

**THE NATURE AND FUNCTION OF GENERAL, SOCIAL-EVALUATIVE AND
PHYSICAL-THREAT WORRY IN NON-ANXIOUS AND PANIC DISORDER
POPULATIONS**

& RESEARCH PORTFOLIO

Charlie Marsh

(M.A. Hons., M.Phil., Dip.Psychother., C.Psychol.)

Submitted in partial fulfilment of the degree of Doctorate in Clinical Psychology,
Department of Psychological Medicine, Faculty of Medicine, University of Glasgow.

August 2000

ProQuest Number: 13833966

All rights reserved

INFORMATION TO ALL USERS

The quality of this reproduction is dependent upon the quality of the copy submitted.

In the unlikely event that the author did not send a complete manuscript and there are missing pages, these will be noted. Also, if material had to be removed, a note will indicate the deletion.



ProQuest 13833966

Published by ProQuest LLC (2019). Copyright of the Dissertation is held by the Author.

All rights reserved.

This work is protected against unauthorized copying under Title 17, United States Code
Microform Edition © ProQuest LLC.

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

GLASGOW
UNIVERSITY
LIBRARY

12058

TABLE OF CONTENTS

PART ONE (this bound volume)		Pages
1.	Small Scale Service Evaluation Project An Assessment of the Content, Length and Quality of Clinical Psychologists' Referral Reply Letters to General Practitioners.	1-25
2.	Major Research Project Literature Review Worry as an Arousal Inhibiting Thought Activity: A Critical Review.	26-51
3.	Major Research Project Proposal The Nature and Function of General, Social-Evaluative and Physical-Threat Worry in Non-Anxious and Panic Disorder Populations.	52-70
4.	Major Research Project Paper The Nature and Function of General, Social-Evaluative and Physical-Threat Worry in Non-Anxious and Panic Disorder Populations.	71-123
5.	Single Case Research Study (Abstract) Overcoming Cognitive Defences in the Psycho-physiological Assessment of Post-traumatic and Prolonged Duress Stress Disorders.	124-126

Appendices

1.	Small Scale Service Evaluation Project	127-132
1.1	Copy of Notes for Contributors to the Journal of Mental Health	128
1.2.	Checklist of Objective Indices for Letter Audit	129
1.3.	Guidelines for Using Letter Audit Checklist	130
1.4.	Record of Qualitative Evaluation of Letters	131
1.5.	Guidelines for Interpreting Qualitative Characteristics of Letters	132
2.	Major Research Project Literature Review	133
2.1.	Copy of Information for Contributors to Behaviour Research and Therapy	134
3.	Major Research Project Proposal	135-140
3.1.	Application Guidelines for Mini-Project Grants: Health Services Research	136
3.2.	Participant Information Sheet	137-138
3.3.	Participant Consent Form	139
3.4.	Screening Questionnaire for Control Subjects, based on the ADIS-IV Initial Enquiry Questions	140-141
4.	Major Research Project Paper	142-146
4.1.	Copy of Information for Contributors to Behaviour Research and Therapy	143
4.2.	Information about the Minolta Pulsox-3i	144-147
4.3.	Copy of Mentation and Affect Sampling Record Sheet	148
4.4.	Copies of Post-manipulation Ratings Record Sheets	149-150

PART TWO (separately bound volume; numbered from page 1)

	Pages
Single Case Research Study	1-38
Overcoming Cognitive Defences in the Psycho-physiological Assessment of Post-traumatic and Prolonged Duress Stress Disorders	
Appendices	39-41
1. Instructions to Authors submitting articles to Behavioural and Cognitive Psychotherapy	40
2. Scripts for Violence and Humiliation Trauma Images, and for the First and Second Stressful Experience Images (SE1 and SE2)	41

Acknowledgements

I am, of course, very much indebted to all of those who have contributed to and participated in various ways in my research projects. I would, however, like to express my particular thanks to Paul Fleming, my research supervisor, for his guidance and support throughout the whole research process. I also owe a debt of gratitude to Chin Li for all his encouragement, helpful comments, and general support during the period of this research.

Many thanks are owed to family and friends for keeping me going during all the inevitable frustrations that there were. Most of all, though, I would like to thank Marian for all of her support and for accepting all the small sacrifices that were required to see this research through to completion.

1. SMALL SCALE SERVICE EVALUATION PROJECT

**An Assessment of the Content, Length and Quality of Clinical Psychologists'
Referral Reply Letters to General Practitioners**

Prepared for submission to the *Journal of Mental Health*
(See Appendix 1)

**An Assessment of the Content, Length and Quality of Clinical Psychologists'
Referral Reply Letters to General Practitioners**

Charlie Marsh
Department of Psychological Medicine
University of Glasgow, G12 OXH

Running Title: An Assessment of Clinical Psychologists' Letters.

Abstract

Seventy-two initial referral reply letters to general practitioners from clinical psychologists with varying levels of clinical experience were examined for content, length and quality. The typical content and length of letters, together with content omissions, are described. Inter-rater agreement in judging quality attributes of letters was tested, and significant discrepancies between the judgements of experienced clinicians were found. When letters were allocated to 'quality' categories on the basis of the majority opinion of three such clinicians, only a quarter were judged as 'good', while almost half were considered merely 'adequate', and 28% were thought to be 'poor'. A number of objective and qualitative characteristics of 'good' letters were identified. It was also revealed that the quality of experienced clinicians' letters did not differ from that of novice clinicians, and that there were few noteworthy differences in content. Finally, some recommendations for improving training in writing initial reports are made.

Introduction

Communication between secondary health care specialists and general practitioners (GPs) takes place predominantly by means of letters, and good communication between both is essential to effective patient care (Shah & Pullen, 1995; Westerman et al., 1994). However, clinicians have repeatedly expressed dissatisfaction with their practice in this respect (Leonard et al., 1990; Roland et al., 1991). Consequently, there have been numerous reported examinations of the content and structure of such letters and attempts made to determine standards. These have mainly concerned exchanges of letters between psychiatrists and GPs (Yellowlees & Pullen, 1984; Pullen & Yellowlees, 1985; Prasher et al., 1992; Shah & Pullen, 1995; Blakely et al., 1997; Markar & Mahaddeshwar, 1998), or between other hospital medical specialists and GPs (Newton et al., 1992; Newton et al., 1994). Reported evaluations of referral reply letters from other health professionals are rare, but McKenna and colleagues (1994) have demonstrated that it is possible for various mental health professionals, including clinical psychologists, to agree upon basic standards of letter writing that can be audited. In keeping with other studies, the consensual standards described were focused upon content and structure, rather than qualitative variables.

Despite the importance of good letter writing to effective patient care, and the fact that incompetence among medical personnel has been attributed, in part, to a lack of training in communication skills (Young et al., 1991), this continues to be a gap in medical curricula (Shah & Pullen, 1995). The representation of letter/report writing in the training curricula of clinical psychologists is unknown. In any case, the feasibility of such training depends upon demonstrating that qualified clinical psychologists can

reliably agree on the identification of 'quality' letters, and can determine the constituents of these. These issues have yet to be addressed by the profession.

In its *Guidelines on Clinical Supervision*, the British Psychological Society (BPS, 1991) acknowledges the importance of supervisory guidance for verbal and written communications (pp. 28-29). However, the guidelines note that there is "a wide variation within the profession in how clinical reports are written and presented" (para. 8.2). Moreover, they suggest that if "agreement about minimal requirements of clarity and relevance in reports" (para. 8.2) can be achieved, then there will be less potential for trainees to be confused by exposure to the various report writing styles of supervisors. Unfortunately, it is not evident how achievable such agreements are, nor is it clear how important such factors are to the overall quality of reports and letters.

The guidelines further advise that: "Trainees should be encouraged to write reports which are appropriate to the recipient, avoid jargon, distinguish clearly between fact and opinion and provide consistent clarity of expression" (para. 8.2). This statement again contains untested assumptions that clinicians' can reliably assess such elements, and that they indicate 'quality' in report writing. There is clearly a need for these assumptions to be empirically tested and for the nature of 'quality' in written reports to be determined, if possible, so that supervisors can be more informed in their attempts to guide the report writing of trainees.

Aims

The main aims of the present study were:

- 1) To identify the typical content and length of clinical psychologists' initial referral reply (assessment) letters to GPs.
- 2) To determine whether clinicians can agree in judging the 'quality' of letters.
- 3) To evaluate the quality of clinical psychologists' letters.
- 4) To identify the characteristics of 'good quality' letters.
- 5) To ascertain whether clinical experience alters or improves letter writing.

Methodology

Letter Selection

Letters were drawn from the host department's discharged case files relating to years 1987 –1998. For each of eight first year trainee clinical psychologists, eight new entrant clinical psychologists (with less than two years post-qualification experience), and eight highly experienced clinical psychologists (with fifteen or more years of post-qualification experience), three of their referral reply letters to GPs were randomly selected. This yielded a pool of 72 letters, with 24 from each of the three clinician groups.

All details that could identify the patient, the psychologist or the referrer were removed.

Procedure

Audit of Objective Indices. Using written guidelines¹, a single clinician audited all letters for the presence of 14 items of content and three items indicating letter length (see Tables 1 & 2). These were selected to be of relevance from a review of previous studies of medical communication. Twenty of the letters were also audited by another clinician to assess the reliability of the audit method.

Qualitative Evaluations. Each letter was further independently evaluated on qualitative dimensions by three experienced clinical psychologists. Two clinicians assessed all 72 letters, while two further clinicians each judged half of that number, thereby yielding three sets of ratings per letter. Eight qualitative characteristics (see Table 3) were rated using a four-point scale: poor – adequate – good – excellent. Evaluation guidelines¹ were provided to ensure consistency of interpretation. These offered pointers on how to understand the nature of each characteristic.

Results

Letter Content

The content data from the twenty letters audited by two clinicians were analysed for levels of agreement using the kappa coefficient (Suen & Ary, 1989) to remove chance

¹ Obtainable from the author

agreement. Agreement on the identification of indices was generally high, with a mean kappa of 80%, ranging between 40% and 100%. The lowest agreement related to recording the presence of value judgements. On only two other indices did the kappa fall below 60% - these concerned recording whether the explanatory significance of problem onset information and of problem maintenance information was indicated (55% and 48% respectively). The non-kappa adjusted percentage agreements for these three low-agreement variables were 70%, 75% and 79%, with greater than 80% agreement being achieved for all other variables.

Table 1 provides the audit results expressed as percentages of letters in which each item was identified. The table also shows how often predisposing, onset, and maintenance factors were 'specified' as problem determinants. The percentage of letters in which the relevance of prognostic information was clearly specified is also indicated. The table further presents the percentages of letters in which problems and action plans are described in some detail, rather than in generalized terms.

Chi-square tests were applied to the frequencies with which information about predisposing, onset and maintenance factors appeared in letters, and to the frequencies with which the particular relevance of each was specified. These revealed significant differences in each case, $\chi^2(2) = 7.09$, $p < 0.05$; and $\chi^2(4) = 32.5$, $p < 0.001$. Descriptions of onset factors were more frequently present and more often specified, than were descriptions of predisposing and maintenance factors.

Insert Table 1 about here

Letter Length

Table 2 presents three types of categorical data reflecting the length of letters. In each case means are provided together with the percentages of letters falling into each category.

Insert Table 2 about here

Clinician Agreement on Qualitative Evaluations

Agreement between the four judges was also calculated using the kappa coefficient. Kappas were derived for each of the five possible pairings of judges on each rated qualitative attribute and an overall Kappa was calculated for each pair based on summed agreements across all ratings. Non-adjusted overall levels of agreement across pairings ranged from 46% to 61%, compared to 17% to 41% for kappa-adjusted levels, with the means being 52.2% and 27.6% respectively. For the

individual attributes the ranges of non-adjusted and kappa-adjusted agreement levels were 22% -80% and 0% - 57%, with the means being 51.5% and 22%. The mean level of agreement between judges did not vary substantially from one variable to another.

No clear pattern emerges to suggest that clinicians are better at agreeing on judgments of more specific qualities than ratings of overall quality. On the other hand, somewhat higher levels of agreement were achieved for evaluations of problem descriptions and reported action plans, than for other evaluations. These were the only judgements for which four out of five judge pairings achieved at least a 25% kappa-adjusted level of agreement. By contrast, on clarity of expression and overall quality, kappa reached no higher than 0.13 (13% agreement) for 3 out of 5 pairings, while for relevance of content 2 judge pairings produced kappas of 0. However, it should be noted that the great majority of all disagreements were in regard to discriminating between adjacent categories (e.g., 'poor' versus 'adequate'), rather than non-adjacent categories (e.g., 'poor' versus 'good'). Moreover, the strong bias of judges towards using the 'adequate' category inflated chance agreements and thereby contributed to the low kappas achieved.

Quality of Letters

To further analyse clinician evaluations, letters were categorized on each qualitative characteristic according to which evaluative rating two of the three independent judges were found to agree upon. Since none were rated excellent overall, and this was a little used category by all judges, 'excellent' ratings were treated as 'good' for

the purpose of analyses. Table 3 gives the percentages of letters judged as belonging to each category.

Insert Table 3 about here

Characteristics of Quality Letters

To examine how specific attribute ratings contributed to overall ratings, percentages of specific ratings were calculated for letters judged overall 'good', 'adequate' or 'poor'. Chi-square tests were applied to the data relating to each attribute. All of these, except that pertaining to adequacy of prognostic opinion, proved highly significant, $\chi^2(4) = 26.2 - 55.9, P_s < 0.001$. Thus, good problem descriptions are usually present in 'good' letters (89%), seldom in 'adequate' letters (23%), and rarely in 'poor' letters (5%). Formulation-relevant information is mainly good in 'good' letters (61%), rarely so in 'adequate' letters (3%) and never so in 'poor' ones. Clarity of expression, relevance of content, and especially appropriateness are generally rated good in 'good' letters (78%, 89% and 94%, respectively), but much less frequently so in 'adequate' ones (21%, 38%, and 29%), while in 'poor' letters only clarity is ever rated good (3%). However, even in poor letters these three characteristics are usually at least adequate (90%, 80% and 100%). Reported action plans are more often good in 'good' letters than in 'adequate' ones (39% and 12%),

while they are never good in 'poor' letters. Even in 'good' letters, though, they are mostly merely adequate (61%), but never poor. Prognostic information, even in 'good' letters is seldom good (11%) and is often poor (50%), but it is rarely good in 'adequate' or 'poor' letters (3% and 5%), in which it is mostly poor (59% and 85%).

Relationships between the objective indices and the judged overall quality of letters were also examined using chi-square tests. Only three content indices yielded significant chi-squares. The date of the first contact ($\chi^2 (2) = 6.1, p < 0.05$), interview observations ($\chi^2 (2) = 6.2, p < 0.05$), and specified problem onset information ($\chi^2 (2) = 13.6, p < 0.01$) were more often present in 'good', as opposed to 'poor' letters.

Chi-square tests further revealed significant correspondences between letter quality and indicators of letter length: number of words, $\chi^2 (4) = 25.2, p < 0.001$; number of pages, $\chi^2 (4) = 22.9, p < 0.001$; and number of paragraphs, $\chi^2 (4) = 16.7, p < 0.01$. In each case greater length was associated with increased quality. Of 'good' letters, 89% were at least 300 words long, 83% comprised at least $\frac{3}{4}$ of a page of text, and 94% had no less than 4 paragraphs. The corresponding percentages for 'adequate' letters were 62%, 53% and 74%, and for 'poor' letters were 15%, 15% and 40%.

Effects of Clinical Experience

Differences between clinical groups were analysed using chi-square tests.

Only four of fourteen analyses of content indices proved significant. These indicated that: (1) letters written by trainees were least likely to include references to the referral letter, while those of experienced clinicians were most likely to, $\chi^2 (2) = 7.7, p < 0.05$; (2) the reason for contact, and (3) prognostic information, were less often

mentioned by new entrants than by other clinicians, $\chi^2(2) = 6.0$, $p < 0.05$, and $\chi^2(2) = 7.1$, $p < 0.05$; and (4) experienced clinicians more frequently included background information, $\chi^2(2) = 7.7$, $p < 0.05$.

When letter length was considered, only differences based on the word count proved to be significant, $\chi^2(2) = 13.3$, $p < 0.01$. New entrants wrote shorter letters than the other two groups, with 75% of their sampled letters being less than 300 words in length, compared with 38% and 25% for trainees and experienced clinicians respectively.

No significant differences were revealed on the evaluative ratings.

Discussion

What typifies the content and style of clinical psychologists' letters?

A number of broad conclusions can be drawn about the generality of initial referral reply letters to GPs from clinical psychologists. Few make reference to the referral letter, specify the reason for initial contact, or provide general background information; and prognostic information is rare. Less than half contain information concerning predisposing factors, with only just over half including information about problem maintenance, while the explanatory relevance of either is at best implied rather than clearly indicated. Onset factors, however, are described in slightly more than two thirds of letters, and indicated as problem determinants in almost half. Problem descriptions are always present, though in 40% of letters these are global descriptions, lacking detail. Surprisingly, one fifth of letters fail to outline an action

plan. Of those that do, 70% are non-specific. Also surprising is the fact that the great majority of letters do not indicate a timescale for follow-up.

Letters are mainly short, with 51% comprising no more than half of a page of text, and 87% being not more than a page in length. Forty four percent have fewer than 300 words and 62% no more than 500.

Almost half of all letters contained at least one example of jargon, and in just over a third of letters there was some form of value judgment present.

Can clinical psychologists agree in identifying 'quality' in letters?

Arguably the most interesting finding to come from this study is that experienced clinicians have difficulty agreeing on the quality of letters. Given the very poor levels of agreement achieved when judging both specific attributes and the overall quality of letters, it is apparent that the individual judgments of clinicians cannot be relied upon as valid indicators of the quality of written communications. Previous evidence from medical practitioners supports this conclusion (Westerman et al., 1990).

How good are clinical psychologists' letters?

Of 72 letters, none were judged to be 'excellent', while only a quarter were considered to be 'good' by at least two judges, with just under half being viewed as merely 'adequate' and 28% as 'poor'. On only three of the more specific qualities were at least a third of letters classified as 'good' by majority decision (adequacy of problem description, relevance of content, and appropriateness), with almost a third judged to be 'good' on clarity of expression. Only on relevance were more than

40% classified as 'good.' Interestingly, it was rare for letters to be categorised as 'poor' on clarity or relevance, with none being so on appropriateness. It would seem, therefore, that it is rare for clinical letters not to meet minimum standards of composition. On the other hand, they seldom meet high standards for written composition, or clinical content. The quality least well rated was adequacy of prognostic opinion - on which 64% of letters were categorised as 'poor' and a further 31% as merely 'adequate', with only 5% achieving a 'good'. This strong finding is at least partly a result of the absence of any prognosis-relevant information in most letters. Clinical psychologists are either reluctant to include such information in their letters to GPs, or do not deem it relevant.

While GP referrers are more likely to receive other clinical information usually regarded as important, such as problem descriptions, formulations, and action plans, in the opinion of clinical psychologists the quality of this information seldom rises above the merely 'adequate'. This occurs on only 35% of occasions for problem descriptions, and on fewer than 17% of occasions for formulations and action plans. These opinions concord with the data from the audit of objective indices, which indicated that problem descriptions often lack detail, formulation-related information is often absent or minimal and of unclear significance, and action plans usually lack specificity.

What determines the quality of a letter?

It would seem that the principal discriminators of ‘good’ letters are: (1) good problem descriptions (i.e. clear and informative); (2) good formulation-relevant information (i.e. clearly explanatory), referring to problem onset factors as a minimum, and often including information about problem maintenance; (3) at least adequate action plans (i.e. not necessarily detailed), and, (4) good clarity, relevance and appropriateness. Prognostic information does not discriminate - perhaps because it is rarely included in letters.

‘Good’ letters are also usually longer in terms of word count, page length, and number of paragraphs, than ‘poor’ letters, and generally more so than ‘adequate’ letters. In the context of initial reply letters presumably longer means more informative, though not invariably.

Additionally, ‘good’ letters are more likely to indicate the date of first contact and to comment on interview presentation, than are ‘adequate’ or ‘poor’ ones.

Table 4 summarizes the attributes associated with a ‘good’ letter.

Insert Table 4 about here

Does more experience mean better letters?

One particularly surprising conclusion arising from this study is that there were very few meaningful differences in the nature or quality of the letters produced by first year trainees compared to new entrants and to highly experienced clinical psychologists. No differences emerged on clinician evaluations, and the few that did in respect of the objective indices were not particularly enlightening. Most noteworthy is the finding that new entrants generally write shorter letters than the other two groups of clinicians. This might partly explain why they were also less likely to present a reason for the initial contact, or to include prognosis-relevant information. That trainees were generally less likely to make references to the referral letter, particularly by contrast with experienced clinicians, may indicate their inexperience, but as most letters were deficient in this respect, it is not an especially meaningful finding. The inclusion of more background information by experienced clinicians may reflect their recognition of the importance of conveying the context in which problems exist.

Conclusions

These findings call into question whether the judgment of any single clinician can serve as a sufficiently reliable guide for trainees in learning how to write good quality letters. Moreover, they suggest that the current BPS guidelines on supervising trainee communications are not adequate, with their unspecific advice focused on characteristics that are not the most helpful discriminators of good letters, and their lack of guidance on attributes that more clearly determine the quality of

letters. Rather, what may be of most help to trainees is for supervisors to: (1) provide objective information about the attributes of 'good' reports; (2) offer guidance on adhering to quality-relevant standards of letter writing that have been specified through consensual agreement with colleagues, and, (3) identify and make available sample letters that reflect these standards. In this way, trainees will have a surer set of guides to their letter writing and ones that combine objective information, agreed standards and concrete exemplars. Given the range of deficiencies identified in the majority of letters sampled in this study, such guidance is urgently required.

References

Blakely, A., Morgan, J. & Anderson, I. (1997). Communication between GPs and psychiatrists: the long and short of it. *Psychiatric Bulletin*, **21**, 622-624.

British Psychological Society (1991). *Guidelines on Clinical Supervision*. BPS.

Leonard, I., Babbs, C. & Creed, F. (1990). Psychiatric referrals within the hospital – the communication process. *Journal of the Royal Society of Medicine*, **83**, 241-244.

Markar, T.N. & Magadeshwar, S. (1998). Audit on communication between general practitioners and psychiatrists following an initial outpatient assessment of patients

with learning disabilities. *The British Journal of Developmental Disabilities*, **44**, 38-41.

McKenna, M., Paxton, R. & Grant, W. (1994). Communications between a multi-agency mental health service and general practitioners: Are standardisation and audit possible? *Journal of Mental Health*, **3**, 513-520.

Newton, J., Eccles, M., & Hutchinson, A. (1992). Communication between general practitioners and consultants: what should their letters contain? *British Medical Journal*, **304**, 821-824.

Newton, J., Hutchinson, A., Hayes, V., McColl, E., Mackee, I. & Holland, C. (1994). Do clinicians tell each other enough? An analysis of referral communications in two specialities. *Family Practice*, **11**, 15-20.

Prasher, V.P., Fitzmaurice, D., Krishman, V.H.R. & Oyebode, F. (1992). Communications between general practitioners and psychiatrists. *Psychiatric Bulletin*, **16**, 468-469.

Pullen, I. & Yellowlees, A. (1985). Is communication improving between general practitioners and psychiatrists? *British Medical Journal*, **290**, 31-33.

Roland, M.O., Porter, R.W., Matthews, J.G., Redden, J.F., Simonds, G.W. & Bewley, B. (1991). Improving care: a study of orthopaedic outpatients referrals. *British Medical Journal*, **302**, 1124-1128.

Shah, P.J. & Pullen, I. (1995). The impact of a hospital audit on psychiatrists' letters to general practitioners. *Psychiatric Bulletin*, **19** 544-547.

Suen, H.K. & Ary, D. (1989). *Analyzing Quantitative Behavioural Observation Data*. Lawrence Erlbaum Associates, Inc.: New Jersey.

Westerman, R.F., Hull, F.M., Bezemer, P.D. & Gort, G. (1990). A study of communication between general practitioners and specialists. *British Journal of General Practice*, **40**, 445-449.

Yellowlees, A.J. & Pullen, I. (1984). Communication between psychiatrists and general practitioners. What sort of letter should psychiatrists write? *Health Bulletin*, **42**, 285-296.

Young, R.C. Jr., Rachal, R.E. & Morgan, A.L. (1991). Maximising communication skills in graduate and postgraduate health-care education through medical writing. *Journal of the National Medical Association*, **83**, 691-696.

LIST OF TABLES

		Pages
Table 1	Percentages of Letters in Which Audit Indices Were Identified	22
Table 2	Overall Means and Percentages of Letters Classified by Indices of Length	23
Table 3	Percentages of Letters Allocated to Quality Categories for Each Attribute	24
Table 4	Attributes of a 'Good' Letter	25

Table 1: Percentages of Letters in Which Audit Indices Were Identified

Objective Indices	YES	NO	SPEC'D	DETAILED
Refce. to Ref. Letter	15.3	61		
Reason for Contact	23.6	76.4		
Date of Contact	81.9	18.1		
Problem Description	100	0		59.7
Background Info.	29.2	70.8		
Findings/Observations	26.4	72.2		
Predisposing Factors	47.2	52.8	14	
Onset Factors	68.1	31.9	44.4	
Maintenance Factors	51.4	48.6	8	
Plan of Action	79.2	20.83		20.8
Prognostic Information	31.9	66.7	11.1	
Timescale- Next Appt.	10	90		
Use of Jargon	48.6	51.4		
Value Judgements	36.1	63.9		

Table 2: Overall Means and Percentages of Letters Classified by Indices of Length

No. of words	Mean	<300	300-500	>500
	367	44.4	37.5	16.7
No. of pages	Mean	.5 or less	.75 Or 1	>1
	.72	51.4	36.1	12.5
No. of paragraphs	Mean	2-3	4-5	>5
	4.5	32	43	25

Table 3: Percentages of Letters Allocated to Quality Categories for Each Attribute

Quality Categories	Poor	Adequate	Good
Qualitative Attributes			
Adequacy of Problem Description	17	48	35
Adequacy of Formulation	39	44	17
Adequacy of Action Plan	28	55	17
Adequacy of Prognostic Opinion	64	31	5
Clarity of Expression	4	67	29
Relevance of Content	4	54	42
Appropriateness	0	63	37
Overall Quality	28	47	25

Table 4: Attributes of a 'Good' Letter

- Is usually longer than 300 words or $\frac{3}{4}$ page of text.
- Includes the date of first contact.
- Records clinician's observations of the patient at interview.
- Describes problem(s) in a clear and informative way.
- Specifies problem onset, and maintenance factors.
- Contains some indication of planned action.
- Is written with clarity to be easily understood.
- Content is wholly relevant to the purpose of the report.
- Content and style are appropriate to the intended recipient.

2. MAIN RESEARCH PROJECT LITERATURE REVIEW

Worry as an Arousal Inhibiting Thought Activity: A Critical Review

Prepared for submission to *Behaviour Research and Therapy*

(See Appendix 2)

Worry as an Arousal Inhibiting Thought Activity: A Critical Review

Charlie Marsh
Department of Psychological Medicine
University of Glasgow, Glasgow, G12 OXH

Abstract

Worry is a feature of most anxiety disorders and it has been linked with their development and maintenance. One influential theory has proposed that worry maintains the persistent moderate anxiety of generalised anxiety disorder as a consequence of its function in suppressing acute autonomic anxiety. By contrast, another model proposes a role for worry in escalating anxious arousal to the levels experienced in panic disorder. This paper seeks to understand and resolve this apparent contradiction by reviewing the empirical evidence on the nature of worry and its relationship to anxious somatic arousal. It concludes that the effects of worry on anxious arousal are variable, and may be dependent upon the prominence of imagery within the worry samples investigated. This in turn may be related to: 1) the nature of the thematic content of worry (social-evaluative versus physical-threat); 2) whether the worrisome concerns are specific and repetitive, or broad ranging (fear-related versus generalised worry); 3) the characteristics of the worrier, including 'fearfulness' and prior levels of anxious autonomic arousal. Hypotheses are proposed which, if empirically confirmed, would resolve the theoretical contradictions alluded to.

Keywords: Worry, thought, imagery, anxiety, autonomic arousal, anxiety disorders.

Introduction

Worry has become recognized as a general characteristic of most anxiety disorders (Barlow, 1988; Molina & Borkovec, 1994). Moreover, chronic worry has been identified as the defining feature of generalized anxiety disorder (GAD), and worry about future panic attacks has been incorporated as a diagnostic criterion of panic disorder (PD; American Psychiatric Association, 1994). This enhanced clinical status of worry is also reflected in the construction of theories implicating it in the development and maintenance of anxiety disorders.

Such worry-focused theories have been developed somewhat separately for GAD and PD. Thus, Borkovec and his colleagues (Borkovec, Shadick and Hopkins, 1991) have constructed a theory of how worry maintains anxiety and its disorders largely within the context of studying non-clinical subjects, chronic worriers and those with GAD. The theory postulates that worry maintains anxiety through: i) its perceived and/or actual capacity to avoid threat by predicting and preparing for future aversive events, and, ii) its capacity to suppress the autonomic accompaniments of anxiety. According to Borkovec, the key to this latter process is the (largely) verbal-conceptual nature of worry, which allows it to suppress aversive imagery that would otherwise generate affective arousal. This process is considered to maintain anxiety through the negative reinforcement of reduced somatic-anxiety, and the consequent inhibition of emotional processing by preventing fear memory structures from being fully accessed (cf. Borkovec, 1994). Thus, worry maintains chronic anxiety by minimizing acute (somatic) anxiety: “Overall, moderate levels of anxiety are maintained in order to

avoid the higher anxiety consequent to fully elaborated and refreshed aversive images” (Borkovec & Lyonfields, 1993, p.114).

In contrast to Borkovec, Barlow (1988) developed his theory of worry mainly in relation to explaining how fear responses, including panic, escalate to become problematic. According to Barlow (1988), worry is a feature of anxious apprehensive mood states, with both being essentially arousal-driven preparatory sets for future action that require “supportive physiology” (p.258). Moreover, he describes a vicious cycle whereby anxious apprehension can lead to a “spiraling of arousal” (p.255). With reference to panic attacks, he suggests that the chronic high arousal resulting from this vicious cycle “lowers the threshold for panic” (p.267). He further proposes that panic attacks only become problematic when “associated with a strong cycle of anxious apprehension” (p.274). Thus, he views worry as incubating anxious arousal and thereby panic attacks and PD.

Tallis and Eysenck (1994) present a model of worry that is consonant with Barlow’s, in so far as it postulates a threat ‘alarm’ function whereby worry repeatedly orients the organism towards identified threat. As these authors point out: “Awareness of threat results in supportive physiological change” such that “the individual will experience increased levels of arousal” (p.45). This perspective, then, contrasts with Borkovec’s view that worry inhibits somatic arousal.

It is possible that the reconciliation of these perspectives lies in the differences between fear and anxiety phenomena. Thus, Jones and Davey (1990) have shown that merely imaging an unconditioned stimulus (UCS) serves to maintain a physiological conditioned fear response (CR), and they suggest that UCS rehearsal may be

analogous to worry. Davey and Matchett (1994) further revealed that UCS rehearsal has an incubating effect on physiological CRs when preceded by somatic anxiety induction, but not when preceded by induced worry. Notably, worry induction was associated with reports of greater thinking and somatic anxiety induction with relatively greater imagery. These findings are consistent with research implicating the occurrence of spontaneous aversive images in the maintenance of fear-related anxiety disorders, including panic disorder (cf. Clark, 1999, for a review).

Since heightened autonomic arousal characterizes the resting and panic states of PD patients, but is not observed in those with GAD (Dractu & Bond, 1998; Hoehn-Saric, McLeod, & Zimmerli, 1988; Rapee, 1985, 1986), it may be that the worry of PD (fearful) individuals is rich in imagery, while in GAD (generally anxious) subjects imagery is particularly suppressed. Moreover, possibly fear-related worry is more imagery-rich than generalized worry. Additionally, since the content of anxious cognition and of worry differs between PD and GAD (e.g., Breitholz, Johansson & Ost, 1999; Starcevic, Fallon, Uhlenhuth, & Patha, 1994; Wells, 1994), perhaps the content of worry influences its level of imagery. Research evidence relating to these issues is reviewed below.

Form and content of worry

Borkovec and Inz (1990) first investigated the formal qualities of worry using a cognitive sampling procedure. During relaxation non-worriers reported a predominance of visual imagery over verbal thought activity, while GAD patients (by definition, chronic worriers) reported equivalent amounts of both. In both groups thought predominated over imagery during worry, and thought frequency increased from relaxation to worry, while imagery decreased.

In a partial replication of the above study, East and Watts (1994) confirmed a predominance of thought and a reduction in imagery during worry (and non-worry thought activity) relative to relaxation, in a group of high trait worriers. Wells and Morrison (1994) also established that worry involves predominantly verbal rather than visual imaginal material when they investigated the diary-recorded worry of students.

Questionnaire surveys have revealed similar findings. Borkovec and Lyonfields (1993) noted that a community sample of 900 women indicated a preponderance of thought or a mixture of thought and imagery over imagery alone (51%, 46% and 3%). A further reported sample of 300 college women also revealed a dominance of thought (70%) over imagery (30%). In two additional samples, 71.3% and 70.4% of students reported a predominance of thought over images within worry (Freeston, Dugas and Ladouceur, 1996; Tallis, Davey and Capuzzo, 1994). Moreover, in the Freeston et al. study excessive worriers reported more thoughts relative to "ordinary worriers".

Two further studies yielded tentative support for Borkovec's thesis. Lyonfields, Borkovec and Thayer (1995) had non-anxious and GAD student analog participants

self-relax, then engage with worry-related imagery, followed by a period of worrisome thinking about the same current concern. Unsurprisingly, subjective reports indicated a predominance of thought during worrisome thinking but not during 'image-worry'. However, the GAD and non-anxious groups did not differ in frequency of thoughts and images during self-relaxation, but the former did display a marginally greater preponderance of verbal thinking across the two experimental tasks.

Molina, Borkovec, Peasley, and Person (1998) administered a questionnaire after a worry period, and found only a marginal tendency for the majority of students identified as 'GAD' and 'dysphoric' to report mainly verbal thoughts during worry, whereas most controls reported a mixture of thoughts and visual images.

Additional indirect evidence supports an interpretation of worry as essentially a verbal-conceptual activity. Rapee (1993) presents data that verbal memory tasks interfere with student worry, while visuo-spatial memory tasks have little effect. Furthermore, during worry, worriers exhibit greater left- relative to right-hemispheric electro-cortical activity in the frontal areas than non-worriers (Carter, Johnson, & Borkovec, 1986). There is also evidence that GAD patients show greater left- relative to right-hemispheric activation than do non-patient controls (Inz, 1990; Wu, Buchsbaum, Hershey, Hazlett, Sicotte, & Hohnson, 1991).

While the evidence cited thus far supports Borkovec's theory, findings from four experimental studies question its applicability to all populations and types of worry. Butler, Wells and Dewick (1995) had students view a video of a gruesome industrial accident, and then worry about it "in verbal form," image it "in pictorial form," or simply "settle down". Unexpectedly, a subsequent manipulation check revealed no

differences between the groups in the proportion of time spent worrying or imaging. These results contrast with those of Lyonfields et al. (1995). Moreover, while the latter study reported that participants found it easier to generate and maintain worrisome thinking than aversive images, Butler et al. (1995) observed the converse among their subjects. While these studies employed differing methodologies for stimulating worry, it may be relevant to understanding their contradictory findings that the worry themes also differed. In the Butler investigation, participants were asked to focus upon a physical threat, while in the Lyonfields study subjects worried about a current concern. Possibly certain topics (e.g., physical threat concerns) are more easily imaged, and therefore facilitate imagery during worry.

In a replication and extension of the Butler et al. (1995) study, Wells and Papageorgiou (1995) confirmed the finding of no difference in time spent worrying or imaging between groups engaging in verbal-worry versus imagery about the film. However, both groups reported spending equivalently more time imaging than did a 'settle-down' group. Moreover, a group asked "to worry about the things they usually worry about" reported substantially less imagery than the film-worry group and did not differ from the control group in this regard. Since research indicates that the 'usual-worry' of a normal population is largely focused upon social concerns (e.g., Eysenck & Van Berkum, 1992), this data is consistent with a hypothesis that imagery may be more pronounced during physical-threat worry than during social-threat worry.

Additional support for this hypothesis comes from a recent study that reported post-manipulation ratings of worrisome thinking about a physical threat (being the victim of a violent crime) versus a social threat (public speaking). Student participants with

these fear complaints rated victimization-fear worry as significantly more image-inducing than speech-fear worry and than relaxation-related thinking, with the latter two being indistinguishable in this regard (Peasley-Miklus & Vrana, 2000). This is despite subjects having been directed towards ‘thought’ mentation in all conditions, thereby encouraging verbal thought to predominate over visual imagery in both types of fear-worry.

Borkovec has also produced findings that are inconsistent with his own theory (Borkovec, Lyonfields, Wisner, & Deihl, 1993). Speech-fearful undergraduates were assigned to several different and repeated worry conditions, including *general-worry* (‘worry in your usual way about current concerns’), and *thought-worry* and *image-worry* (concerning public speaking), or to a *relaxation* condition. Post-manipulation ratings revealed that image-worry and relaxation were associated with high levels of imagery, but so also was general-worry. It is possible that this outcome reflects a tendency of ‘fearful’ subjects (i.e., those with stable threat concerns) to generate more worrisome imagery than generally anxious individuals. It is noteworthy that the usual worry content of the latter is more variable and often includes minor matters (Roemer, Molina, & Borkovec, 1997), and more temporally remote concerns (Dugas, Freeston, Ladouceur, Rheume, Provencher, & Boisvert 1998).

The worry of GAD individuals is also largely focused on the social sphere of life, though not always specifically social-evaluative in nature (Borkovec, Shadick, & Hopkins, 1991; Roemer, Molina, & Borkovec, 1997; Sanderson & Barlow, 1990; Starcevic, Fallon, Uhlenhuth, & Patha, 1994). This contrasts with that of PD sufferers and those prone to panic, whose worry reflects a more marked preoccupation with

physical threats, especially health concerns (Lovibond & Rapee, 1993; Starcevic et al, 1994; Wells, 1994). This population specificity of worry content is consistent with data from studies examining anxiety-related cognitions in anxiety disorders. In PD such cognitions most often concern physical catastrophes, while those of GAD patients reflect social and evaluative themes (Breitholz, Johansson & Ost, 1999; Breitholz, Westling & Ost, 1998; Chambless & Gracely, 1989; Hibbert, 1984; Rapee, 1985).

Generally speaking then, studies supportive of Borkovec's theory have, de facto, investigated social, fluctuating (generalized) and temporally distant, worry concerns in populations not evidencing specific fears, while those eliciting inconsistent findings have examined physical-threat worry, or worry in subjects admitting to specific fears. It may be, therefore, that the worry of groups such as PD patients, particularly when related to physical threats, might not be equivalent to that of most groups studied hitherto. More specifically, worry about physical threats may be more imaginal than worry about miscellaneous social matters, but this may also be so for the generality of worry in 'fearful' individuals.

Arguably, this proposal is congruent with Stober's (1998) hypothesis that the concreteness of the subject matter of worry determines the accessibility and vividness of related images. Physical threats, and stable fear-related concerns, are possibly less often abstract in nature, and therefore more readily imaged, than fluctuating, and more remote, social and evaluative concerns. Moreover, the dramatic nature of panic-related concerns might also facilitate imaginal worry, in a way that would be less likely for the concerns of chronic worriers and GAD patients. It is also possible that

the mentation of 'fearful' individuals generally takes a more concrete, imaginative form than that of 'non-fearful' persons.

Currently these remain speculative propositions since no study to date has directly investigated their validity. The findings from which these hypotheses are derived are incidental to the main aims of the studies reporting them, and methodological limitations prevent the drawing of clear conclusions. For instance, all employed retrospective ratings of worry qualities, rather than more direct cognitive sampling.

Somatic concomitants of worry

Worry and cardiovascular activity

Data from a number of studies support Borkovec's thesis that worry inhibits autonomic arousal. For instance, a repeated finding is a failure to identify tonic cardiovascular differences between worriers and non-worriers, between GAD subjects and non-anxious controls, and between resting periods and periods of worry (Borkovec et al, 1993; Borkovec & Hu, 1990; Borkovec, Robinson, Pruzinsky, & Dupree, 1993; Elliot, 1990). Additional research has confirmed an absence of difference in overall sympathetic activation, and in reactivity to stressors, between GAD clients and non-anxious subjects (Hoehn-Saric, McLeod, & Zimmerli, 1988). Furthermore, it has been repeatedly demonstrated that, when compared to relaxation, preceding worry inhibits the emotional processing of fear imagery, as indicated by

reduced cardiovascular responsiveness (Borkovec & Hu, 1990; Borkovec, et al, 1993; Peasley-Miklus & Vrana, 2000).

Several studies have, however, reported increased heart rates during worry compared to a neutral state (York, Borkovec, Vasey, & Stern, 1987), to a rest period (Lyonfields, Borkovec and Thayer, 1995), and to relaxation (Peasley-Miklus & Vrana, 2000; Thayer, Friedman & Borkovec, 1996). Moreover, York and colleagues also found an increased level of perceived somatic activity associated with worrisome mentation. However, it is possible that all of these discrepant findings could arguably be attributed to methodological factors. For instance, Borkovec and Lyonfields (1993) have suggested that the results of York and colleagues' study are due to their particular worry-induction procedure having prompted imagery processes.

Lyonfields, Borkovec and Thayer (1995) found that heart rate (HR) increased significantly from baseline to 'image-worry' and that there was a further marginally significant increase from 'image-worry' to 'thought-worry'. This result, though, may be explained as a carry-over effect from the preceding worry-related imagery condition. Furthermore, these effects were only evident in a non-anxious group. A GAD group demonstrated no variation in HR across all conditions.

That Thayer, Friedman & Borkovec's (1996) study revealed heart and respiration rates to be elevated during general worry relative to relaxation and baseline, with HR also being greater among GAD clients than non-anxious controls, could conceivably be indirectly attributable to subjects' maintenance of eye-closure throughout the experiment. This might have encouraged more worry-generated images.

This interpretation is consistent with the results of the Peasley-Miklus and Vrana (2000) study, which also required eye-closure throughout. Victimization-fear worry evidenced greater HR acceleration relative to baseline than did relaxation, with speech-fear worry falling non-significantly in-between. Furthermore, speech-fear worry HR was marginally greater than relaxation-related thinking HR, and was significantly so when the mentation-prompt periods were excluded from analysis. These worry HR responses might, of course, reflect greater worry imagery associated with stable fears and physical-threat concerns, as suggested earlier. That HR responsiveness to speech-fear worry was not clearly evident may be due, as the authors point out, to the fact that speech-fear, and other social fears, are more similar to generalized anxiety than to specific phobias, which are characterized by the activation of survival responses (McNeil, Vrana, Melamed, Cuthbert, & Lang, 1993). The last-mentioned implies a greater threat to physical integrity.

The attribution of worry-elicited HR increments to (within-worry) imagery, is further supported by the finding that silently repeating (thinking) fear or neutral sentences produces similar HR responses, while imaging the former evokes a significantly higher HR by comparison (Vrana, Cuthbert & Lang, 1986). However, later studies indicate that small but significantly greater HR responses can result from the silent rehearsal of fear sentences relative to neutral ones (Vrana Cuthbert & Lang, 1989; Vrana & Lang, 1990). Nevertheless, the same studies confirm that imaging fear material produces stronger cardiac responses than does silently verbalizing it. Moreover, it remains possible that fear images intruded during silent repetition,

perhaps facilitated by the requirement to maintain eye-closure. No mentation manipulation checks were conducted to assess this possibility.

As regards worry's reported interference with the emotional processing of fear imagery (Borkovec & Hu, 1990; Borkovec et al, 1993), it is noteworthy that Peasley-Miklus and Vrana (2000) observed inhibited cardiovascular responsiveness to speech-fear imagery, but not to victimization-fear imagery. Moreover, even this effect disappeared when the comparison was made with baseline rather than prior relaxation. The authors argue from their overall results that worry is arousing and that this leads to incremental arousal during subsequent fear imagery. However, their conclusions are tentative, being based partly upon subjective reports and muscular activity, rather than exclusively upon autonomic effects.

Somatic Symptoms of Worry

At a phenomenological level, both worry and GAD are more closely associated with reported symptoms of motor tension, vigilance and scanning than with autonomic hyperactivity (AH) symptoms. By contrast, AH symptoms are more prominent in PD (Anderson, Noyes, & Crowe, 1994; Barlow, Borkovec, Shear, & Lydiard, 1993; Brown, Marten, & Barlow, 1995; Marten, Brown, Noyes, Clarkson, Crowe, Yates, & McChesney, 1987; Noyes, Woodman, Garvey, Cook, Suelzer, Chancy, & Anderson, 1992; Starcevic, Fallon, & Uhlenhuth, 1994). Since the nature of worry in PD and its relationship to PD somatic symptoms has not been investigated, such differences

could feasibly reflect, in part, a greater activation of within-worry imagery in these patients.

Data from Freeston and colleagues (1996) suggest that somatic concomitants of worry may indeed be particularly related to the presence of imagery. In a combined sample of 'ordinary' and excessive worriers, weak but significant correlations were obtained between the percentage of self-reported images in worry and the number of somatic symptoms endorsed. Moreover, among the excessive worriers, there was a substantially stronger positive correlation between percentage of within-worry images and prevalence of AH symptoms, while in this group only there was also a significant negative correlation between AH symptoms and level of thought-worry. Thus, it appears that worry may inhibit somatic arousal or facilitate it, depending on the proportion of thought to imagery activity present within the worry process, with such effects being most evident among excessive worriers.

Conclusions

A number of conclusions can be drawn from the evidence reviewed above. Firstly, the worry of GAD sufferers, chronic worriers and non-anxious individuals takes the form of predominantly verbal conceptual thought activity. Secondly, the worry content of these groups mainly concerns social threats, while PD and panic-proneness are associated with heightened physical-threat worry. Thirdly, readily accessible conceptual thought activity (including 'thought-worry') inhibits aversive images and attenuates autonomic responses to these. Fourthly, the effects of 'general worry' on

imagery and somatic arousal are variable, and possibly dependent upon population characteristics and procedural variations. Lastly, empirical support for the hypotheses that worry induces inhibition of imagery and physiological arousal is relatively strong for generalized social worry, but equivocal for stable social-threat worry; while for physical-threat worry, incidental experimental observations point in the opposite direction.

The available data also suggest the following hypotheses: Firstly, relative to the generalized worry of 'non-fearful' individuals, imagery may be more evident in the (general) worry of fearful populations, and in fear-related worry, particularly when the fears concern physical threats. Secondly, worry rich in imagery may facilitate, and/or be facilitated by, autonomic arousal. Empirical confirmation of these hypotheses could resolve the apparent contradictions between the theories of Borkovec (Borkovec, Shadick & Hopkins, 1991) and Barlow (1988).

References

Anderson, D. J., Noyes, R., & Crowe, R. R. (1984). A comparison of panic disorder and generalized anxiety disorder. *American Journal of Psychiatry*, *141*, 572-575.

American Psychiatric Association (1994). *Diagnostic and statistical manual of mental disorders*, 4th ed. Rev. Washington, DC: American Psychiatric Press.

Barlow, D. H., (1988). *Anxiety and its disorders*. New York: Guilford Press.

Barlow, D. H., Cohen, A. S., Waddell, M., Vermilyea, J. A., Klosko, J. S., Blanchard, E. B., & Di Nardo, P. A. (1984). Panic and generalized anxiety disorders: nature and treatment. *Behaviour Therapy, 15*, 431-449.

Barlow, D. H., (1991). Disorders of Emotions. *Psychological Inquiry, 2*, 58-71.

Borkovec, T. D. (1994). The nature, functions, and origins of worry. In G. C. L. Davey & F. Tallis (Eds.), *Worrying: perspectives on theory, assessment and treatment*. New York: Wiley.

Borkovec, T. D., Robinson, E., Pruzinsky, T., & Dupree, J. A. (1983). Preliminary exploration of worry: Some characteristics and processes. *Behaviour Research and Therapy, 21*, 9-16.

Borkovec, T. D., & Hu, S. (1990). The effect of worry on cardiovascular response to phobic imagery. *Behaviour Research and Therapy, 28*, 69-73.

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

Borkovec, T. D., Shadick, R., & Hopkins, M. (1991). The nature of normal and pathological worry. In R. Rapee, & D. H. Barlow, (Eds.), *Chronic anxiety and generalised anxiety disorder*. New York: Plenum.

Borkovec, T. D., & Lyonfields, J. D. (1993). Worry: Thought suppression of emotional processing. In H. Krohne (Ed.), *Vigilance and Avoidance*, pp. 101-118, Toronto: Hogrefe and Huber Publishers.

Borkovec, T. D., Lyonfields, J. D., Wiser, S., & Deihl, L. (1993) The role of worrisome thinking in the suppression of cardiovascular responses to phobic imagery. *Behaviour Research and Therapy*, 31, 321-324.

Breitholtz, E., Westling, B. B. & Ost, L-G. (1998). Cognitions in generalized anxiety disorder and panic disorder patients. *Journal of Anxiety Disorders*, 12, 567-577.

Breitholtz, E., Johansson, B., & Ost, L-G. (1999). Cognitions in generalized anxiety disorder and panic disorder. A prospective study. *Behaviour Research and Therapy*, 37, 533-544.

Brown, T. A., Marten, P. A., & Barlow, D. H. (1992). Discriminant validity of the symptoms constituting DSM-III-R and DSM-IV associated symptom criterion of generalized anxiety disorder. *Journal of Anxiety Disorders*, 9, 317-328.

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

Chambless, D. L., & Gracely, E. J. (1989). Fear of fear and the anxiety disorders. *Cognitive therapy and Research*, 13, 9-20.

Carter, W. R., Johnson, M. C., & Borkovec, T. D. (1986). Worry: an electrocortical analysis. *Advances in Behaviour Research and Therapy*, 8, 193-204.

Clark, D. M. (1999). Anxiety disorders: why they persist and how to treat them. *Behaviour Research and Therapy*, 37, S5-S27.

Davey, C. L., & Matchett, G. (1994). Unconditioned stimulus rehearsal and the retention and enhancement of differential "fear" conditioning: effects of trait and state anxiety. *Journal of Abnormal Psychology*, 103, 708-718.

Dugas, M. J., Freeston, M. H., Ladouceur, R., Rheume, J., Provencher, M., & Boisvert, J. M. (1998). Worry themes in primary generalized anxiety disorder, secondary generalized anxiety disorder and other anxiety disorders. *Journal of Anxiety Disorders*, 12, 253-261.

Elliott, T. K. (1990). The role of autonomic arousal in generalized anxiety disorder. Unpublished doctoral dissertation, Pennsylvania State University, University Park,

PA. Cited in Borkovec, T. D. (1994), The nature, functions, and origins of worry. In G. C. L. Davey & F. Tallis (Eds.), *Worrying: perspectives on theory, assessment and treatment*. New York: Wiley.

East, M. P., & Watts, F. N. (1994). Worry and the suppression of imagery. *Behaviour Research and Therapy*, 32, 851-855.

Eysenck, M.W., & Van Berkum, J. (1992). Trait anxiety, defensiveness and the structure of worry. *Personality and Individual Differences*, 13, 1285-1290.

Freeston, M. H., Dugas, M. J., & Ladouceur, R. (1996). Thought, images, worry and anxiety. *Cognitive Therapy and Research*, 20, 265-273.

Hoehn-Saric, R., & Mcleod, D. R. (1988). The peripheral sympathetic nervous system: its role in pathological anxiety. *Psychiatric Clinics of North America*, 11, 375-386.

Hoehn-Saric, R., & Mcleod, D. R., & Zimmerli, W. D. (1989). Somatic manifestations in women with generalized anxiety disorder, *Archives of General Psychiatry*, 46, 1113-1119.

Holden, A. E., & Barlow, D. H. (1986). Heart rate and heart rate variability recorded in vivo in agoraphobics and nonphobics. *Behaviour therapy*, 17, 26-42.

Inz, J. (1990). EEG activity in generalized anxiety disorder. Unpublished doctoral dissertation, Pennsylvania State University, University Park, PA. Cited in Borkovec, T. D. (1994), The nature, functions, and origins of worry. In G. C. L. Davey & F. Tallis (Eds.), *Worrying: perspectives on theory, assessment and treatment*. New York: Wiley.

Jones, T., & Davey, G. C. L. (1990). The effects of cued UCS rehearsal on the retention of differential "fear" conditioning: An experimental analogue of the "worry" process. *Behaviour Research and Therapy*, 28, 159-164.

Lovibond, P.F., & Rapee, R.M. (1993). The representation of feared outcomes. *Behaviour Research and Therapy*, 31, 595-608.

Lyonfields, J. D., Borkovec, T. D., & Thayer, S. F. (1995). Vagal tone in generalized anxiety disorder and the effects of aversive imagery & worrisome thinking. *Behaviour Therapy*, 26, 457-466.

Marten, P. A., Brown, T. A., Barlow., Borkovec, T. D., Shear, M.K., & Lydiard, R.B. (1994). Evaluation of the ratings comprising the associated symptom criteria of DSM-III-R generalized anxiety disorder. *Journal of Nervous and Mental Diseases*, 181, 676-682.

McNeil, D.W., Vrana, S.R., Melamed, B.G., Cuthbert, B.N., & Lang, P.J. (1993). Emotional imagery in simple and social phobia: fear versus anxiety. *Journal of Abnormal Psychology, 102*, 212-225.

Molina, S., & Borkovec, T. D. (1994). The Penn State Worry Questionnaire: psychometric properties and associated characteristics. In G.C.L. Davey, & F. Tallis, *Worrying: perspectives on theory, assessment and treatment*. New York: Wiley.

Molina, S., Borkovec, T. D., Peasley, C., & Person, D. (1998). Content analysis of worrisome streams of consciousness in anxious and dysphoric patients. *Cognitive Therapy and Research, 22*, 109-123.

Noyes, R., Clarkson, C., Crowe, R. R., Yates, W. R., & McChesney, C. M. (1987). A family study of generalized anxiety disorder. *American Journal of Psychiatry, 144*, 1019-1024.

Noyes, R., Woodman, C., Garvey, M. J., Cook, B. I., Suelzer, M., Chancy, J., & Anderson, D. J. (1992). Generalized anxiety disorder vs panic disorder: distinguishing characteristics and patterns of comorbidity. *Journal of Nervous and Mental Disease, 180*, 369-379.

Peasley-Miklus, C., & Vrana, R.J. (2000). Effects of worrisome and relaxing thinking on fearful emotional processing. *Behaviour Research and Therapy, 38*, 129-144.

Rapee, R. M. (1985). Distinctions between panic disorder and generalized anxiety disorder: clinical presentation. *Australian and New Zealand Journal of Psychiatry*, *19*, 227-232.

Rapee, R. M. (1993). The utilization of working memory by worry. *Behaviour Research and Therapy*, *31*, 617-620.

Roemer, L., Molina, S., & Borkovec, T. D. (1997). An investigation of worry content among generally anxious individuals. *Journal of Nervous and Mental Disease*, *185*, 314-319.

Sanderson, W. C., & Barlow, D. H. (1990). A description of patients diagnosed with DSM-III revised generalized anxiety disorder. *Journal of Nervous and Mental Disease*, *178*, 588-591.

Starcevic, V., Fallon, S., Uhlenhuth, E. H., & Patha, K. D. (1994). Generalized anxiety disorder, worry about illness and hypochondriacal fears and beliefs. *Psychotherapy and Psychosomatics*, *61*, 93-99.

Stober, J. (1998). Worry, problem solving and suppression of imagery: the role of concreteness. *Behaviour Research and Therapy*, *36*, 751-756.

Tallis, F., & Eysenck, M. W. (1994). Worry: mechanisms and modulating influences. *Behavioural and Cognitive Psychotherapy*, 22, 37-56.

Tallis, F., Davey, G. C. L., & Capuzzo, N. (1994). The phenomenology of nonpathological worry: a preliminary investigation. In G. C. L. Davey & F. Tallis (Eds.), *Worrying: perspectives on theory, assessment and treatment*. New York: Wiley.

Thayer, J. F., Friedman, B. H., & Borkovec, T. D. (1996). Autonomic characteristics of generalized anxiety disorder and worry. *Biological Psychiatry*, 39, 255-266.

Vrana, S.R., Cuthbert, B.N., & Lang, P.J. (1986). Fear imagery and text processing. *Psychophysiology*, 23, 247-253.

Vrana, S.R., Cuthbert, B.N., & Lang, P.J. (1989). Processing fearful and neutral sentences: memory and heart rate change. *Cognition and Emotion*, 3, 179-195.

Vrana, S.R., & Lang, P.J. (1990). Fear imagery and the startle probe reflex. *Journal of Abnormal Psychology*, 99, 189-197.

Wells, A. (1994). A multi-dimensional measure of worry: Development and preliminary validation of the Anxious Thoughts Inventory. *Anxiety States and Coping*, 6, 289-299.

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

Wells, A., & Papageorgiou, G. (1995). Worry and the incubation of intrusive images following stress. *Behaviour Research and Therapy*, *33*, 579-583.

Wu, J. c., Buchsbaum, M. S., Hershey, T. G., Hazlett, E., Sicotte, N., & Hohanson, J. C. (1991). PET in generalized anxiety disorder. *Biological Psychiatry*, *29*, 1181-1199.

York, D., Borkovec, T.D., Vasey, M., & Stern, R. (1987). Effects of worry and somatic anxiety induction on thought intrusions, subjective emotion, and physiological activity. *Behaviour Research and Therapy*, *25*, 523-526.

4. MAIN RESEARCH PROJECT PAPER

The Nature and Function of General, Social-Evaluative and Physical-Threat Worry in Non-Anxious and Panic Disorder Populations

Prepared for submission to *Behaviour Research and Therapy*

(See Appendix 4)

**The Nature and Function of General, Social-Evaluative and Physical-Threat
Worry in Non-Anxious and Panic Disorder Populations**

Charlie Marsh
Department of Psychological Medicine
University of Glasgow, Glasgow G12 OXH

Summary

Worry has been implicated in the development and maintenance of anxiety disorders. However, empirical studies of the worry process have been quite restrictive in the populations and the worry content domains investigated. Incidental research observations suggest that this may have led to a limited understanding of worry and its somatic effects. More specifically, worry about physical threats, as typified by panic disorder (PD) patients, may be a more imaginal process than the typically researched worry about social concerns. Furthermore, while typical (social) worry has been shown to inhibit autonomic arousal, it is possible that physical-threat worry incubates anxious arousal via worrisome imagery, and that panic-prone patients are more inclined to worrisome imagery, and therefore to arousal escalation. It is proposed to experimentally examine whether such differences do exist. A variety of measures will be employed to determine whether particular mentation biases characterise 'general worry' relative to relaxation, or social-threat worry compared to physical-threat worry, or PD patients by comparison with non-anxious controls. Heart rate will be measured throughout and subjective anxiety repeatedly assessed. Participants will undertake seven different 5-minute experimental tasks (5 worry-related and 2 involving relaxation) each preceded by a 3-minute letter cancellation 'buffer task'. In addition, several questionnaire measures of worry and anxiety will be administered, together with two cognitive style assessments.

INTRODUCTION

A number of recent theories have implicated worry in the development and maintenance of anxiety disorders. According to one prominent theory, worry maintains chronic anxiety through its negative reinforcing capacity to inhibit emotive imagery and its accompanying disturbing affective autonomic arousal (Borkovec, Shadick and Hopkins, 1991). This theory proposes that worry achieves this by virtue of being (largely) a conceptual thought activity that suppresses affect-inducing imagery.

Another important theory suggests, by contrast, that worry can incubate somatic arousal and fear responses, including panic attacks, thereby contributing to the development of anxiety disorders (Barlow, 1988). It is possible that the contradiction between this prediction and that arising from Borkovec's theory, is due to the different populations studied by these theorists. Barlow's theory was developed mainly from observations of fearful clinical subjects, including those with panic disorder (PD), while Borkovec's theory arose from research primarily involving comparisons of non-clinical populations, excessive worriers and clients with generalised anxiety disorder (GAD).

There is evidence that PD patients manifest greater autonomic arousal than do individuals with chronic anxiety (e.g., Rapee, 1985). Other evidence indicates differences in the content of anxious cognitions, including worry, between these patient groups, with that of GAD individuals being focused on social threats, and that of PD patients being concerned with physical threats (e.g., Hibbert, 1984; Sanderson & Barlow, 1990; Wells, 1994). Yet further tentative data suggests that during worry fearful subjects can report a relatively high level of imagery (Borkovec, Lyonfields,

Wiser, & Deihl, 1993), while imagery is comparatively infrequently reported in the worry of non-anxious, and particularly of GAD individuals (Borkovec & Inz, 1990). Moreover, there is preliminary evidence that worry about physical threats, such as is evident in PD, may be relatively imagery-rich (Butler, Wells, & Dewick, 1995). Additional findings indicate that imaging fear material evokes a greater heart rate response than does silently verbalising it (Vrana, Cuthbert & Lang, 1986).

Taken together, these data suggest the possibility that in fearful PD patients, worry could be characterised by a relatively high level of imagery, and that fear-related and physical-threat worry may be more imaginal in nature, than general social worry. Moreover, the worry of PD patients, and that related to fear and physical threat, might be expected to be associated with elevated levels of autonomic arousal. These differential relationships, if confirmed, could account for the contradictory predictions generated by the theories of Borkovec (Borkovec, Shadick and Hopkins, 1991) and Barlow (1988) outlined above.

AIMS AND HYPOTHESES

The main aims of the proposed study are: (1) to examine the nature of worry and its effects on anxiety, in PD patients; (2) to investigate the effects of variations in the thematic content of worry on the relative levels of imaginal to thought activity manifest in worry, and on autonomic arousal. A further minor aim is to examine whether a disposition towards anxious arousal (as in PD patients) is associated with a general bias towards the use of visual-imaginal mentation.

The more specific hypotheses to be tested are:

- 1) Compared to non-anxious controls, PD (anxious arousal prone) individuals will be characterised by higher levels of imagery, and consequently higher autonomic arousal, during worry.
- 2) Participants will display a bias towards employing visual-imaginal mentation when processing physical-threat concerns, and a converse bias towards relying upon verbal-thought mentation when processing social-evaluative worrisome topics.
- 3) Focussing upon physical-threat concerns will generate more subjective and autonomic anxiety than will focussing upon social-evaluative concerns.
- 4) Visually imaging worrisome concerns will generate more subjective and autonomic anxiety than will verbally worrying about the same concerns.
- 5) The general, non-worry mentation of PD individuals will exhibit a higher level of visual-imaginal activity than will that of non-anxious individuals.

PLAN OF THE INVESTIGATION

Participants

There will be two participant groups: a group of PD patients and a non-anxious control group. Clinical staff will identify potential patient participants from among those attending clinical psychology outpatient clinics with the help of an abbreviated version of the Panic Attack Questionnaire (PAQ; Norton et al, 1986). The experimenter will determine final selection following administration of the Anxiety Disorder Interview Schedule for DSM IV (ADIS-IV; Brown, DiNardo & Barlow, 1994). This is a structured diagnostic interview for the differential diagnosis of anxiety disorders. Exclusion criteria will include the presence of major affective disorder, substance abuse, psychosis or organic impairment.

Control participants low in anxious arousal will be recruited from among hospital staff and other suitable volunteers at the personal invitation of the experimenter. They will be selected to match patients on age, gender, and education. They will be administered a screening questionnaire based on the ADIS initial enquiry sections to ensure that they have no diagnosable psychiatric disorder.

There will be twenty to twenty five subjects in each group, as determined by a power calculation conducted using the UCLA Power Calculator and based upon relevant data from a study by and Wells and Papageorgiou (1995). Using the sample means and standard deviations from this study to calculate the likely effect size, power values of 0.70 and 0.78 are achieved with sample sizes of 20 and 25, respectively. The aim is to recruit at least 20 subjects per group, but preferably 25 per group if recruitment conditions allow this.

Measures

a) Worry and Anxiety Questionnaires

The Penn State Worry Questionnaire (PSWQ; Meyer, Miller, Metzger, & Borkovec, 1990).

This is a 16-item questionnaire that assesses the tendency to worry and has been shown to discriminate pathological from non-pathological worriers. This measure is included in order to compare the dispositional worry characteristics of the two groups.

Negative Outcomes Questionnaire (NOCQ; Lovibond & Rapee, 1993).

This scale assesses worry in the sense of fear of a range of negative outcomes. This 50-item version consists of 21 social threat items, and 29 physical threat items. It was adapted from the original 116-item scale by excluding items that were clearly not related to either social or physical threat factors. Respondents rate each item on a 5-point scale according to how often they typically worry about it. The scale is included to aid in the identification of personalised worries in these domains.

The Physical Social Outcome Questionnaire (PSOQ; Lovibond & Rapee, 1993).

This scale is contained within the NOCQ and consists of 24 items, 12 forming a social scale and 12 forming a physical scale. Its inclusion will allow direct comparisons between sub-scale scores.

The Beck Anxiety Inventory (BAI, Beck et al, 1988).

This 21-item measure of anxiety symptoms has been reported to be almost entirely panic-centric in content (Cox et al, 1996), thereby providing a comparative index of anxious arousal.

b) Cognitive Style Measures

Verbal-Imagery Style Test (VIST).

This is one of the three sub-tests comprising the Cognitive Styles Analysis (CSA; Riding, 1991). It involves the computer presentation of statements, one at a time, to be judged true or false. Half of the statements contain information about conceptual categories, while the rest describe the appearance of items. Half the statements of each type are true. Visual-imagers are identified by quicker responses to appearance statements and verbalisers by comparatively quicker responses to conceptual category items.

Habitual Use of Imagery Scale (HUIS; Paivio & Harshman, 1983).

This scale consists of 13 true/false item statements gauging the strength of preference for processing information in the imaginal mode. It was derived by factor analysing the 86 items in the better-known Individual Difference Questionnaire (Paivio, 1971), and has good internal consistency and test-retest reliability.

c) Physiological Measure

Pulse Meter (Minolta Pulsox-3i, produce by AVL Medical Instruments, Switzerland, 1997).

This instrument allows for the continuous sampling of pulse rate at 5-second intervals, within the range 20 to 250 bpm. The device resembles a lightweight wristwatch with a wire extending to a finger clip probe.

d) Mentation and Affect Sampling

The methodology for sampling verbal and imaginal mentation is adapted from that used in previous studies (Borkovec & Inz, 1990; East & Watts, 1994). It involves instructing subjects to engage in specified mental/emotional states and then sampling their mentation at three intervals during these periods. Subjects will be asked to identify whether their mentation at these moments involves a thought, an image, 'both' a thought and an image, or whether they are 'unsure' which applies, by ticking the appropriate box on a record sheet. They will further be asked to indicate on the same record sheet, the clarity/vividness of their mentation by marking a 9-point rating scale: *Not at all* to *Very*. Additionally, they will be requested to record their level of state anxiety by marking another 9-point rating scale: *Very relaxed* to *Very anxious*.

e) Post-manipulation Ratings

Following each manipulation period (see below), except the final one, subjects will be invited to record their answers to a series of rating scales. In each case three will involve estimating the percentages (0% - 100%) of time thoughts, images and 'both' were experienced during the preceding period. Either, one or two further rating scales will be included for each condition. For the first two conditions these will act as manipulation compliance checks: Condition 1 - percentage of time 'actually' spent relaxing; Condition 2 - percentage of time 'actually' spent worrying. For the subsequent four conditions 9-point scales (*Very easy* to *Very difficult*) will be employed to provide estimates of difficulty in: a) generating the requested mentation, and b) maintaining that mentation throughout the period.

Design and Procedure

a) Design

The study will comprise two parts. The first is essentially a replication of the Borkovec and Inz (1990) study with a PD rather than GAD patient group, and with added measures – including pulse rate monitoring. It entails a two-factor mixed factorial design with one between-subjects factor (Panic-Proneness) and one within-subjects factor (Worrisome State), with repeated measures on the latter. The panic-proneness factor has two levels: High Panic-Proneness (presence of PD) versus Low Panic-Proneness (absence of a diagnosable psychiatric disorder and BAI scores within the normal/mild range). Groups will be matched for age, gender, and

education. The 'worrisome state' factor will have two levels: Relaxation versus 'General Worry'.

The second part of the study involves a 2 x (2 x 2) mixed factorial design with the same between-subjects factor as described above. The two within-subject factors are 'Worrisome Content' and 'Mentation Task'. Each of these latter has two levels. For 'Worrisome Content' these are Social-Threat versus Physical-Threat; while for 'Mentation Task' they are Visual-Imaging versus Verbal-Thinking. When comparing social-threat worry with physical-threat worry, analyses will be based on normal scores and on difference scores (imaging values relative to thinking values).

The Relaxation and General Worry conditions will always be presented initially, and in that order, thereby replicating the design of Borkovec and Inz (1990). However, to prevent order effects for the remaining four conditions, Social-Threat and Physical-Threat content domains will be counterbalanced across subjects, and within these the Imaging and Thinking tasks will also be counterbalanced. This will yield eight possible orders.

b) Procedure

Following ADIS assessment, individuals who meet the relevant criteria will be invited to consider joining the study. They will be provided with an explanation of the nature of the study and given an information leaflet describing it. They will then be contacted within three to ten days, and if agreeable, will be invited to attend a testing session, which will be planned to take place within two weeks.

At the assessment session participants will again be provided with an outline of the study. They will next be administered the worry and anxiety questionnaires. Three worry topics will then be identified jointly with the experimenter: a main current concern (for General Worry), a social-evaluative concern (for Social-Threat Worry), and a physical-threat concern (for Physical-Threat Worry). Participant answers to the NOCQ will be used to aid identification of the last two mentioned. Cognitive style measures will then be completed, following which they will undertake the experimental procedure after a thorough briefing.

Prior to the start of the experimental procedure, a pulse meter will be attached to the index finger of the participant's non-dominant hand and will remain there until the end of the experiment. There will be six 5-minute experimental manipulation periods as outlined under the design section. There will also be a 5-minute final baseline period preceded by instructions to relax throughout. Each of the seven 5-minute periods will be preceded by a 3-minute letter cancellation task in order to standardise pre-experimental conditions and to act as a buffer activity to prevent carry-over effects from one experimental condition to another. All periods – with the exception of the final relaxation baseline - will entail subjects being interrupted by the experimenter over an intercom at three set intervals (2, 3.5 and 5 minutes) to request the recording of their mentation and affect sampling responses on pre-prepared record sheets. At the end of these same manipulation periods the participants will be further instructed by intercom to complete the post-manipulation rating scales on the next page of their folder.

Instructions for each experimental condition will be delivered over the intercom by the experimenter. The same instructions will be employed for the two relaxation periods. Participants will be asked to *spend time mentally relaxing* by closing their

eyes, relaxing their muscles, then focusing on their breathing while allowing their minds to relax. They will be further instructed as follows: *Do not try to control your mind but rather allow it to wander freely and easily with as little strain as possible.*

For the General Worry condition, participants will be instructed to *worry in the way that you usually would* about their pre-selected current main concern. For this and the subsequent worry conditions, they will be further instructed to bring their minds back to worrying in the requested way should their minds wander.

The two worry-imagery conditions will involve participants being asked to *spend time just visually imagining your concerns without thoughts*, about the agreed topic. The instructions for the two worry-thought conditions will be to *worry using only thoughts and words*. Participants will have received a prior briefing that thoughts refer to: *talking to ourselves in our heads, or thinking in words*; and that 'images' refer to: *pictures in our heads*.

Settings and Equipment

ADIS interviews and the pre-experimental measures will be administered in a clinical office setting. For the experimental procedure participants will be comfortably seated alone at a desk in a small office, and supplied with a pencil and the necessary response sheets pre-sequenced in a folder. They will wear a wristwatch-type pulse meter, as described above. Instructions will be relayed via an intercom from an adjacent room. An electronic timer will be used to accurately determine the required time intervals.

Data Collection and Storage

Subject data will be anonymised through the use of numerical identifiers. This will allow for subsequent data collation from the same subject sources. All data will be securely stored on computer disc and held in an Elonex-PC-6350/I computer within the Department of Clinical Psychology at Dykebar Hospital, Paisley.

Data Analysis

Means and standard deviations will be calculated for the PD and Control participants on the pre-experimental measures and the significance of differences evaluated by means of t-tests.

Data from parts one and two of the study (see Design) will be analysed separately since they are effectively two different experiments. Comparisons will be made between groups and across conditions, and the data will be examined for interaction effects. Mentation frequency data will be analysed using non-parametric statistics. PR and rating data will be analysed with repeated-measures analyses of variance. Means and standard deviations will be calculated for data-sets relating to each group and condition and planned comparisons made using t-tests.

PRACTICAL APPLICATIONS

Since excessive worry and high anxious arousal are characteristics of PD patients, among others, an improved understanding of the complexities of their inter-relationship should assist the development of worry-related therapeutic interventions for PD. For instance, determining the presence of a bias in the form of mentation employed by PD patients would assist efforts to specify the optimum ideational mode to adopt when using cognitive treatments with this patient group.

TIMESCALE

Data collection: April 1999 - March 2000

Statistical Analysis: March 2000 - May 2000

Write Up: June 2000 – August 2000

ETHICAL APPROVAL

Ethical approval will be sought from the Argyll and Clyde Health Board Research Ethics Committee.

REFERENCES

- Barlow, D. H., (1988). *Anxiety and its Disorders*. New York: Guilford Press.
- Borkovec, T.D. & Inz, J. (1990). The nature of worry in generalised anxiety disorder: a predominance of thought activity. *Behaviour Research and Therapy*, 28, 153-158.
- Borkovec, T. D., Lyonfields, J. D., Wiser, S., & Deihl, L. (1993) The role of worrisome thinking in the suppression of cardiovascular responses to phobic imagery. *Behaviour Research and Therapy*, 31, 321-324.
- Borkovec, T. D., Shadick, R. & Hopkins, M. (1991). The nature of normal and pathological worry. In Rapee, R. & Barlow, D. H. (Eds.), *Chronic and Generalised Anxiety Disorder*. New York, Plenum.
- Brown, T.A., DiNardo, P.A. & Barlow, D.H. (1994). *Anxiety Disorders Interview Schedule for DSM-IV*. New York: Graywind Publications.
- Butler, G., Wells, A., & Dewick, H. (1995). Differential effects of worry and imagery: a pilot study. *Behavioural and Cognitive Therapy*, 23, 45-56.
- Cox,B.J., Cohen, E., Direnfield, D.M. & Sarinson, R.P. (1996). Does the Beck Anxiety Inventory measure anything other than panic attack symptoms? *Behaviour Research and Therapy*, 34, 949-954.

East, M.P. & Watts, F.N. (1994). Worry and the suppression of imagery. *Behaviour, Research and Therapy*, 32, 851-855.

Hibbert, G. A. (1984). Ideational components of anxiety: their origin and content. *British Journal of Psychiatry*, 144, 618-624.

Lovibond, P.F. & Rapee, R.M. (1993). The representation of feared outcomes. *Behaviour Research and Therapy*, 31, 595-608.

Meyer, T.J., Miller, M.L., Merzger, R.L. & Borkovec, T.D. (1990). Development and validation of the Pennsylvania State Questionnaire. *Behaviour Therapy and Research*, 28, 487-495.

Norton, G. R., Dorward, J. & Cox, B. J. (1986). Factors associated with panic attacks in non-clinical subjects. *Behaviour Therapy*, 17, 239-252.

Paivio, A. (1971). *Imagery and verbal processes*. New York: Holt, Rinehart & Wilson.

Paivio, A. & Harshman, R. (1983). Factor analysis of a questionnaire on imagery and verbal habits and skills. *Canadian Journal of Psychology*, 37, 461-483.

Rapee, R. M. (1985). Distinctions between panic disorder and generalized anxiety disorder: clinical presentation. *Australian and New Zealand Journal of Psychiatry*, 19, 227-232.

Riding, R. (1991). *Cognitive Styles Analysis* (Birmingham, Learning and Training Technology).

Sanderson, W. C., & Barlow, D. H. (1990). A description of patients diagnosed with DSM-III revised generalized anxiety disorder. *Journal of Nervous and Mental Disease, 178*, 588-591.

Vrana, S.R., Cuthbert, B.N., & Lang, P.J. (1986). Fear imagery and text processing. *Psychophysiology, 23*, 247-253.

Wells, A. (1994). A multi-dimensional measure of worry: Development and preliminary validation of the Anxious Thoughts Inventory. *Anxiety States and Coping, 6*, 289-299.

4. MAIN RESEARCH PROJECT PAPER

The Nature and Function of General, Social-Evaluative and Physical-Threat Worry in Non-Anxious and Panic Disorder Populations

Prepared for submission to *Behaviour Research and Therapy*

(See Appendix 4)

The Nature and Function of General, Social-Evaluative and Physical-Threat

Worry in Non-Anxious and Panic Disorder Populations

Charlie Marsh
Department of Psychological Medicine
University of Glasgow, Glasgow G12 OXH

Abstract

This study examined the generalizability of Borkovec's theory of the nature and function of worry (Borkovec, Shadick & Hopkins, 1991). Various experimental measures were employed to identify bias towards engaging verbal-thought versus visual-imaginal mentation when processing worrisome topics, and to assess predicted effects. Comparisons were made between relaxation and 'general worry', between social-threat worry and physical-threat worry, and between non-anxious and panic disorder groups. The key findings were that: 1) compared to relaxation, 'general worry' has a decremental effect on image reporting that is not mediated by increased verbal-thought processing; 2) verbal-thought mentation is more readily engaged and sustained than is visual-imaginal mentation when processing social-evaluative concerns, but the converse is the case when processing physical-threat topics; 3) panic disorder patients display these processing biases more clearly than do non-anxious patients, and exhibit more inclination to worry about both social and physical threats; 4) physical-threat concerns evoke more anxiety than social-evaluative worries, and this effect appears to be related to their greater ease of imaging; 5) heart rate was not elevated during worrisome thinking or imaging. It is concluded that Borkovec's theory of worry is primarily applicable to social-threat concerns and requires modification to accommodate the findings relating to physical-threat concerns.

Keywords: Worry, thought, imagery, anxiety, anxiety disorders, heart rate.

1. Introduction

According to a theory propounded by Borkovec and colleagues (Borkovec, Shadick and Hopkins, 1991), worry maintains chronic anxiety through the dual mechanisms of negative reinforcement and blocked emotional processing. It is postulated that these effects are mediated by worry's capacity to inhibit or reduce aversive imagery and the autonomic arousal that accompanies it. Worry supposedly achieves this by virtue of being a (largely) verbal-thought activity. There is now a substantial body of evidence that supports this theory (summarized in Borkovec, 1994; Borkovec & Lyonfields, 1993; and, Roemer & Borkovec, 1993). However, this evidence has been produced by studies employing a limited range of subject populations, namely: non-clinical subjects asked to worry, those with chronic trait worry and individuals suffering from generalized anxiety disorder (GAD; American Psychiatric Association, 1994). Moreover, these studies have largely investigated individuals worrying about their usual concerns or, as with Borkovec & Hu (1990), a clear social concern. In fact, all of these studies have most likely examined only social worry since additional research indicates that the usual worry of both normal and GAD populations is primarily concerned with the social sphere of life (e.g., Borkovec, Shadick, & Hopkins, 1991; Eysenck & Van Berkum, 1992; Lovibond & Rapee, 1993; Roemer Molina & Borkovec, 1997; Starcevic, Fallon, Uhlenhuth, & Patha, 1994; Sanderson & Barlow, 1990). It is possible that the findings of the aforementioned studies regarding the nature and function of worry might not hold true for other populations or for other thematic worry contents. Indeed, there is some preliminary evidence to support this contention.

Incidental data from various studies suggest that: i) the general worry of 'fearful' subjects can be relatively imagery-rich (Borkovec, Lyonfields, Wisner, & Deihl, 1993); ii) worry about physical-threat concerns can also be high in imagery (Butler, Wells & Dewick, 1995; Wells & Papageorgiou, 1995), and significantly more imaginal in nature than social-threat worry (Peasley-Miklus & Vrana, 2000); iii) imaging a physical-threat is perceived as easier than verbally worrying about it (Butler et al., 1995), while the opposite seems to be the case with the current (mainly social) concerns of non-anxious and GAD individuals (Lyonfields, Borkovec and Thayer, 1995); iv) when compared to relaxation, worrying about a physical-threat can evoke an accelerated heart rate, but worrying about a social-threat does not (Peasley-Miklus & Vrana, 2000). These incidental findings could possibly be explained by methodological factors, including the fact that all subjective worry assessments were retrospective post-manipulation ratings. Nevertheless, they cast doubt over the generalizability of the earlier cited conclusions about the nature and function of worry. They suggest that worry can sometimes be relatively high in imagery and associated with increments in heart rate, this being most likely in individuals with identifiable fears, or when the worrisome concern is a physical-threat.

A key population in which to assess the general applicability of Borkovec's theory is that of sufferers from panic disorder (PD; American Psychiatric Association, 1994). There are several reasons as to why this is so. Firstly, worry is a prominent feature of PD (e.g., Molina & Borkovec, 1994). Secondly, Barlow (1991, p.62) proposes that panic attacks are the "clinical manifestation of fear" but that they do not develop into a clinical problem until they become "associated with a strong cycle of anxious

apprehension” (Barlow, 1988, p. 274). This suggestion of a role for worry in the incubation of clinical fear-related anxiety stands in contrast to Borkovec’s postulation that worry inhibits the autonomic aspect of anxiety, and may reflect the possibility that worry takes a different form in PD. Moreover, the applicability of an arousal-inhibiting function for worry in the maintenance of PD is challenged by the fact that PD individuals, unlike those with GAD, are characterized by heightened autonomic arousal, even at rest (e.g., Dratcu & Bond, 1998; Rapee, 1985).

A further reason for investigating the nature of worry in PD is that the anxious cognitions of PD individuals are focused on physical catastrophes, by contrast with those of GAD sufferers, which are concerned with social threats (Breitholz, Johansson & Ost, 1999; Hibbert, 1984. Rapee, 1985). Moreover, there is evidence that the worry of PD patients is concordant with their panic cognitions in evidencing elevated concerns about physical health (Wells, 1994; Starcevic, Fallon, Uhlenhuth, & Patha, 1994). It is possible that physical threat concerns are more concrete and less abstract in nature than are social-evaluative threats. According to Stober (1998) this would make them more imaginable, and therefore potentially less able to inhibit somatic arousal.

There are, then, good reasons for not assuming that Borkovec’s hypotheses concerning the formal nature of worry and its inhibitory effects upon imagery and autonomic arousal, necessarily hold true for the everyday worry of PD individuals, nor for physical-threat worry, including worry about panic-related physical-threat outcomes. These hypotheses warrant explicit testing within a single comparative study.

2. Method

2.1. Experimental Design

The study consisted of two experiments conducted with the same participants within the same experimental session. The first experiment investigated the formal qualities of 'general' worry (worry about a current main concern) - and its effects upon imagery and autonomic arousal - by comparison with relaxed-state mentation, in PD and non-anxious control populations. This 2 x (2) experiment was essentially a replication of that conducted by Borkovec and Inz (1990), except that the between-subjects component included PD patients rather than GAD patients, and additional measures, including pulse rate (PR) monitoring, were employed. The second experiment examined whether differences in worry content affect the relative engagement of verbal-thought versus imaginal activity, - and possibly PR, as a consequence. The effect of participant status, and its interaction with the experimental manipulations, was also of interest. This resulted in a 2 x (2 x 2) design. The within-subjects factors were content domain (social versus physical threat concerns), and mentation task (visually imaging or verbally worrying about threatening outcomes). The four combinations of these factors were presented in a counterbalanced order across participants, yielding eight possible orders.

2.2. Participants

Participants were 22 patients with panic disorder and 22 non-anxious controls. Potential patient participants attending clinical psychology outpatient clinics were initially identified by their assessing clinicians. They were further screened by the researcher, using the Anxiety Disorder Interview Schedule for DSM-IV (ADIS-IV; Brown, DiNardo & Barlow, 1994), to ensure they met the DSM-IV diagnostic criteria for PD (American Psychiatric Association, 1994). Patients were excluded from the study if any of the following were present: major affective disorder, substance abuse, psychosis or organic impairment.

The non-patient controls were selected from hospital staff and acquaintances to match the patient group on age, gender and education. They were administered a brief screening questionnaire based on the ADIS initial enquiry sections, to ensure that they had no diagnosable psychiatric disorder. They also completed a Beck Anxiety Inventory (BAI; Beck, Epstein, Brown & Steer, 1988) to check that their reported levels of panic-related anxiety (cf. Cox, Cohen, Dorenfeld, & Sarinson 1996) were within the normal range.

The mean age of the patient group was 41.6m years, with a range of 26-58 years. The mean age of the control group was 40.7 years and the range was 25-56 years. For both groups 6 of 22 participants had undertaken some form of higher education, while the remainder had not. Among the patients, 15 had accompanying agoraphobia, 7 had co-morbid GAD, 5 had co-morbid social phobia, and 1 had a concurrent simple phobia. All

co-morbid disorders were mild to moderate in severity. Four patients also reported some health anxiety. Fifteen patients were taking psychotropic medications including antidepressants (12), beta-blockers (2) and a benzodiazepine (1).

2.3. Worry and anxiety measures

2.3.1. The Penn State Worry Questionnaire (PSWQ; Meyer, Miller, Metzger, & Borkovec, 1990).

This 16-item questionnaire assesses tendency to worry and has been shown to discriminate between pathological and non-pathological worriers. This measure was included to compare the dispositional worry characteristics of the two groups.

2.3.2. Negative Outcomes Questionnaire (NOCQ; Lovibond & Rapee, 1993).

This 50-item version of the NOCQ requires respondents to rate each of 21 negative social outcomes and 29 negative physical outcomes on a 5-point scale indicating typical frequency of worry. It was adapted from the original 116-item scale by excluding items that were clearly not related to either social or physical threat factors. The scale was included to aid in the identification of personalised worries in these domains.

2.3.3. The Physical Social Outcome Questionnaire (PSOQ; Lovibond & Rapee, 1993).

This scale is contained within the NOCQ and consists of 24 items, 12 forming a social scale and 12 forming a physical scale. Its inclusion allowed direct comparisons between sub-scale scores.

2.4. Cognitive style measures

2.4.1. Verbal-Imagery Style Test (VIST; Riding, 1991).

This sub-test of the Cognitive Styles Analysis (CSA; Riding, 1991) involves the computer presentation of statements, to be judged true or false. Visual-imagers are identified by quicker responses to appearance statements and verbalisers by comparatively quicker responses to conceptual category items. This measure, and the next, was included to check for cognitive style differences across groups.

2.4.2. Habitual Use of Imagery Scale (HUIS; Paivio & Harshman, 1983).

This scale consists of 13 true/false item statements gauging the strength of preference for processing information in the imaginal mode.

2.5. Mentation and affect sampling

Following previous studies (Borkovec & Inz, 1990; East & Watts, 1994), participants were instructed to engage in specified mental/emotional states and their mentation was sampled at three intervals during these periods. They were asked to identify whether their mentation at these moments was a thought, an image, both a thought and an image, or whether they were 'unsure', by ticking the appropriate box on a record sheet. They were further asked to indicate, on the same record sheet, their level of state anxiety, by marking a 9-point rating scale anchored: *Very relaxed* to *Very anxious*.

2.6. *Post-manipulation ratings*

Following each experimental manipulation period (see 2.8), except the final one, participants were asked to estimate percentages (0% - 100%) of time spent engaged with thoughts, images or 'both' during the preceding period. Additionally, on completing the relaxation and general-worry tasks of experiment 1, they were asked to rate the percentage of time 'actually' spent relaxing, or worrying, respectively. Following each of the social-threat and physical-threat worry conditions of experiment 2, estimates were requested of difficulty in: a) generating the requested mentation, and b) maintaining that mentation throughout the period. Difficulty ratings were made on 9-point scales: *Very easy* to *Very difficult*.

2.7. *Pulse rate measure*

Pulse rate was measured with a pulse meter (Minolta Pulsox-3i, AVL Medical Instruments, Switzerland, 1997). This instrument allows for the continuous sampling of pulse rate at 5-second intervals, within the range 20 to 250 bpm. The device resembles a lightweight wristwatch with a wire extending to a finger clip probe. Data were computer downloaded and analysed using software from Stowood Scientific Instruments (1998).

2.8. *Procedure*

All participants were fully briefed about the study procedures. Prior to the commencement of the experimental session they were administered the worry questionnaires. Through discussion, and with the aid of the NOCQ, three worry topics were identified: a current main concern (a 'general' worry – usually a concern about

finances, work/education or family), and the most frequently recurring social-evaluative and physical-threat concerns. For PD patients the physical-threat topic was the most feared negative outcome of this type associated with their panic attacks. Next, the cognitive style measures were completed. Participants were then taken to a quiet office where they were seated in a comfortable chair in front of a desk with a folder containing the sheets for recording their cognitive sampling responses and post-manipulation ratings. The pulse meter was attached, with the finger probe clipped to the participant's index finger on the non-dominant hand. Following this, participants were left alone to undertake the experimental procedure, guided by instructions from the experimenter given over an intercom.

The procedure entailed six 5-minute experimental manipulation periods and a 5-minute final baseline relaxation period. The relaxation and general-worry tasks were always presented first and in that order, as in Borkovec and Inz's (1990) study. Participants were next asked to, in turn, visually image and verbally worry about their chosen social-evaluative and physical-threat worry topics, with these tasks being presented in a counterbalanced order across subjects. They were finally requested to spend 5 minutes simply relaxing. Each of the seven 5-minute periods was preceded by a 3-minute letter cancellation task in order to standardise pre-experimental conditions and to act as a buffer activity to prevent carry-over effects from one experimental condition to another. During all periods – with the exception of the final relaxation baseline – participants were interrupted by the experimenter over an intercom at three set intervals (2, 3.5 and 5 minutes) and requested to record their mentation and affect sampling responses on the pre-prepared record sheets. At the end of each 5-minute experimental

manipulation period participants were instructed over the intercom to complete the post-manipulation rating scales on the next page of their folder.

Initial and final relaxation periods were introduced with the same guidelines to relax. Participants were asked to close their eyes, relax their muscles, and then focus on their breathing while allowing their minds to relax and *to wander freely and easily with as little strain as possible*.

Instructions for general worry were to *worry in the way that you usually would about your* (pre-selected) *current main concern*. For this and the subsequent worry conditions, they were further instructed to bring their minds back to worrying in the requested way should their minds wander.

In the two worry-imagery conditions participants were asked to *spend time just visually imagining your concerns without thoughts*, about the agreed topic. The instructions for the two worry-thought conditions were to *worry using only thoughts and words*. Participants received a prior briefing that thoughts refer to: *talking to ourselves in our heads, or thinking in words*; and ‘images’ refer to: *pictures in our heads* (cf. Borkovec et al., 1993).

3. Results

3.1. Descriptive statistics

Table 1 presents the means and standard deviations for the scores of patients and controls on the VIST, HUIS, BAI, PSWQ, PSOQ, and NOCQ. Independent samples t-

tests were computed on the data yielded by the first four of these instruments. There were no significant between-group differences on the two cognitive style measures (VIST and HUIS), but patients produced significantly higher scores than did controls on the BAI, $t(42) = -7.42$, $p < 0.0001$, and the PSWQ, $t(42) = -4.94$, $p < 0.0001$. The PSOQ and NOCQ social-threat worry and physical-threat worry scores were analysed using 2-way (Group by Content Domain) repeated measures ANOVAs. The scores were firstly converted to square roots to overcome the problem of wide ranging variances. Both sets of analyses revealed significant main effects and interaction effects. Social topics were worried about more frequently than physical-threat topics, as indicated by the PSOQ, $F(1, 42) = 82.44$, $p < 0.0001$, and the NOCQ, $F(1, 42) = 11.99$, $p < 0.001$, and patients worried more than controls (PSOQ, $F(1, 42) = 17.37$, $p < 0.0001$; NOCQ, $F(1, 42) = 18.31$, $p < 0.0001$). The F values for the interaction effects were: PSOQ, $F(1, 42) = 4.65$, $p < 0.05$; NOCQ, $F(1, 42) = 8.31$, $p < 0.006$.

Independent samples t-tests demonstrated that patients worry more than controls about both social-threats and physical-threats: PSOQ, $t(42) = -2.85$, $p < 0.007$, and $t(42) = -4.05$, $p < 0.0001$; NOCQ, $t(42) = -2.78$, $p < .009$, and $t(42) = -4.33$, $p < 0.0001$. Related samples t-tests applied to PSOQ data separately for patients and controls revealed that social worry was more prevalent than physical-threat worry in both groups, $t(21) = 8.69$, $p < 0.0001$, and $t(21) = 4.10$, $p < 0.0001$. Analysis of the NOCQ data replicated this finding for controls, $t(21) = 5.31$, $p < 0.0001$, but patients were shown to worry equally about social and physical threats, $t(21) = -0.07$, $p < 0.95$. However, it needs to be remembered that the NOCQ contained more physical-threat than social-threat items. Nevertheless, this finding suggests that there is less of a discrepancy between the

frequencies of social and physical-threat worries among patients than among normal controls.

Insert Table 1 about here

3.2. *Experiment 1*

3.2.1. *Data analysis*

Since the focus of interest of the study was the relative prominence of thoughts to images across conditions and groups, the ‘both’ responses were excluded from analyses, as was the single ‘unsure’ response. ‘Both’ responses comprised 40% of all sampling responses during relaxation, and 60% of responses during worry.

Non-parametric statistical tests were employed to analyse the frequency data. Comparisons within and across conditions were made using Wilcoxon signed-ranks tests, and chi-square tests were employed for between-groups comparisons. Repeated measures ANOVAs were applied to rating and pulse rate data.

3.2.2. *Thought/image mentation sampling*

Table 2 presents the means and standard deviations for image and thought frequencies during relaxation and (general) worry, for patients, controls and the groups combined.

When the relative levels of thoughts to images were compared within conditions, thoughts were shown to predominate over images during both relaxation and worry, $Z(44) = -2.80$, $p < 0.005$, and $Z(44) = -3.40$, $p < 0.001$. For worry, this finding also held true when the analysis was conducted separately for patients and controls, $T(22) = 3.5$, $p < 0.01$, and $T(22) = 13$, $p < 0.01$. However, for relaxation the difference between thoughts and images only reached significance in the patient group ($T(22) = 13.5$, $p < 0.01$), but not in the control group, ($T(22) = 80$, $p < 0.21$). Moreover, there was no difference between conditions in the relative levels of these mentation types.

When thought and image reports were analysed separately, relaxation and worry did not differ on thought reports, but relaxation was associated with more reported images than was worry, $Z(44) = -2.44$, $p < 0.01$.

There were no between-group differences.

Insert Table 2 about here

3.2.3. Estimations of percentage time engaged in imagery and verbal worry

Estimates of percentage time spent in each form of mentation were standardized so that the thought, image and 'both' estimates always totalled 100%. Table 3 contains means and standard deviations of thought and imagery estimates for each condition, displayed for the groups separately and combined.

Group by Mentation Type ANOVAs were applied separately to the relaxation and worry data. There were no significant effects for relaxation, but the worry data revealed a main effect for Mentation Type, $F(1, 42) = 8.45, p < 0.006$. During worry participants spent considerably greater time in thought than image activity. Related samples t-tests indicated that this effect was significant for patients, $t(21) = -2.35, p < 0.029$, but fell short of significance for controls, $t(21) = -1.90, p < 0.072$.

To compare the relative levels of mentation types across conditions and groups, an ANOVA was performed on difference scores (image estimates minus thought estimates). With one patient and one control outlier removed from the analysis, a significant main effect for condition emerged, $F(1, 40) = 4.28, p < 0.05$. Worry was distinguished from relaxation by a greater preponderance of thought over imagery. Group and interaction effects were non-significant.

Group by Condition ANOVAs were also computed separately for imagery and thought ratings. The thought data yielded no significant findings, but the imaging data demonstrated a main effect for condition: participants estimated they spent significantly more time imaging during relaxation than they did during worry, $F(1, 42) = 9.23, p < 0.004$. Additional related samples t-tests showed that this effect was significant among controls but not among patients: controls, $t(21) = 2.61, p < 0.02$; patients, $t(21) = 1.56, p < 0.13$. Group and interaction effects were again non-significant.

Insert Table 3 about here

3.2.4. *Affect ratings*

Table 4 shows the means and standard deviations of the relaxed/anxious sample ratings during each condition, for the groups separately and combined. A 3-way (Group by Condition by Sample) ANOVA was performed on these ratings. The main effect for condition was highly significant, $F = 36.50 (1, 42)$, $p < 0.0001$, indicating more elevated anxiety experienced during worry than during relaxation. There was also a significant difference between groups, with patients reporting greater anxiety than controls, $F(1, 42) = 19.43$, $p < 0.0001$. There were no interaction effects.

 Insert Table 4 about here

3.2.5. *Task compliance ratings*

The mean rating of time ‘actually’ spent relaxing during the relaxation period for the groups combined was 48.86% (SD = 23.74). For patients alone the mean was 38.64% (SD = 23.56), and for controls alone it was 59.09% (SD = 19.50). The combined-groups mean for estimated time ‘actually’ spent worrying during worry was 56.59% (SD = 22.41), while that for patients and controls separately was 54.55% (SD = 25.40), and 58.64% (SD = 19.35), respectively. Independent samples t-tests indicated that the groups did not differ in their capacity to worry when requested to do so, but controls were significantly more able than patients to comply with the relaxation instructions, $t(42) = 3.14$, $p < 0.003$.

3.2.6. *Pulse rate*

Individual pulse rates were taken as the mean values of the middle 3 minutes of each 5-minute manipulation period. Table 5 presents the means of these individual means and their standard deviations for each condition (including the final relaxation baseline), and for groups separately and combined. To assess whether medication status might have influenced pulse rate (PR), separate means were calculated for patients using beta-blockers or drugs with a sedative component (N =9), versus those not on medication (N = 9) or taking non-cardiac sensitive drugs (N = 4) – see table 5. Independent samples t-tests on PR data from each condition revealed no significant differences between these two groups and, therefore, subsequent analyses were performed using the whole patient group. Group by Condition ANOVAs were computed on absolute PR values and on difference scores (within-condition values minus final relaxation baseline values). With absolute PR scores, the difference between relaxation and worry fell just short of significance, $F(1, 42) = 3.67, p < 0.06$, but no other comparisons approached significance.

Insert Table 5 about here

3.3. Experiment 2

3.3.1. Data analysis

As in experiment one, ‘both’ and ‘unsure’ responses were excluded from statistical analyses. There were only 6 ‘unsure’ responses in total, while ‘both’ responses constituted a little more than half of all responses in each condition, ranging between 52% and 54%.

Frequency data were analysed using Wilcoxon signed-ranks tests and chi-square tests, as for experiment 1. Repeated measures ANOVAs were performed on rating and PR data to examine within-subject comparisons, of which there were three main types: a) across mentation types (images versus thoughts); b) across tasks (imaging versus worrisome thinking); c) across content domains (social-threat versus physical-threat). The across-domains analyses of mentation responses were performed on both normal scores and on difference scores (i.e., relative levels of thought-worry values to imaging values).

3.3.2. Thought/image mentation sampling

Table 6 contains means and standard deviations of image and thought frequencies for each task within each content domain, for groups separately and combined

Within-task comparisons of image versus thought frequencies indicated that during worrisome thinking about social concerns, thoughts predominate over images, $Z(44) = -3.79$, $p < 0.0001$, as they do during physical-threat thought-worry, $Z(44) = -2.43$, $p < 0.002$. No comparisons performed on imaging task data approached significance.

Within-domain comparisons across tasks revealed that within the patient group relatively more thoughts were identified during social thought-worry, than were images while imaging the same concerns, $T(22) = 20$, $p < 0.05$; but this was not so among controls, $T(22) = 0.00$, $p < 1.00$. Moreover, within the groups combined more thoughts were reported during the imaging of social concerns than were images during thought-worry about those concerns, $Z(44) = -1.99$, $p < 0.05$. No planned comparisons on physical-threat data approached significance.

The only across-domains comparison to achieve significance was that for intended thought-worry among patients, with social threat scores being higher than physical-threat scores, $Z(22) = -2.17$, $p < 0.03$. Analysis of difference scores disclosed that patients reported more intended images, relative to intended thoughts, of physical-threat material, than was the case for social-threat material, $T(22) = 20$, $p < 0.05$.

Between-groups planned comparisons revealed only one significant difference between patients and controls. Controls recorded more intended images than intended thoughts of social-threat material, while for patients the opposite was the case, $\chi^2 = 7.66$, $p < 0.02$.

Insert Table 6 about here

3.3.3. *Estimations of percentage time engaged in imagery and verbal worry*

Ratings of percentage time imaging and verbally worrying were standardized as in experiment one. Table 7 contains means and standard deviations of thought and imagery ratings for each condition, and for groups separately and combined.

Evaluations of success in generating more intended than unintended mentation during tasks, were made using two-way (Group by Mentation Type) ANOVAs. These showed that participants were clearly successful in three out of four tasks: the social-threat and physical-threat thought-worry tasks resulted in significantly more time spent in thought-worry than in imaging, $F(1, 42) = 20.76, p < 0.0001$, $F(1, 42) = 9.06, p < 0.004$; physical-threat imaging likewise resulted in significantly more time spent imaging than thinking verbally, $F(1, 42) = 7.59, p < 0.009$. However, participants were not significantly better at generating imagery than thought during social-threat imaging, $F(1, 42) = 3.10, p < 0.086$. No group or interaction effects were detected.

Group by Task ANOVAs applied to relative levels of intended to unintended mentation data, confirmed the success of the experimental manipulations. More reported time was spent imaging when requested to do so, than when required to engage in worrisome thinking, and vice versa: social-threat imaging, $F(1, 42) = 14.15, p < 0.001$; physical-threat imaging $F(1, 42) = 31.04, p < 0.0001$; social-threat verbal worry, $F(1, 42) = 12.75, p < 0.001$, and physical-threat verbal worry $F(1, 42) = 21.28, p < 0.001$.

Further examination of unintended mentation revealed a trend for participants to produce more unintended thought while imaging social-threats, than unintended images during worrisome thinking of the same, $F(1, 42) = 3.03, p < 0.089$. No other main or interaction effects were discovered.

Group by Domain ANOVAs failed to uncover differences for unintended mentation. However, a main effect for intended imagery, $F(1, 42) = 5.04, p < 0.03$, showed that participants estimated spending more time engaged in intended imagery when the focus was a physical-threat than when it was a social-threat. This effect was mainly due to patients, with related samples t-tests indicating a significant difference for them, $t(21) = -2.11, p < 0.05$, but not for controls, $t(21) = -0.98, p < 0.34$. By contrast, a significant interaction effect for intended thought, $F(1, 42) = 5.13, p < 0.029$, revealed that patients sustained a more prolonged focus on this mentation with social-evaluative concerns than with physical-threat worries, while the reports of controls displayed an opposite tendency.

Across-domains comparisons of difference scores were made using further two-way (Group by Domain) ANOVAs. Analysis of intended mentation data yielded a significant interaction effect, $F(1, 42) = 6.35, p < 0.016$, with the main effect for domain approaching significance, $F(1, 42) = 3.29, p < 0.077$. These results indicate an overall trend for worrisome thought to be relatively more sustained than worrisome imagery, when focused on social threats rather than physical threats, with which a lesser tendency in the opposite direction is evident. When the comparison was made separately for each group, using related samples t-tests, this difference was revealed to be clearly present

within the patient group, $t(21) = -2.88$, $p < 0.009$, but it was not apparent in the control group, $t(21) = 0.54$, $p < 0.60$.

 Insert Table 7 about here

3.3.4. Ratings of difficulty in producing and maintaining images and thoughts

Table 8 presents the means and standard deviations of ratings of difficulty in producing and maintaining images and thoughts for each task, and for groups separately and combined. A three-way ANOVA (Group by Domain by Task) revealed that:

a) participants found it generally more difficult to produce and maintain thoughts than images, $F(1, 42) = 6.31$, $p < 0.016$; b) they also found it harder to maintain than to initially generate specified forms of mentation, $F(1, 42) = 40.42$, $p < 0.0001$. Group by Task ANOVAs performed on within-domains data indicated that:

a) it was easier for participants to produce images than worrisome thoughts about a physical-threat topic, $F(1, 42) = 5.04$, $p < 0.03$; b) it was likewise easier for them to maintain imagery than thought-worry about a physical-threat concern, $F(1, 42) = 5.50$, $p < 0.02$; c) there was a non-significant trend for images to be easier to maintain than worrisome thoughts, when the focus was a social-threat $F(1, 42) = 12.38$, $p < 0.07$.

Group by Domain ANOVAs performed on difference scores disclosed a significant domain effect for maintenance of mentation, with participants finding it easier to maintain worrisome thinking than imagery about social matters, by comparison with

physical-threat worries, for which the mean rating tended in the opposite direction, $F(1,42) = 9.61, p < 0.003$.

No other comparisons approached significance.

Insert Table 8 about here

3.3.5. *Affect ratings*

Table 9 shows the means and standard deviations of the relaxed/anxious sample ratings for each condition, for the groups separately and combined. A four-way (Group by Domain by Task by Sample) ANOVA was performed on the data. This demonstrated a significant group effect, $F(1, 42) = 8.22, p < 0.006$, and a significant domain effect, $F(1, 42) = 4.03, p < 0.05$. Patients reported more anxiety than controls and physical-threat tasks generated more anxious distress than did social-threat tasks. Three-way (Group by Task by Sample) ANOVAs were performed on the data from each content domain separately. Patients rated their anxiety significantly higher than did controls during both social-threat and physical-threat mentation, $F(1, 42) = 7.71, p < 0.008$, and $F(1,42) = 5.74, p < 0.02$. No other effects proved significant

Four three-way (Group by Domain by Sample) ANOVAs were performed to compare each social-threat task with each physical-threat task. Only one of these comparisons approached significance: physical-threat imaging elicited more anxiety than social-threat imaging, $F(1, 42) = 3.48, p < 0.069$.

Insert Table 9 about here

3.3.6. *Pulse rate*

Individual PR values were calculated in the same fashion as for experiment one. Means and standard deviations for each task, and for each group and the groups combined, are displayed in table 10. The effect of medication status was again explored within each task by comparing the mean PR values of patients taking cardiac-sensitive medication with those who were not. As there were no significant differences between these two groups further analyses were performed on the patient group as a whole. ANOVAs were conducted on absolute and difference values and no significant main or interaction effects emerged.

Insert Table 10 about here

4. Discussion

4.1. Descriptive variables

As expected, PD patients reported being more worrisome and anxious than did normal controls. Their mean PSWQ scores are very similar to those reported for equivalent groups by Brown, Martin and Barlow (1992). The mean BAI score for patients was close to that reported for PD patients by Cox, Cohen, Dorenfeld and Swinson (1996).

Patients admitted experiencing both more social-threat and physical-threat concerns than did controls. While PSOQ responses indicated that patients shared with controls the typical tendency for social worries to predominate over worries about physical outcomes, responses to the NOCQ extended list of negative outcomes, suggest that this is not as apparent for PD patients as for normal controls. This finding is consistent with Wells' (1994) report of equivalence of worry frequency across social and health concerns among PD patients.

PD patients do not appear to differ from non-anxious controls in their general disposition to rely upon imaginal or verbal cognitive representation, as discerned by their responses to the cognitive style tests.

4.2. Experiment 1

Both the sampling and the time estimation data confirm the prediction that worry about a current concern is characterized by a predominance of thought over imagery. The sampling data indicate that this mentation profile also typifies the relaxed state of patients but not of controls, who display an equivalence of each mentation type. The

estimated time data (though not the sampling data) further reveal the expected increase in relative levels of thoughts to images with the shift from relaxation to worry. However, this change in the ratio of thought time to image time, was wholly attributable to a decrement in image activity (confirmed by the sampling data), with thought activity in both groups actually decreasing, albeit non-significantly, from relaxation to worry. Thus, the apparent inhibitory effect of worry on imagery is clearly not due to the effect of an increased level of conceptual thought activity. An alternative explanation is that the mechanism is attentional in nature.

Butler, Wells and Dewick (1995) have previously suggested that the capacity of instructed worry to inhibit emotional processing, may be due to an increment in attentional allocation to verbal-conceptual processing relative to visual-imaginal processing, rather than to an increased frequency of thought activity per se. This explanation is consistent with the present findings, which unexpectedly reveal a reduction in image reporting coincidental with an absence of increment in verbal-thought activity. An attentional bias of the type proposed could, of course, result in images being less salient or detectable, rather than less prevalent (cf. East and Watts, 1994, for a proposal on how to resolve this issue).

Findings from group comparisons of mentation activity are consistent with the cognitive style findings in failing to find a difference in inclination towards imaginal or verbal-thought activity between non-fearful and 'fearful', panic-prone populations. However, only patients recorded a relative predominance of thought samples over image samples during relaxation, and only they reported more thought time than image time during worry. These last results would rather suggest that, as with GAD patients

(Borkovec & Inz, 1990), verbal thinking is more prominent than visual imagery in the mentation of PD individuals, than in that of non-anxious persons. This makes sense since the patients were disclosed to be more worry-inclined than the controls. On the other hand, the fact that other relevant comparisons revealed no between-group differences in this regard casts doubt on the validity of this conclusion. Further group comparisons, including between GAD and PD groups, are required to clarify this matter.

As previously found (Borkovec & Inz, 1990), worry was associated with greater subjective anxiety than was relaxation, and patients reported more anxiety than controls, as well as less ability to relax. Despite relaxation being subjectively less anxiously valenced than worry, it was associated with a marginally greater pulse rate, which may have been due to participants having insufficient time to adapt to the experimental situation. Nevertheless, this finding reinforces the conclusion of previous studies (e.g., Borkovec, Robinson, Pruzinsky & Dupree, 1983; Borkovec & Hu, 1990), that worry has no incremental effect upon autonomic activity, and may even suppress it. Indeed, the discrepancy between the subjective and autonomic components of anxiety when worrying, is congruent with the proposal that worry permits the anxious anticipation of events while avoiding the full affective experience potentially associated with this. However, given the findings presented above, an interpretation of this effect as being due to the inhibitory influence on imagery of elevated verbal-conceptual activity associated with worry (cf. Roemer & Borkovec, 1993) is not tenable. In keeping with the theoretical ideas already presented, shifting to (general) worry may, more feasibly, result in fewer image reports and a suppression of physiological reactivity, as a

consequence of *attention* being diverted from imaginal activity, rather than because it is displaced by an increased volume of verbal-thought processing.

4.3. *Experiment 2*

Evidence from three data sources – mentation sampling, estimated mentation time and ratings of difficulty in producing and maintaining mentation - suggest that social-threat and physical-threat topics differ in the degree to which they engage verbal-conceptual versus visual-imaginal processing. A range of evidence supports this conclusion:

a) Sampling data show that thoughts intruded more during social-threat imaging, than did images during social-threat worrisome thinking, with there being a similar non-significant trend present in the estimated mentation time data. This was not evident during the physical-threat tasks.

b) During social-threat imaging, imagery-focused time was equivalent to thought-worry time, but during physical-threat imaging, time spent imaging was greater than time engaged in thought-worry.

c) A more prolonged focus on intended imagery was achieved when the topic was a physical threat than when it was a social threat.

d) There was a trend towards spending more time in intended worrisome thinking about social threats than in intended imaging of the same, with an opposite trend apparent for physical-threat topics. Among the patient group this was a highly significant difference.

e) It was rated easier to maintain worrisome thinking than imaging when focusing on social threats compared to physical threats, for which there was an opposite tendency.

f) When the topic was a physical threat, but not when it was a social threat,

participants found it easier to produce images than thoughts.

g) It was easier to maintain imaginal rather than thought activity about a physical threat, while the same comparison in regard to social threats showed only a trend in this direction.

These findings support the hypothesis that worrisome thinking, relative to imaging, is preferentially facilitated by a social-threat focus. They also support the converse hypothesis that there is a bias towards processing physical-threat concerns imaginally rather than verbal-conceptually.

That social threat is intimately linked to verbal-conceptual worry processing is congruent with Borkovec et al.'s, (1991, p. 47) speculation that since (most) worry is a conceptual-linguistic activity, and since language evolved in order to permit social communication, then both are fundamentally related to the social sphere of life.

The connection between physical-threat concerns and imaginal processing is not accommodated by Borkovec's theory of worry (Borkovec et al., 1991), but may be explained by reference to Stober's (1998) hypothesis. Stober proposes that the characteristic of (typical) worry that allows it to suppress imagery, or render it less detectable, is its abstractness, or lack of concreteness; in worry, anticipated problems and their consequences lack detail and specificity. By contrast, more concrete problem representations more readily generate imagery, which is also more vivid (detectable). Arguably, typical social-evaluative worries have fewer concrete referents than do typical physical-threat concerns. This might be particularly so in respect of feared outcomes, as is apparent in comparing being rejected or disapproved of with dying of a heart attack or suffocating.

Comparisons across groups suggest that the affiliation between thought activity and social-threat concerns is most apparent in the patient group. Thus, when the groups were analysed separately, the following findings were statistically significant *only* among patients:

a) more thought samples recorded during social-threat thought-worry, compared to images during social-threat imaging;

b) more prolonged engagement with intended thought when the focus was a social-threat than when it was a physical-threat, compared to controls who displayed an opposite tendency.

c) a more sustained focus on intended worrisome thought *relative to* intended aversive imagery, for social-threat material compared to physical-threat topics.

By contrast, the only social-threat task finding implicating a differential disposition in favour of controls was in the opposite direction to this pattern of associations: a higher ratio of intended images to intended thoughts across social-threat tasks. In fact, this may be simply a chance finding, since the remainder of the data suggest that controls show no clear mentation processing inclination in regard to social threats.

These findings, taken as a whole, point to PD patients being more disposed, than are non-anxious controls, towards preferentially generating and sustaining worrisome thought activity, rather than imaginal activity, when the topic concerns social threat. They are also consistent with the finding from experiment 1 that only patients reported more thought than image time associated with worry, and reinforce the view that general worry resembles social-evaluative worry more than physical-threat worry. One obvious explanation for these findings is that – as identified by the worry questionnaire data - the

patients are simply much more practiced at worrying about social-evaluative concerns than are the controls, such that related worrisome thoughts are more accessible to them.

The data also provide some basis for inferring that the connection between physical-threat material and imaginal activity is more manifest among PD patients than in non-anxious controls. For instance, patients, but not controls, reported significantly more time spent engaged in intended imagery when the topics were physical threats than when they were social threats. Unlike controls, they also recorded more intended images *relative to* intended thoughts, with physical-threat rather than social-threat concerns. In contrast, they were less able than controls to produce social-threat images when so instructed.

An explanation can be offered for these group differences that is similar to that proposed above for the patients' preferential disposition towards worrisome thinking with social-threat material. Since the physical-threat topics that the patients were guided to choose were feared outcomes related to their panic episodes, these could be expected to have added salience and familiarity, thereby increasing the accessibility, and possibly the detail, of their imaginably encoded cognitive representations. Alternatively, or additionally, the more dramatic nature of their feared outcomes might have resulted in these being more richly encoded than those of controls.

While physical threat mentation was found to elicit more subjective anxiety than social threat mentation, imaging did not generally evoke more anxiety than worrisome thought. Perhaps surprisingly, more detailed analyses indicated that physical threat imaging did not evoke significantly more anxiety than did social threat thought worry, though there was a trend for it to elicit more anxiety than social threat imaging. It may

be that the methodology employed for stimulating imagery failed to evoke images of sufficient vividness to induce strong affect. Nevertheless, the evidence does suggest that when images occur during physical threat mentation, these are more likely to evoke anxiety than those that appear during preoccupation with social threats. Though this finding requires further investigation, if confirmed it could have implications for understanding how panic-related worry - with its emphasis upon physical threat concerns - can incubate anxiety when social-evaluative worry does not appear to do so.

The absence of PR differences across tasks or domains may have been due to the differential anxiety ratings being insufficiently marked. On the other hand, this absence of PR response is in keeping with Borkovec's hypothesis (Borkovec et al., 1991), that worry is not associated with any heightening of tonic heart rate, though it does elicit elevated subjective anxiety (Borkovec & Inz, 1990). Nevertheless, this finding is surprising given that several studies have reported that imaging fearful material provokes a greater heart rate response than does thinking verbally about the same material (Vrana, Cuthbert & Lang, 1986; Vrana, Cuthbert & Lang, 1989; Vrana & Lang, 1990). One explanation may lie in methodological differences, in that these previous studies employed more fine-grained heart rate analyses than the methodology of the current study allowed. So also did the Peasley-Miklus and Vrana (2000) study, which revealed an elevated HR response to a physical-threat worry (victimization fear).

In respect of the patient group, the current findings replicate the repeatedly observed difficulty in provoking image-induced HR responses in agoraphobics, perhaps due to their less cohesive, more complex fear networks (Cook, Melamed, Cuthbert, McNeil & Lang, 1988; Zander and McNally, 1988). There is also the possibility that cognitive

defensive strategies prevented full access to physiological reactions. Moreover, since instructed worrisome imagery is clearly qualitatively different from spontaneous worry-related imagery, it cannot be concluded that the latter has no role to play in incubating the autonomic component of some forms of anxiety. This complex issue requires further research.

In conclusion, it would seem that the range of convenience of Borckovec's theory of worry (Borkovec et al., 1991) is restricted to social worry concerns. The theory requires modification to encompass physical-threat concerns.

References

American Psychiatric Association (1994). *Diagnostic and statistical manual of mental disorders*, 4th ed. Rev. Washington, DC: American Psychiatric Press.

Barlow, D. H., (1988). *Anxiety and its Disorders*. New York: Guilford Press.

Barlow, D. H., (1991). Disorders of Emotions. *Psychological Inquiry*, 2, 58-71.

Beck, A.T., Epstein, N., Brown, G., & Steer, R.A. (1988). An inventory for measuring clinical anxiety: psychometric properties. *Journal of Consulting and Clinical Psychology*, 56, 893-897.

Borkovec, T. D. (1994). The nature, functions, and origins of worry. In G. C. L. Davey & F. Tallis (Eds.), *Worrying: perspectives on theory, assessment and treatment*. New York: Wiley.

Borkovec, T. D., & Hu, S. (1990). The effect of worry on cardiovascular response to phobic imagery. *Behaviour Research and Therapy*, 28, 69-73.

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

Borkovec, T. D., & Lyonfields, J. D. (1993). Worry: Thought suppression of emotional processing. In H. Krohne (Ed.), *Vigilance and Avoidance*, pp. 101-118, Toronto: Hogrefe and Huber Publishers.

Borkovec, T. D., Lyonfields, J. D., Wiser, S., & Deihl, L. (1993) The role of worrisome thinking in the suppression of cardiovascular responses to phobic imagery. *Behaviour Research and Therapy*, 31,321-324.

Borkovec, T. D., Shadick, R., & Hopkins, M. (1991). The nature of normal and pathological worry. In R. Rapee, & D. H. Barlow, (Eds.), *Chronic anxiety and generalised anxiety disorder*. New York: Plenum.

Borkovec, T. D., Robinson, E., Pruzinsky, T., & Dupree, J. A. (1983). Preliminary exploration of worry: Some characteristics and processes. *Behaviour Research and Therapy*, 21, 9-16.

Breitholtz, E., Johansson, B., & Ost, L-G. (1999). Cognitions in generalized anxiety disorder and panic disorder. A prospective study. *Behaviour Research and Therapy*, 37, 533-544.

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

Brown, T. A., Marten, P. A., & Barlow, D. H. (1992). Discriminant validity of the symptoms constituting DSM-III-R and DSM-IV associated symptom criterion of generalized anxiety disorder. . *Journal of Anxiety Disorders*, 9, 317-328.

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

Cook, E.W., Melamed, B.G., Cuthbert, B.N., McNeil, D.W. & Lang, P.J. (1988). Emotional imagery and the differential diagnosis of anxiety. *Journal of Consulting and Clinical Psychology*, 56, 734-740.

Cox, B.J., Cohen, E., Dorenfeld, D.M. & Sarinson, R.P. (1996). Does the Beck Anxiety Inventory measure anything other than panic attack symptoms? *Behaviour Research and Therapy*, 34, 949-954.

Dractu, L., & Bond, A. (1998). Panic patients in the non-panic state: physiological and cognitive dysfunction. *European Psychiatry*, 13, 18-25.

East, M. P., & Watts, F. N. (1994). Worry and the suppression of imagery. *Behaviour Research and Therapy*, 32, 851-855.

Eysenck, M.W., & Van Berkum, J. (1992). Trait anxiety, defensiveness and the structure of worry. *Personality and Individual Differences*, 13, 1285-1290.

Hibbert, G. A. (1984). Ideational components of anxiety: their origin and content. *British Journal of Psychiatry*, 144, 618-624.

Lovibond, P.F., & Rapee, R.M. (1993). The representation of feared outcomes. *Behaviour Research and Therapy*, 31, 595-608.

Lyonfields, J. D., Borkovec, T. D., & Thayer, S. F. (1995). Vagal tone in generalized anxiety disorder and the effects of aversive imagery & worrisome thinking. *Behaviour Therapy*, 26, 457-466.

Meyer, T.J., Miller, M.L., Merzger, R.L. & Borkovec, T.D. (1990). Development and validation of the Pennsylvania State Questionnaire. *Behaviour Therapy and Research*, 28, 487-495.

Molina, S., & Borkovec, T. D. (1994). The Penn State Worry Questionnaire: psychometric properties and associated characteristics. In G.C.L. Davey, & F. Tallis, *Worrying: perspectives on theory, assessment and treatment*. New York: Wiley.

Paivio, A. & Harshman, R. (1983). Factor analysis of a questionnaire on imagery and verbal habits and skills. *Canadian Journal of Psychology*, 37, 461-483.

Peasley-Miklus, C., & Vrana, R.J. (2000). Effects of worrisome and relaxing thinking on fearful emotional processing. *Behaviour Research and Therapy*, 38, 129-144.

Rapee, R. M. (1985). Distinctions between panic disorder and generalized anxiety disorder: clinical presentation. *Australian and New Zealand Journal of Psychiatry*, 19, 227-232.

Riding, R. (1991). *Cognitive Styles Analysis* (Birmingham, Learning and Training Technology).

Roemer, L., & Borkovec, T. D. (1993). Worry: unwanted cognitive activity that controls unwanted somatic experience. In, D.M. Wenger, & J.W. Pennebaker (Eds.), *Handbook of Mental Control*. Englewood Cliffs, New Jersey: Prentice-Hall.

Roemer, L., Molina, S., & Borkovec, T. D. (1997). An investigation of worry content among generally anxious individuals. *Journal of Nervous and Mental Disease, 185*, 314-319.

Starcevic, V., Fallon, S., Uhlenhuth, E. H., & Patha, K. D. (1994). Generalized anxiety disorder, worry about illness and hypochondriacal fears and beliefs. *Psychotherapy and Psychosomatics, 61*, 93-99.

Stober, J. (1998). Worry, problem solving and suppression of imagery: the role of concreteness. *Behaviour Research and Therapy, 36*, 751-756.

Vrana, S.R., Cuthbert, B.N., & Lang, P.J. (1986). Fear imagery and text processing. *Psychophysiology, 23*, 247-253.

Vrana, S.R., Cuthbert, B.N., & Lang, P.J. (1989). Processing fearful and neutral sentences: memory and heart rate change. *Cognition and Emotion, 3*, 179-195.

Vrana, S.R., & Lang, P.J. (1990). Fear imagery and the startle probe reflex. *Journal of Abnormal Psychology, 99*, 189-197.

Wells, A. (1994). A multi-dimensional measure of worry: Development and preliminary validation of the Anxious Thoughts Inventory. *Anxiety States and Coping, 6*, 289-299.

Wells, A., & Papageorgiou, G. (1995). Worry and the incubation of intrusive images following stress. *Behaviour Research and Therapy, 33*, 579-583.

Zander, J.R., & McNally, R.J. (1988). Bio-informational processing in agoraphobia. *Behaviour Research and Therapy*, 26, 421-429.

LIST OF TABLES

		Pages
Table 1	Means and standard deviations for patients and controls	109
Table 2	Means and standard deviations of thought and imagery frequencies during relaxation and general worry, for groups separately and combined.	110
Table 3	Means and standard deviations of estimates of percentage time spent in thought and imagery during general worry, for groups separately and combined.	111
Table 4	Means and standard deviations of relaxed/anxious ratings during each sample of the relaxation and worry periods, for groups separately and combined.	112
Table 5	Means and standard deviations of pulse rates during relaxation and general worry, for controls, patients taking and not taking sedative or beta-blocker medication, and for groups combined.	113

Table 6	Means and standard deviations of thought and imagery frequencies during imaging and worrisome thinking tasks with social-threat and physical-threat concerns, for groups separately and combined.	114
Table 7	Means and standard deviations of estimates of percentage time spent in thought and imagery during imaging and worrisome thinking tasks with social-threat and physical-threat concerns, for groups separately and combined.	115
Table 8	Means and standard deviations of rated difficulty in producing and maintaining thought and imagery during imaging and worrisome thinking tasks with social-threat and physical-threat concerns, for groups separately and combined.	116
Table 9	Means and standard deviations of relaxed/anxious ratings during each sample of imaging and worrisome thinking concerning social and physical threats, for groups separately and combined.	117
Table 10	Means and standard deviations of pulse rate during imaging and worrisome thinking tasks with social-threat and physical-threat concerns, during final baseline relaxation, for groups separately and combined.	118

Table 1

Means and standard deviations for patients and controls on descriptive measures

	Panic disorder group		Control group	
	Mean	SD	Mean	SD
VIST	1.05	0.11	1.05	0.14
HUIS	9.7	3.7	11.2	3.3
BAI	24.3 ^a	11.6	4.0 ^a	3.5
PSWQ	56.9 ^b	12.9	38.9 ^b	11.2
PSOQ – SW	22.4 ^{cd}	9.6	15.5 ^{de}	6.2
PSOQ – PW	14.2 ^{cf}	10.0	5.1 ^{ef}	3.4
PSOQ – Total	37.0 ^g	17.3	20.6 ^g	8.2
NOCQ – SW	36.0 ^h	18.2	23.6 ^{hi}	10.4
NOCQ – PW	36.2	24.0	13 ⁱ	7.6
NOCQ – Total	72.3 ^k	38.3	36.5 ^k	15.7

Note 1: VIST = Verbal-Imagery Style Test; HUIS = Habitual Use of Imagery Scale; BAI = Beck Anxiety

Inventory; PSWQ = Penn State Worry Questionnaire; PSOQ = Physical Social Outcome Questionnaire;

NOCQ = Negative Outcomes Questionnaire; SW = Social-threat Worry; PW = Physical-threat Worry.

Note 2: All means with matching individual superscript letters are significantly different, with $p < 0.01$ in all cases.

Table 2

Means and standard deviations of thought and imagery frequencies during relaxation and general worry, for groups separately and combined.

Group		Relaxation		General Worry	
		Imagery	Thought	Imagery	Thought
Control	Mean	0.68	1.23	0.27 ^a	0.95 ^a
	Std Deviation	0.99	1.19	0.63	1.21
Patient	Mean	0.36 ^{df}	1.36 ^d	0.18 ^{bf}	1.00 ^b
	Std Deviation	0.49	1.09	0.39	1.02
Combined Groups	Mean	0.52 ^{eg}	1.30 ^e	0.23 ^{cg}	0.98 ^c
	Std Deviation	0.79	1.13	0.52	1.11

Note: Means with matching individual superscript letters are significantly different at $p < 0.05$ or lower

Table 3

Means and standard deviations of estimates of percentage time spent in thought and imagery during relaxation and general worry, for groups separately and combined.

Group		Relaxation		General Worry	
		Imagery	Thought	Imagery	Thought
Control	Mean	32.83 ^d	34.55	18.76 ^d	38.38
	Std Deviation	24.25	30.88	20.90	35.22
Patient	Mean	24.93	36.91	19.30 ^a	36.62 ^a
	Std Deviation	20.65	28.51	14.89	27.49
Combined Groups	Mean	28.88 ^c	35.73	19.03 ^{bc}	37.50 ^b
	Std Deviation	22.62	29.40	17.94	31.24

Note: Means with matching individual superscript letters are significantly different at $p < 0.05$ or lower

Table 4

Means and standard deviations of the relaxed/anxious ratings during relaxation and general worry, for groups separately and combined.

Group		Relaxation			General Worry		
		S1	S2	S3	S1	S2	S3
Control	Mean	3.14 ^a	3.18 ^b	3.09 ^c	4.91 ^d	5.00 ^e	5.05 ^f
	Std Deviation	1.17	1.22	1.23	1.38	1.15	1.50
Patient	Mean	5.00 ^a	4.82 ^b	4.86 ^c	6.00 ^d	6.05 ^e	6.00 ^f
	Std Deviation	1.66	1.68	1.75	1.38	1.50	1.51
Combined Groups	Mean	4.07 ^g	4.00 ^h	3.98 ⁱ	5.45 ^g	5.52 ^h	5.52 ⁱ
	Std Deviation	1.70	1.67	1.75	1.47	1.42	1.56

Note 1: S1 = Sample 1, S2 = Sample 2, S3 = Sample 3.

Note 2: Means with matching superscripts are significantly different at $p < 0.05$ or lower.

Table 5.

Means and standard deviations of pulse rates during initial relaxation, general worry, and final relaxation for controls, patients, patients taking and not-taking sedative or beta-blocker medication, and for groups combined.

Condition		Combined	Controls	Patients	Med. Pts	N-M Pts
		Groups			(N=9)	(N=13)
Initial	Mean	75.19	73.38	77.00	76.41	77.42
Relaxation	Std Deviation	10.56	10.88	10.15	6.04	12.47
General-	Mean	74.26	72.12	76.39	75.48	77.02
Worry	Std Deviation	9.52	10.24	8.44	6.07	9.96
Final	Mean	70.78	69.50	72.07	72.39	71.85
Relaxation	Std Deviation	9.85	11.43	8.03	6.68	9.11

Note: Med. Pts = Patients taking sedative/beta-blocker medication; N-M Pts = Patients not taking sedative/beta-blocker medication.

Table 6

Means and standard deviations of thought and image frequencies during worrisome imaging and thinking tasks with social-threat and physical-threat concerns, for groups separately and combined.

Group		Soc. Threat		Soc. Threat		Phys.Threat		Phys.Threat	
		Imaging		Thinking		Imaging		Thinking	
		Im	Th	Im	Th	Im	Th	Im	Th
Control	Mean	0.95	0.50	0.32	0.91	1.05	0.55	0.27 ^b	1.23 ^b
	Std Deviation	1.09	0.91	0.72	1.11	1.13	1.01	0.70	1.19
Patient	Mean	0.64 ^e	0.64 ^g	0.18 ^{ag}	1.32 ^{ach}	0.77	0.50	0.18	0.91 ^h
	Std Deviation	0.90	1.00	0.39	0.99	1.07	0.96	0.66	1.11
Combined Groups	Mean	0.80	0.57 ^f	0.25 ^{cf}	1.11	0.91	0.52	0.23 ^d	1.07 ^d
	Std Deviation	1.00	0.95	0.58	1.06	1.10	0.98	0.68	1.15

Note 1: Soc. = Social; Phys. = Physical; Im = Images; Th = Thoughts.

Note 2: Means with matching individual superscript letters are significantly different at $p < 0.05$ or lower.

Table 7

Means and standard deviations of estimates of percentage time spent in thought and imagery during worrisome imaging and thinking tasks with social-threat and physical-threat concerns, for groups separately and combined.

Group		Soc. Threat		Soc. Threat		Phys.Threat		Phys.Threat	
		Imaging		Thinking		Imaging		Thinking	
		Im	Th	Im	Th	Im	Th	Im	Th
Control	Mean	36.8 ^j	25.0 ^{mx}	16.7 ^{ajx}	34.5 ^{am}	42.5 ^{dn}	24.4 ^{do}	17.7 ^{gn}	44.1 ^{go}
	Std Deviation	31.6	26.2	16.9	30.6	28.2	29.3	20.8	32.4
Patient	Mean	25.1 ^{kp}	21.3 ^{kq}	13.9 ^{bpz}	42.6 ^{bqδ}	40.1 ^{erz}	19.9 ^{es}	21.6 ^{hr}	34.0 ^{hsδ}
	Std Deviation	26.7	21.7	13.8	27.7	30.5	18.7	23.1	26.6
Combined Groups	Mean	30.9 ^{lt}	23.1 ^{lu}	15.3 ^{cty}	38.6 ^{cu}	41.3 ^{fvy}	22.2 ^{fw}	19.6 ^{iv}	39.1 ^{iw}
	Std Deviation	29.5	23.9	15.3	29.2	29.1	24.4	21.8	29.7

Note 1: Soc. = Social; Phys. = Physical; Im = Images; Th = Thoughts

Note 2: Means with matching individual superscript letters are significantly different at $p < 0.05$ or lower

Table 8

Means and standard deviations of rated difficulty in producing and maintaining thought and imagery during worrisome imaging and thinking tasks with social-threat and physical-threat concerns, for groups separately and combined.

Group		Soc. Threat		Soc. Threat		Phys.Threat		Phys.Threat	
		Imaging		Thinking		Imaging		Thinking	
		Prod.	Maint	Prod.	Maint	Prod.	Maint	Prod.	Maint
Control	Mean	4.23	5.55	5.23	6.68	3.27 ^a	4.91 ^d	5.14 ^a	6.59 ^d
	Std Deviation	2.52	2.26	2.64	2.28	2.64	2.71	2.64	1.82
Patient	Mean	4.64	5.45	4.66	5.82	4.09 ^b	4.86 ^e	4.59 ^b	5.55 ^e
	Std Deviation	2.17	2.30	2.10	2.24	2.43	2.25	2.17	2.06
Combined	Mean	4.43	5.50	4.95	6.25	3.68 ^c	4.89 ^f	4.86 ^c	6.07 ^f
Groups	Std Deviation	2.34	2.26	2.37	2.27	2.54	2.46	2.41	1.99

Note 1: Soc. = Social; Phys. = Physical; Prod. = Production; Maint. = Maintenance.

Note 2: Means with matching superscripts are significantly different at $p < 0.05$ or lower – only indicated for differences of specific interest

Table 9

Means and standard deviations of relaxed/anxious ratings recorded for each sample of worrisome imaging and thinking about social and physical threats, for groups separately and combined.

Group		Soc. W. Im.			Soc. W. Th.			Phys. W. Im.			Phys. W. Th.		
		S1	S2	S3	S1	S2	S3	S1	S2	S3	S1	S2	S3
Control	Mean	4.2	4.0	4.0	4.0	4.4	4.1	4.6	4.6	4.4	4.6	4.6	4.5
	Std Deviation	1.6	1.8	1.6	1.6	1.5	1.6	1.8	1.7	1.8	1.7	1.9	1.6
Patient	Mean	5.6	5.5	5.3	5.3	5.5	5.1	5.6	5.8	5.8	6.0	5.4	5.4
	Std Deviation	1.4	1.4	1.5	1.6	1.5	1.7	1.6	1.7	1.7	1.4	1.1	1.2
Combined Mean		4.9	4.7	4.6	4.6	5.0	4.6	5.1	5.2	5.1	5.3	5.0	4.9
Groups Std Deviation		1.7	1.8	1.7	1.7	1.6	1.7	1.7	1.8	1.9	1.7	1.6	1.4

Note: Soc. W. = Social-threat Worry; Phys. W. = Physical-threat worry; Im = Images; Th = Thinking

Table 10

Means and standard deviations of pulse rates during worrisome imaging and thinking tasks with social-threat and physical-threat concerns, and during final baseline relaxation, for groups separately and combined.

Group		Social Threat Imaging	Social. Threat Thinking	Physical Threat Imaging	Physical Threat Thinking	Final Baseline Relaxation
Control	Mean	71.83	72.27	71.47	71.22	69.50
	Std Deviation	12.35	12.77	10.77	11.31	11.43
Patient	Mean	75.21	75.56	75.27	75.60	72.68
	Std Deviation	9.06	7.64	8.81	7.89	8.03
Combined	Mean	73.52	73.91	73.37	73.41	70.78
Groups	Std Deviation	10.84	10.53	9.91	9.89	9.85

Note: Soc. = Social; Phys. = Physical; Prod. = Production; Maint. = Maintenance.

5. SINGLE CASE RESEARCH STUDY – ABSTRACT

Overcoming Cognitive Defences in the Psycho-physiological Assessment of Post-traumatic and ‘Prolonged Duress’ Stress Disorders

Prepared for submission to *Behavioural and Cognitive Psychotherapy*

(See Appendix 1 of Part Two)

**Overcoming Cognitive Defences in the Psycho-physiological Assessment of
Post-traumatic and 'Prolonged Duress' Stress Disorders**

Charlie Marsh
Department of Psychological Medicine
University of Glasgow, Glasgow, G12 OXH

Abstract

This single case experiment investigated whether: i) post-traumatic stress disorder (PTSD) can be distinguished from so-called prolonged duress stress disorder (PDSD) at the level of patho-physiology; ii) efforts to cognitively avoid vividly imaging taped trauma scripts inhibit physiological responses to these; and, iii) a ‘flooding’ methodology evokes physiological responses despite attempted avoidance. The results indicate that: a) both PTSD and PDSD imagery elicit physiological responses, but these are more readily and more strongly evoked by the former than the latter; b) cognitive avoidance strategies can succeed in preventing physiological reactions to trauma imagery, with this effect being more sustainable with humiliation ‘trauma’ images, than with life-threatening trauma images; c) repeated imagery presentations can overcome these defences to provoke responses. These findings suggest that physiological response differences between PTSD and PDSD are a matter of degree only; that cognitive avoidance reduces the diagnostic accuracy of psycho-physiological assessment; and that a flooding methodology can help to overcome this limitation.

Keywords: Stress disorders, PTSD, diagnosis, psychophysiological assessment, cognitive avoidance.

APPENDIX 1**Small Scale Service Evaluation Project**

	Pages
1.1. Copy of Notes for Contributors to the Journal of Mental Health	128
1.2. Checklist of Objective Indices for Letter Audit	129
1.3. Guidelines for Using Letter Audit Checklist	130
1.4. Record of Qualitative Evaluation of Letters	131
1.5. Guidelines for Interpreting Qualitative Characteristics of Letters	132

Notes for Contributors

Journal of Mental Health welcomes original communications and articles which have relevance to the field of mental health. Papers are accepted on the understanding that their contents have not been published elsewhere.

Manuscripts should be sent to the Executive Editor, Professor Ray J. Hodgson, Centre for Applied Public Health Medicine, Lansdowne Hospital, University of Wales College of Medicine, Cardiff CF1 8UL, United Kingdom.

To expedite assessment, 3 complete copies of each manuscript should be submitted. All submissions should be in the style of the American Psychological Association (*Publication Manual*, Fourth edition, 1994). Papers should be typed on one side of the paper, double spaced (including the references), with margins of at least 2.5 cm (1 inch). The first sheet should include the full title of the paper, a short title not exceeding 45 characters (for a running title at the head of each page), names of authors and the address where the work was carried out. All pages must be numbered. Significant delays may occur to manuscripts that do not conform to journal style. Each article should be accompanied by an abstract of not more than 150 words. Manuscripts should not exceed 6000 words in total, unless previously agreed by the Editor. The full postal address of the author who will check proofs and receive correspondence and offprints should also be included. Footnotes should be avoided where possible.

To expedite blind reviewing the names of authors should not be displayed on figures, tables or footnotes. The title page is removed before sending to referees.

In order to improve accuracy and expedite publication, authors are requested to submit the *final* and *revised* version of their manuscript on disk. The disk should contain the paper saved in Microsoft Word (preferably for Macintosh), rich text format (RTF) or as a text or ASCII (plain) text file. The disk should be clearly labelled with the author(s) name, paper title, file names and the software used. A good quality copy of the manuscript is *always* required.

References should follow the style of the American Psychological Association. All publications cited in the text should be listed following the text; similarly, all references listed must be mentioned in the text. Within the text references should be indicated by the author's name and year of publication in parentheses, e.g. (Folkman, 1992) or (Sartory & Stern, 1979), or if there are more than two authors (Gallico *et al.*, 1985). Where several references are quoted consecutively, or within a single year, within the text the order should be alphabetical, e.g. (Mawson, 1992; Parry & Watts, 1989) and (Grey, 1992; Kelly, 1992; Smith, 1992). If more than one paper from the same author(s) and year are listed, the date should be followed by (a), (b), etc., e.g. (Cobb, 1992a).

References should be listed alphabetically by author on a separate sheet(s) (double spaced) in the following standard form, capitalisation and punctuation:

a) For periodical articles (titles of journals should *not* be abbreviated):

Rachman, S., Cobb, J., Grey, S.J., McDonald, B., Mawson, D., Sartory, G. & Stern, R. (1979). The behavioural treatment of obsessive-compulsive disorders, with and without clomipramine. *Behaviour Research and Therapy*, 17, 467-478.

b) For books:

Powell, T.J. & Enright, S.J. (1990). *Anxiety and Stress Management*. London: Routledge.

c) For chapters within multi-authored books:

Hodgson, R.J. & Rollnick, S. (1989). More fun, less stress: How to survive in research. In G. Parry & F. Watts (Eds.), *A Handbook of Skills and Methods in Mental Health Research* (pp. 75-89). London: Lawrence Erlbaum.

Journal titles should not be abbreviated and unnecessary references should be avoided.

Clear, grammatical and tabular presentation is strongly encouraged.

Illustrations should not be inserted in the text. Each should be provided separately, and numbered on the back with the figure number and title of the paper. Three copies of all figures must be submitted. All photographs, graphs and diagrams should be referred to as 'Figures' and should be numbered consecutively in the text in Arabic numerals (e.g. Fig 3). The appropriate position of each illustration should be indicated in the text. A list of captions for the figures should be submitted on a separate sheet and should make interpretation possible without reference to the text. Captions should include keys to symbols. It would help to ensure greater accuracy in the reproduction of figures if the values used to generate them were supplied. Figures should be provided, on disk, in Microsoft Excel.

Tables should be typed on separate sheets and their approximate position in the text should be indicated. Units should appear in parentheses in the column heading but not in the body of the table. Words and numerals should be repeated on successive lines: 'ditto' or 'do' should *not* be used.

Proofs are supplied for checking and making essential corrections, not for general revision or alteration. Proofs should be corrected and returned within 3 days of receipt.

Offprints Fifty offprints of each paper are supplied free. Additional copies may be purchased and should be ordered when the proofs are returned. Offprints, together with a complete copy of the relevant journal issue, are sent approximately 3 weeks after publication.

Copyright. It is a condition of publication that authors vest copyright in their articles, including abstracts, in Shadowfax Publishing and Carfax Publishing, Taylor & Francis Group Limited. This enables us to ensure full copyright protection and to disseminate the article, and the journal, to the widest possible readership in print and electronic formats as appropriate. Authors may, as of right, use the article elsewhere *after* publication without prior permission from Carfax, provided that acknowledgement is given to the *Journal* as the original source of publication, and that Carfax is notified so that our records show that its use is properly authorised. Authors are themselves responsible for obtaining permission to reproduce copyright material from other sources.

Checklist Of Objective Indices Of Letter Content and Length

Letter Code: _____

Indices	Findings	Comments
Content.		
a) Reference to the original referral letter	Yes / No	
b) Reason for contact	Yes / No	
c) Date of contact	Yes / No	
d) Description of presenting problem(s).	Yes / Det / No	
e) Background information	Yes / No	
e) Findings/observations on examination	Yes / No	
g) Psychological formulation:	Yes / No	
i) Predisposing variables	Yes / Spec / No	
ii) Onset variables	Yes / Spec / No	
iii) Maintenance variables	Yes / Spec / No	
h) Plan of action / recommendations / advice	Yes / Det / No	
i) Prognostic opinion	Yes / Spec / No	
j) Timescale for follow up appointment(s)	Yes / No	
j) Frequency of jargon usage		
k) Frequency of value judgements		
Length of Letter		
a) Length of letter (estd. no. of words)		
b) Length of letter (no. of pages)		
c) Number of paragraphs.		

Guidelines For Letter Assessment – Objective Indices

Content

Reference to original letter: Requires reference to referred problem or referral request.

Reason for contact: Refers to nature of the clinical contact or its purpose (e.g., initial assessment or interview).

Description of the presenting problem(s): Identify whether the problem(s) is/are described in relatively specific terms versus in a generalised fashion (e.g, problems in being able to venture out into specified situations versus ‘agoraphobia’).

Findings/observations on examination: Refers to descriptions/observations of the patient’s presentation, mental state etc., at interview.

Psychological formulation: Refers to the use of psychological concepts (rather than ‘everyday’ concepts) to explain the development or maintenance of the presenting problem. Indicate whether these are clearly specified as possible determinants, or whether their role is merely implied.

Actions/recommendations: Indicate whether presented in a relatively specific form (e.g., relaxation exercises and graded exposure, or in a more generalized fashion (e.g., cognitive or exploratory therapy).

Prognostic opinion: Indicate whether it is specified as such (i.e., this person/problem is likely to respond well/poorly to psychological therapy versus this person seems well motivated for therapy).

Timescale for follow up: Count as present only if there is a relatively specific time period given for follow up (e.g., date of the next appointment or to be seen again within the nextweeks).

Frequency of jargon usage: Count examples of jargon present. Jargon = Terms which are not intelligible without explanation.

Value judgements/pejorative comments: These statements about the patient based on the psychologist’s personal opinions.

Letter Length

Word count: Average the number of words over 3 lines and multiply by the number of lines, taking account of ½ lines.

Number of pages: Count in ¼ pages of actual text – ignore headings and signing off etc.

Record of Qualitative Evaluation of Letters

Letter Code: _____

For each of the eight characteristics listed below, decide which of the four 'quality' categories (poor / adequate / good / excellent) best describes this letter, then tick the box next to the appropriate category. In forming your judgements, please bear in mind the guidelines for interpreting these characteristics, which you have been provided with.

- | | | | | | | | | |
|--------------------------|------|--------------------------|----------|--------------------------|------|--------------------------|-----------|--------------------------|
| 1. Problem Description | Poor | <input type="checkbox"/> | Adequate | <input type="checkbox"/> | Good | <input type="checkbox"/> | Excellent | <input type="checkbox"/> |
| 2. Formulation | Poor | <input type="checkbox"/> | Adequate | <input type="checkbox"/> | Good | <input type="checkbox"/> | Excellent | <input type="checkbox"/> |
| 3. Action Plan | Poor | <input type="checkbox"/> | Adequate | <input type="checkbox"/> | Good | <input type="checkbox"/> | Excellent | <input type="checkbox"/> |
| 4. Prognostic Opinion | Poor | <input type="checkbox"/> | Adequate | <input type="checkbox"/> | Good | <input type="checkbox"/> | Excellent | <input type="checkbox"/> |
| 5. Clarity of Expression | Poor | <input type="checkbox"/> | Adequate | <input type="checkbox"/> | Good | <input type="checkbox"/> | Excellent | <input type="checkbox"/> |
| 6. Relevance | Poor | <input type="checkbox"/> | Adequate | <input type="checkbox"/> | Good | <input type="checkbox"/> | Excellent | <input type="checkbox"/> |
| 7. Appropriateness | Poor | <input type="checkbox"/> | Adequate | <input type="checkbox"/> | Good | <input type="checkbox"/> | Excellent | <input type="checkbox"/> |
| 8. Overall Quality | Poor | <input type="checkbox"/> | Adequate | <input type="checkbox"/> | Good | <input type="checkbox"/> | Excellent | <input type="checkbox"/> |

Guidelines For Interpreting Qualitative Characteristics Of Letters

These guidelines are intended to provide you with some indication of what each of the listed qualities refers to. Please familiarize yourself thoroughly with them and keep them in mind when evaluating each letter. However, bear in mind that these are not definitions and therefore your own personal understanding of each attribute will necessarily be involved in arriving at your judgements.

- | | |
|---|---|
| 1) Adequacy of Problem Description | <ul style="list-style-type: none"> - How well do you feel you have been able to understand the nature of the presenting problem(s) as reported in this letter? - How informative do you believe the description of the presenting problem(s) was for the referrer? |
| 2) Adequacy of Formulation | <ul style="list-style-type: none"> - How well explained are the determinants of the main problem(s) and their interconnections? - How informative to a GP would the formulation be? - To what extent does the formulation indicate an appropriate therapeutic approach? |
| 3) Adequacy of Action Plan | <ul style="list-style-type: none"> - How clearly do you feel you have understood the nature of the action(s) or intervention(s) proposed in this letter? - How informative to the referrer would the action plan be? - To what extent is the action plan related to the formulation? |
| 4) Adequacy of Prognostic Opinion | <ul style="list-style-type: none"> - To what extent does the letter provide a clear indication of the expected outcome for this case? - How well explained are the reasons for any prognostic opinion offered? |
| 5) Clarity of Expression | <ul style="list-style-type: none"> - How readily did you understand and assimilate the key points of this letter? - Did you have to read the letter, or parts of it, repeatedly in order to fully understand what was written or intended? |
| 6) Relevance: | <ul style="list-style-type: none"> - How clearly pertinent to its purpose, was the content of the letter? - To what extent were unnecessary points of information, comment, or opinion included? |
| 7) Appropriateness | <ul style="list-style-type: none"> - How suited was the content, and language to a GP? - You may also wish to give consideration to what you know of the training backgrounds and working contexts of GPs. |
| 8) Overall Quality | <ul style="list-style-type: none"> - What is your overall or summative judgement on the quality this letter given the context of its writing – how ‘good’ is it? - This judgment is to be based on your general impressions and may reflect more subtle qualities than those listed above. |

APPENDIX 2**Major Research Project Literature Review**

	Pages
2.1. Copy of Information for Contributors to Behaviour Research and Therapy	134

BEHAVIOUR RESEARCH AND THERAPY

incorporating BEHAVIORAL ASSESSMENT

Information for Contributors

Submission of Papers

Authors are requested to submit their original manuscript and figures with two copies. Manuscripts for the regular section should be sent to Dr S. Rachman, Department of Psychology, University of British Columbia, Vancouver, British Columbia, Canada, V6T 1Z4. Manuscripts for the *Behavioral Assessment* Section should be sent to Dr S. Taylor, Department of Psychiatry, 2255 Westbrook mall, Vancouver, British Columbia, Canada, V6T 2A1.

Submission of a paper implies that it has not been published previously, that it is not under consideration for publication elsewhere, and that if accepted it will not be published elsewhere in the same form, in English or in any other language, without the written consent of the publisher.

Manuscript Preparation

General: Manuscripts must be typewritten, double-spaced with wide margins on one side of white paper. Good quality printouts with a font size of 12 or 10 pt are required. The corresponding author should be identified (include a Fax number and E-mail address). Full postal addresses must be given for all co-authors. Authors should consult a recent issue of the journal for style if possible. An electronic copy of the paper should accompany the final version. The Editors reserve the right to adjust style to certain standards of uniformity. Authors should retain a copy of their manuscript since we cannot accept responsibility for damage or loss of papers. Original manuscripts are discarded one month after publication unless the Publisher is asked to return original material after use.

Abstracts: A summary, not exceeding 200 words, should be submitted on a separate sheet in duplicate. The summary will appear at the beginning of the article.

Keywords: Authors should include up to six keywords with their article. Keywords should be selected from the APA list of index descriptors, unless otherwise agreed with the Editor.

Text: Follow this order when typing manuscripts: Title, Authors, Affiliations, Abstract, Keywords, Main text, Acknowledgements, Appendix, References, Vitae, Figure Captions and then Tables. Do not import the Figures or Tables into your text. The corresponding author should be identified with an asterisk and footnote. All other footnotes (except for table footnotes) should be identified with superscript Arabic numbers.

References: All publications cited in the text should be present in a list of references following the text of the manuscript. In the text refer to the author's name (without initials) and year of publication, e.g. "Since Peterson (1993) has shown that . . ." or "This is in agreement with results obtained later (Kramer, 1994)". For 2-6 authors, all authors are to be listed at first citation, with "&" separating the last two authors. For more than six authors, use the first six authors followed by et al. In subsequent citations for three or more authors use author et al. in the text. The list of references should be arranged alphabetically by authors' names. The manuscript should be carefully checked to ensure that the spelling of authors names and dates are exactly the same in the text as in the reference list.

References should be prepared carefully using the *Publication Manual of the American Psychological Association* for style as follows:

Birbaumer, N., Gerber, D., Miltner, W., Lutzenberger, W., & Kluck, M. (1984). Start with biofeedback and continue with behavior therapy in migraine. *Proceedings of the 15th Annual Meeting of Biofeedback Society of America* (pp. 33-36) Albuquerque.

Gray, J.A. (1976). The behavioral inhibition system: a possible substratum for anxiety. In M. P. Feldman & A. Broadhurst. *Theoretical and experimental bases of the behaviour therapies* (pp. 3-41). London: Wiley.

Taber, I.I., McCormick, R.A., Russo, A.M., Adkins, B.J., & Ramirez, L.F. (1987). Follow-up of pathological gamblers after treatment. *American Journal of Psychiatry*, 144, 757-761.

Illustrations: All illustrations should be provided in camera-ready form, suitable for reproduction (which may include reduction) without retouching. Photographs, charts and diagrams are all to be referred to as "Figure(s)" and should be numbered consecutively in the order to which they are referred. They should accompany the manuscript, but should not be included within the text. All illustrations should be clearly marked on the back with the figure number and the author's name. All figures are to have a caption. Captions should be supplied on a separate sheet.

Line drawings: Good quality printouts on white paper produced in black ink are required. All lettering, graph lines and points on graphs should be sufficiently large and bold to permit reproduction when the diagram has been reduced to a size suitable for inclusion in the journal. Dye-line prints or photocopies are not suitable for reproduction. Do not use any type of shading on computer-generated illustrations.

APPENDIX 3**Major Research Project Proposal**

	Pages
3.1. Application Guidelines for Mini-Project Grants: Health Services Research	136
3.2. Participant Information Sheet	137-38
3.3. Participant Consent Form	139
3.4. Screening Questionnaire for Control Subjects, based on the ADIS-IV Initial Enquiry Questions	140-141

- 1.1 Applicants - names and addresses including the names of co-workers and supervisor(s) if known.
- 1.2 Title - no more than 15 words.
- 1.3 Summary - No more than 300 words, including a reference to where the study will be carried out.
- 1.4 Introduction - of less than 600 words summarising previous work in the field, drawing attention to gaps in present knowledge and stating how the project will add to knowledge and understanding.
- 1.5 Aims and hypothesis to be tested - these should wherever possible be stated as a list of questions to which answers will be sought.
- 1.6 Plan of investigation - consisting of a statement of the practical details of how it is proposed to obtain answers to the questions posed. The proposal should contain information on Research Methods and Design i.e.
 - 1.6.1 Subjects - a brief statement of inclusion and exclusion criteria and anticipated number of participants.
 - 1.6.2 Measures - a brief explanation of interviews/observations/ rating scales etc. to be employed, including references where appropriate.
 - 1.6.3 Design and Procedure - a brief explanation of the overall experimental design with reference to comparisons to be made, control populations, timing of measurements, etc. A summary chart may be helpful to explain the research process.
 - 1.6.4 Settings and equipment - a statement on the location(s) to be used and resources or equipment which will be employed (if any).
 - 1.6.5 Data analysis - a brief explanation of how data will be collated, stored and analysed.
- 1.7 Practical applications - the applicants should state the practical use to which the research findings could be put.
- 1.8 Timescales - the proposed starting date and duration of the project.
- 1.9 Ethical approval - stating whether this is necessary and, if so, whether it has been obtained.

Worry and Panic Disorder

**An Investigation of the Nature and Role of Worry
in Panic Disorder.**

If you have been provided with this leaflet it is because it is believed that you may be a suitable candidate to participate in the psychological study referred to above, and because you have expressed an interest in finding out more about the study.

The study is being conducted in association with Glasgow University Department of Psychological Medicine. The principal researcher is Charlie Marsh, Consultant Clinical Psychologist and Head of Clinical Psychology at Dykebar Hospital.

Please be good enough to carefully read the information contained in the leaflet and consider whether you would be willing to participate in the study. Your assistance would be greatly appreciated.

You will be contacted within 3 to 10 days after receiving this leaflet so that any questions which you may have about the study can be answered. You will then be asked if you are willing to be a participant.

Thank you for your time and interest in reading this leaflet.

Introduction.

The main purpose of this study is to examine the nature of worry and its contribution to anxious distress. Though everyone has experienced worry at some time, relatively little is known about it and how it affects us. While it is known that worry is closely associated with anxiety, we know very little of how it is experienced by those who suffer from Panic Disorder. The main aim of this study is to investigate some aspects of worry in those who suffer from this disorder, and to compare the results with those from individuals who do not so suffer. It is hoped that the findings will improve our understanding of the link between worry and Panic Disorder.

What will be required of you?

Initially you will be interviewed to ascertain whether you do, or do not suffer from Panic Disorder as officially defined. If you do, you will then be asked to a further meeting, lasting about an hour and a half. At this meeting you will be asked to:

- a) complete three brief questionnaires about your experience of worry and anxiety;
- b) undertake a short task presented on a computer screen which involves making some simple choices in order to identify your 'cognitive style', that is your typical thinking style. You will also be asked to complete a further brief questionnaire for the same reason;
- c) spend short periods of time relaxing and then focusing on some personal worries, while occasionally reporting on the form that your worry takes in response to some simple questions. While doing so, the pulse in your finger will be monitored by a small electronic meter. This will cause no discomfort whatsoever.

Confidentiality

The information that you provide will be treated in the strictest confidence. Your name will not be attached to it, but rather it will be identified only by a number so that there will be no possibility of anyone associating it with yourself.

Withdrawal from the study

Please be assured that you are free to withdraw from the study at any point without having to offer any explanation, and this will not in anyway affect the treatment which you may be receiving.

Benefits

It is hoped that the findings from this study will contribute towards developing a better understanding of panic disorder and eventually lead to even more effective psychological treatments for it. If you suffer from Panic Disorder, the information gained from being assessed for the study may be of help in understanding and treating your condition. For this reason, with your permission, relevant information will be passed to the psychologist who is treating you.

Consent Form

Title of Study - An Investigation of Worry in Panic Disorder

Name _____

Date of Birth _____

Address _____

I hereby give my consent to participating in the study named above.

Signed _____ Date _____

I also give my consent to information gained from my assessment during the study, to be passed to the psychologist who is currently treating me.

Signed _____ Date _____

I have read and understood the contents of the information sheet for participants in the above named study and have received a copy for myself to retain. I am satisfied that there has been sufficient opportunity to ask questions about it, and to have these answered. I also understand that I may withdraw from the study at any stage if I so choose and that this will have no effect upon any treatment which I may be receiving.

Screening Questionnaire

- 1a. Have there been occasions recently, when you have felt a sudden rush of intense fear or discomfort, accompanied by symptoms such as dizziness, shortness of breath, palpitations, sweating, trembling and an urge to escape?

YES ___ NO ___

If YES,

- b. How recently? _____
- 2a. Do you feel panicky in any situations or avoid them because you might feel panicky?

YES ___ NO ___

If YES,

Which situations? _____

- 3a. In social situations where you might be observed or evaluated by others, or when you are meeting new people, do you feel fearful, anxious or nervous?

YES ___ NO ___

- b. Are you overly concerned that you may do and / or say something that might embarrass or humiliate yourself in front of others, or that others may think badly of you?

YES ___ NO ___

If YES to a or b,

- c. Do these feelings / concerns interfere with your life, or cause you distress to more than a quite minor extent?

YES ___ NO ___

- 4a. Over the last several months, have you been continually worried or anxious about a number of events or activities in your daily life?

YES ___ NO ___

If YES,

What kind of things do you worry about? _____

- b. Over recent months, has your tendency to worry been excessive or out of control?

YES ___ NO ___

- c. Over the past month, what percentage of the day did you feel worried?

_____ %

- 5a. Currently, have you been feeling depressed, sad, empty or have you lost interest or pleasure in almost all of your activities?

YES ___ NO ___

- b. Currently, have other people commented to you that you appear down or fearful, or that you seem less interested in your usual activities?

Depressed YES ___ NO ___

Loss of Interest YES ___ NO ___

- 6a. Over the last several months have you continually feared or believed that you might have a serious physical disease or illness (cancer, heart disease, AIDS, etc.)?

YES ___ NO ___

If YES,

- b. What type of disease or illness do you fear you might have? _____

- 7a. Have you experienced a lot of different physical problems in your life?
YES ___ NO ___
If YES,
- b. Over the past several years, have these physical problems prompted you to see the doctor on many occasions, or have they significantly interfered with your life (e.g., job, social activities)?
YES ___ NO ___
If YES, specify _____
- 8a. Currently, how much alcohol do you typically drink in an average week? _____

- b. Over the past year, has your drinking resulted in any problems (e.g., poor work performance, family rows, trouble with the police etc.), or have you repeatedly used alcohol to deal with anxiety or depression?
YES ___ NO ___
- 9a. Currently, how much caffeine do you typically drink in an average week? (Please specify the number, type and amount of drinks). _____

- b. Has your caffeine consumption caused you any difficulties (e.g., anxiety, sleep difficulties, physical symptoms such as stomach / bowel disturbances, agitation, headaches)?
YES ___ NO ___
- 10a. Besides alcohol or caffeine, have you ever used other substances such as marihuana or cocaine?
YES ___ NO ___
If YES,
How recently was this? _____
- b. Have you ever experienced any problems because of your use of these substances, or has your use of them caused you difficulties at home, at work or in social relations? YES ___ NO ___
- c. Have you ever used certain prescription or non-prescription medications (e.g., tranquilizers, cough remedies) in excessive amounts or at a frequency or dosage that was higher than that prescribed by your doctor?
YES ___ NO ___
If YES, please specify _____
- 11a. Has there ever been a time when you had strange or unusual experiences such as:
- b. Hearing or seeing things that other people didn't notice? YES ___ NO ___
- c. Hear voices or conversations when no one was around? YES ___ NO ___
- d. Visions that no one else saw? YES ___ NO ___
- c. Had the feeling that something odd was going on around you, that people were doing things to test you or antagonize or hurt you so that you felt you had to be on guard constantly?
YES ___ NO ___
- 12a. Have you ever been hospitalized for anxiety, depression, substance abuse, or any other emotional problem?
YES ___ NO ___
- b. Have you ever received any outpatient treatment or evaluations for any emotional or personal difficulties?
- 13a. Are you currently taking any medications for anxiety, depression, or any other emotional problem? (include sleep medications>)
YES ___ NO ___
- b. Have you ever taken medications for anxiety, depression, or any other emotional problem? (include sleep medications.)
YES ___ NO ___

APPENDIX 4**Major Research Project Paper**

	Pages
4.1 Copy of Information for Contributors to Behaviour Research and Therapy	143
4.2. Information about the Minolta Pulsox-3i	144-47
4.3. Copy of Mentation and Affect Sampling Record Sheet	148
4.4. Copies of Post-manipulation Ratings Record Sheets	149-152

BEHAVIOUR RESEARCH AND THERAPY

incorporating BEHAVIORAL ASSESSMENT

Information for Contributors

Submission of Papers

Authors are requested to submit their original manuscript and figures with two copies. Manuscripts for the regular section should be sent to Dr S. Rachman, Department of Psychology, University of British Columbia, Vancouver, British Columbia, Canada, V6T 1Z4. Manuscripts for the *Behavioral Assessment* Section should be sent to Dr S. Taylor, Department of Psychiatry, 2255 Wesbrook mall, Vancouver, British Columbia, Canada, V6T 2A1.

Submission of a paper implies that it has not been published previously, that it is not under consideration for publication elsewhere, and that if accepted it will not be published elsewhere in the same form, in English or in any other language, without the written consent of the publisher.

Manuscript Preparation

General: Manuscripts must be typewritten, double-spaced with wide margins on one side of white paper. Good quality printouts with a font size of 12 or 10 pt are required. The corresponding author should be identified (include a Fax number and E-mail address). Full postal addresses must be given for all co-authors. Authors should consult a recent issue of the journal for style if possible. An electronic copy of the paper should accompany the final version. The Editors reserve the right to adjust style to certain standards of uniformity. Authors should retain a copy of their manuscript since we cannot accept responsibility for damage or loss of papers. Original manuscripts are discarded one month after publication unless the Publisher is asked to return original material after use.

Abstracts: A summary, not exceeding 200 words, should be submitted on a separate sheet in duplicate. The summary will appear at the beginning of the article.

Keywords: Authors should include up to six keywords with their article. Keywords should be selected from the APA list of index descriptors, unless otherwise agreed with the Editor.

Text: Follow this order when typing manuscripts: Title, Authors, Affiliations, Abstract, Keywords, Main text, Acknowledgements, Appendix, References, Vitae, Figure Captions and then Tables. Do not import the Figures or Tables into your text. The corresponding author should be identified with an asterisk and footnote. All other footnotes (except for table footnotes) should be identified with superscript Arabic numbers.

References: All publications cited in the text should be present in a list of references following the text of the manuscript. In the text refer to the author's name (without initials) and year of publication, e.g. "Since Peterson (1993) has shown that . . ." or "This is in agreement with results obtained later (Kramer, 1994)". For 2-6 authors, all authors are to be listed at first citation, with "&" separating the last two authors. For more than six authors, use the first six authors followed by et al. In subsequent citations for three or more authors use author et al. in the text. The list of references should be arranged alphabetically by authors' names. The manuscript should be carefully checked to ensure that the spelling of authors names and dates are exactly the same in the text as in the reference list.

References should be prepared carefully using the *Publication Manual of the American Psychological Association* for style as follows:

Birbaumer, N., Gerber, D., Miltner, W., Lutzenberger, W., & Kluck, M. (1984). Start with biofeedback and continue with behavior therapy in migraine. *Proceedings of the 15th Annual Meeting of Biofeedback Society of America* (pp. 33-36) Albuquerque.

Gray, J.A. (1976). The behavioral inhibition system: a possible substratum for anxiety. In M. P. Feldman & A. Broadhurst. *Theoretical and experimental bases of the behaviour therapies* (pp. 3-41). London: Wiley.

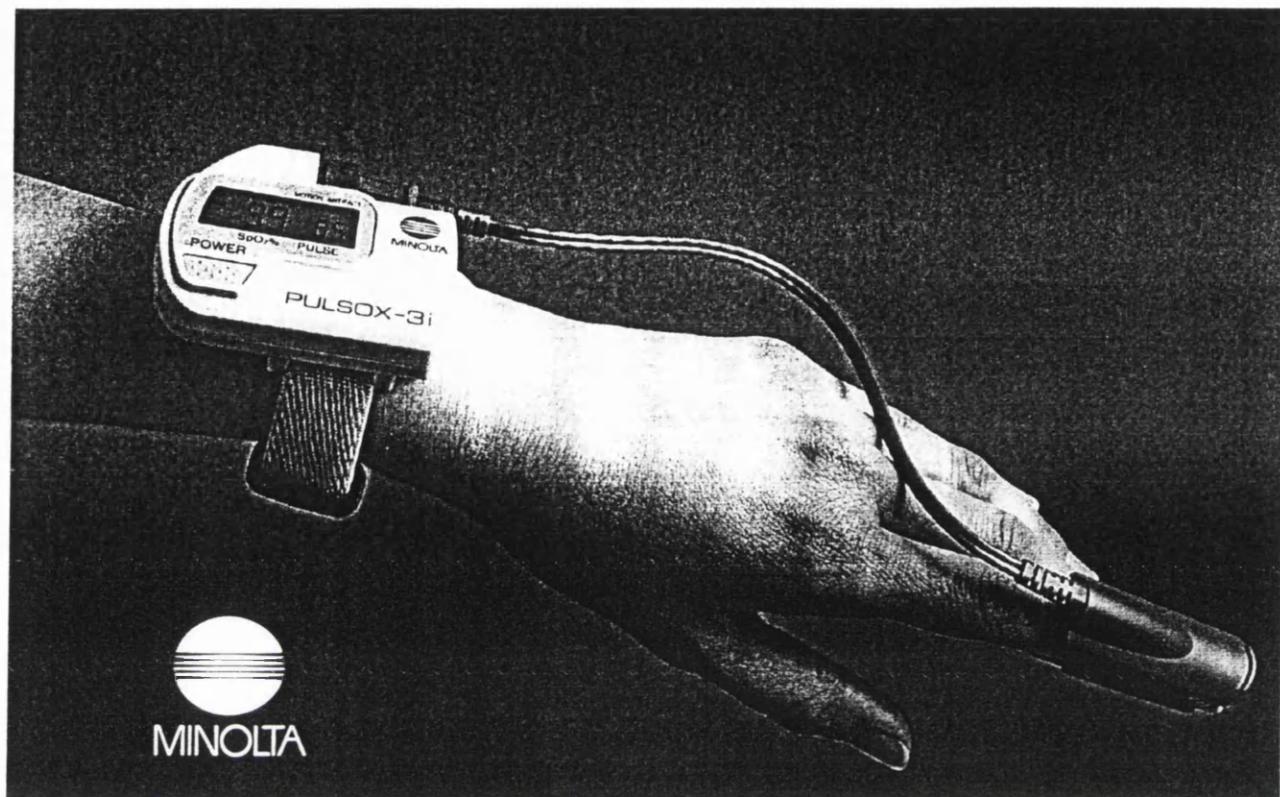
Taber, I.I., McCormick, R.A., Russo, A.M., Adkins, B.J., & Ramirez, L.F. (1987). Follow-up of pathological gamblers after treatment. *American Journal of Psychiatry*, 144, 757-761.

Illustrations: All illustrations should be provided in camera-ready form, suitable for reproduction (which may include reduction) without retouching. Photographs, charts and diagrams are all to be referred to as "Figure(s)" and should be numbered consecutively in the order to which they are referred. They should accompany the manuscript, but should not be included within the text. All illustrations should be clearly marked on the back with the figure number and the author's name. All figures are to have a caption. Captions should be supplied on a separate sheet.

Line drawings: Good quality printouts on white paper produced in black ink are required. All lettering, graph lines and points on graphs should be sufficiently large and bold to permit reproduction when the diagram has been reduced to a size suitable for inclusion in the journal. Dye-line prints or photocopies are not suitable for reproduction. Do not use any type of shading on computer-generated illustrations.

A new Standard

Pulsox-3 and Pulsox-3i



- Wristwatch type pulse-oximeter
- Simple operation
- Optional memory facility
- Ideal for home and hospital use
- Windows®-based software package

More than just portable...

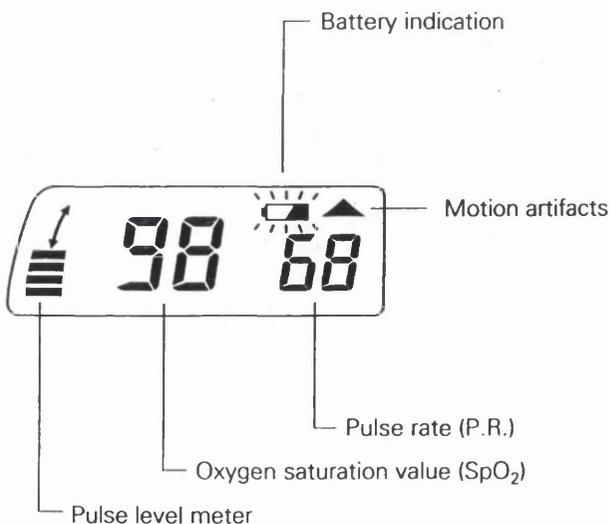
The pulse-oximeters are light-weight and compact. Thanks to its portability the Pulsox-3 and -3i are the ideal pulse-oximeters, for use in both the hospital or the home.

Two models for your choice...

Two models are available; the Pulsox-3 which covers the basic needs for spot-checking and the Pulsox-3i which has an internal memory and other additional features.

Display

The LCD shows pulse rate, oxygen saturation and pulse level. It also indicates body movement and battery load. When it is dark, a backlight function is available.



12-hours memory function (Pulsox-3i)...

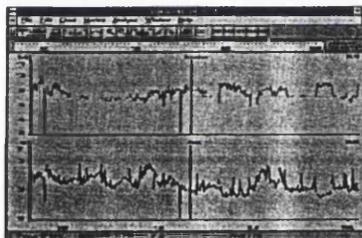
Pulsox-3i can record 12-hours of measured data in up to 64 files.

Data-transfer...

The data can be either printed via an optional printer or downloaded through an interface unit to an optional Windows-based software package.

Data Management...

- For pulse-oximeters used for data gathering at the hospital or in the home.
- One program supports Minolta's Pulsox-3i (but is also available for Pulsox-5, -7, -8).



Features include:

- Windows display with variable time intervals
- Analysis package for oximetry and pulse rate (desaturation dips, cumulative distribution graph, means etc)
- Selected signal areas can be excluded from the analysis
- Exporting data to spreadsheets
- Montages to enable quick display changes

Demonstration software is available on request.

The following configurations are available:

Configuration as displayed: ►

Pulsox-3, incl. SR-5C finger clip probe, finger mesh cover, batteries, wrist band, neck strap, manual English
Order No. CH8230



Optional probes for Pulsox-3 and -3i:

UD-5C universal probe
Order No. CH8017

SD-5C personal probe
Order No. CH8026

Accessories:

Finger mesh cover (10 pcs)
Order No. CH8250

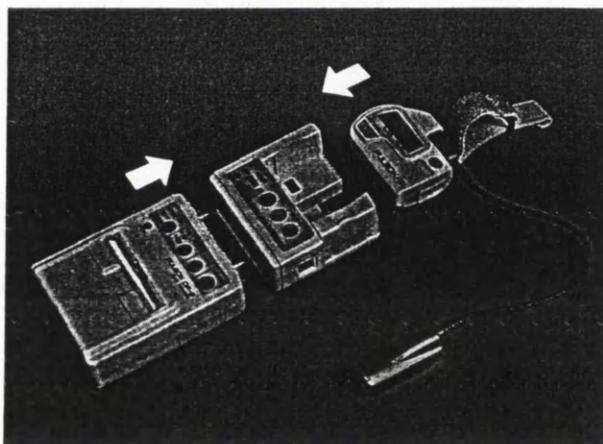
Paper for printer (10 rolls)
Order No. CH8081

Configuration as displayed: ►

Pulsox-3i, incl. SR-5C finger clip probe, finger mesh cover, batteries, wrist band, neck strap, manual English
Order No. CH8240

Pulsox DP-3 set, incl. DP-3 printer, IF-3 interface, AC-adaptor, Paper
Order No. CH8195

Optional:
Pulsox DS-3 software, incl. interface cable, manual English
Order No. CH8043

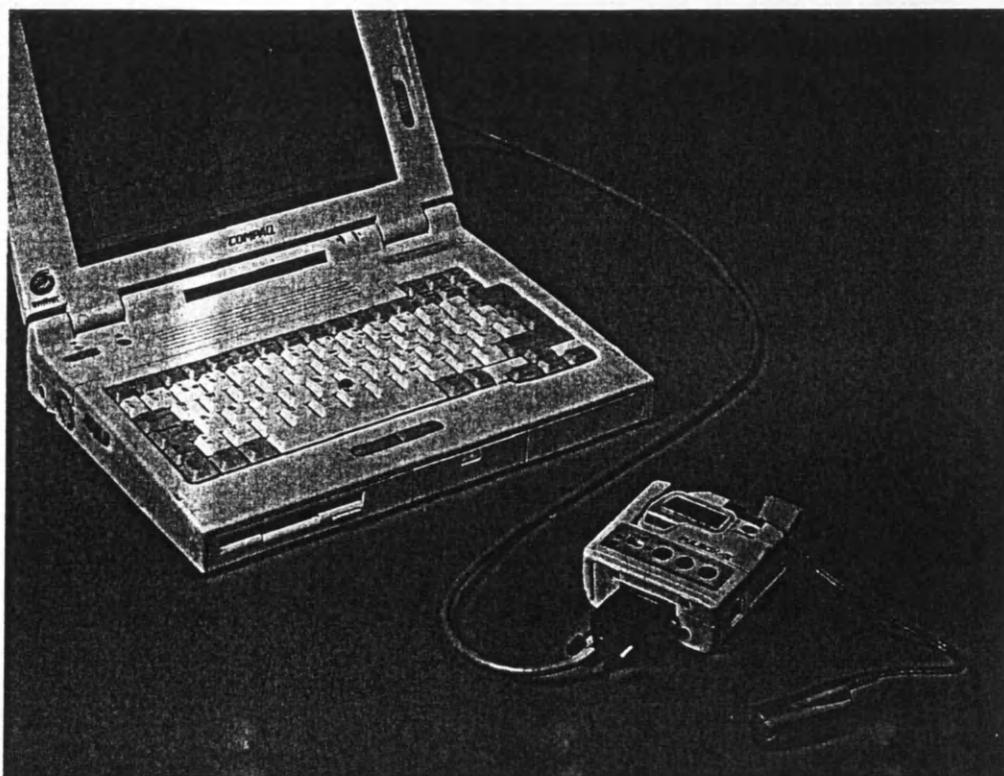


Configuration as displayed: ►

Pulsox-3i, incl. SR-5C finger clip probe, finger mesh cover, batteries, wrist band, neck strap, manual English
Order No. CH8240

Pulsox IF-3 interface, AC-adaptor
Order No. CH8198

Pulsox DS-3 software, incl. interface cable, manual English
Order No. CH8043



Main Specifications Pulsox-3 and 3i

	Pulsox-3	Pulsox-3i	147
Measuring method	Dual-wavelength pulse-type oximeter	Dual-wavelength pulse-type oximeter	
Measuring range			
SpO ₂	0 to 100%	0 to 100%	
Pulse rate	20 to 250 bpm	20 to 250 bpm	
Measuring accuracy			
SpO ₂	+/- 2% (50 to 100% range)	+/- 2% (50 to 100% range)	
Pulse rate	+/- 2 bpm	+/- 2 bpm	
Display	LCD Liquid crystal display, backlight	LCD Liquid crystal display, backlight	
Displayed items	oxygen saturation SpO ₂ pulse rate number pulse level meter error messages	oxygen saturation SpO ₂ pulse rate number pulse level meter error messages date and time file identification number	
Memory function		12 hours (64 files maximum)	
Output function		DP-3 printer (optional) Interface unit IF-3 (optional) Pulsox DS-3 software (optional)	
Temperature range (Operating)	0 to 40 °C 30 to 85% relative humidity	0 to 40 °C 30 to 85% relative humidity	
Temperature range (Storage)	-10 to 60 °C 30 to 95% relative humidity	-10 to 60 °C 30 to 95% relative humidity	
Power	2 AAA size alkaline batteries	2 AAA size alkaline batteries	
Dimensions	68 x 21 x 54.5 mm (W x H x D)	68 x 21 x 54.5 mm (W x H x D)	
Weight	42 g (without wrist band, batteries and probe)	42 g (without wrist band, batteries and probe)	

Main Specifications Interface Unit IF-3

Temperature range (Operating)	0 to 40 °C 30 to 85% relative humidity
Temperature range (Storage)	-10 to 60 °C 30 to 95% relative humidity
Power	AC adapter AA-5P
Dimensions	86.5 x 34 x 77 mm (W x H x D)
Weight	85 g (without AC adapter)

Main Specifications Printer DP-3

Print method	Thermal dot matrix
Print item	date, SpO ₂ , pulse rate number, title
Print mode	spot print, continous print, graph print
Print out interval	5, 10 or 30 seconds or 1 minute
Temperature range (Operating)	0 to 40 °C 30 to 85% relative humidity
Temperature range (Storage)	-10 to 60 °C 30 to 95% relative humidity
Paper	Thermal roll paper
Dimensions	86.5 x 36.5 x 104 mm (W x H x D)
Weight	200 g

AVL MEDICAL INSTRUMENTS AG
Stettenerstrasse 28
P.O. Box 1140
CH-8207 Schaffhausen/Switzerland
Phone [+41] 848 800 885
Fax [+41] 848 800 875
E-Mail info@avl.inet.ch



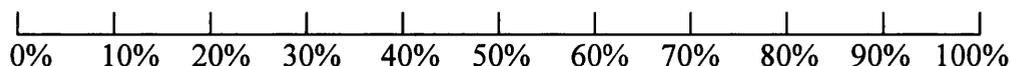
Data subject to change without notice. The technical data given in this publication are for general information purposes only. They imply no warranty of any kind. Consult the AVL General Conditions of Contract.



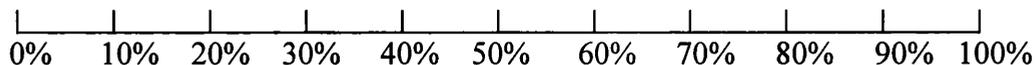
RATINGS OF MENTAL CONTENT (RLX)

PLEASE RATE YOUR EXPERIENCES OVER THE WHOLE OF THE LAST PERIOD. DO SO BY CIRCLING THE APPROPRIATE NUMBERS IN EACH CASE.

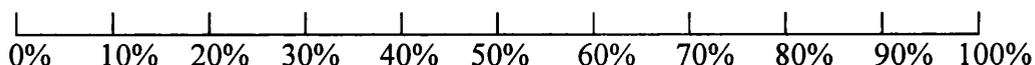
- A) What percentage of the time during this task did you experience images alone (not accompanied by thoughts)?



- B) What percentage of the time during this task did you experience thoughts alone (not accompanied by images)?



- C) What percentage of the time during this task did you experience both images and thoughts combined?



- D) During this period that you were asked to relax, what percentage of time do you estimate you actually spent relaxing?

