLEMS _____

_____

PSYCHOLOGY
First Appt. Offered: _____   **ATTEND:**   yes   no, if no, DNA   □
                                                                          CANCEL   □
                                                        date first seen: _____

PSYCHOLOGY DIAGNOSIS:

_____

_____

PSYCHOMETRICS USED:

BDI-II	□	dates assessed	_____
BAI	□	dates assessed	_____
McGILL	□	dates assessed	_____
PAIN	□	dates assessed	_____
OTHER	□	dates assessed	_____

STILL IN TREATMENT: yes □   no □ if no, when discharged _____
                                   reason for discharge _____

seen as **OUT-PT** □   **IN-PT** □

ANY CONCURRENT TREATMENTS _____

_____

DISTRIBUTION LIST FOR CLINICAL PSYCHOLOGY QUESTIONNAIRES

DR L MURRAY	CONSULTANT IN A&E SERVICES
DR K MACKENZIE	CONSULTANT IN ANAESTHETICS
DR R JACKSON	CONSULTANT IN ANAESTHETICS
DR I R MACDIARMID	CONSULTANT IN ANAESTHETICS
DR R MCMAHON	CONSULTANT IN ANAESTHETICS
DR K MEIKLEJOHN	CONSULTANT IN ANAESTHETICS
DR D RYAN	CONSULTANT IN ANAESTHETICS
DR I TAYLOR	CONSULTANT IN ANAESTHETICS
DR P WYLIE	CONSULTANT IN ANAESTHETICS
DR A HARDIE	CONSULTANT IN DERMATOLOGY
DR L MARTIN	CONSULTANT IN GERIATRIC MEDICINE
DR J BLAIR	CONSULTANT IN GERIATRIC MEDICINE
DR S GHOSH	CONSULTANT IN GERIATRIC MEDICINE
DR J A ELLIOTT	CONSULTANT IN GENERAL MEDICINE
DR S BICKNELL	CONSULTANT IN GENERAL MEDICINE
DR A COLLIER	CONSULTANT IN GENERAL MEDICINE
DR J D GEMMILL	CONSULTANT IN GENERAL MEDICINE
DR P M G REYNOLDS	CONSULTANT IN GENERAL MEDICINE
DR J D R ROSE	CONSULTANT IN GENERAL MEDICINE
DR R WRIGHT	CONSULTANT IN GENERAL MEDICINE
DR P McGETTRICK	CONSULTANT IN OPTHALMOLOGY
DR A GASKELL	CONSULTANT IN OPTHALMOLOGY
DR I T HANNA	CONSULTANT IN OPTHALMOLOGY
DR A SINGH	CONSULTANT IN OPTHALMOLOGY
DR P SHAH	ASSOCIATE SPECIALIST-OPTHALMOLOGY
MR P RAE	CONSULTANT IN ORTHOPAEDICS
MR D LARGE	CONSULTANT IN ORTHOPAEDICS
MR A MUIRHEAD	CONSULTANT IN ORTHOPAEDICS
MR H POTTS	CONSULTANT IN ORTHOPAEDICS
DR S MAHADIK	ASSOCIATE SPECIALIST - ORTHOPAEDICS
DR M J ABLETT	CONSULTANT RADIOLOGIST
DR K OSBOURNE	CONSULTANT RADIOLOGIST
MR A L FORSTER	CONSULTANT SURGEON
MR G STEWART	CONSULTANT VASCULAR SURGEON
MR S BOOM	CONSULTANT VASCULAR SURGEON
MR C J SIMPSON	CONSULTANT SURGEON
MR I MACMILLAN	CONSULTANT VASCULAR SURGEON
MR C WILSON	CONSULTANT SURGEON
MR M T HASAN	SURGICAL SPECIALIST SURGEON
MR A V KRISHNAN	ASSOCIATE SPECIALIST SURGEON
MR G S WATSON	CONSULTANT UROLOGIST
MR R N MEDDINGS	CONSULTANT UROLOGIST
MR N AL-SAFFAR	CONSULTANT UROLOGIST
MR D DUNAWAY	CONSULTANT PLASTIC SURGEON
MS E WEILER-MITHOFF	CONSULTANT PLASTIC SURGEON

MR J DEMPSTER   ENT CONSULTANT
MR R S SINGH   ENT CONSULTANT
MR R K SOOD   ENT CONSULTANT

MR N E MERCHANT   CONSULTANT ORAL SURGEON

MRS N WALLIS   STOMA CARE SPECIALIST NURSE
MRS L KERR   PALLIATIVE CARE SPECIALIST
MRS S WHITE   BREAST CARE SPECIALIST NURSE
MRS V MILLAR   INCONTINENCE CARE SPECIALIST NURSE
MRS M MANZI   MACMILLAN NURSE
MRS J McCULLOCH   DIABETIC SPECIALIST NURSE
MRS A REID   DIABETIC SPECIALIST NURSE
MR D RUTHERFORD   ERECTILE DYSFUNCTION SPECIALIST
                                       NURSE

MISS M WHITESIDE   AUDIOLOGY SERVICES MANAGER
MRS C MACGREGOR   CARDIOLOGY SERVICES MANAGER
MS H McWHINNIE   ACTING HEAD ORTHOPTIST
MRS S ERSKINE   PARAMEDICAL SERVICES MANAGER
MR N MEIKLE   PHYSIOTHERAPY MANAGER
MS E SEMPLE   CHIEF DIETICIAN
                                       HEAD OF SPEECH THERAPY SERVICES

Please insert speciality name:

....

Please mark relevant discipline:

Medical ☐   Nursing ☐   Paramedical ☐

Please circle answer of choice:

Do you believe Clinical Psychology...

- increases patient choice?   YES   NO   DON'T KNOW

- decreases medical involvement?   YES   NO   DON'T KNOW

- increases likelihood of compliance to medical interventions and advice?

                                        YES   NO   DON'T KNOW

Do you believe Clinical Psychology input to patients improves health outcome in terms of:

- improved symptom control?   YES   NO   DON'T KNOW

- patient coping strategies?   YES   NO   DON'T KNOW

- improved functional status?   YES   NO   DON'T KNOW

- rate and success of recovery?   YES   NO   DON'T KNOW

- overall quality of life?   YES   NO   DON'T KNOW

Does the information given to you by the Clinical Psychologist about your patient(s):

- influence your management of their physical health problems?

                                        YES   NO   DON'T KNOW

- influence your understanding of psychological aspects of their problem?

                                        YES   NO   DON'T KNOW

- influence your management of psychological aspects of their problem?

                                        YES   NO   DON'T KNOW

- influence your management/approach to, other patients in your care?

                                        YES   NO   DON'T KNOW

Do you believe the current Clinical Psychology service available in Ayr Hospital could be improved?

<div align="center">YES   NO   DON'T KNOW</div>

Which of the following do you believe could lead to improvement in the Clinical Psychology service *(please tick all relevant boxes)*:

- greater allocation of resources to the service   ☐
- increased awareness of the role of a Clinical Psychologist   ☐
- more time spent in consultancy with other disciplines   ☐

Are there times when you may decide not to refer a patient to Clinical Psychology because of a potential waiting time?

<div align="center">YES   NO   DON'T KNOW</div>

Do you believe any of the following have been obstacles to further development of the Clinical Psychology service? *(please tick all relevant boxes)*:

- Clinical Psychology not perceived as a high priority   ☐
- belief that there is no evidence of effectiveness of Clinical Psychology   ☐
- belief that other disciplines can do the same with less experience   ☐

Is there anything else you feel would lead to an improvement in service? _____

_____

_____

_____

Where do you see Clinical Psychology 'fitting in' as part of the treatment process?

- alternative treatment option   ☐

- concurrent treatment option   ☐   *(please tick one)*

Would you be interested in the provision of:

- staff support   YES   NO   DON'T KNOW

- staff training   YES   NO   DON'T KNOW

- research advice   YES   NO   DON'T KNOW

- clinicalconsultancy   YES   NO   DON'T KNOW

(from Clinical Psychology)

Could you please rate your overall satisfaction with the Clinical Psychology service provided in Ayr Hospital by marking a point on the scale below:

not at all satisfied	*slightly satisfied*	*satisfied*	*fairly satisfied*	*very satisfied*
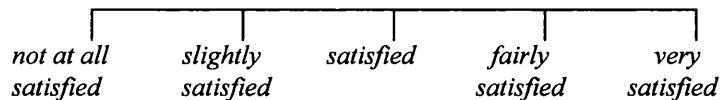
"I believe there is a need for an improved Clinical Psychology service within Ayr Hospital"

Please rate your agreement with the above statement on the following scale:

strongly disagree	*disagree*	*uncertain*	*agree*	*strongly agree*
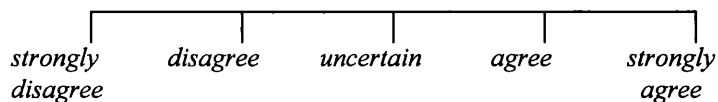
Medical Consultants Comments

Very satisfied with <u>quality</u> but not satisfied with <u>quantity</u>.

1. Communication - more than just an initial letter.
2. I have no idea whether the psychologist considers my referrals appropriate.

Improved access to clinical psychology service. Because of poor current access we tend only to refer patients with major problems who then have to wait for ages!

My principle concern is in relation to diabetic patients who "don't care". They need more help.

More staff. More advice and information to clinician to improve his approach to patient.

Easier access to services. Better training of staff in other disciplines (re. Ward staff, clinic staff...).

Information not usually available in time.
If the psychologist came to the multi-disciplinary meeting when the referral was discussed.
The service to us e.g. stroke patients is so slow that the problem has had to be resolved and is usually over by the time the patient is seen by the psychologist.

Easier access, shorter waiting time, increased resources and manpower.

Agreed patient pathways which might be audited.

Good........to support other specialities. Very satisfied with assessment but long waiting time.

Nursing Staff Comments

1. More sessions specifically for oncology service.
2. More input re. staff development, coping strategies and specific issues relating to psychological care of patients <u>and</u> families.
The service provided given the current constraints of allocated sessions is excellent (and a lot of effort) but not enough.

Appendix 1.6

SOUTH AYRSHIRE HOSPITALS

NHS TRUST

THE CLINICAL PSYCHOLOGIST

A PATIENT INFORMATION LEAFLET

CHARTER MARK

Changing ... for the better

Appendix 1.6

CONTENTS

Appendix 1.6

INTRODUCTION

You will have been given this leaflet because a member of hospital staff believes that it may be helpful for you to meet with a Clinical Psychologist. This leaflet will explain:-

- what a Clinical Psychologist does
- what sort of problems he/she might help with
- what assessment and treatment involve

WHAT DOES A CLINICAL PSYCHOLOGIST DO?

A Clinical Psychologist is a specialist in the way people feel, think and behave. He/she is specially trained to help people who are experiencing problems which relate to their feelings, their thoughts and their behaviour. A Clinical Psychologist applies this knowledge to problems associated with physical and mental health. It takes a minimum of 7 years to train as a Clinical Psychologist. This time is spent studying the basic science of psychology followed by 3 years working in hospitals and in the community with people experiencing difficulties relating to physical or mental health problems.

WHY SHOULD I SEE A CLINICAL PSYCHOLOGIST?

Before explaining why it might be helpful to you to see the Clinical Psychologist, it is important to stress that you are not being referred because your physical symptoms are not real or because doctors think they are all in your mind.

1

Appendix 1.6

You might benefit in a number of ways from seeing a Clinical Psychologist. You could gain a better understanding of your feelings; develop new strategies to deal with problems or try out new ways of alleviating your symptoms.

WHY ARE PEOPLE REFERRED TO A CLINICAL PSYCHOLOGIST?

People are referred to the Clinical Psychologist when they develop problems such as:-

- *anxiety*
- *coping with pain*
- *depression*
- *sleep problems*
- *flashbacks/nightmares*
- *unwanted thoughts*
- *difficult to explain physical symptoms*
- *phobias*
- *chronic fatigue*
- *panic*
- *coping after an operation*
- *dissatisfaction with appearance*

WHAT WILL HAPPEN IF I SEE THE CLINICAL PSYCHOLOGIST?

When you see the Clinical Psychologist they will want to carry out an assessment. This assessment will include any problems which you have, your thoughts and feelings about these problems and your ability to cope with them. The Clinical Psychologist will also ask about when your problems

2

Appendix 1.6

began and other information such as what has made them worse and what has helped them improve. When the assessment is finished, the Clinical Psychologist will discuss with you whether you want to begin to work together to help with any problems which have been identified. If you both agree that treatment might be helpful then you will work together to devise a treatment plan - this might involve developing new ways of thinking about problems or using new coping strategies to deal with them.

FOR FURTHER INFORMATION

For further information or advice contact:-

Dr Craig A White
Chartered Clinical Psychologist
Ayr Hospital
Telephone: 01292 610555 Ext 4263

If you are unhappy with any aspect of your treatment, we would like to know so we can put things right. If you feel unable to discuss this with your Clinical Psychologist then contact:-

Director of Consulting and Clinical Psychology Services
Strathdoon House
50 Racecourse Road
Ayr KA7 2LZ
Telephone: 01292 285607

3

Appendix 1.6

PATIENT'S NOTES

What is your "problem list" at the moment?

1 _____

_____

2 _____

_____

3 _____

_____

4 _____

_____

What questions would you like to ask the Clinical Psychologist?

A _____

_____

B _____

_____

4

Appendix 2: Major Research Proposal

Major Research Project Proposal Guidelines from D.Clin.Psy. Course Handbook.

The Research Proposal should be laid out according to the format described below. This format is based upon the application for a mini-project grant in Health Services Research (SOHHD - Chief Scientist Office). Trainees may find that forms provided by ethical committees are substantially similar to this and this may be an acceptable alternative format.

1.1   Applicants - names and addresses including the names of co-workers and supervisor(s) if known.

1.2   Title - no more than 15 words.

1.3   Summary - no more than 300 words, including a reference to where the study will be carried out.

1.4   Introduction - of less than 600 words summarising previous work in the field, drawing attention to gaps in present knowledge and stating how the project will add to knowledge and understanding.

1.5   Aims and hypothesis to be tested - these should wherever possible be stated as a list of questions to be answered to which answers will be sought.

1.6   Plan of investigation - consisting of a statement of the practical details of how it is proposed to obtain answers to the questions posed.

The proposal should contain information on Research Methods and Design i.e.

1.6.1   Subjects - a brief statement of inclusion and exclusion criteria and anticipated number of participants.

1.6.2   Measures - a brief explanation of interviews/observations/rating scales etc. to be employed, including references where appropriate.

1.6.3   Design and Procedure - a brief explanation of the overall experimental design with reference to comparisons to be made, control populations, timing of measurements, etc. A summary chart may be helpful to explain the research process.

1.6.4   Settings and equipment - a statement on the location(s) to be used and resources or equipment which will be employed (if any).

1.6.5   Data analysis - a brief explanation of how data will be collated, stored, and analysed.

1.7   Practical application - the applicants should state the practical use to which the research findings could be put.

1.8   Timescales - the proposed starting date and duration of the project.

1.9   Ethical approval - stating whether this is necessary and, if so, whether it has been obtained.

GREATER GLASGOW PRIMARY CARE NHS TRUST

VERBAL LEARNING IN ANXIOUS AND NON-ANXIOUS HUMANS

SEMI-STRUCTURED INTERVIEW TO BE USED AT DEBRIEFING SESSION

1. What do you think the experiment was about?

2. How did you feel during the experiment?

3. How do you feel now that you have finished?

4. Was there anything you found particularly difficult?

5. Was there anything you found particularly anxiety provoking?

6. Is there anything you want to ask me or check before you go?

PLEASE RATE HOW ANXIOUS YOU FEEL **RIGHT NOW**

0

NOT AT ALL
ANXIOUS

100

EXTREMELY
ANXIOUS
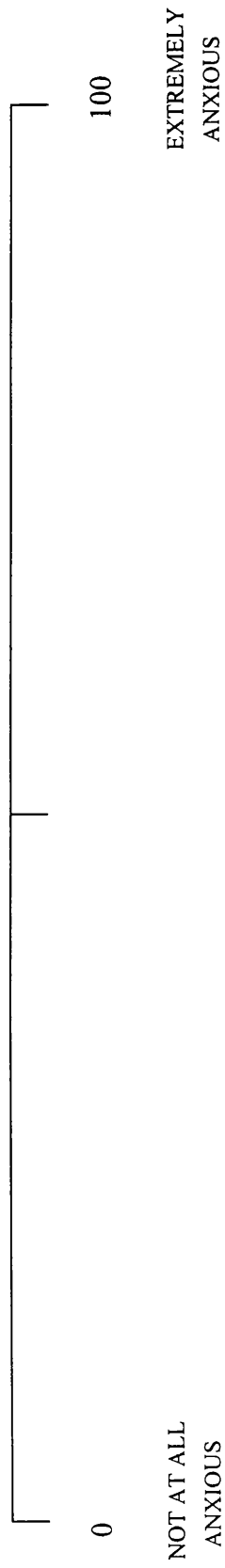
GREATER GLASGOW PRIMARY CARE NHS TRUST

Administrator Research Ethics Committee:
Mrs Anne McMahon

AMC

Trust Headquarters
Gartnavel Royal Hospital
1055 Great Western Road
GLASGOW
G12 0XH

Tel: 0141-211 3824
Fax: 0141-211 3971

02 August 1999

Ms K McHugh
Academic Centre
Gartnavel Royal Hospital
1055 Gt Western Road
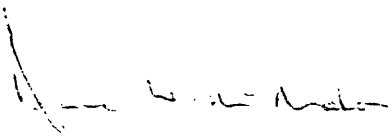Glasgow
G12 0XH

Dear Ms McHugh

PROJECT: ***Verbal learning in anxious and non-anxious humans***

Many thanks indeed for sending the required amendments to this submission.   The Committee debated this submission further at its meeting on Thursday, 22 July 1999 and I am pleased to be able to tell you that the Committee now has no objections from an ethical point of view, to this project proceeding and ethical approval is formally granted.   You will know that you should also inform the Research & Development Directorate.

I would also like to take this opportunity to remind you that you should notify the Committee if there are any changes, or untoward developments, connected with the study – the Committee would then require to further reconsider your application for approval.   The Committee would be grateful if a brief final report on your project could be forwarded to the Committee when the project reaches its conclusion.
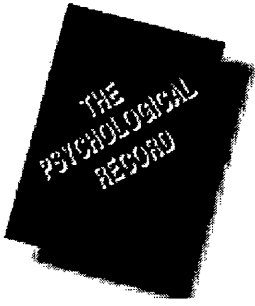
May I wish you every success with your study.

Yours sincerely

ANNE W McMAHON
Administrator – Research Ethics Committee

cc   B Rae

Appendix 3: Major Research

THE PSYCHOLOGICAL RECORD

MANUSCRIPT SUBMISSIONS

The Psychological Record publishes theoretical and experimental articles and commentary on recent and historical developments in psychology.

Articles submitted to The Psychological Record should be prepared according to the Publication Manual of the American Psychological Association, Fourth Edition. Upon receipt of a manuscript, the opinions of at least two reviewers will be obtained. The substantive criticisms and comments of the reviewers will be forwarded to the author(s) along with the publication decision of the editor. Normally the time elapsed between receipt of a manuscript and a decision is 4 to 6 weeks.

The average length of articles published is 8 to 10 printed pages. Two typed pages are approximately equivalent to one printed page. All manuscripts must be submitted in triplicate and include a brief abstract. Reprints are available at the time of publication and produced with an attractive cover. A copy of the reprint cost form is available. Mail to:

> The Psychological Record
> Kenyon College
> Gambier OH 43022

Instructions to Participants Appearing on Screen During Experiment

Thankyou for agreeing to take part in this study. Firstly, make sure that you are sitting comfortably and can read all that you see here. In a little while we are going to show you words that you have never seen before. It does not matter what the words mean – we simply want you to learn which words go with each other. We cannot tell you at the beginning which words go with each other. What we will do is show you one word, and then show you two others and get you to select which one of the two others goes with the first one. The screen will look like:

```
+-----------------------------+
|             Top             |
|                             |
|  Left              Right    |
+-----------------------------+
```
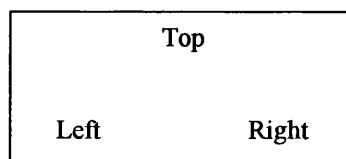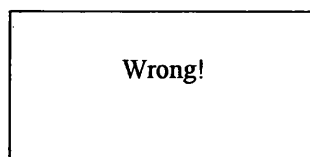
You simply press the 'X' key if you think the word on the left is the correct answer, or press the 'M' key if you think the word on the right is the correct answer.

If your choice is correct, you will see on the screen the message:

```
+-----------------------------+
|                             |
|          Correct!           |
|                             |
+-----------------------------+
```
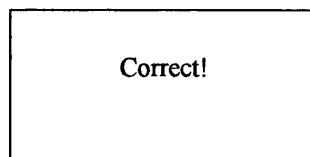
If not, you will see the message:

```
+-----------------------------+
|                             |
|           Wrong!            |
|                             |
+-----------------------------+
```

From time to time, we will test your views as to which words go together – when testing, we will not say whether you are correct or incorrect. Also, after a while we will introduce some new words and teach you about these just as we have for the others.

Supplementary Instructions Following Familiarisation with Procedure

Thankyou for your attention during that test run. We are now ready to proceed with the main part of the study. It will be just like what you have completed. If there is anything you do not understand, please ask now. When you are ready, press any key.