AN EXPERIMENTAL INVESTIGATION OF REPETITIVE THINKING IN DEPRESSION

AND RESEARCH PORTFOLIO

submitted in partial fulfilment of the degree of

Doctor of Clinical Psychology

by

DAVID GILLANDERS

University of Glasgow
Department of Psychological Medicine
Gartnavel Royal Hospital, 1055 Great Western Road
Glasgow, G12 0XH.

1st AUGUST 2000

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

CONTENTS

Acknowledgement

Many thanks to Dr. Paul Flemming, for helpful advice and patiently reading the many revisions. Thanks also to the Class of 2000, who cushioned the hardships of the last three years and to Jon-Boy Smallwood, who was frequently the only other person to whom this made sense. Thank you to both of my parents, for getting me started in asking questions. Most of all, thank you to Becky, who continues to help me balance questioning with being.

SMALL SCALE SERVICE EVALUATION PROJECT

By

David Gillanders

Submitted in partial fullfillment of the degree of

Doctor of Clinical Psychology

Scientist - Practitioners ? A Survey of Clinical Psychologists Research Activity

written according to the guidelines for the

Journal of Clinical Effectiveness

Scientist - Practitioners ? A Survey of Clinical Psychologists Research Activity

Summary

Clinical psychologist's training emphasises research as a key component of their professional skills. Recent surveys have shown, however, that the majority of clinical psychologists produce no research. Looking only at articles published as a definition of research may have led previous surveys to underestimate the level of research activity of clinical psychologists. Using a broader definition of research activity, "The RIPS: Research Involvement of Psychologists Scale" was constructed and distributed to a sample of qualified clinical psychologists working in the NHS. The survey revealed that previous surveys of this kind had underestimated the research activity of clinical psychologists, and that the majority of respondents indicated that they were dissatisfied with their lack of research involvement, pressure to spend time in clinical contact contributing significantly to this. Clinical psychologists must alter their working priorities if they are to fulfil the research potential promised by their lengthy and intensive research training.

Introduction

The teaching of clinical psychology in Britain, as well as producing skilled therapists also emphasises research methodology as a key feature of clinical training. Arising principally from the work of Eysenck and The Institute of Psychiatry's efforts to "develop a hypothetico-deductive structure, of unquestionably scientific appearance for..abnormal behaviour," clinical psychologists have adopted the model of "Scientist-Practitioner".[1]

Several recent surveys have discovered, however, that the majority of clinical psychologists publish no research, the published work being produced by a highly industrious few. [2,3,4,5.]

Milne, Britton & Wilkinson, (1990)[6] replicated the finding that the majority of clinical psychologists produce zero research, but found that looking only at number of articles published creates an artificially low estimate of the research involvement of most clinical psychologists. Milne et al.'s survey operationalised research involvement as; publishing research, using single-case experimental designs, presenting an empirical paper at a local professional event, discussing research informally with colleagues and reviewing an article for a journal, for example. Using this broad definition, Milne et. al. conclude that, "as a group, our sample of U.K. Clinical Psychologists are supportive of and adhere to the scientist - practitioner model of professional practice".

The current survey seeks to determine the level of research involvement of clinical psychologists within Greater Glasgow Community and Mental Health Services NHS Trust and to uncover the factors that are associated with research production.

Methods

A questionnaire was devised to survey the participants, who were 54 qualified clinical psychologists employed either by the above mentioned trust, the University of Glasgow Department of Psychological Medicine or were jointly funded by these two bodies. These two groups shall be referred to as clinical staff and academic staff respectively. 39 participants responded, representing a response rate of 72 % , which compares favourably with other surveys of this nature.

Respondents

47.4% of respondents were B grade, 52.6% A grade, 78.9% of the sample were clinical staff with 21.1% academic staff. 55.3% of the sample described their favoured

conceptual orientation as cognitive-behavioural, with 36.8% favouring an eclectic approach. 1 respondent (2.6%) endorsed behavioural, 1 psychodynamic and 1 feminist as their favoured conceptual orientation. 23.1% of respondents had obtained a PhD, 89% of these were academic staff, 11% clinical. The minimum number of years since qualification as a clinical psychologist was 1, maximum 22, with a mean of 10 and a standard deviation of 6.7.

There are approximately 300 trained clinical psychologists in Scotland, it is estimated that approximately 16 - 20 of these are in academic posts. This represents a proportion of approximately 6.6% , indicating that the current sample is biased towards academic staff. As it is reasonable to assume that academic staff will differ in their research activities from clinical staff, these two groups have been reported separately throughout.

Despite this it was hypothesised that the current sample would be similar to the sample reported by Milne et al. (1990) such that a broad operationalisation of research involvement would yield more information than published articles alone.

The questionnaire was organised in three sections;

1. level of research activity
2. attitudes towards research
3. demographic information concerning various aspects of the respondents job and career including grade, source of post funding, number of years qualified and type of qualification(s) held.

Questionnaires were anonymous and confidentiality was assured. A copy of the "RIPS : Research Involvement of Psychologists Scale" is enclosed (Appendix 1).

Analysis

In examining research involvement, different activities were categorised as research involvement, others as research production and other items contributed to a research consumption score. Individuals responses to these items (currently involved, involved since qualifying and never involved since qualifying) were summed to generate ordinal scores for each of the above factors. Attitude questions were also broken down to reflect two factors; favourable attitudes towards research involvement and perceived external pressure discouraging research involvement. Respondents answers on a Likert scale were summed to give ordinal scores on each of these two factors. Demographic information was categorised either directly (e.g. number of years qualified) or coded numerically (e.g. A grade =1 B Grade = 2).

Results

Levels of Research Activity

Table 1 shows the level of endorsement of the research items on the RIPS, collapsed into the three factors described above; production, involvement and consumption. The table shows levels of activity for academic and clinical staff and for the whole sample.

(Insert Table 1 here)

Table 1 shows that there is considerable research activity being reported by the sample as a whole. Current involvement in research consumption activities (e.g. reading articles, discussing research findings with colleagues, attending local or national conferences) is reported by an average of 52.8% of the sample. A further 41.5% have done these activities since qualifying and only 5.6% have never been involved in research consumption activities, indicating that the scientist-practitioner model has been broadly adopted by almost 95 % of the psychologists surveyed.

Looking separately at clinical versus academic staff, 90% of academic compared to just 43.3% of clinical staff are currently involved in research consumption. An average of 50% of clinical staff indicated that they had only been involved in research consumption activities since qualifying, but were not currently involved in these activities. None of the academic staff were in this category.

Research Involvement Activities (e.g. designing and carrying out studies, surveys, audit, clinical outcome trials, seeing patients for research studies) were currently being pursued by 35.3 % of the total sample. An equally large figure (38 %) had never done these types of activities since qualifying. Again, looking at the two groups separately, 70.2 % of academic compared to only 25.4% of clinical staff were currently involved in research. 26.3% of clinical staff had been involved in research since qualifying but almost half of the clinical staff (48%) had never been involved in the activities categorised as research involvement since qualifying.

Current involvement in Research Production Activities (e.g. presenting at a conference, writing reviews, submitting work for publication) were reported by an average of 35.8 % of the total sample. 84.4% of academic staff were currently involved in producing research, compared to 23.8% of the clinical staff. 30% of the clinical staff had been involved in research production since qualifying, though almost half (46.2%) had never produced research since qualifying as a clinical psychologist.

Close examination of Table 1 reveals that the average endorsement of research production activities is similar to the average endorsement of research involvement activities, both for academic and clinical staff. This implies that those that are involved in research are also managing to disseminate the results of their research by producing research for journals, local and national meetings and conferences. This is in contrast

to the conclusions reached by other surveys of this nature, and likely reflects the broader definition of research production adopted by the current survey.

Looking more closely at the items that contribute towards a persons' research production score, it is encouraging to see that, as mentioned above, a similar figure who report involvement in research are submitting it to journals for publication. Although approximately 50 % of clinical staff have never submitted work for publication, the other 50 % are either currently submitting or have done since qualifying. This is surprising compared to previous surveys' conclusions. 25% of clinical staff currently submitting work for publication would appear to qualify as more than the "Highly industrious few," reported by previous surveys. [2,3,4,5.]

Psychologists' Attitudes Towards Research

Table 2 indicates that although academic staff tend to agree more strongly that they regularly think about areas of psychological theory or practice that they would like to research, it remains encouraging that 90% of clinical staff regularly think about these areas also. Only 20 % of clinical staff, compared to 62.5 % of academic staff, feel that they have enough time to put their research ideas into practice. Consistent with this is the finding that 80 % of clinical staff feel that pressure to spend time in clinical contact is preventing them from carrying out research. This is only rated as a problem for 25% of academic staff.

(Insert Table 2 Here)

Almost the entire sample agreed that research findings are of relevance to clinical practice, with only 3.3% of clinical staff disagreeing. Consistent with this, 100 % of academic staff and 60 % of clinical staff indicated strongly that research was the domain of clinical psychologists. A further 36.7% of clinical staff endorsed this item positively, though less strongly, making a total of 100% of academic staff and 96.7% of

clinical staff indicating that research is thought to be a valid pursuit for clinical psychologists.

86.7% of clinical staff and 87.5% of academic staff indicated that they were interested in doing research. Unusually, 12.5% of academic staff indicated strongly that they were not interested in doing research. Members of clinical staff were more strongly in agreement than academic staff that psychologists should have agreed research time and, in fact, 12.5% of academic staff strongly disagreed that they should have research time.

Compared to clinical staff, academic staff were more likely to rate their research involvement as about right (62.5% vs. 20 %). 56.7% of clinical staff rated their research involvement as "Far too little". A further 23.3% of clinical staff felt that there involvement in research was slightly too little. Combining these figures the majority of clinical staff (80%) feel that their involvement in research is too little. This compares to only 37.5% of academic staff.

Interestingly, both academic and clinical staff felt that research was encouraged in their post, though academic staff felt it was more strongly encouraged than clinical staff. Again 12.5% of academic staff felt that research was strongly discouraged in their post. Given that this figure represents one respondent, and that their responses are so at odds with the other members of academic staff, it may be parsimonious to assume that this person's responses are a result of misunderstanding the questions rather than a reflection of their actual attitude.

Factors Associated with Research

The items on Table 2 were summed to create ordinal scores for each individual on both of the underlying factors, favourable attitudes towards research and pressures against research. These attitude scores could then be analysed for association with the

research involvement, consumption and production factors, along with the demographic components of the RIPS. Table 3 shows the matrix of Kendall's Tau b correlation coefficients for the variables of interest with research production, consumption, and involvement.

(Insert Table 3 Here)

Although many of the correlations shown in the table are statistically significant, due to the constrains of this article, only a selection of them will be discussed in the text.

Table 3 shows a number of interesting associations. Firstly, unsurprisingly, working in a split clinical / academic post is significantly associated with higher scores on all three measures of research activity. Secondly, and also unsurprisingly, being highly involved in research and being a high consumer of research are strongly associated with research production, for clinical staff alone and for the whole sample but not for academic staff. It becomes apparent from an examination of table 3 that separating clinical staff from respondents who work in split clinical / academic posts significantly alters the factors that are associated with research activity. Being a B grade psychologist, for instance, is significantly associated with all three research factors when looking at the sample combined, but is significantly associated only with research involvement when looking at clinical staff alone.

Number of hours per week dedicated to research is significantly associated with all three research measures for the sample combined, and for clinical staff alone, but is not associated with production or consumption of research for the academic staff.

A number of correlations appear to be artefacts of the academic vs. clinical variable. For instance: number of hours per week in clinical contact is significantly negatively associated with research involvement and consumption for the whole sample, but not

for clinical staff alone. As the academic staff tend to spend less time in clinical contact (mean = 14 hours per week vs. 24 hours per week) combining the sample creates the association described.

Given the responses illustrated in table 2, however, it would not be unreasonable to suggest that the reduced pressure to spend time in clinical contact is a significant factor in the academic psychologists' greater research production.

Number of years qualified is significantly associated with research activity, with those qualified longer reporting more involvement and consumption both for clinical staff and the whole sample. This may simply reflect that staff with longer careers have had more opportunity to be involved in the activities surveyed.

Interestingly, holding a PhD is significantly associated with all three measures of research activity for the sample as a whole, again related to the third variable of academic vs. clinical staff, but only for research consumption when looking at the clinical staff.

Another surprising finding was that recently qualified psychologists who hold the new D. Clin. Psy. qualification are significantly less likely to be involved in research than their longer qualified colleagues. This association remains true for clinical staff alone and is seen in both the research consumption and involvement domains. Given that part of the purpose of increasing training to a three year doctoral degree was to promote the research aspect of the clinical psychologist's role, this survey indicates that as yet the professions' aspirations in this area remain unfulfilled.

Discussion

These results have a number of implications for the profession. Firstly, the current sample's research activity contrasts favourably with the levels of research production (as defined by numbers of articles published) reported by previous surveys, supporting Milne et al's. view that research involvement can not be narrowly confined to publishing articles in peer reviewed journals. Taking this broader position on research it appears that the psychologists employed within the trust under study have very much adopted the scientist practitioner role.

Secondly, there is still a huge discrepancy between the research activity of university clinical psychologists and NHS clinical psychologists. As there are several differences between these groups (e.g. academic staff feel less pressures against research, they are more likely to hold a PhD, tend to be longer qualified, spend less hours per week in clinical contact, have more hours per week dedicated to research, and feel that research is more strongly encouraged in their post) it is difficult to determine which of these are the key factors in explaining the research differences between these groups.

The data also suggest that the majority of NHS psychologists would like to get more involved in research, they feel that they have the skills and ideas, but that time pressures to see patients simply don't allow them to become involved in research.

Furthermore, the respondents reporting research involvement tend to be longer qualified and are often B grade staff. Looking at clinical staff alone shows that these respondents report less time in clinical contact, more time in management duties and clinical supervision. An interesting extension of this study would be to investigate whether B grades feel less pressure to see patients, whether they are better at organising their time to let them become involved in research or whether other factors are involved in their greater research involvement.

It would also be highly informative to follow up this survey when the holders of D. Clin. Psy. qualifications have had more time to develop their careers and see whether their research potential is fulfilled. Given that recent graduates are probably more likely to be familiar with recent literature and research methodology it would seem a waste of a valuable resource that they are not getting more involved in research. A further interesting extension of this study would be to investigate the reasons behind newly qualified staff not being involved in research.

Given that 80% of clinical staff feel that pressure to spend time in clinical contact is a barrier to their research involvement and that an equivalent percentage feel that their research involvement is not nearly enough, it would seem prudent to investigate ways of tackling both of these problems.

Given clinical psychology's scientific, problem focused approach to patient's problems, it seems unusual that the profession as a whole has been unable to reach a solution to the problem of increasing demand on psychologist's time. Could not psychologists be given a proportion of time in which to develop innovative approaches to therapeutic contact, whilst evaluating these new approaches for effectiveness? This would be, after all, a daring application of the scientist-practitioner model in practice.

References

1. Rachman, S. The evolution of cognitive behavioural therapy, in Clark, D.M., & Fairburn, C.G., (Eds.) *Science and Practice of Cognitive Behaviour Therapy*, Oxford University Press, 1997.

2. Agnew, S., Carson, J., & Dankert, A., The research productivity of clinical psychologists and psychiatrists: a comparative study. Clinical Psychology Forum; 1995; 86: 2-5.

3. Carr, A. A survey of clinical psychologists in Ireland. Part two: research, job satisfaction, continuing professional development and private practice. Clinical Psychology Forum; 1996; 96: 24-30

4. Skinner, A. Research and clinical psychologists. Clinical Psychology Forum; 1996; 96, 44-5

5. Jefferis, P., Volans, J., & Minter, M. A survey of research activities, skills and training needs in a clinical psychology department. Clinical Psychology Forum; 1997; 108: 13-14

6. Milne, D., Britton, P., & Wilkinson I. The Scientist-Practitioner in Practice Clinical Psychology Forum; 1990; 30: 27-30

7. Breakwell, G. M., Hammond, S., & Fife-Schaw, C., Research Methods in Psychology. SAGE Publications: 1995

Table 1: Average Level of Research Activity

	Currently Involved			Involved Since Qualifying			Have never been involved since qualifying		
	Academic %	Clinical %	Total %	Academic %	Clinical %	Total %	Academic %	Clinical %	Total %
Research Involvement	**70.2**	**25.4**	**35.3**	**14.6**	**26.3**	**26.2**	**15.3**	**48**	**38**
Research Consumption	**90**	**43.3**	**52.8**	**0**	**50**	**41.5**	**2.5**	**6.7**	**5.6**
Research Production	**84.4**	**23.8**	**35.8**	**9.4**	**30**	**27.2**	**6.3**	**46.2**	**36.9**
Submitting work for Publication	**100**	**26.7**	**43.6**	**0**	**23.3**	**17.9**	**0**	**50**	**38.5**

Table 1: Average Level of Research Activity

Table 2: Psychologists' Attitudes Towards Research

	Strongly Agree		Agree		Neither Agree or Disagree		Disagree		Strongly Disagree	
	Academ %	Clinic %	Academ %	Clinic %	Academ %	Clinic %	Academ %	Clinic %	Academ %	Clinic %
I regularly think about areas of psychological theory / practice I would like to research	**75**	**33.3**	**12.5**	**56.7**	**12.5**	**3.3**	**0**	**6.7**	**0**	**0**
I rarely get the time to put my research ideas into practice	**12.5**	**40**	**0**	**30**	**12.5**	**10**	**62.5**	**20**	**12.5**	**0**
Even if I had the time, I don't feel I have the skills to carry out research	**0**	**0**	**0**	**6.7**	**0**	**13.3**	**37.5**	**63.3**	**62.5**	**16.7**
Pressure to spend time in clinical contact prevents me from doing research	**12.5**	**26.7**	**12.5**	**53.3**	**12.5**	**10**	**50**	**10**	**12.5**	**0**
Research findings are of relevance to clinical psychology practice	**75**	**73.3**	**25**	**23.3**	**0**	**0**	**0**	**3.3**	**0**	**0**

Table 2: Psychologists attitudes towards research (cont.)

Research is not the domain of clinical psychologists	**0**	**3.3**	**0**	**0**	**0**	**0**	**0**	**36.7**	**100**	**60**
I am not interested in doing research	**12.5**	**0**	**0**	**3.3**	**0**	**10**	**12.5**	**36.7**	**75**	**50**
Clinical psychologists should have regular agreed time in which to pursue research	**37.5**	**56.7**	**12.5**	**36.7**	**37.5**	**6.7**	**0**	**0**	**12.5**	**0**

	Far too much		Slightly too much		About right		Slightly too little		Far too little	
	Academ %	Clinic %	Academ %	Clinic %	Academ %	Clinic %	Academ %	Clinic %	Academ %	Clinic %
At the moment my involvement in research is	**0**	**0**	**0**	**0**	**62.5**	**20**	**12.5**	**23.3**	**25**	**56.7**

	Strongly Encouraged		Somewhat Encouraged		Neither Encouraged or Discouraged		Somewhat Discouraged		Strongly Discouraged	
	Academ %	Clinic %	Academ %	Clinic %	Academ %	Clinic %	Academ %	Clinic %	Academ %	Clinic %
In my post I feel that research is	**75**	**13.3**	**12.5**	**36.7**	**37.5**	**6.7**	**0**	**0**	**12.5**	**0**

Table 3: Factors Significantly Associated With Research Activity

Kendall's Tau B Correlation Coefficients

Factor	Research Production			Research Involvement			Research Consumption		
	Acc	Clin	Total	Acc	Clin	Total	Acc	Clin	Total
Academic Post			.547 **			.386 **			.524 **
B Grade	.554	.266	.373 **	.000	.376 *	.362 **	.280	.325	.420 **
Grants	.161	.258	.547 **	.148	.263	.386 **	-.275	.256	.498 **
No. of Hours per week dedicated to Research	.125	.332 *	.545 **	.692 *	.291 *	.446 **	.143	.303 *	.504 **
No. hours per week in clinical contact	-.158	.046	-.240	-.513	-.115	-.35 **	-.418	-.200	-.41 **
No of hours per week in management duties	.474	.090	.111	.154	.129	.259 *	.299	.152	.296 *
No. of years qualified	.293	.299	.339*	-.154	.36**	.335 **	.095	.40 **	.452 **
Favourable attitudes towards research	.251	.229	.132	.577	.231	.255 *	.476	.191	.134
Perceived pressure against research	.000	-.136	-.32 **	-.431	-.139	-.229	-.243	-.164	-.34 **
Qualification									
PhD.	.554	.292	.530 **	.000	.207	.349 *	.280	.354 *	.549 *
MSc.	.	.343 *	.414 **	.	.43 **	.439 **	.	.120	.253
D. Clin. Psy.	.	-.233	-.348 *	.	-.35 *	-.37 **	.	-.33 *	-.405
Research Involvement	.251	.59 **	.597 **	1.00	1.00	1.00	.333	.324 *	.432 **
Research Consumption	.207	.305 *	.501 **	.333	.324 *	.432 **	1.00	1.00	1.00

** Correlation significant at 0.05 level ** Correlation significant at 0.01 level*

MAJOR PROJECT LITERATURE REVIEW

Submitted as part of the research portfolio for the degree of

Doctorate in Clinical Psychology

by

DAVID GILLANDERS

1st AUGUST 2000

TITLE:

Evidence for Repetitive Thinking as a Factor In the Maintenance of Depression

JOURNAL: **The Journal of Abnormal Psychology**

DAVID GILLANDERS

University of Glasgow
Department of Psychological Medicine
Gartnavel Royal Hospital, 1055 Great Western Road
Glasgow, G12 0XH.
+00 44 141 / 211 3920

dgillanders@ggpct.scot.nhs.uk

Evidence for Repetitive Thinking as a Factor In the Maintenance of Depression

Criticisms of Beck's cognitive theory have led to theoretical developments in models of information processing. A new framework, The Interacting Cognitive Subsystems Model (ICS), (Teasdale and Barnard, 1993) is outlined. This framework has suggested that a repetitive style of information processing is an important factor in the maintenance of depression (see Teasdale & Barnard, 1993, p. 106). This position is discussed with reference to empirical studies and theoretical reviews in the current literature. Directions for further research are suggested.

Introduction

In introducing a recent edited text on the subject of cognitive behaviour therapy, Rachman suggested that,

> "Cognitive behaviour therapy is...in all likelihood...the most broadly and confidently endorsed form of psychological therapy. Cognitive behaviour therapy dominates clinical research and practice in many parts of the world" (Rachman, 1998, p. 4).

Arising principally from the clinical observations of Beck (see Beck; 1963; 1964; Beck, Rush, Shaw and Emery, 1979), the cognitive model suggests that depression is associated with an identifiable pattern of cognitive changes. Beck (1964) proposes that certain individuals "stable mental representations of experience" (schemata), put them at greater risk of developing depression than others, as their life experiences have supported the development of "maladaptive schemata" (Beck, 1964).

An example of such a schema might be, "Less than perfect performance in all that I do is equivalent to total failure." Critical life events are thought to 'activate' such schemata - in the above example, life events involving minor failures would be expected to activate this schema.

Once activated, schemata are believed to distort perceptual and inferential processes and lead to behaviour changes, such that experience remains consistent with the active schema. For example, the perception of personal failure might lead a person to withdraw from social contact. This may result in reduced probability of encountering success experiences, predictions of future successes might be reduced, and attributions for any success experiences may be more likely to be attributed to external

factors (Abramson, Seligman & Teasdale, 1978). This "domination" of information processing is hypothesised to maintain depressed mood (Beck, 1963).

Whilst recognising the highly influential contribution of Beck's model to the study of psychopathology, Teasdale and Barnard (1993), have proposed that it is flawed in several ways and propose an alternative framework within which information-processing accounts of a wide range of psychopathological phenomena may be developed.

The criticisms of Beck's model (Beck, 1963; 1964; Beck, Rush, Shaw and Emery, 1979) and The Interacting Cognitive Subsystems Model which attempts to answer them are described more thoroughly in a book and several journal articles, (see for example Teasdale & Barnard, 1993; Teasdale, 1993; Teasdale, Segal & Williams, 1995; Teasdale, Taylor, Cooper, Hayhurst & Paykel, 1995). A brief outline of this work is presented here.

Teasdale and colleagues argue that Beck's theory is flawed in a number of theoretical and pragmatic ways. Firstly, they argue that Beck's account is,

"A clinical rather than a scientific theory...[its]...purpose is to guide the clinician in understanding and treating patients, rather than to provide a detailed exposition articulated in precise theoretical terms" (Teasdale & Barnard, 1993, p. 7).

Teasdale further contends that the development of Beck's theory, "Has proceeded largely in isolation from basic cognitive science" (Teasdale, 1993, p. 341). It is argued that this has resulted in Beck's theory being, "Relatively imprecise" (Teasdale & Barnard, 1993, p. 7), and that Beck's, "use of the term cognition diverges from [its] use in cognitive psychology...and has been the basis of a number of misunderstandings" (Teasdale & Barnard, 1993, p. 8).

Beck's model is further criticised on the basis that clinical and research findings do not support Beck's *original* formulation of cognitive theory (Beck et. al., 1979). For example, evidence suggests that dysfunctional schemata may be a consequence rather than a cause of depression (Teasdale, 1988).

Similarly, Simons, Garfield & Murphy (1984) have shown that after pharmacological treatment for depression, which makes no explicit attempt to modify cognition but instead alleviates depressed mood through biochemical means, most measures of negative cognition return to normal levels (Simons, Garfield & Murphy, 1984). This suggests that the characteristic depressive cognition observed by Beck (Beck, 1963), may at least be a consequence, rather than a cause of depression.

Whilst acknowledging that Beck's theory has now taken a more parsimonious position to accommodate findings such as these, this process of revision is further criticised by Teasdale & Barnard: "Presentations of the model have...varied from one statement to another and have shifted in their emphasis over time"
(Teasdale & Barnard, 1993, p. 7).

Finally, and perhaps the most clinically relevant criticism levelled by Teasdale & Barnard, is at Beck's conceptual position on the relation between meaning and emotion. They argue,

> "Beck's cognitive model recognises only one level of meaning and for that reason has considerable difficulties with the distinction between "intellectual " and "emotional" belief, or, more generally, between "cold" and "hot" cognition. So when a depressed person says something like "I know I'm not worthless but I don't believe it emotionally," the Beck

approach suggests that this simply reflects *quantitative* variations in a single level of meaning:

> "The therapist can tell the patient that a person can not believe anything 'emotionally'...when the patient says he believes or does not believe something emotionally, he is talking about *degree of belief*" (Beck et. al., 1979, p. 302, original italics).

Many clinicians have found this analysis unconvincing, regarding "emotional" belief as qualitatively distinct from "intellectual" belief, and functionally more important"

(Teasdale & Barnard, 1993, p. 10, original italics).

These authors propose an alternative framework within which to investigate cognitive-affective interaction, The Interacting Cognitive Subsystems approach (ICS), (Teasdale and Barnard, 1993).

The Interacting Cognitive Subsystems Model

ICS is a conceptual framework within which its authors claim, "in principle, accounts of any aspect of information processing can be developed" (Teasdale & Barnard, 1993, p. 49).

Its authors claim that it addresses their criticisms of the cognitive model by

1) Allowing conceptually for two different levels of meaning, with correspondingly different relationships to emotion production.
2) they claim that its specification is at a level precise enough both to provide a theoretical account of cognitive-affective interaction, and provide a source of experimental hypotheses that can be empirically tested.

3) They further claim that ICS's development within a basic cognitive science perspective prevents the misunderstandings described earlier, that are associated with Beck's theory.

Given such ambitious claims, it is no surprise that the resulting framework proposed is detailed and complex. Interested readers are referred to Teasdale & Barnard, 1993, and Teasdale, 1997, for a comprehensive account. The essence of the ICS framework is briefly presented below, and is portrayed in simplified diagrammatic form (Fig. 1).

(Insert Figure 1. here)

The ICS framework rests on a few relatively simple ideas (see Teasdale, 1997, p. 144). Firstly, different aspects of conscious experience are mentally represented in different subsystems, each of which is specialised to process only that kind of representational code. For example, the visual sub-system processes information representative of very basic sensory information, such as the pattern of light and shade falling upon the retina, whilst the acoustic sub-system operates on mental representations of sound waves detected by the ear.

Recurring regularities in patterns of these basic sensory codes are synthesised by dedicated subsystems into higher level codes, representing increasingly elaborate levels of conscious experience. There are for example, subsystems dedicated to processing representations of objects, of words and of specific concepts and the relationships between them (The 'object', 'morphonolexical' and 'propositional' subsystems, respectively). The ICS framework also proposes that an 'implicational' subsystem exists, which processes mental representations that relate to the holistic, felt senses that have been abstracted as prototypical of particular experiences. It is these implicational representations, at a very abstract level of meaning, that are linked to the production of emotion.

The second concept in the ICS approach is that each sub-system transforms representations in its own code into other codes and directs this as output to the other appropriately dedicated sub-system. Each sub-system learns the transformations to make based on recurring regularities and co-variations encountered in an individual's experience. Figure 2 helps to illustrate.

(Insert Figure 2. here)

In the upper part of the diagram, basic sensory codes simply represent the patterns of light and dark falling upon the retina, reflected from the page. At this level of representation, the patterns are simply black and grey marks and lines against a white background. In the middle panel, exactly the same areas of light and shade are presented, though their arrangement synthesises (on the basis of prior recurring regularities of similar stimuli) a stylised picture of a ship in port. In the language of ICS, the pattern of basic sensory codes synthesised by the visual sub-system has produced an output in the object code which has then been directed to the object sub-system. The arriving pattern of code has been synthesised by the object sub-system (on the basis of previous co-occurrences of such patterns of visual code) to recognise the scene presented.

Looking at the lower panel, a small change in the positioning of the elements results in a different propositional meaning being synthesised. The object level of representation remains the same, it is still a cartoon of a ship. The re-arrangement of the elements have, however constructed the new meaning; of the ship putting to sea. Through these increasingly elaborate combinations of codes, from basic sensory codes, through object recognition codes to propositional level code, the Interacting Cognitive Subsystems' patterns of activity construct, "The specific meanings in terms of the discrete concepts and the relationships between them" (Teasdale, 1997, p. 145).

Importantly, the viewer will also synthesise an 'implicational model' which is a mental representation of the total holistic experience. As well as taking representations of object codes (the construction of a ship), and the specific propositional meanings (the ship is leaving port), the implicational sub-system can use information taken from basic sensory elements, (e.g. environment, internal bodily state) to synthesise any particular implicational model.

Very different implicational models of the experience of looking at figure 2 will be synthesised depending upon whether the viewer has ever worked at sea. To illustrate: a retired merchant ship captain will experience different associations (implicational models) when looking at the picture compared to a person who does not have such life experience.

The third basic idea upon which ICS rests is that each sub-system has its own memory record of the inputs it receives and the transformations it performs on them. Partial fragments of codes arriving at a sub-system initiate access to the memory record of that sub-system, completing the fragment with stored representations in the memory code and generating appropriate outputs. It follows that after a particular experience, multiple records of the event will exist, distributed across the subsystems involved in the process. For instance, after a conversation, memory records will exist of the words said, the tone of voice and volume used, the specific propositional meaning of the words and the implicational meaning of the, "total conversation experience, such as threat, attraction or hidden agendas" (Teasdale, 1997, p. 145).

The implication of this memory process is that partial fragments of mental codes can complete a total pattern. For example, implicational models relating to 'self as abandoned' may previously have been synthesised from propositional codes relating to specific losses (e.g., the end of a romantic relationship), in combination with body state

codes (stooped posture, tearfulness, tiredness), and acoustic codes (callous tone of voice used by the partner ending the relationship). Due to each individual sub-system's ability to produce total outputs based on fragments of code, the 'self as abandoned' implicational model may be synthesised, for example, by another person behaving in an off-hand manner, without the other elements of the pattern being present.

Finally, a crucial facet of ICS in relation to understanding cognition in depression is the process that Teasdale & Barnard term 'Interlock'. 'Depressive Interlock' occurs when the affect-eliciting implicational models which represent global, holistic dimensions of the self, produce outputs that result in the synthesis of specific propositional meanings related to the implicational model from which they were derived. For instance,

> "The implicational model of 'self as a worthless, useless, culpable person' will generate specific propositions relating to being to blame for something bad that has just happened, or to pessimistic expectations concerning future personal action, or to instructions to access memory records of previous failure-related experiences. These propositional representations can be [transformed]...to produce elements of implicational code. There is an inherent possibility that the pattern of implicational code...will recreate a schematic model similar to that from which the propositional representations were derived in the first place. In this case the "central engine" of cognition, the implicational – propositional loop, can become "locked" onto processing information of a particular theme...in this way a given mood state, will be maintained in the absence of further affect-eliciting environmental input"
> (Teasdale & Barnard, 1993, p. 106).

The position presented by Teasdale & Barnard is that a key factor in the maintenance of depression is that information processing in depression becomes "stuck." The

depressed person's mind cycles between negative implicational models related to depressed affect and specific thoughts, predictions and expectancies related to being unhappy, then back again to re-create similar implicational models. Evidence relevant to this position is drawn from a variety of sources and summarised below though a detailed description of each of these studies is beyond the scope of the present paper.

Evidence for Repetitive Information Processing in Depression

There are several converging strands of evidence that indicate that repetitious thinking may be linked to the maintenance of depression. These can be summarised as:

1) Evidence from correlational studies of peoples' responses to naturally occurring depressed moods (Nolen-Hoeksema, 1987; 1990; 1991; Nolen-Hoeksema and Morrow, 1991; Nolen-Hoeksema, Morrow and Frederikson, 1993);
2) Experimental studies of people with clinically significant depressed mood (Fennel, Teasdale, Jones and Damlé, 1987).
3) Experimental studies of naturally occurring dysphoric moods (Nolen-Hoeksema and Morrow, 1993).
4) Experimental studies of artificially induced dysphoric moods in otherwise healthy people (Morrow and Nolen-Hoeksema, 1990).
5) Prospective longitudinal studies examining the impact of repetitious thinking on individual's risk of experiencing depression (Just and Alloy, 1997; Nolen-Hoeksema, Larson and Grayson, 1999).

These studies have, however, been limited in a number of ways. Firstly, they have for the most part used non-clinically depressed samples, rendering generalisation to clinical samples more difficult (though see for example Fennel, Teasdale, Jones and Damlé, 1987). Secondly they have often measured repetitive information processing using self-report questionnaire. This has led to them studying individuals *reported*

responses to depressed mood. No attempt has been made in any of the papers above to verify whether people accurately report upon their responses to depressed mood. Thirdly, the studies to date have tended to conceptualise rumination as a relatively conscious, controlled process in which people choose to engage. The ICS account suggests that 'depressive interlock' is far less controllable than the above studies would suggest. Theoretical and empirical studies that support this position are reviewed below.

The Self-Perpetuating Nature of Depression

Several researchers describe findings that suggest that repetitive information processing in depressed mood has an uncontrollable quality. Pyszczynski & Greenberg (1987), for example, present a 'self-regulatory model of depression', in which depression is triggered, "By the loss of an important source of self-worth when an individual becomes stuck in a self-regulatory cycle in which no response to reduce the discrepancy between actual and desired states are available. Consequently the individual falls into a pattern of virtually constant self-focus, resulting in intensified negative affect" (Pyszczynski & Greenberg, 1987, p. 122).

Pyszczynski & Greenberg (1987), argue that the loss of important sources of self-esteem instigates a process of self-focus, in an effort to self-regulate. They describe the process by which (under normal circumstances) individuals engage in various methods to reduce the discrepancy between actual and desired states, devaluing the lost object or, for instance, seeking a replacement object. If the lost object is of such central importance to their self-esteem that it can not be devalued and no other objects are available of remotely equivalent value, the self-regulatory loop can not be exited. This results in a high frequency of thoughts about the lost object and the actual / ideal self-discrepancy its loss engenders.

It appears, therefore that the loss of important sources of self-worth in actual and symbolic form lead (understandably) to negative affect. Negative affect in turn activates a self-regulatory routine designed to reduce the discrepancy between actual and desired outcomes. When this discrepancy can not be reduced, the person remains "stuck", continuing to repetitively focus upon the lost object and the self-ideal discrepancy represented by its loss.

Further experimental work by Carr, Teasdale and Broadbent (1991), supports the hypothesis that negative affect increases negative self-focus. Using a musical mood induction procedure, these authors induced elated or dysphoric moods in non-clinically depressed participants (Beck Depression Inventory <14). Visual analogue scales were used to check the efficacy of the mood manipulation. These indicated that the groups differed significantly in the expected direction. Whilst in elated or dysphoric mood, participants were administered a sentence completion task designed to assess self or external focus. Participants' performance on this task was compared with their pre-mood induction performance on the same task.

Results indicated that dysphoric mood significantly increases negative self-focus, but does not decrease positive or neutral external focus, in comparison to elated mood. These results may have adaptive significance, as follows: negative moods may initiate a "self-focus routine, " in which saddening events are replayed and 'emotional processing' (Rachman, 1980) may occur. To presume that an affect-regulation process exists in humans makes intuitive sense. Negative affect instigates an 'actual self-ideal self discrepancy'. This begins a process of self-attention in an effort to search for behaviours that will return the organism to the ideal self state, thereby reducing negative affect. Such discrepancy reducing behaviours may be overt (such as distracting activity, sports, socialising) or may be covert (such as thinking about other achievements, daydreaming, distracting pleasurable fantasy). If, as suggested by Pyszczynski & Greenberg (1987), the extent of the loss is very great and no

discrepancy reduction behaviours are available, the self-regulatory loop will persist. Unfortunately, this self-focus will further lower mood, creating a vicious circle.

Drawing upon the Revised Learned Helplessness work of Abramson, Seligman & Teasdale (1978), Pyszczynski & Greenberg (1987) further suggest that when an individual becomes stuck in this self-regulatory loop it affects their attributions for events such that more internal attributions are made for negative events. These authors contend that these negative self-attributions lead to the formation of a negative identity that helps the person to avoid future expectancy of happiness. By avoiding such happiness the individual will never again have to face such pain as they did as a result of the original loss. The formation of such attributions may be the only available means of exiting the self-regulatory cycle, which is presumed to be a cognitively costly process and in depression is likely to be experienced as unpleasant. The relief from unpleasant negative self-focus provided by the formation of such an identity is likely to be negatively reinforcing, which would be expected to lead to a greater probability that internal attributions are made for future negative events, thereby maintaining that identity. This would be expected to maintain low mood, lack of motivation and negative expectancies for future events, adding to the depressed individuals practical and social problems, the burden of which feedback to confirm the negative identity (Pyszczynski & Greenberg, 1987).

Furthermore, as demonstrated by Lyubomirsky, Caldwell and Nolen-Hoeksema (1998), and Lyubomirsky and Nolen-Hoeksema (1995), self-focussed dysphoric rumination facilitates spontaneous retrieval of negatively toned autobiographical memories and reduces the quality of solutions produced to a social problem-solving task. This supports the suggestion that the self-regulatory mechanism proposed by Pyszczynski & Greenberg (1987) may be detrimental to the maintenance of effective emotional homeostasis in persons who experience many life events or have few personal resources with which to deal with negative moods.

Champion & Power (1996), also suggest that the loss of important sources of self-worth is a key factor in the development of depression and that the repetitive focus on the self-ideal discrepancy serves to maintain depressed mood. Their analysis focuses upon social roles in which individuals are 'highly invested'. By this they mean that if a particular role is an important source of personal identity and self-esteem for a person, it's loss will have correspondingly greater psychological impact than if the role is unvalued or if the person has alternate identity-giving roles. These authors describe a pattern of over-investment in too few roles as conferring vulnerability to depression, if those roles are lost. This is similar to Pyszczynski & Greenberg (1987), in that the over-investment in one social role would lead a person to have few discrepancy reduction strategies (e.g. other roles to focus on) if that role were to be lost to them.

Some Clinical Implications of New Theory

Another suggestion has come from Lyubomirsky and Nolen-Hoeksema (1993). These authors found that dysphoric undergraduates who were offered the opportunity to engage in ruminative or distracting responses chose to engage in ruminative responses, even when they had indicated by questionnaire that the distracting activities would be likely to be enjoyable and that their sense of efficacy to engage in these activities was no different to the non-dysphoric participants'. Dysphoric participants indicated that they believed the ruminative activities would lead to greater insight, and that this insight was a valuable goal. For this reason, participants pursued the ruminative strategies, even though they knew that rumination made them feel worse.

Work in other areas of psychopathology, namely generalised anxiety disorder (GAD), has used the concept of meta-cognition, or beliefs about beliefs, to devise new treatments which tackle worry, a central feature of GAD (Wells, 1995). Lyubomirsky and Nolen-Hoeksema's (1993) finding that people do not wish to distract themselves

from their low moods because they think that the insight this provides will be of long-term benefit is a meta-belief that could maintain low moods for some people. Given the success that the meta-cognitive analysis has had on treatment of GAD, the study of beliefs about beliefs specific to depression may in time bear similar fruit.

Research by McIntosh, Harlow and Martin (1995) has investigated individuals' tendency to link lower order goals with higher order goals. These authors hypothesised that individuals who had a tendency to link the attainment or blocking of lower order goals (e.g. being one's ideal weight) to higher order goals (e.g. being a worthwhile human being) would experience greater impact of daily hassles upon their moods.

Consistent with this hypothesis, they found that participants' dispositions to make links between lower order goals and higher order goals was associated with participants experiencing more rumination, greater levels of depression and more physical symptoms of depression, particularly in those who had reported a high number of daily hassles. Goal linking may be a consequence, cause or phenomenon associated with rumination and may therefore be another form of meta-cognition which future researchers may be able to exploit in the development of more efficacious treatments for depression.

Kool, Smeets, Van Knippenberg and Dijksterhuis (1999) provide further theoretical suggestions that may be translated into therapeutic procedure. In a series of three experiments, these authors investigated undergraduate's responses to failure on a mock IQ test. Their findings were that failure induced ruminative thinking about the self-ideal discrepancy and lowered participants' mood, entirely consistent with suggestions from the research reviewed above.

They further found that procedures similar to those used in cognitive therapy (reframing the meaning of the event by telling participants that the tests did not really measure

intelligence) reduced participants' rumination. Furthermore, allowing participants to re-affirm a valued aspect of their self-identity led to equivalent reductions in ruminative thinking, compared to a control condition in which participants were given the opportunity to re-affirm an aspect of their self-identity which they did not particularly value.

Interestingly, the ability of self-affirmation to reduce ruminative thinking was also demonstrated when the self-affirmation occurred *before* the failure experience. This finding may have implications for developing relapse prevention techniques for patients recovering from depression. Pyszczynski & Greenberg (1987) suggest that individuals fail to disengage from the self-regulatory loop because they lack alternate sources of self-esteem. Therapeutic efforts that develop other sources of self-esteem, either through skill acquisition, behaviour change or raising awareness of other aspects of individual's lives from which esteem could be drawn will be likely to be more effective at preventing relapse. Applying Kool et al.'s (1999) findings to this suggests that regular re-affirmation of a wide diversity of sources of self-esteem would be likely to prevent the instigation of ruminative thinking and its reciprocal relationship with mood, retrieval of dysphoric memories and disruption of social problem solving. Such affirmation would be relatively easy to incorporate into existing therapeutic programs and would be likely to be experienced as both rational and pleasurable by recovering depressed persons.

Self-affirmation can only work, however, if the person has positively valued aspects of the self to affirm. Clinical observation suggests that depressed persons devalue formerly valued aspects of the self. As described above, Pyszczynski & Greenberg (1987) have suggested that a depressive attributional style develops in which expectancy for future happiness is avoided in order to protect the individual from future pain. Whilst the depressive self-focussing style may protect from pain, it's long term consequences are costly both to individuals and society.

In dealing effectively with distressing life events, Hunt (1999) has suggested that "The only way out is through." Using undergraduates and again, exposing them to false failure on an IQ test, she examined the effect of three post-failure processing conditions on subjects self-reported moods tracked over a period of 24 hours. Dysphoria was measured using a revised version of the Multiple Affect Adjective Check List (MAACL, Zuckerman et al., 1983).

After receiving failure feedback, participants were asked to write one of three essays. Participants in the emotional processing condition were asked to write about their test performance, their feelings in relation to it and the implications of the test for the future. Participants in the disputation condition (designed to be an analogue of cognitive therapy) were instructed to write about their perception of the test, to marshal evidence that they were brighter than the test suggested and to question whether the test result had any relevance for the future. In a distracting condition, participants were instructed to write about their favourite TV show in depth, including why they liked it and to describe an episode that typified the show. Participants repeated the essays at each measurement interval, those in the distracting condition wrote three different essays targeted toward pleasure, mastery and simple re-focussing of attention.

As might be expected, all participants reported increased dysphoria following failure on an IQ test. Those in the emotional processing condition experienced greater dysphoria at time one (immediately after the essay writing) than participants in the other two conditions, who experienced similar levels of dysphoria. At time 2 (that evening) and time 3 (the following afternoon) Participants in the emotional processing condition felt significantly better than those in the other two conditions, who still did not differ significantly.

In the second part of Hunt's study, blind raters coded and analysed each essay for evidence of emotional arousal and evidence of cognitive restructuring (including goal

shifting, citing counter-evidence, and reframing the meaning of the test failure). Regression analysis revealed that in each condition, the more dysphoric a person had been at time one, the better they felt at time two. A path-analytic model allowed Hunt to demonstrate that emotional arousal was the significant variable predicting dysphoria at time two, whilst essay condition was not. Hunt argues, "It is only the initial emotional processing, while the event is still fresh and the emotions are still strong, that has an effect on mood" (Hunt, 1999, p. 374).

Examination of the data for cognitive restructuring indicated some surprising results. Firstly, disputers whose essays immediately after failure showed a high level of cognitive restructuring had *greater* dysphoria the following day. When this comparison was made with the emotional processing condition, the *opposite* result was found: that subjects who produced a high level of cognitive restructuring and a high level of emotional tone in essay one, had better mood the following day. Hunt (1999) concludes;

> "There was a marginally significant interaction between simultaneous emotional arousal and cognitive restructuring such that restructuring was somewhat helpful at low levels of arousal, but had little effect at high levels of arousal...This study addressed the question of whether emotional processing is a useful coping strategy in response to dysphoric mood following a depressing life event. The main experimental results provided strong evidence that this is the case. Emotional processing improved people's mood more than either pleasure and mastery oriented distraction or unemotional cognitive restructuring and problem solving" (Hunt, 1999, p. 378).

Though Hunt's (1999) data has been gathered on non-clinical samples, and has investigated the immediate reactions to distressing events rather than individuals' long-

term reactions to chronic depression, it does suggest that emotional processing may be an important conceptual model in research efforts aimed at developing clinical techniques to reduce the depressive self-focussing style, negative attributions and lack of positive expectancies that Teasdale neatly summarises as "Depressive Interlock" (Teasdale and Barnard, 1993).

Conclusions

There appears to be evidence that repetitive information processing plays a strong role in the maintenance of negative moods. (NolenHoeksema,1991; Nolen-Hoeksema, Larson & Grayson, 1999; Just & Alloy, 1997). There is also some evidence that distraction can lift depressed mood, at least in the short-term (Fennel, Teasdale, Jones & Damlé, 1987; Nolen-Hoeksema & Morrow, 1993).

The distractions described in these studies are however, attention demanding and require effortful persistence. It is probably not too presumptuous to state that the majority of depressed people are unable to distract themselves from their concerns and moods, it is the uncontrollability with which information processing becomes dominated by negative concerns that appears to be a characteristic feature of depression.

This may relate to the dysfunction of biologically prepared self-regulatory mechanisms, (Pyszczynski & Greenberg,1987). This dysfunction may stem from several sources; individuals may lack alternate sources of self-worth with which to replace the lost source of self-esteem, they may devalue other sources of self-worth as being unable to replace the lost object or they may even believe that the repetitive self-focus engendered by such situations leads to insight, which is to be valued.

ICS and Repetitive Information Processing

There are likely to be neurological and biochemical mechanisms that underpin the emotional regulation system hypothesised by Pyszczynski & Greenberg (1987). Likewise, there may be neuropsychological correlates of repetitious information processing (see for example Mega and Cummings, 1994; Paradiso, Lamberty, Garvey and Robinson, 1997; DegIInnocenti, Agren and Backman, 1998).) There may also be particular qualities of basic learning processes that may influence the learning of affectively valenced information. Future research that investigates the learning and re-learning of hedonically toned information may shed light on some of the basic principles by which cognitive representations become associated with affective tone.

ICS is an extremely complex model, necessarily so Teasdale & Barnard might argue. It's utility to clinical psychological research and treatment remains to be shown. It can readily provide research hypotheses, from which more specific accounts of normal and pathological processes may be developed and tested. A major conceptual issue which Teasdale and Barnard do not address however, is the lack of definition of implicational representations, which sheds doubt upon the ICS models ability to produce *testable* hypotheses. Because the concept of implicational meaning is presented (cf. Teasdale, 1997, p.88), as generic, prototypical of recurring themes of experience, holistic, abstract, felt senses, not easily defined in words, it makes it very difficult to operationalise any test of the ICS model. Implicational meaning is extremely difficult to measure, which has left researchers designing studies which infer implicational processing, rather than directly manipulating or measuring the process (see for example, Teasdale, Lloyd and Hutton, 1998). Given the potential to an understanding of cognitive-affective interaction suggested by The ICS framework, future empirical and theoretical work is needed to determine whether Teasdale and Barnard's theory can be successfully operationalised.

References

Abramson, L. Y., Seligman, M. E. P., & Teasdale, J. (1978). Learned helplessness in humans: Critique and reformulation. *Journal of Abnormal Psychology, 87,* 49-74.

Beck, A. T. (1963). Thinking and depression: I. Idiosyncratic content and cognitive distortions. *Archives of General Psychiatry, 9,* 324-333.

Beck, A. T. (1964). Thinking and depression: II. Theory and therapy. *Archives of General Psychiatry, 10,* 561-571.

Beck, A. T., Rush, A. J., Shaw, B. F., & Emery, G. (1979). *Cognitive therapy of depression.* New York: Guilford Press.

Carr, S. J., Teasdale, J. D., & Broadbent, D., (1991). Effects of induced and depressed mood on self-focussed attention. *British Journal of Clinical Psychology, 31*, 273-273.

Champion, L. A. & Power, M. J. (1996). Social and cognitive approaches to depression: Towards a new synthesis. *British Journal of Clinical Psychology, 34,* 485-504.

DeglInnocenti, A., Agren, H., & Backman, L., (1998). Executive deficits in major depression. *Acta Psychiatrica Scandinavica,* Vol. 97, No. 3, 182-188.

Fennel, M. J. V., Teasdale, J. D., Jones, S., & Damlé, A. (1987). Distraction in neurotic and endogenous depression: An investigation of negative thinking in major depressive disorder. *Psychological Medicine, 17,* 441-452.

Hunt, M. G., (1999). The only way out is through: emotional processing and recovery after a depressing life event. *Behaviour Research and Therapy, 36,* 361-384.

Just, N., & Alloy, L. B., (1997). The response styles theory of depression: Tests and extension of the theory. *Journal of Abnormal Psychology,* 106, 221-229.

Lyubomirsky, S., Caldwell, N. D., & Nolen-Hoeksema, S. (1998). Effects of ruminative and distracting responses to depressed mood on retrieval of autobiographical memories. *Journal of Personality and Social Psychology, 75,* 166-177.

Lyubomirsky, S., & Nolen-Hoeksema, S. (1995). Effects of self-focussed rumination on negative thinking and interpersonal problem-solving. *Journal of Personality and Social Psychology, 69,* 176-190.

Lyubomirsky, S., & Nolen-Hoeksema, S. (1993). Self-perpetuating properties of dysphoric rumination. *Journal of Personality and Social Psychology, 65,* 339-349.

Kool, S. L., Smeets, K., Van Knippenberg, A., & Dijksterhuis, A. (1999). The cessation of rumination through self-affirmation. *Journal of Personality and Social Psychology, 77,* 111-125.

Mega, M. S., & Cummings, J. L. (1994). Frontal-subcortical circuits and neuropsychiatric disorders. *Journal of Neuropsychiatry and Clinical Neurosciences, 6,* 358-370.

McIntosh, W. D., Harlow, T. F., & Martin, L. L. (1995). Linkers and non-linkers – Goal beliefs as a moderator of the effects of everyday hassles on rumination,

depression and physical complaints. *Journal of Applied Social Psychology, 25,* 1231-1244.

Morrow, J., & Nolen-Hoeksema, S. (1990). Effects of responses to depression on the remediation of depressive affect. *Journal of Personality and Social Psychology, 58,* 519-527.

Nolen-Hoeksema, S. (1991). Responses to depression and their effects on the duration of depressive episodes. *Journal of Abnormal Psychology, 100,* 569-582.

Nolen-Hoeksema, S. (1990). *Sex differences in depression.* Stanford, CA: Stanford University Press.

Nolen-Hoeksema, S. (1987). Sex differences in unipolar depression: Evidence and theory. *Psychological Bulletin, 101,* 259-282.

Nolen-Hoeksema, S., Larson, J., & Grayson, C. (1999). Explaining the gender difference in depressive symptoms. *Journal of Personality and Social Psychology, 77,* 1061-1072.

Nolen-Hoeksema, S., & Morrow, J. (1993). Effects of rumination and distraction on naturally occurring depressed mood. *Cognition and Emotion, 7,* 561-570.

Nolen-Hoeksema, S., & Morrow, J. (1991). A prospective study of depression and post traumatic stress symptoms after a natural disaster – The Loma-Prieta earthquake. *Journal of Personality and Social Psychology, 61,* 115-121.

Nolen-Hoeksema, S., Morrow, J., & Frederikson, B. L. (1993). Response styles and the duration of episodes of depressed mood. *Journal of Abnormal Psychology, 102,* 20-28.

Paradiso, S., Lamberty, G. J., Garvey, M. J., & Robinson, R. G. (1997). Cognitive impairment in the euthymic phase of chronic unipolar depression. *Journal of Nervous and Mental Disease, 185,* 748-754.

Pyszczynski, T., & Greenberg, J. (1987). Self-regulatory perseveration and the depressive self-focussing style: A self-awareness theory of reactive depression. *Psychological Bulletin, 102,* 122-138.

Rachman, S. (1997). The evolution of cognitive behaviour therapy. In D. M. Clark & C.G.Fairburn, *Science and Practice of Cognitive Behaviour Therapy, (pp. 3-26)* Oxford: Oxford University Press.

Rachman, S. (1980). Emotional Processing. *Behaviour Research and Therapy, 18,* 51-60.

Simons, A. D., Garfield, S. L., & Murphy, G. E. (1984). The process of change in cognitive therapy and pharmacotherapy for depression: changes in mood and cognition. *Archives of General Psychiatry, 41,* 45-51.

Teasdale, J. D. (1997). The relationship between cognition and emotion: the mind-in-place in mood disorders. In D. M. Clark & C.G. Fairburn, *Science and Practice of Cognitive Behaviour Therapy, (pp. 67-93)* Oxford: Oxford University Press.

Teasdale, J. D. (1993). Emotion and two kinds of meaning: cognitive therapy and applied cognitive science. *Behaviour Research and Therapy, 31,* 339-354.

Teasdale, J. D. (1988). Cognitive vulnerability to persistent depression. *Cognition and Emotion, 2,* 247-274.

Teasdale, J. D., & Barnard, P. J. (1993). *Affect, cognition and change: re-modelling depressive thought.* Hove: Lawrence Erlbaum Associates.

Teasdale, J. D., Lloyd, C. A, & Hutton, J. M. (1998). Depressive thinking and dysfunctional mental models. *British Journal of Clinical Psychology, 37,* 247-258.

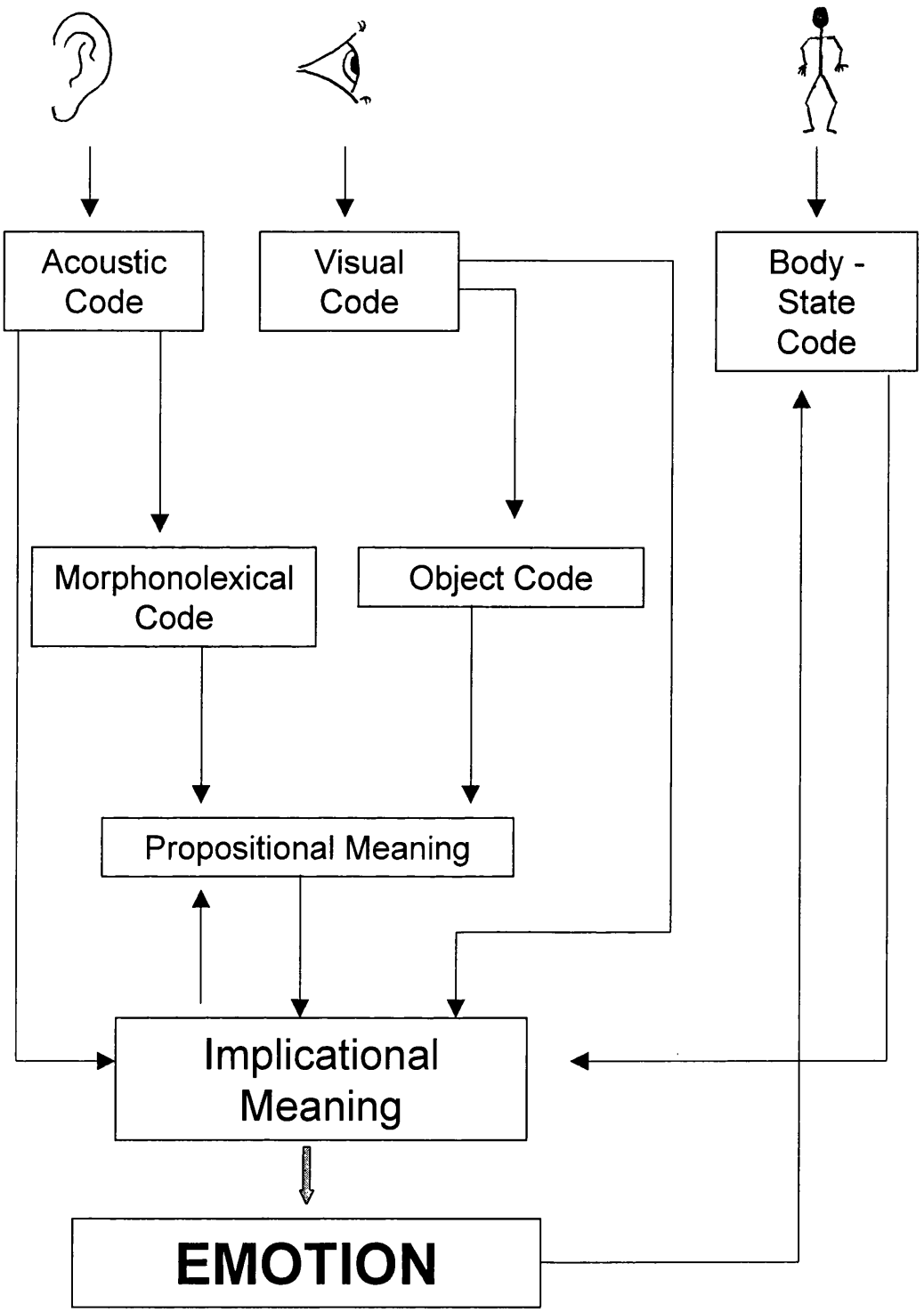
Teasdale, S. D., Segal, Z. V., & Williams, J. M. G. (1995). How does cognitive therapy prevent depressive relapse and why should attentional control (mindfulness) training help? *Behaviour Research and Therapy, 33,* 25-39.

Teasdale, J. D., Taylor, M. J., Cooper, Z., Hayhurst, H., & Paykel, E. S. (1995). Depressive thinking: shifts in construct accessibility or in schematic models? *Journal of Abnormal Psychology, 104,* 500-507.

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

Zuckerman, M., Lubin, R., & Rinck, C. M. (1983). Construction of the new scales for the multiple affect adjective check list. Journal of Behavioural Assessment, 5, 119-129.

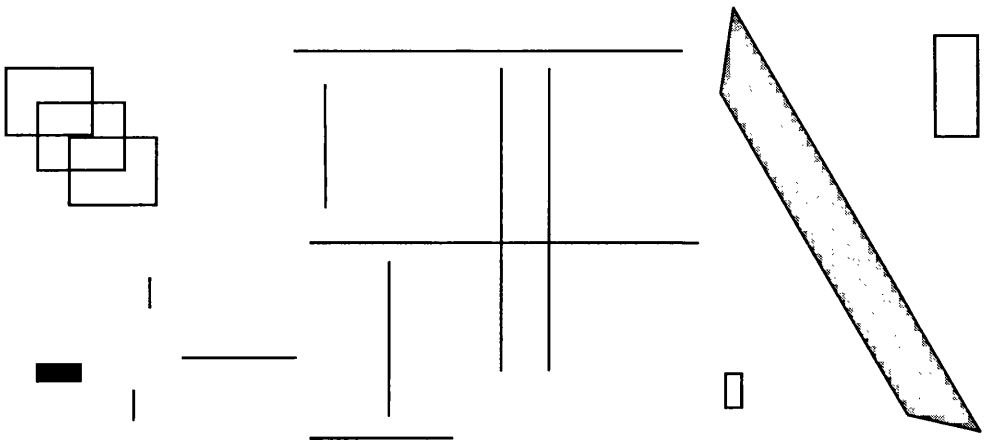
Figure 1: The Interacting Cognitive Subsystems Model



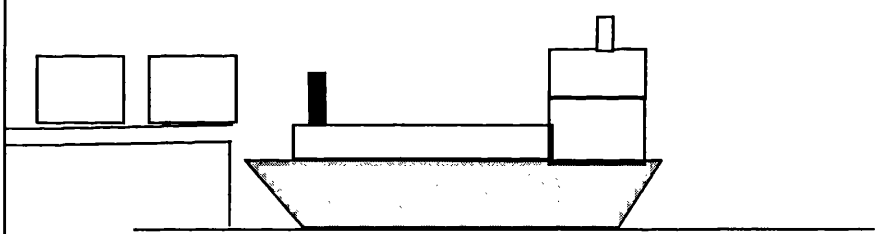
For simplicity, the arrows have been represented as indicating a one way flow of information between systems. Teasdale and Barnard's model shows a 'data matrix' in which all possible connections may be made. The above diagram is a heuristic representation of their model to help to illustrate, rather than a detailed exposition of ICS in diagrammatic form

Figure 2: The Synthesis of Higher Order Meanings From Lower Order Representational Codes

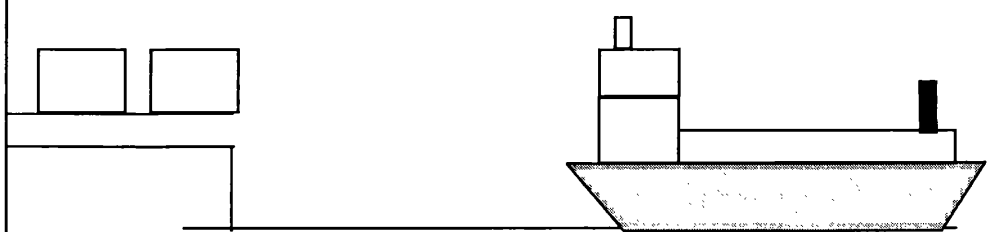
2a: Raw sensory perceptions encoded as visual code



2b. Positioning of elements of visual code synthesise object level representation



2c. Change of positioning of elements of visual code changes propositional meaning



MAJOR RESEARCH PROPOSAL 31st MARCH 1999

Applicants David Gillanders, Trainee Clinical Psychologist

Paul. F. J. Fleming, Research Supervisor

Title *"An Experimental Study of Repetitive Thinking in Depression "*

Summary Continuing development in the field of clinical cognitive theory has led to a number of information processing accounts of the maintenance of depression. One such account, The Interacting Cognitive Subsystems Model (ICS)(Teasdale & Barnard 1993) suggests that depression is maintained by depressive interlock. Interlock is thought to be a tendency for the repetitive synthesis of depression related patterns of information processing, at the expense of other patterns of information processing. In a sense, interlock is mental "stuckness."

One of the flaws of the ICS account is that it's very theoretical richness gives rise to many hypotheses but few predictions. It is a framework that appears to explain everything, whilst predicting nothing.

The process by which interlock operates requires elaboration if the concept is to usefully inform clinical and research practice. It is suggested that an experimental study, using a modified version of the paired associate learning task (PA) to create "novel concepts" of varying hedonic tone will lead to a more precise account of the information processing phenomena known as interlock.

Introduction From its earliest inception, The Cognitive Model of Psychopathology (Beck 1967) has proved useful, in both the clinical and research fields, in

understanding depression.

Beck and others have, however, failed to be satisfied with the cognitive model and have continued to research, revise and refine the theory, seeking greater and greater clarity, understanding and empirical validity.

Different research groups have developed, each choosing a specific aspect of information processing in which to account for the cognitive characteristics of the depressed individual. Bower, for example, has investigated the effects of mood on memory processes, stating that mood alters the retrieval process in a mood congruent manner, such that in depressed mood, life events related to loss / depression are more easily retrieved (Bower, 1981). Williams similarly has investigated cognition in depression in terms of memory. Williams' account focuses, however, on the impaired ability of depressed individuals to retrieve specific memories. According to Williams, it is the overgenerality of memory in depressed mood that maintains depression (Williams & Dritschel 1988).

Recent theoretical insights into cognitive-emotive links have led to the development of the Interacting Cognitive Subsystems Model. (ICS) (Teasdale and Barnard 1993). It is a general model of human information processing that provides a framework for understanding information processing occurring in any situation, disordered or normal.

The ICS framework also attempts to account for clinical observations relating to "hot vs. cold cognition", or knowing with the heart vs. knowing with the head. The ICS model suggests that "knowing" is the result of particular patterns of information processing and that there exists two

qualitatively distinct processes by which something is known. These are suggested to be; a propositional level of knowing, similar to verbal / semantic definitions. At this level things are "known" in an easily understood semantic form, e.g. The capital of Scotland is Edinburgh.

The ICS model states that a second type of knowing exists; namely Implicational Knowing. Information processed at this level synthesises input from other levels (e.g. Propositional, body-state information, and acoustic patterns) and represents that information as to its implications for the individual. Knowledge represented at an implicational level is said to be difficult to accurately convey as it is generic, holistic, and representative of recurring regularities of experience. This level of representation is closest to Beck's concept of the schema (Beck 1976). One of the features of the ICS analysis is the proposal that thinking in depression tends to be negative, self-focused and is repetitive.

Teasdale describes this phenomenon of repetitive synthesis of patterns of information processing related to negative meanings as "Depressive Interlock." Interlock is said to be akin to being "stuck in a particular frame of mind" and Teasdale further argues that Interlock is a key factor in the maintenance of depression.

The ICS model is ambitious, complex and explicitly cognitive in its conceptual foundations. Its complexity is, however, its downfall. It has been described as a framework for developing hypotheses, rather than a complete theory, "The problem may be that there is too much explanatory power in the absence of precise predictions" (Mathews & Macleod, 1994).

The ICS account has the potential to guide and inform a major strand of clinical and research work. The account itself is too large to approach in a single study. A more fruitful approach may be to deal with different aspects of the account in piecemeal fashion, to refine our understanding of the different processes of the model in such a way that it will more readily inform clinical practice.

It is suggested that a modified version of the paired associate learning task may be a useful and innovative tool for "unpacking" the nature of interlock and understanding the processes it involves.

Aims and Hypotheses to Be Tested

1. Is Thinking Stuck in Depression?
2. Is this Specific To Negative Thoughts or a General Feature of Thinking in Depression?

Participants

Participants will be 30 moderately depressed patients, aged 18 –65, male or female, being seen by psychologists in the primary care sector. They will be screened for severity of depression using the Beck Depression Inventory (criterion of moderate depression = score between 15 and 30). Depression will be confirmed using the Structured Clinical Interview for DSMIV (SCID IV). Patients will be excluded on the basis of known organic pathology, co-morbid psychiatric disorder such as psychotic or bipolar disorder, presence of alcohol or drug dependency problems and personality disorders. They will be recruited through their contact with a primary care clinical psychologist.

Controls will also be male or female, aged 18 – 65, screened for the above

and will be recruited from non-clinical NHS and University staff through poster advertisement. 30 participants in the control group will also be recruited.

Plan of Investigation

The current study proposes that the PA task be constructed with real words paired with pronounce-able non-word trigrams, such as NIF and CIR. These trigrams have no meaning to the participants. The real word pairs would be selected to reflect concepts of positive, negative and neutral hedonic tone, and would be matched for concreteness, imageability, frequency in the English language and degree of pleasant / unpleasantness. These features of words have been established as influencing PA performance. Watkins et. al. (1992), Anderson (1968) and Montague & Keiss (1967), have carried out the necessary pilot work to control for these variables, the word lists used will be the taken from these sources.

Participants are presented the trigram – real word pairs and then asked to supply the trigram when presented with the real word. Participants are given ongoing feedback on their performance as this has also been shown to improve PA performance. After association with affectively meaningful words the trigrams are assumed to 'borrow' corresponding hedonic tone and are therefore an experimental analogue of the propositional mental representations that Teasdale argues are subject to interlock in depression.

Participants will continue to be presented with the associations until their recall accuracy is 100 %. Using the well established norms from the PA test from the Weschler Memory Scale – Revised and a one person

"dummy run" of the procedure involving an associate of the proposer, it is anticipated that the majority of participants will achieve this criteria within 8 presentations.

In the second phase of the study, the same trigrams would then be paired with the *opposite toned real word.* Neutral pairs would be randomised within themselves as a measure of "baseline" interference. The PA task would then be re-run using the new word – trigram pairs.

It is predicted that there will be some interference from learning in trial 1 on performance on trial 2. There will, however, be a differential effect according to the emotional tone of the words. It is further predicted that interference will be greatest when learning positive category trigrams in phase 2 that were previously paired with negative words in phase 1.

It is predicted that this effect will be seen more strongly for depressed participants than controls. Outcome will be measured as amount of interference from learning in phase 1 on performance on phase 2.

Measures

Ratings will be required of participant's mood. This will be measured using a standardised rating scale, the Beck Depression Inventory.

To control for possible confounding variables, The National Adult Reading test will be used to provide a quick measure of intellectual ability.

A previous study by DeRosiers and Robinson (1992) has also shown that scores on the Eysenck Personality Inventory influenced performance on

an emotional paired associate task. This will also be used as a covariate.

The main measure will be number of trials to meet 100% accuracy criteria in phase 2 minus number of trials to meet same criteria in trial 1. This represents amount of interference from trial 1 on learning in trial 2.

Design & Procedure

The study will use an experimental design with between and within group comparisons. The between group will be healthy vs. depressed participants. The within group variable is hedonic tone of the words. The NART and EPI will be measured and used as covariates.

During the running of the study, participant's depression (and lack of for controls) will be confirmed using the SCID IV. They will then be asked to complete the Beck Depression Inventory and the Eysenck Personality Inventory. They will then be administered the NART.

After the NART they will be read a list of 6 real word – trigram pairs. They will then be presented with the word and asked to recall the trigram that went with it. They will be given ongoing feedback on their performance as this has been shown to enhance performance. This sequence will be repeated until participants have achieved 100 % accuracy.

In phase two of the experiment the trigrams will be paired with words of opposite hedonic tone, while the neutral category will be switched within itself. The task will be run again as before. Number of trials to 100 % success on trial two minus number of trials to 100% success on trial one is the outcome variable and is interpreted as interference from trial one on learning in trial two. It is anticipated that if "depressive interlock" exists,

there will be significantly more interference for the depressed group when learning a positive association on trial two which was previously associated with a negative word on trial one.

Settings & Equipment

The study will be carried out in an adult primary care setting and will require no special equipment.

The BDI, The NART, The EPI and SCID IV will be required.

Data Analysis

Data will be of ratio level measurement as it is based on observable counts of behaviour that have a true zero and equal intervals between increments. A 2 x 2 Analysis of Covariance will be applied to the group means, using depressed versus healthy participants as one comparison and hedonic tone of responses as the other. Intelligence (as measured by the NART) and personality (as measured by the EPI) will be held as covariates. These statistical techniques are readily accessible using SPSS software. Post hoc comparisons are planned as follows: interference in shifting category from negative to positive, interference in shifting category from positive to negative, interference in shifting category from neutral to different neutral, each comparison being repeated for differences between depressed versus healthy subjects. SPSS offers a range of techniques for adjusting for the increased Type 1 error rate when performing multiple comparisons, The Bonferroni Correction being a frequently used option.

Practical Applications

An emerging strand in psychological therapies research appears to be the focus on "process" over "content" issues. Examples include Adrian Wells's recent work on Meta-Cognition in Anxiety as well as cognitive treatments for Obsessive Compulsive Disorder.

Greater understanding of the process (rather than content) of information processing in mood disorder is likely to facilitate the development of more specific, and therefore more efficient, forms of psychological therapy.

Timescales The actual experiment will be likely to take one hour of participant's time. It is anticipated that 20 – 30 participants per group will be recruited. Total time for completion of the study is envisaged at ten months.

Ethical Approval Application completed and submitted concurrently with academic proposal.

Power Calculation Watkins et al. (1996), report a study in which depressed and healthy subjects were presented with affectively negative, positive and neutral words. They were then required to free associate to previously unseen cues. Their main dependant measure was the number of previously presented words subjects spontaneously produced during the free association phase. This was reported by the authors to be a "conceptually driven implicit memory task". Using this task Watkins et al. demonstrate an implicit mood congruent memory bias, such that depressed participants gave more negative previously studied words during their free associations, whilst the non-depressed participants produced more positive previously studied words. This main effect of implicit memory is assumed to underpin the learning required in the Mod-PAL task and although dissimilar, is the closest empirical data available upon which to base a power calculation.

In their experiment, however, the words were free recalled. This is assumed to be a relatively easier task than that proposed in the current

study, producing large numbers of "words recalled." To reflect the greater difficulty of the current study, Watkins et al.'s results have been consistently divided by a factor of ten, to arrive at figures that are anticipated to reflect the relative magnitude and direction of the main experimental effect.

No study has yet investigated the second "set shift" part of the proposed study. Power has therefore been calculated to reflect the differential effect (based upon mood congruent implicit memory) that is anticipated in part one of the study. It is assumed that experimental effects observed in part two will be of adequate power.

The power calculation was performed using the University of California, department of statistics Power calculation web site. A two sample, unequal variance model was used.

HEDONIC TONE OF WORD	DEPRESSED GROUP		CONTROL GROUP	
	mean	S.D.	Mean	S.D.
negative	6.4	1.4	4.7	1.8
Required sample size	14		11	

P < 0.05 (*one tailed test)* **Power required > 0.8**

The above figures represent numbers of previously studied words recalled during a free association task, reflecting an implicit memory bias based upon non-conscious priming or activation of the words. The current study is more complex than this, though these figures reflect the power required for the separate main effects. As the current study proposes an interaction between mood and hedonic tone, if the main effect is of similar magnitude to that observed by Watkins et al. the sample size will be adequate to detect such interaction effects. Results will be subject to statistical analysis using a 2

x 2 ANCOVA. It is proposed that between 20 – 30 participants per condition be recruited, in order to render the results more generalisable.

References

Anderson, N. H. (1968). Likeableness ratings of 555 Personality Trait Words. *Journal of Personality and Social Psychology, 9,* 272-279.

Beck, A. T. (1976). *Cognitive Therapy and the Emotional Disorders.* New York: American Library.

Beck, A. T. (1967). *Depression: Clinical, experimental and theoretical aspects.* New York: Harper & Row.

Bower, G. (1981). Mood and Memory. *American Psychologist, 36,* 129-148.

Montague, W. E., & Keiss, H. O. (1967). The associability of CVC pairs. *Journal of Experimental Psychology, Supplementary Monograph, Vol. 78,* 2, Part 2.

Teasdale, J.D. and Barnard, P. J. (1993). *Affect, Cognition and Change: Re-modelling Depressive Thought.* Hove, Lawrence Erlbaum And Associates.

Teasdale, J. D. (1997). The Relationship Between Cognition and Emotion: The mind-in-place in mood disorders. P 67 – 93. In; "Science and Practice of Cognitive Behaviour Therapy, Clark, D. M. & Fairburn, C. G. (Eds.) Oxford Medical Publications.

Watkins, P.C., Vache, K., Verney, S. P., Muller., S. & Matthews, A. (1996). Unconscious Mood Congruent Memory Bias in Depression *Journal of Abnormal Psychology; 101,* 581-586.

Williams, J. M. G. & Dritschel, B. H. (1988). Emotional Disturbance and the Specificity of Autobiographical Memory. *Cognition and Emotion, 22,* 221- 234.

Amendment to Major Research Project Proposal

Over the course of the study, a number of amendments were required to the study as follows:

1. It became clear during the first 3 months that recruiting only from the primary care sector would not be adequate to reach the numbers required. 4 Community Mental Health Teams were therefore approached, who agreed to participate in the study. The recruitment and selection criteria remained broadly unchanged, though individuals scoring more than 30 on the BDI were included in the study.

2. Despite these efforts, only 14 patients were recruited, instead of the 30 anticipated. This is still adequate for the power calculation and statistical requirements, though was a somewhat disappointing return, given the prevalence of the disorder.

3. It was originally proposed to recruit control participants through NHS administration staff. Preliminary discussions regarding this revealed people would be unlikely to give up the time required. The control group was therefore recruited from colleagues and associates of the author who gave their free time to participate.

4. The original outcome measure in the study was to be number of trials to 100% criteria. Although the first 5 patients recruited satisfied this criterion, not all patients learned the associations to 100% criteria. Likewise there were similar numbers of people in the control group who did not reach 100% criteria. A new outcome measure was therefore defined, which involved categorising individuals' errors as random or perseverative (see Major Project Research Paper, p. 64). This measure is still thought to reflect differential interference on memory of hedonic tone.

MAJOR RESEARCH PROJECT PAPER

Submitted as part of the research portfolio for the degree of

Doctor of Clinical Psychology

by

DAVID GILLANDERS

1st August 2000

An experimental investigation of repetitive thinking in depression.

JOURNAL: **The Journal of Abnormal Psychology**

DAVID GILLANDERS

University of Glasgow
Department of Psychological Medicine
Gartnavel Royal Hospital, 1055 Great Western Road
Glasgow, G12 0XH.
+00 44 141 / 211 3920

dgillanders@ggpct.scot.nhs.uk

An experimental investigation of repetitive thinking in depression

The Interacting Cognitive Subsystems Model (ICS, Teasdale and Barnard, 1993), predicts that depression is associated with a repetitive style of information processing. The current study empirically investigated this prediction, using an experimental methodology to compare the processing of affectively valenced material by depressed (n = 14) and non-depressed individuals (n = 14). It was also predicted that such repetitive processing would be observed more strongly for negative, compared to positive or neutral stimuli. Results indicated support for the hypothesis that depression would be associated with repetitive information processing, but only partial support for the hypothesis that this would be seen more strongly for negative material. The results are interpreted as providing preliminary empirical support for the ICS model. Implications for psychological therapies for depression are discussed.

Introduction

Previous research in the experimental, neuropsychological and clinical fields has indicated that vulnerability to recurring episodes of major depressive disorder, as well as length and severity of individual depressive episodes may be influenced by a ruminative response style (see Gillanders, 2000). A ruminative response style is thought to be a relatively stable, trait-like dispositional tendency (Just and Alloy, 1997), and is thought to be underpinned by a repetitive style of information processing. This repetitive style of information processing is thought to develop from attempts to regulate affect in the face of losses of important sources of self-esteem (Pyszczynski & Greenberg, 1987). It is thought to confer vulnerability to recurrent major depression when repetitive information processing occurs as a habitual response to depressed mood.

The experimental and correlational studies that make up the Response Styles Theory (Nolen-Hoeksema, 1990), have also suggested that repetitive information processing may be linked to the severity and duration of episodes of depressed affect. These studies have measured repetitive information processing using self-report questionnaires such as the Response Styles Questionnaire (RSQ, Morrow and Nolen-Hoeksema, 1990). The RSQ invites respondents to indicate which of a variety of responses they typically make to depressed affect. None of these studies have attempted to verify the accuracy of respondents reported responses. Furthermore, these studies have tended to conceptualise the tendency to ruminate or distract ones-self from depressed mood and negative thinking as a relatively controllable phenomenon in which people choose which type of response to make.

Gillanders (2000) has drawn upon a variety of sources to indicate that ruminative responding to depressed affect may be much less controllable than the Response Styles Theory would suggest. It is suggested that the tendency to ruminate may be

based upon differences in information processing between depressed and non-depressed people and that this repetitive style of information processing may be related to the hedonic tone or affective meaning of the material upon which depressed people ruminate.

Teasdale & Barnard (Teasdale & Barnard, 1993) have outlined a conceptual framework, The Interacting Cognitive Subsystems model (ICS), within which a wide variety of psychological phenomena may be investigated. At the cornerstone of the ICS analysis of information processing in depression is the concept of depressive interlock. In essence depressive interlock refers to depressed individuals' disposition to become 'stuck' in a particular mode of information processing, a phenomena which Teasdale and Barnard (1993), have suggested leads to the maintenance of major depressive disorder. Depressive Interlock may be a useful concept in understanding the cognitive – affective process that may underpin the ruminative phenomena described by the Response Styles Theory (Nolen-Hoeksema, 1990).

Teasdale and Barnard (1993), have argued that repetitive information processing in depression is theoretically underpinned by continuing interactions between implicational level meanings and propositional meanings (see Teasdale, 1997). According to Teasdale and Barnard (1993), in depression, the processing of specific propositional meanings is likely (though not inevitably) to lead to the synthesis of implicational models which have previously been associated with the processing of that specific propositional code. The implicational meanings are associated with the production of emotion, in this instance sadness. The implicational model that evokes sadness will also lead to the synthesis of specific meanings related to the experience of depressed affect (propositional meanings). These propositional meanings may then feed back into the continuing synthesis of implicational models, engendering further depressed affect. This is the process which Teasdale and Barnard refer to as 'depressive interlock'. They argue that depressive interlock is relatively uncontrollable,

in that the persons' information processing configuration becomes stuck in this particular loop.

The current study sought to investigate the phenomenon of repetitive information processing in depression in order to subject an element of the theoretical ICS model to empirical test, thereby attempting to add to the growing body of research that seeks to establish whether ICS is a useful construct for the study of psychopathological phenomena (see for example Gumley and Power, 2000; Gumley, White and Power, 1999). The current study also sought to empirically investigate whether repetitive information processing is a feature in depression at a pre-conscious level, in contradiction to the conceptualisation of relatively conscious choice implied by the Response Styles Theory (e.g. Nolen-Hoeksema, 1991).

The Current Study

Hypotheses

In line with the theoretical predictions of the ICS framework two hypotheses were tested:

H_1: Information processing is more prone to repetition in depressed people compared to non-depressed people.

H_2: Repetitive information processing will be more likely to be seen for information with affectively negative tone than for similar material with either positive or neutral affective tone.

To test these hypotheses, an information processing task was designed which involved participants learning associations between novel verbal stimuli in the form of

consonant–vowel–consonant (CVC) trigrams and hedonically neutral, negative and positive personality trait adjectives, which they had previously rated for how well they felt each described them. Once these associations had been learned, the same CVC trigrams were paired with oppositely toned adjectives. Trigrams that had been paired with neutral adjectives were paired with different neutral adjectives, whilst trigrams paired with positive adjectives were paired with negative adjectives and vice-versa.

This cognitive-affective learning task was based upon the Paired Associate Learning Task (PAL) of the Weschler Memory Scale - Revised (WMS-R), (Weschler, 1987), and was named the Modified Paired Associate Learning Task (Mod-PAL).

The Mod-PAL uses 6 affectively positive, neutral and negative personality trait descriptors. These words were in the neutral category; hesitant and average; in the negative category; hostile and rude and in the positive category; kind and helpful. Considerable care was taken in selecting words that were matched according to frequency in the English language, concreteness and meaningfulness (see Anderson, 1968). The words are assumed only to differ significantly in terms of affective tone. These hedonically toned words are paired with consonant-vowel-consonant (CVC) trigrams, which have been matched for their associability (see Montague & Keiss, 1967).

In order to engender implicational processing, thereby attenuating the different emotional tones of the words, the 6 personality trait descriptors were first presented in random order to participants, who were asked to consider each word carefully as to how well they felt each word described them. Although this presents participants with a propositional meaning, the self-referencing and holistic nature of the evaluation they were asked to perform is thought to lead to the synthesis of an implicational meaning (i.e. a holistic – felt sense representation of the construct behind each word, in relation

to themselves). These implicational models, having been primed, will be more readily accessed when the personality adjectives are then presented during the Mod-PAL.

When the personality trait words are paired with the novel propositions (the CVC trigrams), it is anticipated that part of the affective tone will be associated with the CVC trigram. When the CVC trigram is then re-associated with a differently toned adjective, it is anticipated that the prior learning will interfere with the new association. In essence, the initial CVC trigram will become stuck, inhibiting the new learning. It is hypothesised that this will be seen least for neutral stimuli and most for negative stimuli and that this effect will be seen more strongly for depressed compared to non-depressed participants.

The Mod-PAL was considered to be an experimental analogue of the process of interlock, in that the prior self-rating of the personality adjectives would result in participants accessing implicational models of the self in relation to each adjctive, for example 'self as hostile', 'self as kind' etc. When presented with each adjective in the Mod-PAL, the implicational model of self is thought to be activated and is immediately paired with a novel propositional representation, in the form of the CVC trigram. When participants are then required to re-learn the associations, the interlock process hypothesised to exist during depression should lead participants to access the original trigram (propositional representation) with which each adjective (and its associated self-related implicational representation) was paired. This process will interfere with learning the new adjective-trigram pairs.

Method

Participants

Participants in the experimental group (*n* = 14, 5 males, 9 females) were recruited through their contact with mental health professionals in the primary care sector or community mental health team. Mental health workers were asked to identify persons for whom depression was a primary complaint but to exclude potential participants on the basis of co-morbid drug or alcohol problems, known organic pathology, diagnosed personality disorder and age range of 18 – 65 years. Anxiety symptoms were not criteria for exclusion. Whilst participants were therefore a doubly selected sample (i.e. their key workers identified who would be suitable *and* they consented to be in the study) they were considered nonetheless a relatively representative sample of the adult depressed population in urban Scotland.

Having been identified by their key workers, participants were required to meet diagnostic criteria for a current major depressive episode, which was confirmed using the mood disorders section of the Structured Clinical Interview for DSM IV (SCID IV), (First, Spitzer, Gibbon and Williams, 1996).

Participants in the control group (*n* = 14, 6 males, 8 females) were recruited through associates of the author. They were in the age range 18 – 65, and were not paid for their participation. They were screened using the SCID IV to confirm that they were not currently experiencing an episode of major depression.

Demographic variables are reported for the experimental and control groups in Table 1.

(Insert Table 1 Here)

Materials

Beck Depression Inventory (BDI) One of the most widely used self-report measures, the BDI (Beck, Ward, Mendelson, Mock & Erbaugh, 1961) assesses the presence and severity of a number of somatic, affective, cognitive and motivational symptoms of depression over the previous week.

Personality Self-Ratings (PSR) The 6 personality words which formed the Modified Paired Associate Learning Task were presented alongside 100 mm visual analogue scales which were anchored with the words, *"not like me at all"* on the left hand side and *"a lot like me"* on the right. Participants were asked to "spend a moment considering each word carefully as to how well it described their personality and to make a clear mark across the line according to how well they felt each word described them."

Eysenck Personality Inventory (EPI) The EPI is a 57 item, forced choice self-report measure that measures the personality dimensions of neuroticism and extraversion (Eysenck and Eysenck, 1964). It was included in the present study as a covariate, as previous research involving memory for affective material had demonstrated that neuroticism significantly influenced participants' responses, irrespective of depression status (desRosiers and Robinson, 1992).

National Adult Reading Test (NART) The NART is a very brief measure of reading ability, consisting of 50 irregularly spelled words whose pronunciation can not be deduced by following grapheme to phoneme rules (e.g. drachm). Number of errors is used to calculate equivalent WAIS-R IQ scores. Typically used as a test of premorbid intelligence, its use in this instance is as a brief screening measure of intellectual ability, as suggested by desRosiers and Robinson (1992).

Structured Clinical Interview for DSM IV (SCID IV) The mood disorders section of the SCID IV was used to confirm the presence or absence of major depression. The whole SCID IV was not administered in order to reduce the time demands upon participants.

Modified Paired Associate Learning Task (Mod-PAL) The Mod-PAL is a specially constructed verbal learning task, based upon the Verbal Paired Associates Test of the Weschler Memory Scale – Revised (Weschler, 1987). Hedonically negative, neutral and positively toned personality trait adjectives (from Anderson, 1968), are paired with three letter consonant-vowel-consonant trigrams, matched for associability (from Montague & Keiss, 1967). The personality trait words are balanced for frequency of use in the English language, concreteness and meaningfulness.

The 6 personality-trait - CVC pairs are presented orally by the examiner at the rate of one per second. Participants are then given the personality words and are required to recall the CVC trigram with which it was associated. Feedback is given immediately and if incorrect the correct answer is supplied, as suggested by Weschler (Weschler, 1987, p. 24). In each presentation set the order of presentation and the order in which participants are required to recall the trigrams are randomised. The six pairs are presented until participants have learned all six associations to 100% accuracy, or have completed nine presentations. In the second part of the Mod-PAL, CVC trigrams previously associated with a positively toned personality adjective are presented paired with a negatively toned adjective, whilst trigrams previously associated with negatively toned adjectives are paired with positively toned adjectives. Trigrams previously paired with neutral adjectives are paired with different neutral adjectives. The presentation procedure is then followed in exactly the same fashion, until participants have learned the new associations to 100% accuracy, or they have been presented the pairs nine times. The nine trial limit was selected to limit the duration of the experiment for each participant.

Procedure

Having consented to be involved in the study, participants were offered an appointment at a convenient time. They were seen in the building in which they usually attended for mental health services in the case of the experimental group, or in a familiar setting for the control group.

After settling participants into the setting, demographic data such as age, medication and treatment status were collected, participants were administered the mood disorders subsection of the SCID IV, followed by the BDI. Participants then completed the PSR. After the PSR, participants were administered the Mod-PAL.

The two versions of the Mod-PAL were presented in counterbalanced order. The NART was administered between presentations of the two versions of the Mod-PAL, to serve as a distracter task. Participants then completed the EPI. Finally, a full de-briefing was carried out, during which participants' perceptions of the study were assessed, including whether they had been able to determine the hypotheses of the study as well as whether any part of the procedure had caused them distress. No participant found the procedure unduly distressing, all responded favourably to the debriefing and explanation of the study's hypotheses. During the debriefing it was evident that the studies' hypotheses had remained obscured to all participants. The order in which participants learned each list did not affect their performance.

Analysis

Analysis was performed using SPSS for Windows, version 9.0.0 (SPSS Inc., 1998). Individual's responses to the Mod-PAL were coded as correct or incorrect. Participants' incorrect responses were further coded as follows;

Where an incorrect response was given that had not previously been given for that word, it was scored as a random error. Where a response was given which the participant had previously been told was wrong for that word, it was categorised as a within trial perseverative error. Where a participant supplied a response that had been correct in Trial A but was now no longer correct, this was categorised as a between trial perseverative error.

Because individuals in both groups differed according to their overall number of errors, the compute command was used to determine for each participant the proportion of their total errors that was made up of each type of error, for each category of hedonic tone, positive, negative and neutral. These proportions were expressed as percentages to facilitate understanding of the data and were entered into a 2 x 3 x 3 mixed ANOVA design. The first factor in the design was a between groups factor of group, with two levels; experimental group and control group. The second factor was the within subjects factor of hedonic tone of the words, with three levels; positive, negative and neutral. The third factor was the within subjects factor of error type with 3 levels; proportion of random errors, proportion of within trial perseverative errors and proportion of between trial perseverative errors.

For both designs, Eysenck Personality Inventory Neuroticism scores and NART scores were entered as co-variates, as described by desRosiers and Robinson (desRosiers and Robinson, 1992).

Mauchley's test of sphericity indicated that the dependant variables did not depart significantly from the assumption of equal variance (Approx. Chi-square, TONE, 5.722, $p = .06$; ERROR, 1.684, $p = .428$).

Results

There were no significant main effects or interactions in learning the initial associations (Mod-PAL trial A, GROUP x TONE x ERROR; F(2,48) = 1.038, p=0.362). This suggests that there were no between groups differences in learning the initial associations, for any tone of stimuli.

Table 2 shows the mean proportions of the total errors in trial B, made up by each type of error, for each tone of stimuli for each group.

(Insert Table 2 here)

Hypothesis 1

On the basis of the ICS model, it was hypothesised that depression would be associated with a higher proportion of perseverative to random errors. This hypothesis was examined using the anova model described above. There was no main effect for GROUP ($F_{(1,24)}$=. 635, p=. 433). There were significant two-way interaction effects for GROUP x ERROR TYPE ($F_{(2,48)}$= 3.796, p=.029), and TONE x ERROR TYPE ($F_{(4,96)}$=2.580, p=0.042). There was also a significant three-way interaction effect for TONE x ERROR x NEUROTICISM ($F_{(4,96)}$=4.434, p=.002).

Selected means were subjected to post-hoc comparison, using between subjects and repeated measures t-tests, where appropriate, to unravel the phenomena being observed within the significant interactions described. For each variable, where multiple comparisons are made, a statistical adjustment is required to control for the increased chance of making a Type 1 error. The Bonferonni correction is typically used, though SPSS lacks the facility to perform post hoc comparisons when using a mixed ANOVA design. The Bonferroni correction involves dividing the desired level of

significance, in this case 0.05, by the number of comparisons being made. This results in a very conservative criterion, for example if comparing three means the Bonferroni adjusted values for a $p < 0.05$ would be $0.05 / 3 = 0.016$. This means that the probability of any particular value of T must be less than 0.016, if we are to be sure that the result is significant at below the 0.05 level. The Bonferroni correction was applied to each of the comparisons where a particular mean was subject to more than one comparison. This procedure is described where appropriate for each result.

Across all tones of words, the control group made proportionately more random errors than the experimental group, and this difference was significant: (neutral, 22.86% vs' 10.6%, $T_{(26)} = -2.519$, $p=0.018$; negative, 23.9% vs' 12.03%, $T_{(26)}=-3.255$, $p=.003$; positive, 17.2% vs' 10.86%, $T_{(26)}=3.38$, $p=0.016$). Furthermore, compared to the control group, the experimental group made proportionately more within trial perseverative errors for negative words (15.3% vs' 4.6%, $T_{(26)} =3.38$, $p=.002$) and positive words (14.9% vs' 7.7%, $T_{(26)} =2.068$, $p=0.049$), but not for neutral words (6.6% vs' 3.4%, $T_{(26)} = 1.37$, $p=0.190$).

The expected difference between groups for between trial perseverations was not observed for any tone of material (neutral, 13.8% vs' 6.16%, $T_{(26)} =1.7$, $p=0.101$; negative, 8.03% vs' 8.5%, $T_{(26)} =-.122$, $p=0.904$; positive, 7.28% vs' 5.6%, $T_{(26)} =0.633$, $p=0.513$).

The above results suggest that depressed participants' original learning does not get 'stuck' when the associations are re-learned in the second Mod-PAL trial. What appears to occur is that they perseverate upon an incorrect response unrelated to the initial association that was correct during trial 1 of the Mod-PAL. This does not occur for neutral material, but does occur for negative and positive material.

Whilst the finding that between trial perseveration did not differ between groups is contrary to the relationship expected, the results do indicate that the control group tend to be random in their errors, whilst the experimental group are considerably less random, indicative of a higher overall level of repetitive responding. For this reason, perseverative error types were collapsed to reflect random errors versus all types of perseverative errors. T tests were again used to compare overall levels of perseveration for each tone of material, between groups. Perseveration was equally spread across the different tones of material, though for all material the experimental group evidenced significantly more perseverative responses than the control group (neutral words, 20.5% vs' 9.6%, $T_{(26)}$ =2.431, p=.022; negative words, 23.3% vs' 13%, $T_{(26)}$ =3.085, p=0.005; positive words, 22.2% vs' 13.3%, $T_{(26)}$ =2.039, p=0.05).

It is of note that whilst all of these are significant, the strongest difference is observed for negative material. These results are interpreted as supporting the hypothesis that depression is associated with a repetitive pattern of information processing.

Hypothesis 2

It was hypothesised that the repetitive pattern of information processing predicted by the ICS account of cognitive-affective interaction would be most clearly observed when depressed individuals are required to process material with negative hedonic tone. This hypothesis was tested using paired sample t-tests to compare errors between different tones of material, within each group. Bonferroni adjustments are described where relevant.

Depressed participants, made more within trial perseverative errors for negative material than neutral material (15.3% vs' 6.6%, $T_{(13)}$ =2.76, p=0.016,) and for positive material compared to neutral material (14.9% vs' 6.6%, $T_{(13)}$ = -3.01, p=0.010). No difference in within trial perseveration was observed between positive and negative

material (15.3% vs' 14.9%, $T_{(13)} = .114$, p=.911). Three comparisons were made, therefore the critical value of p = 0.016, indicating that even with strict criterion the above relationships are significant at $p < 0.05$.

Furthermore, the experimental group also made more between trial perseverations for neutral material than for negative material (13.85 vs' 8.03%, $T_{(13)} = 2.43$, p=0.03), but not for positive material (13.85% vs' 7.28%, $T_{(13)} = 1.327$, p=.207). This result is contrary to the relationship expected. The Bonferroni correction with 2 comparisons is 0.025, indicating that the significant difference between negative and neutral between trial perseverative errors may be a statistical artefact, the significance of this result is therefore treated with caution.

None of these relationships were observed in the control group, suggesting that they respond similarly across the different tones of material. The observation that the experimental group make more within trial perseverative errors to negatively toned material than to neutrally toned stimuli lends support to the hypothesis that a repetitive pattern of information processing would be most strongly seen for negative material. The observation that positive material is also more prone than neutral to within trial perseverative errors is contrary to the hypothesis, as is the finding that more between trial perseverations occur for neutral stimuli than negative. This result is treated with caution as described above.

With caution, however, it appears that the negative associations are not more likely to 'get stuck' as predicted, but that the neutral associations are. Negative material is more prone than neutral material to repetitive processing, though not as predicted. The negative associations are more likely to be incorrectly recalled, the errors made are then more likely to be perseverated upon. That this effect is also seen for positive material is difficult to interpret. It may be related to mutual interference on memory of these stimuli (as they are swapped between them), leading people to be more likely to

make an erroneous response, which is then perseverated. Whilst these results pose difficulty in accepting the second hypothesis, the fact that such differential effects for tone are only observed in the experimental group does lend support to the hypothesis that the hedonic tone of information is relevant to the degree to which it is vulnerable to repetition. This is interpreted as partial support of the second hypothesis.

Secondary Analysis

Though included in the analysis as a covariate, the highly significant interaction effect observed for Eysenck Personality Inventory Neuroticism scores, error type and tone of word ($F_{(4,96)}=4.434$, p=.002), was interesting and deserved closer attention. As would be expected, the experimental group had significantly higher neuroticism scores than the control group (see for example Watson, Clark and Harkness, 1994). A median split of neuroticism scores was used to create groups and the anova model described above was performed, using this as the between group variable, instead of depression status. Unsurprisingly, similar significant interactions were observed as in the major analysis. When Beck Depression Inventory scores were added as a covariate, however, the significant effects disappeared, indicating that the difference between groups in neuroticism was responsible for the originally observed significant interaction effect involving neuroticism.

The interesting tone by neuroticism interaction was further explored, using a correlation matrix of neuroticism scores and individuals' self-ratings of the different personality words. This revealed that neuroticism was associated with differential responses to the words on the personality self-ratings. In the depressed group high neuroticism was associated with a tendency to rate oneself more highly on the negative words (hostile, r. = .518, p=0.005; rude, r. =.727, p=.003), Neuroticism was also significantly correlated with self-ratings for one of the neutral words (hesitant, r. =0.793, p=0.000). In the control group a similar pattern of correlations were observed, except that the

correlation between neuroticism and self-ratings for rude was not significant (r. =.304, p=291).

These correlations lend support to the hypothesis that depressed participants differential responding to the hedonically toned stimuli may be underpinned by the construct of neuroticism. It is possible that the emotional lability that is at the heart of the construct of neuroticism reflects differences in the accesibility of implicational models of the self. The degree to which implicational models of the self can be thought of as on a 'hair trigger' will affect how readily individual's 'minds' adopt an interlocked processing configuration.

In the personality self-rating task, implicational models of 'self as rude, self as hostile etc.' may be more readily accessed by individuals who are high in neuroticism, thereby differentially affecting the degree to which the affective component becomes associated with the CVC trigrams, thus affecting the degree to which such 'borrowed affective valence' then interferes with the relearning of different stimuli.

Discussion

The current study subjected a prediction of the ICS framework to empirical test and found that depression does appear to be associated with higher levels of repetitive responding, though not in the manner anticipated. The second prediction, that repetitive information processing would be more evidenced for negative than neutral material was partially supported.

The type of perseveration observed for negative material was of the perseveration of an incorrect response that was not the correct response in the first learning phase. This is not the result that was expected and is somewhat difficult to account for. The

perseveration of incorrect responses indicates that depressed persons show a pattern of being unable to inhibit an incorrect response even when provided with corrective feedback. An alternative explanation may be that the negative associations did get stuck, in that they may have been readily brought to mind by participants, who knew that the response was correct in the first trial but now no longer. This sticking could inhibit new learning in just the way described, though if the individual knew the response was incorrect would not be observed as a between trial perseveration. Unfortunately there is no way of knowing whether this account is accurate and it remains speculative. It is clear, however, that the type of perseveration of responding observed is not that expected. Future empirical work is required to clarify the reasons behind this.

The mixed nature of this result may be related to the finding that high neuroticism scores lead participants to differentially respond to the affectively valenced information during the personality self-rating task. Neuroticism was highly correlated with the rating of oneself as hesitant. Though these words had been chosen because they had previously been rated by over 1000 people as to their hedonic tone (Anderson, 1968), it could be that people with high neuroticism scores do not consider the trait hesitant as neutral, but see it as a negative trait, and so respond to it in a similar fashion as they do to the words hostile or rude. This may help to explain why neutral words evidenced more between trial perseveration than negative or positive words.

Although not exactly as predicted, the results do provide general support for the ICS model in that depression does appear to be related to differential responding to affectively valenced material which may then influence the degree to which that information is prone to a repetitive pattern of information processing. Such patterns of repetitive responding are unlikely to be mediated at a conscious level, suggesting that the position taken by the Response Styles Theory (that responding to depression with

distraction or rumination involves a relatively conscious choice, Nolen-Hoeksema, 1990), may be somewhat over-simplified.

The experimental analogue created for the current study is artificial and it can be criticised on the grounds of ecological validity. Even within these constraints however, differential responding to affectively valenced stimuli were observed. The mechanisms by which such effects are mediated are likely to be at a relatively basic level of the way in which the cognitive architecture of the mind processes the affective tone of stimuli. Such basic cognitive-affective processes may be considered likely to have very far reaching effects on more ecologically relevant processes such as autobiographical memory, future directed thinking and attributional style.

The current study can further be criticised for recruiting a relatively impure sample. Individuals were confirmed as depressed using the SCID IV, other exclusion criteria were only screened through the knowledge of the key-worker of the patient, rather than being confirmed. Whilst this means that the current sample may have been suffering other forms of psychopathology, they did exhibit comparable clinical levels of depression. Though it may be argued that this makes attributing the cause of the results reported to depression and not another unknown factor, it is considered unlikely. The use of a sample such as this does have the advantage that it renders generalisation to everyday clinical samples more easy.

Problems in Investigating ICS

One major problem in subjecting the ICS framework to empirical test is in the measurement of implicational processing. As mentioned above, interlock refers to the continuing interplay between propositional and implicational meanings. Because

implicational meanings are "deep interrelationships extracted from experience, representing holistic, felt senses encoded as prototypical of particular themes, they are by definition at a very abstract level, are not easily captured by language and not easily conveyed" (cf. Teasdale, 1999, p. 61). This definition makes it very difficult to define an adequate test of implicational processing. Previous studies have tended to use individuals' linguistic responses (propositional meaning) in a way which *infers* implicational processing of a particular theme (see for example, Teasdale, Lloyd and Hutton, 1998).

Implicational processing is yet to be 'directly captured' or measured empirically. It may even be that 'direct' measurement is conceptually impossible, leading the ICS model to adopt a philosophical position uncomfortably akin to psychoanalytic accounts of the unconscious, also presented as somewhat ill defined, intangible and not open to direct inspection. While these criticisms may pose significant problems for a model pertaining to be a "comprehensive account of information processing...in an applied science approach" (Teasdale and Barnard, 1993, p. 4), it is commendable in it's attempt to bring the richness of human experience inherent in the construct of implicational processing into focus as a legitimate subject of scientific enquiry. To investigate only the cognitive processes to which we have conscious access will be likely to provide us with an impoverished cognitive psychology. Future studies that attempt to investigate ICS would benefit from trying to develop a measurable but ecologically valid method of invoking implicational processes. Such an approach would help to resolve the philosophical position described above, but would be inherently difficult due to the nature of the phenomenon being investigated.

Teasdale & Barnard (1993, p. 73) use a comparison between prose and poetry as an illustration of the difference between implicational and propositional meaning. It may be that the evocative nature of poetry or art may be one way to engender implicational

meaning, though this still leaves the problem of how it is to be accurately and reliably measured.

Clinical Implications

If (as suggested by the current study) the affective tone of stimuli leads to particular processing pathways (and hence response) at a very basic level, individual's experience of these processes in depressed states is likely to be felt as automatic and uncontrollable. This may make stable internal attributions for the individual's feelings and behaviour more likely. Attempting to 'normalise' the process by imparting (in patient-relevant terms) psychological knowledge about the links between repetitive information processing and depression may, for some, allow them to create different propositional models, such as suggested by Teasdale (1997, p.85-86). The very process of psychological therapy may engender the kind of change of implicational meanings to which Teasdale refers (i.e. the change from an implicational model of 'self as globally worthless and future as uncontrollable and hopeless' to 'depression as a psychological state in which I am likely to make unrealistic attributions about my worth and the future'.

The automaticity of repetitive information processing may, however, make such models very hard to retain, leading the person to fall back into the 'depressive interlock' configuration readily. Teasdale (1999) argues that the creation of new implicational models requires incorporating new elements into existing affect eliciting implicational codes. Presumably this requires the synthesis of the unchanged mental model before new elements can be incorporated into it. As this mental model encapsulates holistic felt senses of the self, built up over the whole of a person's life experiences it may be that conscious awareness of such models are likely to be highly distressing for individuals. In such instances, the synthesis of a propositional code that focuses conscious attention away from the affect-eliciting implicational model may be negatively

reinforcing, as it allows short-term avoidance of the distress associated with the synthesis of particular implicational models.

Hunt (1999) has argued that 'the only way out is through', meaning that focussing one's attention on the unpleasant emotion and bearing it without distraction results in more effective emotional processing (Rachman, 1980) than distraction or rationalisation. Likewise, Teasdale (1999) argues that mindful experiencing of implicational meanings is the most effective processing mode to facilitate emotional processing. This would suggest that, for some individuals at least, psychotherapy must discover ways of working with 'deep themes' or 'holistic senses of the self' that are difficult to capture with language. The discovery of such methods is likely to be challenging, though the current theoretical predictions would indicate that such endeavours would be highly worthwhile. Future clinical research may falsify or support these theoretical predictions.

Nolen-Hoeksema and Morrow (1993) have shown, however, that distraction results in shorter episodes of depressed mood, indicating that introspection may be counter-productive. A possible solution to this contradiction is that in therapy, the introspecting is done within the context of a relationship. Focussing attention on the self may indeed be likely to prolong depressed mood, as it is unlikely that new patterns of implicational code will be incorporated into existing models. The therapists interventions, suggestions and interpretations are more likely to be able to achieve the necessary change than solo introspecting as an external source of new information is available in the person and demeanour of the therapist.

The above findings suggest a two-stage process may be useful in the treatment of depressive disorder. The first stage ought to attempt to break the interlock process in whatever way possible, by distraction, pleasurable activity, distancing one's self from negative automatic thoughts by rational challenging. Such efforts should attempt to stabilise the individual into a position where interlock is no longer the dominant mode of

processing. Following such stabilisation, however, some patients will require a second stage of psychological treatment. This will be necessarily more 'deep', involving exploration of holistic themes of the self, emotional processing and the incorporation of new elements of implicational code (interestingly, this two stage approach is likely to be similar to the approach taken by the majority of clinicians in routine clinical practice). The dominant tools of most conventional forms of psychological therapy appear to be language and relationship. It may be that language is not the most effective tool for the second stage of this 'idealised therapy'. Alternative practices (see for example Arntz and Weertman, 1999) therefore require scientific and theoretical scrutiny in the search for more effective tools. The ICS framework can provide a framework within which such practices may be investigated, which will also help to establish the empirical validity of the model.

It is highly likely, however, that if we are to encourage such patients to focus their attention on holistic senses of the self that engender unpleasant emotion and expect them to bear it successfully to allow emotional processing to occur, relationship factors between therapist and patient will be extremely important. That such resurgence in interest in the therapeutic relationship in some forms of cognitive behavioural therapies (e.g. Davidson, 2000; Linehan, 1993) has been occurring in recent years represents a convergence of theoretical predictions and clinical observation and is encouraging.

References

Anderson, N. H. (1968). Likeableness ratings of 555 Personality Trait Words. *Journal of Personality and Social Psychology, 9,* 272-279.

Arntz, A.,& Weertman, A. (1999). Treatment of childhood memories: theory and practice. *Behaviour Research and Therapy, 37,* 715-740.

Beck, A. T., Ward, C. H., Mendelson, M., Mock, J., & Erbaugh, J. (1961). An inventory for measuring depression. *Archives of General Psychiatry, 4,* 53-63.

Davidson, K. M., (2000). *Cognitive Therapy for Personality Disorders: A clinicians guide.* Oxford, Butterworth Heinemann,

DesRosiers, G., & Robinson, D. (1992). Memory and hedonic tone: 'personality' or 'mood' congruence. *Psychological Medicine, 22,* 117-129.

Eysenck, H. J., & Eysenck, S. B. G. (1964). T*he Eysenck Personality Inventory.* Sevenoaks, Hodder and Stoughton.

First, M. B., Spitzer, R. L., Gibbon, M., & Williams, J. B. W. (1996). *Structured Clinical Interview for DSM-IV Axis 1 Disorders.* New York State Psychiatric Institute, New York.

Gillanders, D. T. (2000) *Evidence for Repetitive Thinking as a Factor in the Maintenance of Depression.* Unpublished Manuscript, University of Glasgow.

Gumley, A. I., & Power, K. G. (2000). Is Targeting Cognitive Therapy During Relapse in Psychosis Feasible? *Behavioural and Cognitive Psychotherapy, 28,* 161-174.

Gumley, A. I., White, C. A., & Power, K. G. (1999). An interacting cognitive subsytems model of relapse and the course of psychosis. *Clinical Psychology and Psychotherapy, 6,* 261-278.

Hunt, M. G. (1999). The only way out is through: emotional processing and recovery after a depressing life event. *Behaviour Research and Therapy, 36,* 361-384.

Just, N., & Alloy, L. B. (1997). The response styles theory of depression: Tests and and extension of the theory. *Journal of Abnormal Psychology, 106*, 221-229.

Linehan, M. M. (1993). *Cognitive-behavioural treatment of borderline personality disorder.* New York: Guilford Press.

Montague, W. E. & Kiess, H. O. (1967). The associability of CVC pairs. *Journal of Experimental Psychology, Supplementary Monograph,* 78, Part 2.

Morrow, J., & Nolen-Hoeksema, S. (1990) Effects of responses to depression on the remediation of depressed affect. *Journal of Personality and Social Psychology, 58, 519-527.*

Nelson, H. E., & Willison, J. R. (1991). *Manual of the National Adult Reading Test – 2nd ed.* Windsor: NFER-Nelson.

Nolen-Hoeksema, S. (1991). Responses to depression and their effects on the duration of depressive episodes. *Journal of Abnormal Psychology, 100,* 569-582.

Nolen-Hoeksema, S. (1990). *Sex differences in depression.* Stanford, CA: Stanford University Press.

Nolen-Hoeksema, S., & Morrow, J. (1993). Effects of rumination and distraction on naturally occuring depressed mood. *Cognition and Emotion, 7,* 561-570.

Pyszczynski, T., & Greenberg, J. (1987). Self-regulatory perseveration and the depressive self-focussing style: A self-awareness theory of reactive depression. *Psychological Bulletin, 102,* 122-138.

Rachman, S. (1980). Emotional Processing. *Behaviour Research and Therapy, 18,* 51-60.

SPSS Inc. (1998). *Statistical Package for the Social Sciences, v. 9.0.0.* Chicago, SPSS Inc.

Teasdale, J. D. (1999). Emotional processing, three modes of mind and the prevention of relapse in depression. *Behaviour Research and Therapy, 37,* S53-S77.

Teasdale, J. D. (1997). The relationship between cognition and emotion: the mind-in-place in mood disorders. In D. M. Clark & C.G. Fairburn, *Science and Practice of Cognitive Behaviour Therapy, (pp. 67-93)* Oxford: Oxford University Press.

Teasdale, J. D., & Barnard, P. J. (1993). *Affect , cognition and change: re-modelling depressive thought.* Hove: Lawrence Erlbaum Associates.

Teasdale, J. D., Lloyd, C. A., & Hutton, J. M. (1998). Depressive thinking and dysfunctional mental models. *British Journal of Clinical Psychology, 37,* 247-258.

Watson, D., Clark, L. A., and Harkness, A. R. (1994). Structures of personality and their relevance to psychopathology. *Journal of Abnormal Psychology, 103,* 18-31.

Weschler, D. (1987). *Manual for the Weschler Memory Scale-Revised.* New York: The Psychological Corporation.

Table 1: Demographic Information for Participants

Variable	Experimental Group		Control Group	
	Mean	SD	Mean	SD
Age (years)	42.7	9.47	44.21	14.67
Beck Depression Inventory	30.64	9.59	5.71	3.22
National Adult Reading Test	110	8.51	114	9.77
Eysenk Personality Inventory Neuroticism	17.85	3.86	10.71	5.4
Eysenk Personality Inventory Extraversion	6	4.2	11	3.86
Months of Contact with Mental Health Services	16.42	17.75	0	0
Number of anti depressant medications	1.36	1.3	0	0
	Frequencies			
Gender	Male 5	Female 9	Male 6	Female 8
Anti Depressant Medication Status	Present 11	Absent 3	Present 0	Absent 14

Table 2: Proportions of Errors in each category by Tone of Word and Group

Type of Error	Depressed Group						Non-depressed Group					
	Tone of Word						Tone of Word					
	Neutral		Negative		Positive		Neutral		Negative		Positive	
	Mean	*(S.D.)*	*Mean*	*(S.D.)*	*Mean*	*(S.D.)*	*Mean*	*(S.D.)*	*Mean*	*(S.D.)*	*Mean*	*(S.D.)*
Proportion of Random Errors (%)	10.6	(9.4)	12.03	(6.8)	10.86	(5.8)	22.86	(15.6)	23.9	11.8)	17.2	(7.2)
Proportion of between trial perseverative errors (%)	13.8	(15.3)	8.03	(9.96)	7.28	(6.3)	6.16	(7.2)	8.5	(10.2)	5.6	(6.98)
Proportion of within trial perseverative errors (%)	6.66	(7.36)	15.3	(9.5)	14.9	(8.8)	3.4	(5.2)	4.59	(7.1)	7.7	(9.7)

SINGLE CASE RESEARCH STUDY

submitted as part of the research portfolio for the degree of

Doctor of Clinical Psychology

by

DAVID GILLANDERS

University of Glasgow
Department of Psychological Medicine
Gartnavel Royal Hospital, 1055 Great Western Road
Glasgow, G12 0XH

1ST August 2000

TITLE:

Specificity of Treatment Effects of Exposure Response Prevention for Compulsive Symptoms in Obsessive Compulsive Disorder

JOURNAL: *Behavioural and Cognitive Psychotherapy*

RUNNING HEAD: **Specificity of ERP for Compulsive Symptoms**

Specificity of Treatment Effects of Exposure Response Prevention for Compulsive Symptoms in Obsessive Compulsive Disorder

Abstract. The last three decades have seen a change in clinician's impressions of the treatability of obsessive compulsive disorder (OCD). Once regarded as chronic and intractable, the application of learning theory has provided an approach for this disorder (Rachman and Hodgson, 1980). Clinical outcome trials have established the behavioural treatment of exposure response prevention (ERP) as the treatment of choice for compulsions (e.g. Hand, 1998). Preliminary evidence is divided as to whether cognitive treatments are effective treatments in their own right (Dar, 1996, James and Blackburn, 1995). Lindsey, Crino and Andrews (1997), demonstrate that the specificity of ERP to target particular symptoms is the vital element in treatment, compared to plausible general treatments such as anxiety management. The current study employed a single case successive treatments design to further investigate the extent to which treatment effects of ERP generalise to other non-treated compulsions. Results indicate that generalisation of ERP treatment gains does not occur, each compulsion requiring to be individually targeted and treated. This relationship was true for conceptually related and unrelated compulsions. Future research directions are discussed, along with clinical implications of the current findings.

Keywords: Obsessive Compulsive Disorder, Behaviour Therapy, Single Case Methodology

Research Portfolio Appendix

Section 1: Appendices for Major Research Project Paper

1.1 Authors notes to the Journal of Abnormal Psychology

Instructions to Authors
Journal of Abnormal Psychology

Most of the articles published in the *Journal of Abnormal Psychology* are reports of original research, but other types of articles are acceptable. Short Reports of replications or of failures to replicate previously reported results are given serious consideration. Comments on articles published in the journal are also considered. Case studies from either a clinical setting or a laboratory will be considered if they raise or illustrate important questions that go beyond the single case and have heuristic value. Manuscripts that present or discuss theoretical formulations of psychopathology, or that evaluate competing theoretical formulations on the basis of published data, may also be accepted. For further information on content, authors may refer to the Journal Description.

Authors must prepare manuscripts according to the *Publication Manual of the American Psychological Association* (4th ed.). All manuscripts must include an abstract that contains a maximum of 960 characters and spaces (which is about 120 words) typed on a separate sheet of paper. All copy must be double-spaced, and further typing instructions, especially in regard to tables, figures, references, metrics, and abstracts, appear in the *Manual.* Also, all manuscripts are copyedited for bias-free language (see chap. 2 of the *Publication Manual*). Original color figures can be printed in color provided the author agrees to pay half of the associated production costs.

In preparing a Short Report, authors should set the character-space limit at 60 characters per line and should not exceed 410 lines of text and references (exclusive or the title page, abstract, author note, footnotes, tables, and figures). There should be no more than two figures or tables. As for regular manuscripts, the abstract must not exceed 960 characters and spaces.

Masked reviews are optional, and authors who wish masked reviews must specifically request them when they submit their manuscripts. For masked reviews, each copy of the manuscript must include a separate title page with the authors' names and affilitations, and these ought not to appear anywhere else in the manuscript. Footnotes that identify the authors must be typed on a separate page. Authors are to make every effort to see that the manuscript itself contains no clues to their identities.

Articles, except where other limits are specified, must not be longer than 36 manuscript pages, unless they report an unusually large series of studies or present unusually important detail. Case studies are ordinarily no longer than 16 manuscript pages. Comments ought not to exceed half the length of the original article. For Short Reports, the length limits are exact and must be strictly followed.

APA policy prohibits an author from submitting the same manuscript for concurrent consideration by two or more publications. In addition, it is a violation of APA Ethical Principles to publish "as original data, data that have been previously published" (Standard 6.24). As this journal is a primary journal that publishes original material only, APA policy prohibits as well publication of any manuscript that has already been published in whole or substantial part elsewhere. Authors have an obligation to consult journal editors concerning prior publication of any data upon which their article depends. In addition, APA Ethical Principles specify that "after research results are published, psychologists do not withhold the data on which their conclusions are based from other competent professionals who seek to verify the substantive claims through reanalysis and who intend to use such data only for that purpose, provided that the confidentiality of the participants can be protected and unless legal rights concerning proprietary data preclude their release" (Standard 6.25). APA expects authors submitting to this journal to adhere to these standards. Specifically, authors of manuscripts submitted to APA journals are expected to have available their data throughout the editorial review process and for at least 5 years after the date of publication.

Authors will be required to state in writing that they have complied with APA ethical standards in the treatment of their sample, human or animal, or to describe the details of treatment. A copy of the APA Ethical Principles may be obtained by writing the APA Ethics Office, 750 First Street, NE, Washington, DC 20002-4242.

Authors submit five (5) copies of their manuscripts. All copies must be clear, readable, and printed on paper of good quality. A dot matrix or unusual typeface is acceptable only if it is clear and legible. Dittoed or mimeographed copies are not acceptable and will not be considered. It is suggested that authors keep a copy of the manuscript to guard against loss. Manuscripts are not returned except on request.

In addition to postal addresses and telephone numbers, authors are requested to supply electronic mail addresses and fax numbers, if available, for use by the editorial and production offices. Effective in January 2000, the Incoming Editor is receiving all submissions to the journal. Submissions that are accepted will be published beginning in the 2001 volume. Mail manuscripts to the Incoming Editor, Timothy B. Baker, Department of Psychology, University of Wisconsin—Madison, 1202 West Johnson Street, Madison, Wisconsin 53706.

Table 3: Mean Number Of Errors In Each Category By Tone Of Word And Group

Type of Error	Depressed Group						Non-depressed Group					
	Tone of Word						Tone of Word					
	Neutral		Negative		Positive		Neutral		Negative		Positive	
	Mean	*(S.D.)*	*Mean*	*(S.D.)*	*Mean*	*(S.D.)*	*Mean*	*(S.D.)*	*Mean*	*(S.D.)*	*Mean*	*(S.D.)*
Mean no. of Random Errors	2.3	(1.5)	2.9	(1.79)	2.6	(1.6)	2.1	(1.5)	2.8	(1.8)	2.4	(1.5)
Mean no. of between trial perseverative errors	2.7	(1.98)	1.5	(1.0)	1.5	(1.2)	.93	(1.1)	1.1	(1.3)	.93	(1.2)
Mean no. of within trial perseverative errors	2	(2.5)	3.7	(2.4)	4.0	(2.9)	0.6	(1.1)	0.9	(1.3)	1.36	(1.69)

Section 2: Appendices for Small Scale Service Evaluation Project

2.1 The Research Involvement of Psychologists Scale

THE RESEARCH INVOLVEMENT OF PSYCHOLOGISTS SCALE

This survey looks at clinical psychologist's involvement in a variety of research activities, their attitudes towards research and the nature of their working day. It is being distributed to all psychologists within Greater Glasgow Community and Mental Health Services NHS Trust and is entirely anonymous. Your time in completing it is highly valued.

Section A: Attitudes Towards Research

Please indicate your level of agreement with the following statements.

1. In my post, I feel that research is

Strongly Encouraged	Somewhat Encouraged	Neither Encouraged nor Discouraged	Somewhat Discouraged	Strongly Discouraged

2. How much is your clinical practice informed by research evidence ?

Strongly *Informed*	Somewhat Informed	Neither Informed nor Uninformed	Somewhat Uninformed	Strongly Uninformed

1. I regularly think about areas of psychological theory / practice that I would like to research.

Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree

4. I rarely get around to putting my research ideas into practice.

Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree

5. Even if I had the time I don't feel I have the skills to carry out research.

Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree

6. Pressure to spend time in clinical contact prevents me from doing research

Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree

7. Research is not the domain of clinical psychologists.

Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree

8. Clinical psychologists should have regular "agreed" time in which to pursue research.

Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree

9. I am not interested in doing research.

Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree

10. At the moment, my involvement in research is

Far too much	Slightly too much	About right	Slightly too little	Far too little

Section B: Research Activities

Please indicate your level of involvement in the following activities, using the scale below:

	Involved in the last 12 months	Involved in the last 5 years	Involved since qualifying	Have never done this since qualifying
Clinical Outcome Studies				
Service Related Research				
Writing grant applications				
Performing literature searches				
Designing research studies, including questionnaire / survey design				
Data collection and / or data entry				
Data analysis				
Writing up of results				
Managing ongoing Research projects (Please indicate how many)				

	Involved in the last 12 months	Involved in the last 5 years	Involved since qualifying	Have never done this since qualifying
Writing empirical papers.				
Writing conceptual / theoretical papers				
Submitting work for publication				
Having work published				
Presenting at local Events (dept meetings, research forums, interest groups)				
Presenting at national international conferences, meetings etc.				
Attending (but not presenting at) local events				
Attending national / international events				
Reading empirical articles / books				
Discussing research articles / ideas with colleagues				
Using single case Designs with measures				
Using evidence based treatments				
Seeing patients as part of a research study				
Training others as part of a research study				
Supervising other people's research (Assistants, Trainees, Other Disciplines)				

	Involved in the last 12 months	Involved in the last 5 years	Involved since qualifying	Have never done this since qualifying
Meta-analytical studies				
Writing Review Articles				
Other research (please specify)				
a.)				
b.)				
c.)				
d.)				

Section C: About Your Career

In compiling the following questions care has been taken to ensure that individual psychologists can not be identified from their responses.

1. Please indicate the number of years you have been qualified

_____

2. What type of post do you hold ? 100 % Clinical ☐ Split Clinical / Academic ☐

3. Are you currently in receipt of any research grants / other funding ? YES ☐ NO ☐

4. What Grade are you ? A Grade ☐ B Grade ☐

5. Please indicate the type of qualification(s) you hold:

D. Clin. Psy ☐ Ph.D. ☐ Masters ☐

6. Are you currently registered for a further degree ? NO ☐ YES ☐ Please specify_____

7. On average I spend _____ hours per week involved in management duties.

8. On average I spend _____ hours per week in clinical supervision of other staff.

9. On average I offer _____ hours of clinical contact per week.

10. On average I spend_____hours per week involved in research.

11 I would describe my favoured theoretical orientation as:

Cognitive – Behavioural | Cognitive | Behavioural | Psycho-dynamic | Eclectic | Other (specify)

_____

If you have opinions about research that you have not been able to express through our questions, please use this space to inform us.

Your time taken in filling in this questionnaire is greatly appreciated, please return it to David Gillanders or Susan Howat, using the internal mail envelope and address label provided.

Thank You

2.2 Authors notes for The Journal of Clinical Effectiveness

INSTRUCTION TO AUTHORS

JOURNAL OF CLINICAL EFFECTIVENESS

Original articles should be submitted to:

Ms Mary Edwards
Northampshire Hospitals NHS Trust,
Aldermaston Road,
Bastingstoke,
Hampshire RG24 9NA, UK.
Enquiries to editorial office on: +44 (0) 171 274 3476

The editors cannot accept responsibility for damage or loss of typescripts.

A paper is accepted for publication on the understanding it has not been submitted simultaneously to another journal in the English language.

Rejected papers will not be returned to authors except on request.

All submissions will be peer reviewed. The Editors reserve the right to make editorial and literary corrections.

Any opinions expressed or policies advocated do not necessarily reflect the opinion or policy of the Editors.

COPYRIGHT

The copyright of the journal is held by Financial Times Professional Ltd and the copyright on each paper must be assigned to Financial Times Professional Ltd by the Senior author (on behalf of all the authors). Extra copies of the copyright form are available from the publishers or the Editors.

We assure you that no limitation will be put on your personal freedom to use material contained in the paper, provided acknowledgement is made to the journal as the original source of publication.

CHECKLIST

Before sending your typescript ensure that you have included the following:

- Three good-quality typescripts, double line spaced
- Figures of reproducible quality (not photocopies)
- A complete reference list with no missing details and cited in the text
- Written permission from the original publishers and authors to reproduce any borrowed material.

DISK SUBMISSION

Once a paper has been accepted for publication, submission on disk will be requested. The hard paper copy must match the electronic version exactly. Please label your disk clearly.

PRESENTATION OF TYPESCRIPTS

- Please include the full title of your paper plus your preferred title and professional name and address for correspondence, if different.
- Copy must be typed double-spaced throughout.
- Include headings to facilitate reading and understanding, distinguishing major and minor headings.
- Illustrations can be included to clarify your material. Please send only good quality reproducible figures, including captions for each one. Make sure the figure is cited in the text.
- Tables should be double-spaced on separate sheets. Make sure that the table is cited in the text.

Full papers
Papers should be set out as follows with each section beginning on a separate sheet: title page, summary text, acknowledgements, references, tables, captions to illustrations. They should be between 2,000 and 4,000 words. Audit projects of 500–1000 words are also acceptable for publication.

Title page
The title page should give the following information:

- title of article
- initials and name of each author
- name and address of the department or institution to which the work should be attributed
- telephone and fax contact numbers.

Summary
This should consist of not more than 150 words summarizing the contents of the article.

Text
Headings should be appropriate to the nature of the paper, the use of headings enhances readability.

Do not use 'he', 'his' etc. where the sex of the person is unknown: say 'the patient' etc. Avoid inelegant alternatives such as 'he/she'.

References
The accuracy of references is the responsibility of the author. References should be entered consecutively by Arabic superscript numerals in the text. The reference list should be listed in numerical order on a separate sheet in double spacing. References to journals should include the author's name and initials (list all authors when six or fewer, when seven or more, list only the first six and add 'et al'), full title of paper, journal title (do not use abbreviations of journal titles), year of publication, volume number, first and last page numbers.

For example:
Small J O. Management alternatives. Journal of Health Services Research and Policy 1995; 1(1): 22–25

References to books should be set out as follows:
McKinney P, Conn B. Management Ethics. Edinburgh: Churchill Livingstone, 1995

Statistics
Numerical data should be analysed by appropriate statistical methods.

The use of standard deviation and standard error should be clearly distinguished. Use of '±' symbol should be avoided; these statistics should be presented in parentheses after the mean value.

Tables
These should be double spaced on separate sheets and contain only horizontal rules. A short descriptive title should appear above each table and any footnotes suitably identified. Ensure that each table is cited in the text.

Line illustrations
All line illustrations should present a crisp black image on an even white background (no smaller than 127 × 173 mm and no larger than 203 × 254 mm).

PERMISSIONS TO PRODUCE BORROWED MATERIAL

Written permissions to reproduce borrowed material (illustrations, tables, etc.) must be obtained from the original publishers and authors, and submitted with the typescript. Borrowed material should be acknowledged in the captions.

PROOFS

- Page proofs are sent to the first-named or corresponding author for checking. The proofs plus any minor corrections should be returned to the Production Editor by fax or post within 48 hours of receipt.
- Offprints may be ordered on a form which will accompany your page proofs. The minimum order is for 100 and a charge will be made.

Section 3: Appendices for Single Case Research Study

3.1 Authors notes for Behaviour and Cognitive Psychotherapy

Behavioural and Cognitive Psychotherapy
Instructions to Authors

Submission

Articles written in English and not submitted for publication elsewhere should be sent to:

Paul Salkovskis
Editor
Behavioural and Cognitive Psychotherapy
Department of Psychiatry
University of Oxford
Warneford Hospital
Oxford OX3 7JX
UK

Manuscript preparation

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

Manuscripts will be sent out for review exactly as submitted. Authors who want a blind review should mark three copies of their article 'review copy', omitting from these copies details of authorship and other identifying information. Submission for blind review is encouraged.

Abbreviations where used must be standard. The Systeme International (SI) should be used for all units; where metric units are used the SI equivalent must also be given. Probability values and power statistics should be given with statistical values and degrees of freedom (e.g. $F(1,34) = 123.07$. $p < .001$), but such information may be included in tables rather than the main text. *Spelling* must be consistent within an article, either using British usage (*The Shorter Oxford English dictionary*), or American usage (*Webster's new collegiate dictionary*). However, spelling in the list of references must be literal to each original publication.

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

Articles should conform to the following scheme:

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

(b) *Abstract.* The abstract should include up to six key words that could be used to describe the article. This should summarize the article in no more than 200 words.

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

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

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

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

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

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

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

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

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

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

Proofs, Reprints and Copyright

On acceptance a 3.5 soft copy will be requested. Proofs of accepted articles will be sent to authors for the correction of printers' errors; authors' alterations may be charged. Authors submitting a manuscript do so on the understanding that if it is accepted for publication exclusive copyright of the paper shall be assigned to the Association. In consideration of the assignment of copyright, 25 copies of each paper will be supplied. Further reprints may be ordered at extra cost: the reprint order form will be sent with the proofs. The publishers will not put any limitation on the personal freedom of the author to use material contained in the paper in other works.

Typeset and Printed in the United Kingdom by J. W. Arrowsmith Ltd., Bristol.

Section 4: Appendices for Major Research Project Proposal

4.1 Word lists to be used in the Modified Paired Associate Learning Task

Real Words

Positive	Neutral	Negative
Helpful	Hesitant	Hostile
Kind	Average	Rude

Taken from:

Anderson, N. H. (1968). Likeableness ratings of 555 Personality Trait Words. *Journal of Personality and Social Psychology, 9*, 272-279.

Non-Word Trigrams

MEZ	SEP	VOY
BIS	JEK	FOS

Taken from

Montague, W. E., & Keiss, H. O. (1967). The associability of CVC pairs. *Journal of Experimental Psychology, Supplementary Monograph, Vol. 78*, 2, Part 2.

4.2 Information sheet and consent form used to recruit participants

GREATER GLASGOW PRIMARY CARE NHS TRUST

PATIENT INFORMATION SHEET

"An Experimental Study of Repetitive Thinking In Depression"

11th October 1999

Dear Sir / Madam,

I have asked the person you have been seeing to give you this form because part of the problem you are being seen for is depression.

I am writing to ask that you consider being a participant in a research study investigating the way in which depression affects how people think.

Psychologists have known for some time that people who have depression are often self-critical or expect negative things to happen.

It has been suggested by recent research carried out by psychologists elsewhere in the U.K. that one of the reasons that people find it very hard to break out of depressed moods is that these negative thoughts are very likely to persist in a repetitive way.

The study that I propose attempts to understand this better, so that in future, psychological treatments may be developed which help to reduce the repetitive thinking and thereby provide better psychological therapy for depression.

Your involvement in this study would make no difference to your own treatment, but will hopefully lead to greater understanding of depression. Clearer understanding of the way in which the mind works in depression could be vital to finding faster and better psychological treatments for future sufferers of this disabling condition.

If you were to agree to be involved in this research, you would be contacted either by post or telephone, according to your wishes, and offered an appointment at your convenience. You would be asked to complete three short paper and pencil questionnaires asking about your moods, personality and other information such as your age, gender and whether you take any medication etc.

The total time for the study is expected to be approximately one hour.

You will not be asked to talk about yourself or have to think about or provide any personal information.

First, you will be asked a series of questions about your moods and other symptoms you may have experienced. Secondly, you will be asked to rate how well certain words describe you. Next, you will be asked to read out-loud a list of words. Then you will be read a list of different words that have been paired together with three letter non-words, like this:

Naive - DAP
Choosy - NAZ

After each set of 6 words, you will be given the first parts and asked which non words went with them. These sequences will be repeated several times to give you a chance to learn them. After a

certain number of attempts, the words will be mixed up and you will be asked to try to learn the new pairs.

There is no right or wrong answer; I am interested in how depression affects thinking.

The appointment should not be distressing and will take only one hour, at a time that is convenient to you. Your participation will be completely confidential. The only record that will be kept of your name is the attached consent form. This consent form will be kept completely confidential. The person you have been seeing is not involved in this study and will not know whether you decide to take part or decide not to take part. Regardless of your decision, your treatment will not be affected in any way.

I will be running the experiment myself, I am a trainee clinical psychologist with experience of interviewing and treating people who have depression. If you need more information before deciding whether or not to take part, I can be contacted by telephone on 0141 / 211 3920. I am happy to discuss the study with you, after which you are under no obligation to take part.

If you agree to be contacted for this research, please fill in and sign the consent form. The consent form also asks that an independent witness signs. This is to ensure that people participating in research do so of their own free will. The witness can be your choice of any one not involved in the study.

Please use the FREEPOST envelope provided to return the consent form.

YOU DO NOT NEED TO PUT A STAMP ON THE ENVELOPE.

Thank you for taking the time to read this information sheet,

Yours faithfully,

DAVID GILLANDERS
Trainee Clinical Psychologist

GREATER GLASGOW PRIMARY CARE NHS TRUST

PATIENT CONSENT FORM

"An Experimental Study of Repetitive Thinking In Depression"

Name: _____

Address: _____

_____

_____

_____

Telephone: _____

(if you would rather not be contacted by telephone, leave the space blank and you will be contacted by post instead)

Male: ☐ Female: ☐ ***(please tick a box)***

I ..... declare that I have read and understood the attached information sheet. I have kept a copy of the information sheet for myself.

I have had an opportunity to discuss and ask questions about the study with the research worker.

I am fully aware that it is my right to end my participation in the study at any time I choose and I do not need to give a reason for doing so.

I understand that my treatment will not be affected in any way, *whatever I have chosen now or at any future time,* and that my participation is completely confidential.

I therefore consent to take part in the study as described.

Signed ..... Date .....

Witness..... Date .....