Development and Validation of the Glasgow Intrusive Thoughts Inventory (GITI): A New Measure For The Assessment Of Pre-Sleep Cognitive Intrusions.

and Research Portfolio

Part I

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Small Scale Service Evaluation Project

Why do patients attend? An exploration of patients' decision process when attending clinical psychology services.

Running title: Patient attendance to clinical psychology

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Prepared in accordance with the requirements for submission to the *Journal of Mental Health* (Appendix 1.1)

Abstract

This paper explores patients' reasons for attending their clinical psychology appointments. Forty patients attending their initial appointment completed a questionnaire designed from previous research on non-attendance. Using a categorisation system and responses to individual questionnaire items, results were analysed descriptively for the whole sample, and according to age, gender, and disorder. Patients' "perception of their problem" was found to be very important in their decision to attend, and remained so when analysed by age, gender, and disorder. Male participants considered "support from significant others" important in their decision to attend, with their G.P.s' reaction to their problem being particularly important. Rank ordering of individual items revealed similarities between subgroups, with the most important items associated with attendance being the effect on ones' life, the severity, and duration of the problem. Results are discussed in relation to previous research and suggestions for future research highlighted.

Introduction

Approximately one third of patients referred to UK clinical psychology services terminate therapy early (Hughes, 1995), highlighting a need to identify factors affecting attendance and ways of resolving the problem. A review of the literature on non-attendance revealed results focus on six main categories outlined below.

1."Issues" Arising Prior to the Appointment

Previous psychiatric treatment is thought to be associated with increased attendance (Carpenter *et al*, 1981; Rogawski & Edmundson, 1971), although others (e.g. Trepka, 1986) have found the reverse relationship. Betz & Shullman (1979) found that patients of both sexes were less likely to return when interviewed by a male therapist. Torrens & Harris (1996) found that although patients generally did not express a preference, those who did overwhelmingly requested a female therapist. First appointment waiting time appears to be important to patients' perception of therapy (Torrens & Harris, 1996), but not compliance (Weighill *et al*, 1983). Providing patients with information leaflets about clinical psychology prior to their appointment has also been found to increase attendance (Balfour,1986; Spector, 1988).

2. Support From Significant Others

The interaction between the G.P. and the patient at the point of referral is crucial in the patients' decision to attend (Seager, 1994). Eastman & McPherson (1982) found that G.P.s rated clinical psychology as 8th (jointly with psychiatry) in terms of input to general practice. Uncertainty regarding psychological therapy may, if detected by the patient, influence their decision process. Support from family and friends is also related to increased likelihood of attendance (Carpenter *et al*, 1981).

3. Perception Of Problems

Gerhand and Blakely (1994) found that those dropping out of treatment considered their problems to have minimum interference on their private and leisure activities. Contrary to G.P.s, psychologists also thought many patients considered themselves stigmatised if attending for treatment.

4. Expectations Of Therapy

Torrens & Harris (1996) found that attending patients were very clear about what type of treatment they wanted and held realistic views regarding the outcome of therapy.

5. Practical Issues

Practical issues (e.g. appointment location, arranging childcare) can also influence patients in their decision to attend their appointment (Weighill, *et al*, 1983).

6. Patient Characteristics

Amongst the patient characteristics studied, patients whose presenting difficulties are anxiety-related, of young age, and female, are considered less likely to attend (Carpenter *et al,* 1981; Weighill *et al*, 1983).

Why Explore Patients Decision to Attend Clinical Psychology?

Although identifying some of the factors influencing attendance at clinical psychology appointments, the above studies focus solely on patients who fail to attend. As yet there is no known research that has explored the decision process of patients who attend their appointment, despite the fact that large numbers make the decision to do so. It seems logical that patients engage in a decision process that leads them to attend their appointment (Seager 1994), but may also hold reservations about their decision. Information on factors affecting that decision process would be beneficial not only in enabling more patients to attend their appointments but, if identified at the start of therapy, could prove useful for engagement and establishing a therapeutic relationship. The present study is therefore

an investigation into which factors influenced patients in their decision to attend.

Aims of the current study

1) To assess the relative importance of factors thought to influence participants in their decision to attend their initial clinical psychology appointment.

2) To analyse differences between participants according to gender, age and disorder, in terms of the factors they identify as important in their decision to attend.

3) To determine if there are differences in participants' ratings of how strongly factors influenced their decision to attend according to gender, age and disorder.

Methodology

Population

Adult outpatients (age 16-65) attending their first appointment with clinical psychology services in Glasgow (East) formed the basis of the study.

Materials

A patient information sheet (Appendix 1.2), consent form (Appendix 1.3), and a draft questionnaire were developed to investigate patients' decision to attend their appointment. As there was no known research focusing on patients' reasons for attending, factors identified from research on non-attendance were used to construct questionnaire items.

Procedure

Pilot Study: A pilot study (n = 10) was conducted in which participants completed the draft questionnaire. Changes to the draft questionnaire were made using the results obtained, and verbal feedback from patients. Participants in the pilot study were excluded from the main study. Readability of the final questionnaire was assessed using the Flesch (1948) scoring procedure which yielded a score of 64, placing the questionnaire within the "standard" range of 60-70 (reading level = 8th/9th grade).

The final questionnaire (Appendix 1.4) comprised two sections. Section 1 recorded "demographic information" (age, sex, marital status, occupational status, presenting problems, and number of children under 16 to indicate childcare needs). Questions 7(a) and (b) were free report questions asking participants to indicate if anyone had explained to them what a clinical psychologist was, and how seeing one could help. Section 2 was a 20 item forced choice inventory focusing on reasons for attending. Questions 12, 13, & 14 assessed participants' knowledge of clinical psychology and the effect of previous psychiatric treatment. These questions involved a choice - (a) or (b) - depending on the participants' circumstances (e.g. no previous psychiatric treatment vs previous psychiatric treatment).

A response format was added in which participants were instructed to read each item and to consider if -

a) the item made them think they **would** or **would not** attend, and
b) indicate the degree to which the item influenced their decision - **"a little"** vs **" a lot"**.

Questions included in the study were structured so as to reflect themes identified from the literature (Table 1).

<< INSERT TABLE 1 HERE >>

Procedure

Main Study: To avoid confounding effects due to rapport and information gained after the first appointment, patients completed the questionnaire whilst waiting to attend their initial appointment. After reading the information sheet and, if willing to participate, participants signed the consent form and completed the questionnaire. Participants were instructed to enclose the completed consent form and questionnaire in a pre-addressed envelope provided, seal it and return it either to reception staff or their clinical psychologist who then forwarded results to the researcher.

The main study ran for 13 consecutive weeks from 17th May to 13th August 1999, during which period 43 questionnaires were received. Three were removed due to incorrect completion and/or missing data, thus 40 questionnaires formed the basis of the study. During this period, 368 patients were offered an initial appointment with clinical psychology. Fifty-three percent attended, yielding a participation rate to the study of 22.1%.

Participants

Thirteen males and 27 females participated in the study (n = 40). Age ranged from 17 to 64 years old (mean age = 36.9 years, sd =11.91). Twenty one (52.5%) were married or cohabiting, 11 (27.5%) were single, and 8 (20%) were separated, divorced or widowed. Nineteen (46.2%) were unemployed, 10 (26.6%) were

employed (full-time or part-time), and 11 (28.2%) were on sick leave, disabled, retired or students. Twenty one (53.8%) had children under 16 years old, the maximum being 3 children.

Reason For Referral (Figure 1): Classification of disorder was conducted using the DSM-IV classification system, and feedback from the clinical psychologist. The categories used were "mood disorders" and "anxiety disorders". One participant was classified as having an "eating disorder". Two other categories were developed to represent the remainder of the sample - "relationship problems" and "neuropsychological assessment". Most participants (n=25, 62.5%,) were classified as having a mood disorder, predominantly depression. Eight (20%) had an anxiety disorder (panic disorder, OCD, PTSD, GAD). Three participants attended for neuropsychological assessment, and 3 for relationship problems.

<< INSERT FIGURE 1 HERE >>

Opt - In: As only some psychologists operated an opt-in service, it was decided to compare responses of those who opted into treatment versus those sent a standard appointment. Twenty six participants (65%) opted in, and 14 (35%) were sent a standard appointment. All received a standard information leaflet on clinical psychology with their letter.

Results

Results were analysed descriptively according to the aims stated.

Aim 1 : To assess the relative importance of items thought to influence participants in their decision to attend their initial clinical psychology appointment.

The results of the total sample (n=40) were converted into a frequency chart according to the categories outlined in Table 1. The results are presented in Table 2.

<< INSERT TABLE 2 HERE >>

Most participants rated all items in the questionnaire as being influential to some degree in their decision to attend. All 40 participants considered the severity of their problem, duration of their problem, and its effect on their life as reasons for attending their appointment. Eight participants felt that the gender of their psychologist was important in their decision to attend. Three participants (1 male, 2 females) indicated that their psychologists' gender (in all cases male) had made them consider not attending. The number of responses on "would **not** attend (a lot)" was small, and inspection of the data revealed no connection to a specific item or category, although all were rated as such by females. Twenty-six participants (65%) considered their G.P.s' reaction to their problem

to be very important in their decision to attend, with 2 participants indicating that this had made them consider not attending. Twenty-five participants (70%) felt they had some knowledge of what a clinical psychologist was. Thirteen (46.4%) felt this was very important in their decision to attend. One third of the sample did not know what a clinical psychologist was, and had considered not attending to a minor degree. Twenty participants (50%) had received previous psychiatric treatment. Twelve indicated that this was important in their decision to attend. Four participants felt it had made them consider not attending. Of those with childcare needs, almost one third indicated that having to arrange childcare made them consider not attending. Of the 10 participants who were employed, only 2 felt arranging time off work made them consider not attending.

To assess the relative importance of items, the raw data was arranged according to the categories in Table 1. As the majority of responses were recorded under "[made me think I] **would attend (a lot)**", responses recorded under this heading were collated and converted into percentages to reflect the distribution by categories (Figure 2).

<< INSERT FIGURE 2 HERE >>

"Perception of problems" accounted for the greatest proportion of responses, followed by "support from significant others". "Practical

issues" associated with attendance accounted for the least proportion of responses.

The number of participants' responding "would attend (a lot)" on individual items was converted to percentages to determine the order of the 10 most important factors associated with attendance (Table 3).

<< INSERT TABLE 3 HERE >>

90% of the total sample considered "effect on life" as very important in their decision to attend. Eighty per cent viewed the "severity of the problem" and "duration of the problem" as very important. "G.P.s' reaction" was ranked 4th (65%).

The "letter from clinical psychology" was ranked 6.5 (55%), however no difference occurred when results were compared for those opting into treatment versus those receiving a standard appointment letter.

Aim 2 : To analyse differences between participants according to gender, age, and disorder in terms of the factors they identify as important in their decision to attend.

To compare demographic and clinical subgroups the categorisation system was adopted and percentages calculated on "would attend (a lot)" for visual inspection using pie charts. The results are presented in Appendix 1.5 [figures (i) to (vii)] and are summarized below.

Gender

"Perception of problems" accounted for the greatest proportion of responses associated with attendance regardless of gender. For males, "support from significant others" accounted for the second largest proportion of responses, whilst for females "expectations of therapy" was second. "Support from significant others" accounted for the least amount of female responses, alongside "practical issues" associated with attendance.

Age

The total sample was arranged into 3 age groups; 16-30 years, 31-45 years, and 45+ years. For all 3 groups, "perception of problems" accounted for the greatest proportion of responses. In general, all 3 groups were similar in the proportion of responses allocated to other categories.

Psychiatric Disorder

Results are shown for the "mood disorders" and "anxiety disorders" subgroups. "Perception of problems" accounted for the greatest proportion of responses associated with attendance for these subgroups, and both were similar in the proportion of responses in other categories. Those with "relationship problems" considered "practical issues" associated with attendance important in their decision to attend. "Support from significant others" accounted for the least proportion of responses for this group.

Aim 3: To determine if there are differences in participants' ratings of how strongly factors influenced their decision to attend according to gender, age, and disorder.

The number of responses for "would attend (a lot)" on individual items was calculated and results placed in rank order to determine the most important items according to gender, age, and disorder.

Gender

"Effect on life" was rated the most important item by both males and females (Table 4). "G.P.s' reaction" was ranked 2nd for males, alongside "duration of problems" and "severity of problems". For females, "G.P.s' reaction" was ranked 5th behind "benefit of seeing a clinical psychologist".

<< INSERT TABLE 4 HERE >>

Age

Little difference was found between the 3 age groups and the top 5 items associated with attendance (Table 5). All 3 age groups ranked "effect on life" as most influential, followed by "severity of problem" and "duration of problem".

<< INSERT TABLE 5 HERE >>

Psychiatric Disorder

For those with "mood disorders" and "anxiety disorders", the most important factor associated with attendance for both was the "effect on [their] life" (Table 6). There was little variation between groups on items included within the top 5.

<< INSERT TABLE 6 HERE >>

Information on Clinical Psychology

Analysis of free report answers [section one, question 7 (a,b)] revealed that 17 participants (42.5%) felt they had no information on what a clinical psychologist was, and how attending could help with their current difficulties, despite the fact that all referred patients received an information leaflet explaining these issues. The

remainder indicated varying degrees of knowledge, or stated that they had read the information leaflet.

Discussion

The factors considered in the present study as potentially relating to patients' decision to attend clinical psychology appointments were developed from the literature on non-attendance. Analysis of pooled results according to categories highlighted that patients' "perception of problems" was particularly important in their decision to attend. This remained so when results were analysed by gender, age, and disorder. Arrangement of results in rank order supported the conclusion that the severity, duration, and effect on ones' life, appear to be strong positively motivating factors associated with attendance, supporting previous research (Gerhand & Blakely, 1994) that non-attenders view their problems as having limited interference in their life.

Unlike females, males viewed "support from significant others" as important in their decision to attend, with their G.P.s' reaction to their problem being as important as the duration and severity of their problems. In line with Gerhand & Blakely (1994), males may still perceive there to be a stigma attached to psychological problems. A supportive response from G.P.s is therefore vital in enabling males to accept treatment, supporting Seager (1994), who highlighted that

engagement in therapy begins to grow or falter at the point of referral. Further research would be beneficial in exploring this finding.

Unlike previous research (Betz & Shullman, 1979; Torrens & Harris, 1996), most patients did not view their psychologists' gender as important in their decision to attend. None of the previous studies specify if this finding is related to particular groups (e.g. survivors of child sexual abuse, victims of sexual and/or physical assault). Similarly, patients in the present study were not asked about traumatic experiences, or to indicate if given the choice what their response would be, therefore it is difficult to expand on this result.

Those participants with "mood disorders" and "anxiety disorders" were similar in their perception of which factors were important in their decision to attend. Those with "relationship problems" were the only group to consider "practical issues" important in their decision to attend, whilst "support from significant others" was not considered important by this group. Numbers within this group were small, and further research using larger samples is required, however two participants (a couple), subsequently dropped out of treatment through problems arranging childcare and time off work, therefore supporting their rating of this category.

No differences were observed when results were compared by age group, or for those who opted into treatment versus those sent a standard appointment letter, supporting Seagers' (1994) view that opt-in still leaves the patient with a choice to accept or decline appointments after the G.P. has made the referral. Thus, although beneficial in reducing waiting lists and DNA rates (Waring *et al*, 1999), the opt in system adopted in this area does not appear to affect patients' decision to attend their clinical psychology appointment.

Analysis of patients' knowledge of clinical psychology prior to their first appointment revealed that, when patients read the information leaflet enclosed with the appointment letter, this tended to be their primary source of information on the service they would receive. Other responses included *"my doctor told me it would help"* and *"it's someone to talk to"*. It would therefore be beneficial to explore other methods of improving patients' knowledge of clinical psychology (e.g. a return appointment with the G.P. to discuss any queries prior to referral) and analysing the effect on their decision to attend.

This study was an exploratory one, as no similar research has focused on the patients' decision process when attending clinical psychology appointments. Nevertheless, the results are a step towards achieving what Seager (1994) referred to as *"psychologising the referral process"*, by identifying factors patients consider

important in their decision to attend. Replication using a larger sample would help consolidate or disprove findings, whilst a comparison of attenders and non-attenders could determine significant differences within the decision process. Comparing those who attend but terminate therapy early could provide greater understanding of factors influencing patients in their decision and predict factors associated with early termination.

In a minority of cases, patients voluntarily discussed items within the questionnaire that they found particularly relevant to their decision to attend. Discussion of items was successfully used to dispel fears patients had, and to educate patients about psychological therapy. Although not designed as a tool to facilitate engagement, further development of the questionnaire for therapeutic use could be conducted.

In summary, this study has been successful in highlighting the importance of considering what happens before patients arrive at our clinical psychology departments, the decision process they engage in that leads them to attend, and the importance of utilising that process more productively to improve services for patients referred to clinical psychology.

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Table 1 : Categorisation of questions

Category	Question
Practical Issues Associated with Attendance	1 – Location 2 - Time of appointment 4 - Arranging childcare 5 - Arranging time off work
"Issues" Arising Prior to Appointment	3 - Waiting time 6 - Letter from clinical psychology 14 (a,b) - Perceptions of treatment 17 - Gender of psychologist
Perceived Support From Significant Others	7 - G.P.s' reaction 15 - Views of family 16 - Views of friends
Perception of Problems	8 - Severity of problems 9 - Duration of problems 10 - Effect of problems on life
Expectations of Therapy	11 - Benefits of attending clinical psychology 12 (a,b) - Awareness of clinical psychology 13 (a,b) - Awareness of role of clinical psychology

Table 2 : Raw data of total sample (n = 40) by category

Question	No. Responding "Attend-a little"	No. Responding "Attend-a lot"	No. Responding "Not attend - a little"	No. Responding "Not attend - a lot"
Category 1 : Practical Issues 1 – Location	21	18	1	0
2 – Time	23	14	3	0
4 - Arranging childcare	9	3	3	2
5 - Arranging time off work	6	4	2	0
Category 2 : Issues Prior to Appt. : 3 - Waiting Time	25	8	6	1
6 - Letter from Clinical Psychology	18	22	0	0
14 (a) : Previous psychiatric treatment	8	12	3	1
14 (b) : No previous psychiatric treatment	9	2	4	1
17 - Gender of psychologist	29	8	1	2
Category 3 : Perceived support from others : 7 - G.P.'s reaction	12	26	1	1
15 - Views of family	14	22	3	1
16 - Views of friends	20	15	5	0
Category 4 : Perception of problem : 8 - Severity of problem	8	32	0	0

9 - Duration of problem	8	32	0	0
10 - Effect on life	4	36	0	0
Category 5 : Expectations of therapy : 11 - Benefits of seeing a Clin. Psy.	14	24	2	0
12 (a) - Knowledge of what a clin. Psy. is	12	13	3	0
12 (b) - No knowledge of what a clin. Psy. is	6	2	4	0
13 (a) - Knowledge of how clin. psy. could help	10	18	2	0
13 (b) - No knowledge of how clin. Psy. Could help	6	1	3	0

Table 3: Rank order of items by importance in decision to attend for response "Would Attend (a lot)" (n=40)

Rank	Item	% of Total Sample
1	Effect on Life	90
2.5	Severity of Problems	80
2.5	Duration of Problems	80
4	G.P.'s Reaction	65
5	Benefit of Seeing a Clinical Psychologist	60
6.5	Letter From Psychology	55
6.5	Views of Family	55
8.5	Location	45
8.5	Knowledge of How Clinical Psychology Could Help	45
10	Views of Friends	37.5

Table 4 : Rank order of item importance by gender for response "would attend (a lot)"

Males (n=27)			Females (n=13)		
Rank	**Item**	**% of sample**	**Rank**	**Item**	**% of sample**
1	effect on life	84.6	1	effect on life	92.6
3	G.P.'s reaction	69.2	2.5	duration of problems	85.2
3	duration of problems	69.2	2.5	severity of problems	85.2
3	severity of problems	69.2	4	benefit of seeing a Clinical Psychologist	70.4
5	views of family	61.5	5	G.P.'s reaction	63

Table 5 : Rank order of item importance by age for response "would attend (a lot)"

Age Group 16 – 30 (n=12)			Age Group 31 – 45 (n=16)			Age Group 45 + (n=12)		
Rank	**Item**	**% of sample**	**Rank**	**Item**	**% of sample**	**Rank**	**Item**	**% of sample**
1	effect on life	83.3	1	effect on life	100	1	effect on life	83.3
2.5	severity of problem	75	1	duration of problem	100	2.5	severity of problem	66.7
2.5	duration of Problem	75	1	severity of problem	100	2.5	duration of problem	66.7
4	G.P.'s reaction	66.7	4	benefit of seeing a Clin. Psy.	80	4.5	G.P.'s reaction	50
5	benefit of seeing a Clin. Psy.	58.3	5	G.P.'s reaction	73.3	4.5	views of family	50

Table 6 : Rank order of item importance by disorder for response "would attend (a lot)"

Mood Disorders (n=25)				Anxiety Disorders (n=8)		
Rank	**Item**	**% of sample**		**Rank**	**Item**	**% of sample**
1	effect on life	87.5		1	effect on life	100
2	duration of problems	83.3		1	duration of problems	100
3.5	severity of problems	79.2		1	severity of problems	100
3.5	G.P.'s reaction	79.2		1	views of family	100
5	benefit of seeing a Clinical Psychologist	66.7		5	benefit of seeing a Clinical Psychologist	62.5
				5	letter from Clinical Psychology	62.5
				5	views of friends	62.5

Figure 1: Total sample by disorder (n=40)

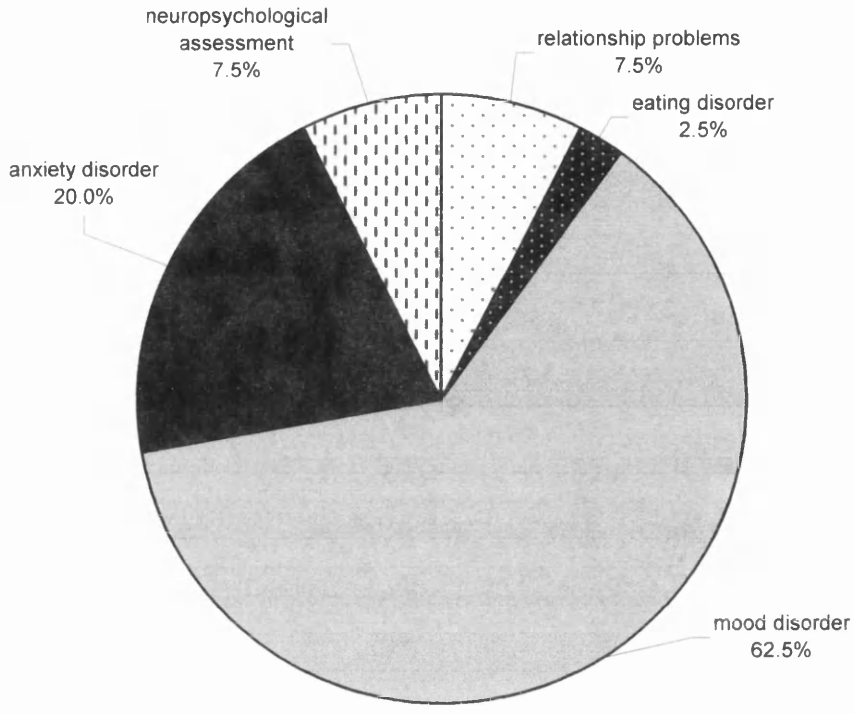
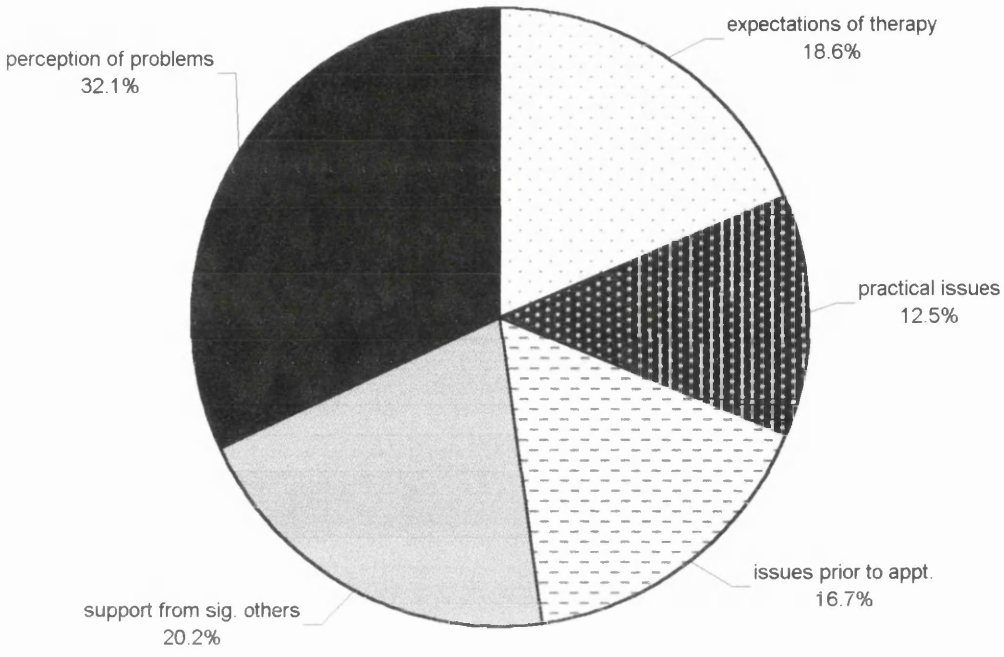


Figure 2: Total sample by category on "Would Attend - (a lot)"



Major Research Project Literature Review

Assessing Pre-Sleep Cognitive Intrusions : A Review of Current Self-Report Measures and Suggestions for Future Scale Development.

Prepared in accordance with the requirements for submission to the *British Journal of Clinical Psychology* (Appendix 2.1)

Title: Assessing pre-sleep cognitive intrusions: A review of current self-report measures and suggestions for future scale development.

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Abstract

This paper reviews the role of pre-sleep cognitive arousal and dysfunction in the development and maintenance of sleep-onset insomnia from a cognitive-behavioural perspective. Experimental and clinical evidence is presented that supports the role of cognitive arousal in delaying sleep onset. Recent research has suggested that pre-sleep cognitive intrusions are particularly important to the assessment and treatment of sleep-onset insomnia, and that they share a number of commonalties (e.g. type, frequency, ease of dismissal) with the experience of cognitive intrusions in other disorders such as OCD and GAD. Research has highlighted the specific content and structure of pre-sleep cognitive intrusions, and a methodological review of existing self-report measures assessing pre-sleep cognitive arousal and dysfunction suggests that existing scales are inadequate in their ability to validly assess pre-sleep cognitive intrusions. It is argued that the development of a new scale designed to assess pre-sleep cognitive intrusions would hold significant benefits for future research in this area, and cognitive-behavioural treatment approaches for sleep-onset insomnia.

Title: Assessing pre-sleep cognitive intrusions: A review of current self-report measures and suggestions for future scale development.

Introduction

Insomnia is defined as a "heterogeneous complaint reflecting reduced quality, duration, or efficiency of sleep (Morin *et al,* 1999). Primary insomnia is reported by up to 30% of the population, with the prevalence of chronic insomnia estimated at 10-15% (Ohayon, Caulet, & Guilleminault, 1997). Up to 44% of patients presenting with complaints of insomnia are also reported to have a psychiatric disorder (Buysse *et al,* 1994), such as mood disorders (e.g. depression, anxiety), schizophrenia, and eating disorders (Espie, 1991). Medical disorders, such as cardiovascular, renal, and gastrointestinal problems, are also known to disrupt sleep (Espie, 1991). This makes insomnia, or complaints of sleep loss, a common presenting problem in daily clinical practice, that often persists relatively unchanged over many years (Morin *et al,* 1999).

As with other disorders, cognitive-behavioural treatment approaches (CBT) for primary insomnia are now widely used in clinical practice (Espie, Inglis, Tessier, & Harvey, 1999). This review examines the role of pre-sleep cognitive activity in the establishment and maintenance of sleep-onset insomnia. Methodological issues associated with the assessment of pre-sleep cognitive arousal and dysfunction are discussed, and suggestions are made for future scale developments to aid the assessment and treatment of pre-sleep cognitive intrusions.

Pre-sleep cognitive arousal in sleep-onset insomnia

"Psychological arousal" in insomnia can be classified as *cognitive* (related to intrusive thoughts, self-beliefs) or *emotional* (due to psychopathology, personality variables) (Espie, 1991). There now exists a growing body of experimental and clinical research highlighting the central role of cognitive arousal in sleep-onset insomnia. In a survey of causal attributions of insomnia, Lichstein and Rosenthal (1980) found that insomniacs were ten times more likely to blame excessive cognitive activity as opposed to somatic activity for their sleep disturbance. Experimental work by Gross and Borkovec (1982) demonstrated that increased sleep-onset latency (SOL) could be induced in good sleepers by increasing cognitive arousal. Participants were instructed to have a daytime nap after being given one of three instructions designed to manipulate the likelihood of cognitive arousal. Group one were told simply to go to sleep. Group two were told that they had to give a three-minute speech following their sleep, while group three were given the same instructions and told the topic on which they were to present. Results revealed that group three took significantly longer to fall asleep, and obtained less sleep overall than the other groups. The effect was found to occur independently of physiological activity (heart rate and skin conductance measures), supporting the causal role of cognitive arousal in sleep-onset insomnia. Similar results were obtained by Haynes, Adams, and Franzen (1981) who examined SOL in insomniacs and good sleepers exposed to brief cognitive stressors (a series of moderately difficult mental arithmetic problems) on the fourth and fifth night prior to sleep-onset during a five night stay in a sleep laboratory. Significant increases were observed in

good sleepers for both objective measures of SOL (time to reach stage II sleep as measured using polysomnograph recordings), and subjective measures (sleep diary). Interestingly, insomniacs exhibited decreased objective and subjective SOL recordings. The authors suggest that the task had interrupted the usual ruminative, intrusive cognitive activity that occurs during the pre-sleep phase, thereby resulting in shorter SOL. These findings can be understood when considering CBT approaches for insomnia, a more detailed discussion of which is presented later. CBT approaches often involve teaching clients strategies that disrupt the usual flow of ruminative, intrusive cognitive activity. The introduction of a different cognitive stressor may have functioned in a similar manner to disrupt pre-sleep cognitive activity and decrease SOL.

Morin (1993) has proposed an integrative model of insomnia (Figure 1) which cites hyperarousal (emotional, cognitive, and physiologic) as the central mediating feature of insomnia. Arousal is elevated by various stimulus conditions (e.g. maladaptive bedtime routines, sleep-incompatible activities) that interrupt sleep-onset. The resulting sleep-loss leads to cognitive arousal (e.g. worries over sleep-loss, ruminations about the effect on daytime performance, misattributions, unrealistic expectations, and a general body restlessness). The consequences for the next day are social discomfort, fatigue, mood disturbance, and performance impairments. Over time, the perceived negative sequelae are seen to trigger further dysfunctional cognitions about oneself and sleep, and a pattern of maladaptive coping develops (e.g. spending excessive time in bed, daytime

napping, irregular sleep-wake schedules). These temporarily minimise sleep loss, but eventually interfere with the sleep-wake rhythm. Cognitive distortions serve to further increase emotional distress and aggravate the disorder further.

<<< INSERT FIGURE 1 HERE >>>

Morins' (1993) model and previous experimental findings highlight the importance of cognitive dysfunction both as a causal factor and a mediating factor in sleep-onset insomnia. This has led to more detailed exploration of the content and process characteristics of pre-sleep cognitive intrusions. Such research has its roots in previous research conducted with other clinical populations, a brief summary of which is given below.

Cognitive intrusions: definition and research findings from other clinical populations

Rachman (1981) defined unwanted intrusive thoughts as *"repetitive, unacceptable or unwanted thoughts, images or impulses that (a) interrupt ongoing activity; (b) are attributed to an internal origin; and (c) are difficult to control"* (p.89). The majority of research into the content and process characteristics of cognitive intrusions has focused on their role in disorders that have worry as a core component, such as obsessive-compulsive disorder (OCD) (e.g. Salkovskis, Richards & Forrester, 1995) and generalised anxiety disorder (GAD) (e.g. Wells, 1999). Using non-clinical samples, Rachman and De Silva (1978) and, in a later replication,

Salkovskis and Harrison (1984), demonstrated that in a comparison of abnormal and normal obsessions, cognitive intrusions shared a number of similarities (e.g. type of intrusion, frequency, and the ease of dismissal). In a critique of the literature on the assessment of intrusive thoughts, Clark and Purdon (1995) suggest that along with thought content, process characteristics (e.g. frequency, degree of intrusiveness, uncontrollability) need to be considered during assessment to help distinguish cognitive intrusions from other non-intrusive cognitions.

Pre-sleep cognitive intrusions: research findings

Van Egeren, Haynes, Franzen and Hamilton (1983) examined pre-sleep cognitions in chronic insomniacs. Prior to spending five nights in a sleep laboratory, participants were interviewed to assess sleep parameters, their perceived control over pre-sleep cognitions, and their causal attributions for their sleep-onset difficulties. On the fifth night, participants were involved in a pre-sleep cognitive sampling procedure using a "beep" which sounded at random intervals and signalled to participants to state the thought that occurred prior to the beep. The sampling phase lasted a maximum of thirty minutes, after which participants were interviewed to clarify statements, to obtain ratings of affect (anxiety and degree of unpleasantness), and perceived control associated with each thought. Results suggested that the content of pre-sleep cognitions was related to laboratory-measured subjective SOL (but not objective SOL), general sleep problem concerns, and the degree of discrepancy between objective and subjective measures of sleep-onset. Pre-sleep cognitions concerning sleep, physical sensations, and

environmental cues were associated with longer subjective SOL and greater general concerns about sleep. The authors concluded that further investigation of cognitive factors such as ruminative thoughts, frequency, and content categories would support a cognitive theory of sleep-onset insomnia.

Watts, Coyle and East (1994) have defined insomniacs as either "worrying insomniacs", whose pre-sleep cognitions focus on various topics (e.g. thoughts about sleep, trivial topics, plans, work, bodily sensations, family, and recent concerns), or "non-worrying insomniacs" whose pre-sleep cognitions focus predominantly on concerns about sleep loss. More recently, Harvey (2000) used a semi-structured interview to investigate the focus of attention, content, and process characteristics of pre-sleep cognitions in good sleepers and insomniacs. As expected, insomniacs reported poorer sleep quality and estimated their SOL to be longer in comparison to good sleepers. Ratings of cognitive interference, estimated duration, and intrusiveness (preoccupation and effect on sleep) were higher for insomniacs than for good sleepers. Similar to Watts *et al* (1994), insomniacs' attention was focused on trying to solve problems, worries, or concerns, listening to noises inside and outside the house, thinking about not sleeping, and reviewing events of the day. Insomniacs also reported that their thinking "just happened", whereas good sleepers viewed their thinking as intentional. As previously highlighted, an important finding within the literature on intrusive thoughts is the individuals' perceived lack of control over their thinking processes (Clark & Purdon, 1995). This finding would

suggest that process characteristics found in other disorders are also relevant to the assessment of pre-sleep cognitive intrusions.

Wicklow and Espie (2000) identified eight categories of pre-sleep cognitive intrusions by obtaining "live" recordings of insomniacs' thoughts during the pre-sleep phase using voice-activated tape recorders. Actigraphic recordings and sleep diaries were used to provide objective and subjective estimates of SOL respectively. The Actiwatch (Cambridge Neurotechnology Ltd, Sleepwatch Software) is an activity monitoring system that is attached to the wrist and, based on the amount of movement, can reliably differentiate between sleep and wake periods (Sadeh, Hauri, Kripke, & Lavie, 1995). Hauri and Wisbey (1992) recommend actigraphy as an additional tool in the clinical evaluation of insomnia, and results are highly correlated with polysomnographic (PSG) measures of sleep (Kripke, Mullaney, Messin, & Wybourney, 1978). Three categories of pre-sleep cognitive intrusions labelled "thinking about sleep", "the anticipated consequences of poor sleep", and "general problem solving" emerged as the strongest predictors of objective SOL. Factor analysis revealed that the content of pre-sleep cognitive intrusions could be classified under three factors – "active problem-solving", "present state monitoring" and "environmental reactivity" – accounting for 63% of the total variance. Only objective measurement of SOL was significantly correlated with the categorical content of pre-sleep cognitive intrusions. The authors concluded that the use of "live" recordings of pre-sleep cognitive intrusions merited further

investigation, and that the categorical and factorial structure uncovered might be used to develop a scale to assess pre-sleep cognitive intrusions.

The assessment of pre-sleep cognitive dysfunction

The above findings highlight the important role of cognitive intrusions in sleep-onset insomnia, however there is, as yet, no self-report measure available to aid assessment in this area. The following section reviews the psychometric properties of existing measures, and raises methodological issues supporting the development of a new scale to measure pre-sleep cognitive intrusions.

<<< INSERT TABLE 1 HERE >>>

Table 1 provides a description of the current measures available for the assessment of pre-sleep cognitive dysfunction and arousal. What is immediately apparent is the lack of reliable and valid measures available. A review of the scale development literature revealed only four measures commonly used in the assessment of pre-sleep cognitive dysfunction and arousal. Information on the scale development procedure used, and each scales' psychometric properties is reviewed below.

The Pre-Sleep Arousal Scale (PSAS)

Nicassio, Mendlowitz, Fussell, and Petras (1985) developed the PSAS to assess the intensity of pre-sleep somatic and cognitive arousal. Items for the PSAS were developed from clinical observations and interviews with

insomniacs. The component structure, reliability, and validity of the PSAS were explored using a large sample of students, good sleepers, and insomniacs. Participants completed the PSAS along with other measures of affect and sleep (see Table 1). For insomniacs, results suggested that the cognitive and somatic subscales of the PSAS were internally consistent over time ($r = 0.81$, $r = 0.76$ respectively). Similar values were obtained for students ($r = 0.88$, cognitive subscale, $r = 0.79$, somatic subscale), and good sleepers ($r = 0.67$, cognitive subscale, $r = 0.84$, somatic subscale). Although a modest correlation between the cognitive and somatic subscales emerged ($r = 0.51$), the subscales were statistically independent (74% unshared variance). Using the student sample, test-retest reliability was found to be acceptable ($r = 0.72$-cognitive subscale; $r = 0.76$-somatic subscale). A low correlation ($r = 0.29$) emerged between the somatic subscale and SOL, however the cognitive subscale demonstrated a stronger association ($r = 0.59$). Acceptable levels of construct validity emerged, with both scales correlating modestly with measures of anxiety ($r = 0.50$-cognitive subscale; $r = 0.58$-somatic subscale) and depression ($r = 0.40$-cognitive subscale; $r = 0.41$-somatic subscale). The PSAS was found to successfully discriminate between insomniacs and good sleepers, with insomniacs scoring significantly higher on individual items in the cognitive subscale (t value range 2.69 ($p<0.05$) to 10.99 ($p<0.001$); somatic subscale t value range 2.17 ($p<0.05$) to 5.84 ($p<0.001$)).

Wicklow and Espie (2000) found the PSAS cognitive subscale to be significantly correlated with subjective diary estimates of SOL ($r = 0.42$),

but not objective measures (actigraphic recordings) of SOL (r = 0.17). The PSAS cognitive subscale was modestly correlated with factor 2 "present state monitoring" (r = 0.43), and 3 specific thought categories ("sleep and its consequences" r = 0.37; "rehearsal/planning" r = 0.33; "autonomic experiences" r = 0.29).

Sleep Disturbance Questionnaire (SDQ)

Espie, Brooks, and Lindsay (1989) developed the SDQ to guide the implementation of CBT as part of a major controlled outcome trial. Again items were generated through clinical judgement, and assessed four areas of dysfunction - physical tension; sleep incompatible behaviour; anxious effort to sleep; and general cognitive intrusion. Results suggested that three factors – F1 -"mental anxiety", F2 -"sleep pattern" and F3 -"physical tension" – accounted for 68% of the total variance. Validity and internal consistency were not explored in this early study.

Espie, Inglis, Harvey, and Tessier (2000) investigated the psychometric properties of the SDQ using a large sample of clinically presenting insomniacs. They found the SDQ to have satisfactory internal consistency (r = 0.67). Analysis of the factorial structure suggested four factors were accountable for 61% of the total variance (F1-"restlessness/agitation"; F2-"mental over-activity"; F3-"consequences of insomnia"; F4-"lack of sleep readiness").

Dysfunctional Beliefs & Attitudes About Sleep Scale (DBAS)

Morin (1993) and Morin, Stone, Trinkle, Mercer, and Remsberg (1993) developed the DBAS to aid the assessment of pre-sleep cognitions, pre- and post-treatment. Items for the questionnaire were generated from reviews of patient monitoring forms, clinical judgement, and theoretical conceptualisations of sleep-onset insomnia. The resulting thirty analogue-scaled items were not investigated for their component structure, reliability or validity, although internal consistency was high (r = 0.81, Morin *et al,* 1993). Morin (1993) described five subscales within the DBAS ("misconceptions about the cause of insomnia"; "misattributions of amplification of the consequences"; "unrealistic expectations"; "control & predictability of sleep"; "faulty beliefs"), however the factorial structure was not investigated at this point. Using a sample of older adult insomniacs and good sleepers, Morin *et al* (1993) found that insomniacs endorsed stronger dysfunctional beliefs about sleep than good sleepers, with beliefs related to the perceived consequences of insomnia, fear of losing control, and the unpredictability of sleep discriminating the two groups.

Espie *et al* (2000) analysed the psychometric properties of the DBAS. Only two of the original five subscales proposed by Morin achieved satisfactory levels of internal consistency ("misattributions/amplifications of the consequences of insomnia" r = 0.77; "diminished perceptions of control and predictability of sleep" r = 0.41). Measurement sensitivity of the thirty items revealed that ten items displayed sensitivity to change following treatment and at follow-up. The amended scale (DBAS-10) demonstrated satisfactory

internal consistency (r = 0.69). The scale appeared to be factorially "pure", with three factors accounting for 55% of the total variance (F1-"beliefs about the immediate negative consequences of insomnia"; F2-"beliefs about the long-term consequences"; and F3-"beliefs about the need for active control over thought processes").

The Self-Statement Test:60+ (SST:60+)

The SST:60+ is a 34-item self-report measure of older adults' pre-sleep cognitions (Fichten, Creti, Amsel, *et al,* 1995, Fichten, Creti, Bailes, *et al,* 1997; Fichten, Libman, Creti, *et al,* 1998). Items were derived using open-ended thought listings to examine older adults' thought content during nocturnal awake times. In the initial study (Fichten, Creti, Amsel, *et al,* 1995), findings were linked to Schwartz and Garamonis' (1986) "states of mind ratio" [positive (positive + negative) thoughts] to reflect two subscales (a positive subscale and a negative subscale), and it was found that highly distressed insomniacs had more negative pre-sleep cognitions, more frequent "worry thoughts", and worse ratings of "overall thought unpleasantness" than minimally distressed insomniacs and good sleepers. In subsequent studies (Fichten, Creti, Bailes, *et al,* 1997; Fichten, Libman, Creti, *et al,* 1998), the SST:60+ was further developed, and administered to a large group of older adults (college/university seniors) along with other indices of sleep disturbance (see Table 1). The SST:60+ was found to have good internal consistency (Cronbach's α = 0.903 - positive subscale; α = 0.898 - negative subscale). Following factor analysis, three factors emerged, accounting for 48.5% of the total variance (F1-"generalised positive

thinking"; F2-"generalised negative thinking"; F3-"sleep thoughts"). No significant correlations with other self-report measures emerged.

Limitations of existing measures

There are a number of problems with existing measures that affect their ability to accurately assess pre-sleep cognitive intrusions. Firstly, the PSAS, SDQ, and DBAS-10 were not developed specifically for the assessment of pre-sleep cognitive intrusions, and therefore provide a more global measure of cognitive dysfunction and arousal. Secondly, all scale items were obtained through various methods of retrospective analysis. The content accuracy of a review of patient thought records and/or diaries may decrease as patients typically complete such records the morning after. Thus, there are likely to be problems with the accuracy of reports (e.g. specificity of thoughts, omissions or distortions due to forgetting). For similar reasons, patient interviews are likely to be less reliable and accurate, and also limit responses through the use of pre-defined questions. Thirdly, none of the scales directly reflect the research findings of Harvey (2000) who highlighted the specific thought content of pre-sleep cognitive intrusions, or the findings of Wicklow and Espie (2000) who revealed the categorical nature and factorial structure of pre-sleep cognitive intrusions. Closest to this is the SST:60+, as it focuses specifically on cognitions during the pre-sleep phase and nocturnal wake periods. However, the SST:60+ was developed for use with older adults. The presentation of insomnia in this population is often compounded by the presence of age-related changes to sleep pattern, increased health problems, medication use, behavioural

factors (e.g. daytime napping), and lifestyle changes (Morin, Kowatch, Barry, & Walton, 1993; Morin *et al,* 1993). Thus, although the content of the SST:60+ appears applicable to younger insomniacs, its reliability may be affected. As yet, there are no data supporting its use with insomniacs below 65 years.

There is, therefore, a need to develop a new scale that can address these issues by providing a reliable and valid measure of pre-sleep cognitive intrusions, which can then be used in future research to explore their role in sleep-onset insomnia.

Benefits of a new scale to cognitive-behavioural treatment of sleep-onset insomnia

Meta-analytic reviews suggest that 70% to 80% of insomniacs benefit from non-pharmacological interventions, with 50% achieving clinically significant outcomes (Morin, *et al,* 1999). Multi-faceted CBT is considered to meet the American Psychological Association (APA) criteria for "probably efficacious treatment", with stimulus control, progressive relaxation and paradoxical intention currently considered "empirically supported treatments for insomnia" (Morin *et al,* 1999).

Most CBT approaches comprise a multi-component package of well established non-pharmacological treatment strategies such as progressive relaxation, stimulus control strategies, sleep hygiene practices, sleep restriction procedures and cognitive therapy (Espie *et al,* 1999; Morin *et al,*

1999; Schramm, Hohagen, Backhaus, Lis, & Berger, 1995;). Espie *et al* (1999) found CBT to be superior to self-monitoring in reducing SOL and wakefulness during the night. At one-year follow-up, 84% of insomniacs who received CBT had successfully stopped taking medication, suggesting that the "mind set" of participants had altered.

The core aim of cognitive therapy for sleep-onset insomnia is to help insomniacs identify and re-evaluate their faulty appraisals, misattributions, unrealistic expectations, and cognitive distortions regarding their sleep (Morin, 1993). As in other disorders, cognitive restructuring techniques such as reappraisal, reattribution, and de-catastrophising are employed (Morin, 1993). Pre-bedtime rituals (e.g. planning for the next day, completing routine tasks in early evening) help insomniacs increase their perceived control over their thinking, and make sleep more predictable (Espie, 1991; Morin *et al,* 1999). Using a revised version of Wells and Davies' (1994) *Thought Control Questionnaire (TCQ)*, Harvey (2001) compared the cognitive strategies of good sleepers and insomniacs. Insomniacs were found to use reappraisal, suppression and worry to deal with their pre-sleep cognitive intrusions. As well as suppression and reappraisal, good sleepers used social control (e.g. discussing issues with friends) and replacement. The author concluded that controlling pre-sleep cognitive activity with suppression, reappraisal, worry or punishment appears to be associated with dysfunction.

The cognitive treatment model highlights four desirable outcomes – *minimal processing of information; minimal cognitive drive; minimal effort;* and *minimal affective load.* Espie and Wicklow (1999) have outlined a cognitive treatment model (Figure 2) incorporating the desired outcomes.

<<< INSERT FIGURE 2 HERE >>>

As highlighted by Morin *et al,* (1999), control of affect-laden cognitions is achieved by dealing with thought content in advance of bedtime. Blocking techniques (e.g. articulatory suppression, thought stopping) are useful for non-affect laden cognitions, while cognitive restructuring is used for assumptions and beliefs that interfere with sleep-onset. SOL due to pre-sleep cognitive intrusions can be reduced by encouraging insomniacs to spend time (e.g. 15-20 minutes) in the early evening rehearsing the day, planning for the next day, and dealing with "unfinished business", thereby reducing cognitive load and cognitive drive in preparation for sleep-onset (Espie & Wicklow, 1999). A scale that can reliably assess and quantify pre-sleep cognitive intrusions in terms of their nature, content and frequency of interference on sleep will therefore be beneficial not only in the initial assessment of an individuals' sleep problem, but also in the process of devising appropriate treatment packages and monitoring treatment outcome more effectively.

Conclusions

This paper focused on the role of cognitive dysfunction, and in particular pre-sleep cognitive intrusions in sleep-onset insomnia. Existing measures of cognitive arousal and dysfunction were reviewed, and limitations in their ability to assess pre-sleep cognitive intrusions highlighted. CBT approaches that address pre-sleep cognitive dysfunction were presented, and the potential benefits of a new scale to cognitive-behavioural treatment packages for sleep-onset insomnia were raised.

It is therefore concluded that there is a need to develop a new scale that can validly assess pre-sleep cognitive intrusions. Such a development would be beneficial for future research on pre-sleep cognitive intrusions, and would be applicable for use in clinical settings to aid the process of tailoring cognitive-behavioural treatment to the individual needs of clients who present with sleep-onset insomnia.

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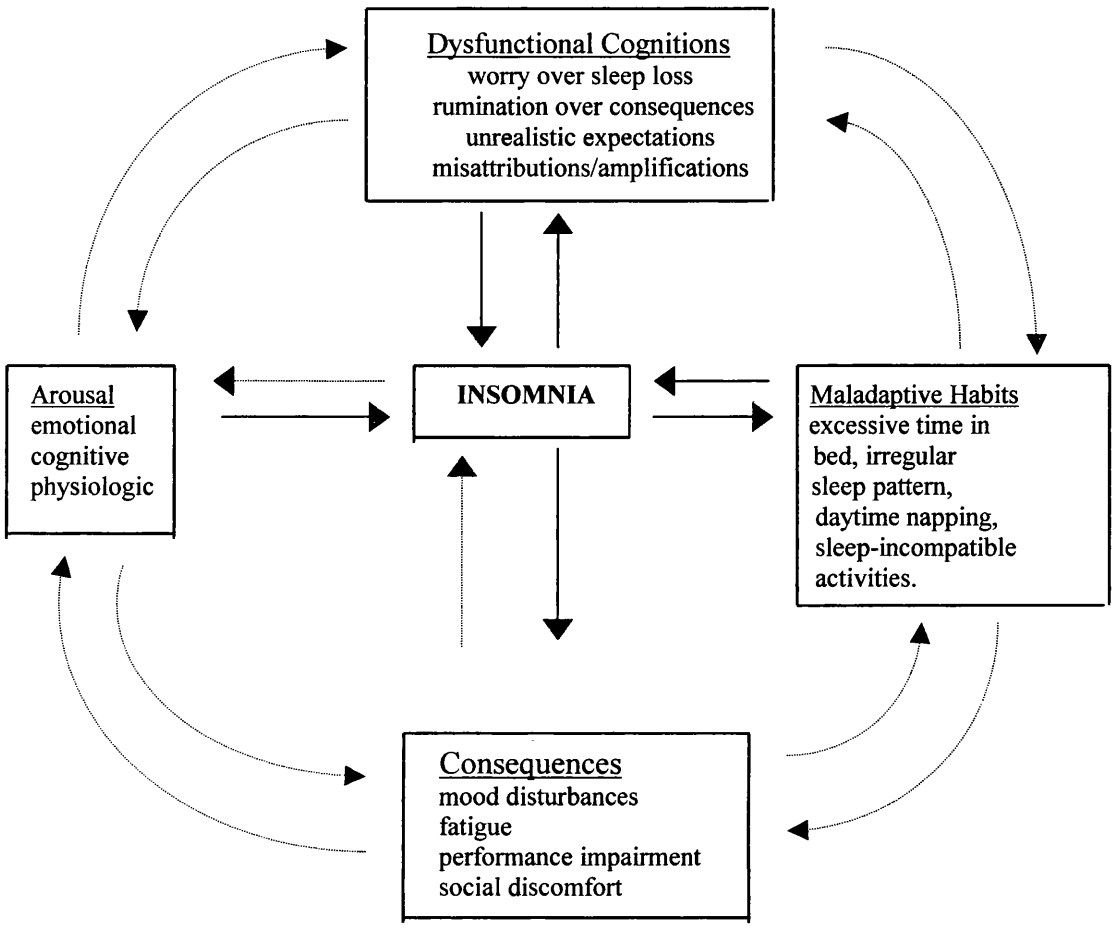
Table 1: Summary of scale development studies on pre-sleep cognitive dysfunction/arousal

Study & Scale	Participants	Scale Development	Scale Description	Item Examples
Nicassio *et al* (1985) **PSAS**	147 students, 30 adult good sleepers, 30 insomniacs.	Scale content - clinical observations, interviews with insomniacs. Psychometric evaluation – PSAS completed alongside Taylor Manifest Anxiety Scale (MAS), Cognitive-Somatic Anxiety Questionnaire (CSAQ), Centre for Epidemiological Studies Depression Scale (CES-D) & subjective measures of sleep parameters.	16 items (2 subscales – cognitive & somatic). Scoring - 1 (not at all) to 5 (extremely) rating of how intensely individual experiences symptoms during pre-sleep phase.	Q'n 1 – "worry about falling asleep". Q'n 4 – " worry about problems other than sleep". Q'n 7 – " thoughts keep running through your head".
Espie *et al* (1989, 2000) **SDQ**	Espie *et al* (1989) - 42 insomniacs; Espie *et al* (2000) - 178 insomniacs.	Espie *et al* (1989) - Scale content – clinical judgement reflecting 4 areas – physical tension, sleep incompatible behaviour, anxious "effort to sleep", & general cognitive intrusion. Psychometric evaluation (Espie *et al*, 2000) – SDQ, sleep diaries, actigraphic recordings.	12 statements rated 1 (never true) to 5 (very often true) indicating how reflective statement is of individuals' sleep pattern.	Q'n 3 – "I can't get my sleep pattern into a proper routine". Q'n 7 – "I don't feel tired enough at bedtime". Q'n 10 – "I am unable to empty my mind".

Table 1 (Cont'd)

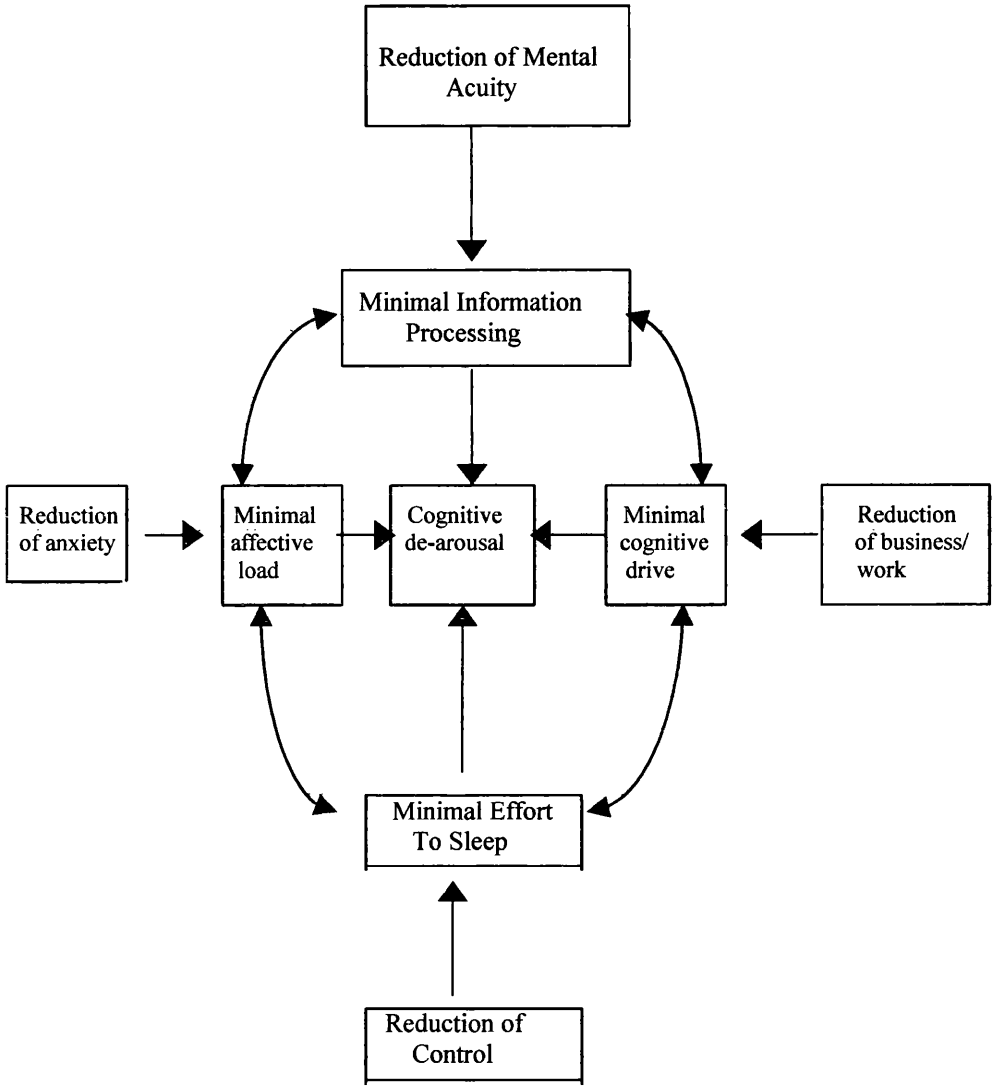
Study & Scale	Participants	Scale Development	Scale Description	Item Examples
Morin (1993); Morin *et al* (1993) **DBAS**	Morin (1993) – 75 insomniacs; Morin *et al* (1993) – 145 older adults with insomnia.	Scale content – Morin (1993): patient monitoring forms, clinical notes, & theoretical conceptualisations of insomnia.	30 analogue-scaled items. Response indicated by placing a mark on 10cm line to indicate level of agreement/disagreement ("strongly disagree" to "strongly agree").	Q'n 5 – "Insomnia seriously affects my health". Q'n 18 – "I cannot function without adequate sleep". Q'n 26 – "My sleep problem is hopeless and uncontrollable".
Fichten *et al* (1998) **SST:60+**	445 older adults with insomnia.	Scale content – open-ended thought listings to derive 34 items. Psychometric evaluation – SST:60+, PSAS, Brief Symptoms Inventory (BSI), Anxious Self Statement Questionnaire (ASSQ), Eysenck Personality Inventory (EPI) & Penn State Worry Questionnaire (PSWQ) completed.	34 items (+ve subscale & -ve subscale), 5 point response scale (0 = never, 4 = very often) indicating frequency with which thought occurs when trying to sleep.	Q'n 7 – "Good things happening to my family". Q'n 18 – "Unpleasant things I did during the past few days". Q'n 22 – "How disturbing the sounds of my bedroom are".
Espie *et al* (2000) **DBAS-10**	178 clinically presenting insomniacs	Psychometric evaluation - Espie *et al* (2000) – Original DBAS reduced to 10 items that displayed sensitivity to change after treatment and at follow-up.	10 analogue-scaled items. Response indicated by placing a mark on 10cm line to indicate level of agreement/disagreement ("strongly disagree" to "strongly agree").	Q'n 4 –"When I have trouble getting to sleep, I should stay in bed and try harder". Q'n 6 –"After a poor nights' sleep, I know it will interfere with my daily activities on the next day". Q'n 8 - "I try too hard to get to sleep".

Figure 1 : An Integrative Model of Insomnia



Morin C.M. (1993). *Insomnia - Psychological Assessment & Management.* New York Guilford Press.

Figure 2 : Proposed Cognitive Treatment Model of Insomnia



Espie, C.A. & Wicklow, A. in Shapiro, C. & Sloan, E.P. (1999) *Sleep in Psychiatry.* Cambridge University Press.

Major Research Project Proposal

The assessment of pre-sleep cognitive intrusions: Scale development and validation.

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Prepared in accordance with the D.Clin.Psy. guidelines for the Major Research Project Proposal (Appendix 3.1)

Summary

Cognitive intrusions are now thought to play an important part in pre-sleep cognitive arousal and sleep onset latency. Previous research has yielded important information regarding the content and nature of intrusive thoughts associated with insomnia. The proposed study is a psychometric scale development study which, through the recruitment of two groups (insomniacs and good sleepers), aims to demonstrate the validity, reliability and sensitivity of the scale to assess pre-sleep cognitive intrusions identified in insomnia, and to differentiate insomniacs from good sleepers. This will have particular application for both research and clinical work in insomnia. The proposed study will be carried out in Glasgow using a non-clinical population.

Introduction

Insomnia, defined as a "heterogeneous complaint reflecting reduced quality, duration, or efficiency of sleep" (Morin *et al,* 1999), is reported by up to 30% of the population, with chronic insomnia estimated at 10-15% (Ohayon Caulet, & Guilleminault, 1997). Up to 44% of patients presenting with a complaint of insomnia are reported to have a psychiatric disorder (Buysse *et al,* 1994), making insomnia, or complaints of sleep loss, one of the most common co-morbid disorders associated with poor mental health. Research into the origin and maintenance of insomnia has led to increasing emphasis on the role of pre-sleep cognitive intrusions in insomnia. A summary of the literature is presented below.

Cognitive Models of Insomnia

Researchers have separated "psychological arousal" in insomnia into two sub-components distinct from "physiological arousal", these being *cognitive arousal* (e.g. intrusive thoughts, self-beliefs) and *emotional arousal* (e.g. psychopathology, personality) (Espie, 1991). Insomniacs are known to experience high levels of cognitive arousal, and it is believed that this is more strongly associated with delayed sleep onset than somatic arousal (Lichstein & Rosenthal, 1980; Gross & Borkovec, 1982; Morin, 1993). Research illustrates that insomniacs endorse state (pre-sleep) and trait (daytime) measures, with obsessive worry being a common cognitive style (Edinger, Stout, & Hoelscher, 1988), increasing their affective response to poor sleep (Coyle & Watts, 1991). When instructed to worry, insomniacs report increases in negative intrusions (Borkovec, Robinson, Pruzinsky, &

De Pree, 1983).

These findings replicate research focusing on the role of intrusive thoughts in other disorders such as obsessive-compulsive disorder (OCD) (Trinder & Salkovskis, 1994; Wells & Papageorgio, 1995) and generalised anxiety disorder (GAD) (Wells & Morrison, 1994). Research on intrusive thoughts also highlights that deteriorations in mood occur as the frequency of negative intrusions increase (Reynolds & Salkovskis, 1992). Furthermore, attempting to suppress negative cognitions leads to increases in the degree of intrusiveness (Matthews & Milroy, 1994), suggesting that suppression has a paradoxical effect on cognitive intrusions and may contribute to the development and severity of emotional disorders (Purdon, 1999).

The role of pre-sleep cognitive intrusions in sleep-onset insomnia

Research on pre-sleep cognitive intrusions draws directly from early work demonstrating that it is not the thoughts themselves that contribute to the development of a disorder, but the individuals' interpretation of the thought that is problematic (Rachman & De Silva, 1978; Rachman & Hodgeson, 1980; Salkovskis & Harrison, 1984). The content of pre-sleep cognitive intrusions is significantly associated with increased sleep onset latency and cognitive arousal and, as in other disorders, is perceived to be uncontrollable, to increase feelings of hopelessness, to be negative in content, and emotionally distressing (Borkovec, Lane, & Van Oot, 1981; Van Egeren, Haynes, Franzen, & Hamilton, 1983; Morin, Stone, Trinkle, Mercer, & Remsberg, 1993). Research has also shown that the pre-sleep cognitive intrusions of "worried" insomniacs are trivial or work-related,

whilst those of "non-worried" insomniacs focus predominantly on sleep itself (Watts, Coyle, & East, 1994). Wicklow and Espie (2000) used voice-activated tape-recorders to record pre-sleep cognitions. They identified eight categories of pre-sleep intrusions, similar to those found in previous research (e.g. Nicassio, Mendelowitz, Fussell, & Petras, 1985; Watts *et al,* 1994). Categories labeled "thinking about sleep", "the anticipated consequences of poor sleep" and "general problem solving" emerged as the strongest predictors of objective sleep latency (Wicklow & Espie, 1999). Further analysis suggested that sleep-related intrusions could be classified under three factors - "active problem-solving", "present state monitoring" and "environmental reactivity" (Wicklow & Espie, 1999). The authors conclude that the categorical nature and factorial structure identified could be used to develop a scale to assess pre-sleep cognitive intrusions.

Current self-report measures

There are currently only a small number of scales available that focus on pre-sleep cognitive dysfunction and arousal in insomnia. *The Pre-Sleep Arousal Scale (PSAS)* (Nicassio *et al,* 1985) assesses cognitive and somatic dimensions of pre-sleep arousal, while *The Dysfunctional Beliefs & Attitudes about Sleep Scale (DBAS)* (Morin, 1993, Morin *et al,* 1993) is extremely useful in clinical practice due to its ability to identify irrational, affect-laden cognitions reported within the pre-sleep phase (Morin *et al,* 1993). *The Sleep Disturbance Questionnaire* (Espie, Brooks, & Lindsay, 1989) is an attributional measure developed to guide cognitive-behavioural treatment of insomnia. Espie, Inglis, Harvey, and Tessier (2000) analysed

the psychometric properties of the DBAS and the SDQ. They found that a revised ten-item form of the DBAS (DBAS-10) proved more robust and sensitive to treatment change (Espie *et al,* 2000). The *Self-Statement Test:60+ (SST:60+)* (Fichten, Creti, Amsel, *et al,* 1995; Fichten, Creti, Bailes, *et al,* 1997; Fichten Libman, Creti, *et al,* 1998) assesses cognitions during the pre-sleep phase, but was developed solely for use with older adults (65+ years). It has not been validated for use with younger insomniacs.

Despite emerging research supporting the role of pre-sleep cognitive intrusions, no such scale has been developed for use with younger insomniacs (i.e. 16-65 years). The development of an assessment tool that can identify key pre-sleep cognitive intrusions is therefore likely to prove useful to insomnia research and routine clinical practice.

Aims

The main aim of the study is -

- To develop an assessment measure for the assessment of pre-sleep cognitive intrusions.
- The study is a psychometric, scale development study which aims to demonstrate-

  a) the validity of the scale.

  b) the reliability of the scale .

  c) the sensitivity of the scale to discriminate insomniacs from good sleepers.

Plan Of Investigation

The study will consist of two phases: **(1) the development of a scale to assess intrusive thoughts in insomnia** (pilot study), and **(2) evaluation of the psychometric properties of the scale** (main study).

Participants

It is intended to recruit participants from the general population through the use of advertisements within the University of Glasgow (University e-mail service, University Staff Newsletters, letters to Heads of Departments), and notices placed in the Department of Psychological Medicine. However, if this proves insufficient, a clinical population will be recruited through Clinical Psychology, Psychiatry etc.

Pilot study: A pilot study (n=12) using participants who meet inclusion criteria for insomnia will be conducted to aid the development of the scale. Those participating in the pilot study will be supplied with an information leaflet explaining the study (Appendix 3.2) and a consent form to complete (Appendix 3.3) prior to participation. Participants in the pilot study will be excluded from the main study.

Main study: Two groups (insomniacs and good sleepers) will be recruited as outlined for the pilot study. Wicklow & Espie (2000) recruited 21 participants in their study and, using statistical tables, for a significant correlation, large effect size (=0.05, power = 0.8), 28 participants per group (N = 56) would be required (Cohen, 1992). However, as the study is a

psychometric scale development study, the intention is to exceed this sample size. Those participating in the main study will be supplied with an information leaflet (Appendix 3.4) explaining the aims of the study, and a consent form (Appendix 3.3) to be completed prior to participation.

The inclusion and exclusion criteria for both the pilot study and the main study are outlined in Table 1.

Table 1: Inclusion & Exclusion Criteria

Inclusion Criteria	Exclusion Criteria
• **Age** – 16-65 years • **Insomniacs** – Significant complaints of falling asleep, with min. SOL* = 30 min. on 4 out of 7 nights, with or without disruption to other sleep variables (International Classification of Sleep Disorders (ICSD-R -1997). • **Insomniacs** – A PSQI score of 5 or above. • **Good sleepers** – Not currently meeting ICSD criteria for insomnia, & a PSQI score below 5. *SOL = sleep onset latency, the time period between going to bed & falling asleep.	• Currently receiving active psychological treatment for sleep difficulties. • Currently, or in the past 3 months, been taking medication known to affect sleep (e.g. hypnotics). • Have a chronic medical condition known to impact on sleep. • Currently suffering from a psychopathological disorder. • Experiencing intermittent wakening without a difficulty falling asleep. • A BDI score of 20 or above.

Screening Measures

The following screening measures will be used to select participants for both the pilot and main study. A screening interview (approximately 1.5 hours) with each participant will take place at the Department of

Psychological Medicine, Gartnavel Royal Hospital, during which the following measures will be administered –

- **Sleep History Questionnaire** (Morin, 1993) (Appendix 3.5) - Provides a structured screening interview for assessing the diversity and severity of an individuals' sleep problems.
- **Pittsburgh Sleep Quality Index (PSQI)** (Buysse, Reynolds, Monk, Berman, & Kupfer, 1989) (Appendix 3.6) - Assesses current sleep quality, and can discriminate good sleepers from poor sleepers (Espie, 1991). The cutoff score of 5 has a diagnostic sensitivity of 89.6% and specificity of 86.5% (Buysse *et al,* 1989).
- **Beck Depression Inventory (BDI)** (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) - The BDI is a 21 item self-report inventory that assesses the severity of depressive symptomatology in the week prior to interview. A cutoff score of 20 will be used to exclude participants with suspected clinical depression (Espie, Inglis, Tessier, & Harvey, 1999).
- **State-Trait Anxiety Inventory (STAI)** (Spielberger, Gorusch, & Lushene, 1970) - The STAI measures two anxiety constructs, state-anxiety and trait-anxiety, on two separate subscales. State anxiety reflects the intensity of anxiety at a given point in time, while trait-anxiety is a more stable construct reflecting individual differences in proneness to anxiety. Each subscale consists of 20 items with a 4-point response scale ("not at all" to "very much so"). The psychometric properties of the STAI are well established, and norms are available.
- **Penn State Worry Questionnaire** (PSWQ) (Meyer, Miller, Metzger, & Borkovec, 1990) - The PSWQ is a 16 item self-report measure that

allows individuals to describe their views on their tendency to worry. Using a 5-point scale it requires individuals to rate each statement on how typical it is of them ("not at all typical" to "extremely typical").

Baseline data from previous research (Espie *et al,* 1999) provides information on the performance of insomniacs on the STAI, BDI and PSWQ. Results from the current study will be compared with those obtained in previous research to assess the representativeness of the sample.

Pilot Study - Procedure

Those participating in the pilot study will complete the following measures at home -

- **Voice Activated Recorder** - the use of a voice activated tape-recorder (Sony Cassette Recorder TCS-580 V) placed at the participants' bedside at night has been found to be a reliable and relatively non-intrusive method of gathering data on the nature and content of pre-sleep cognitive intrusions (Wicklow & Espie, 2000). For three consecutive nights, participants will record their thoughts in the pre-sleep phase, and the recordings analysed using the categories and factorial structure identified in previous research (Wicklow & Espie, 2000).
- **Actigraphic Recordings** - The Actiwatch (Cambridge Neurotechnology Ltd, Sleepwatch Software) is an activity monitoring system attached to the wrist and, based on the amount of movement, can reliably differentiate between sleep and wake periods

(Sadeh, Hauri, Kripke, & Lavie, 1995). It provides an objective measure of motor movement that is a recognised correlate of sleep disturbance, and supplements the use of questionnaires particularly in the identification of sleep phase disorders (Espie *et al,* 1999). Actigraphic recordings are highly correlated with polysomnographic (PSG) recordings (Kripke, Mullaney, Messin, & Wybourney, 1978). Participants will wear the watch continuously for 72 hours, only removing it for wet activities. This will be recorded using the event marker on the watch which participants press to record such instances. This can also be used to record when participants go to bed and when they wake up.

- **Sleep Diary** (Appendix 3.7) - Provides a reliable subjective measure of sleep complaint and a summary of the previous nights' sleep (Espie, 1991). A sleep diary will be completed on rising for three consecutive nights.

Results

Using the categories of thought identified in previous research (Wicklow & Espie, 2000), and the results of the pilot study, a self-report measure will be developed for psychometric evaluation in the main study.

Main Study - Procedure

Participants will be selected for inclusion to the main study as outlined for the pilot study. Participants will then complete the new scale developed from the pilot study, along with the following measures that will be used to

explore the psychometric properties of the new scale-

- **Pre-Sleep Arousal Scale - cognitive subscale (PSAS)** (Nicassio *et al,* 1985) (Appendix 3.8) - The PSAS is a self-administered 8 item questionnaire completed by participants following a night of disturbed sleep. Using a 5 point scale (1-"not at all" to 5-"extremely"), the PSAS provides a description of an individuals' cognitive arousal in the pre-sleep phase. The PSAS has demonstrated satisfactory internal consistency for both cognitive and somatic subscales, with some degree of independence and acceptable face and construct validity. The PSAS will be completed once by participants.
- **Dysfunctional Beliefs & Attitudes About Sleep - 10 (DBAS-10)** (Espie *et al,* 2000) (Appendix 3.9) - The DBAS is used in clinical practice for the identification of affect-laden cognitions. A revised 10 item version of the scale was developed which demonstrated a more robust principal component structure, satisfactory internal consistency, and treatment-related measurement sensitivity (Espie *et al,* 2000). The DBAS-10 will be completed once by participants.
- **Sleep Disturbance Questionnaire (SDQ)** (Espie *et al,* 1989; 2000) (Appendix 3.10) - The SDQ was developed as a guide for tailoring cognitive-behavioural treatment (CBT) of insomnia. The SDQ has been proven to have a robust factor structure, and sound internal consistency (Espie *et al,* 2000). The SDQ will be completed once by participants.
- **Actigraphic Recordings** - The Actiwatch (Cambridge Neurotechnology Ltd, Sleepwatch Software) will be used in the main study to provide an objective measure of participants' sleep. The procedure used will be the

same as that adopted in the pilot study.

- **Sleep Diary** (Appendix 3.7) - As in the pilot study, a sleep diary will be completed on rising for three consecutive nights.

All measures will be completed at home and returned to the researcher by post.

Participants from both phases of the study will be offered an optional individual interview to receive feedback on their results.

Results

Results will be analysed using SPSS (version 9) to evaluate the psychometric properties of the new scale.

Content Validity

Content validity of the new scale will be checked by comparing results from the pilot study with those from Wicklow and Espie (2000).

Concurrent, Discriminant, & Construct Validity

Results from the above sleep measures will be used to assess the scales' relationship to objective and subjective sleep measures, its relationship to other insomnia self-report questionnaires, and ability to differentiate insomniacs from good sleepers.

Test-Retest Reliability

The new scale will be administered to participants approximately 2-3 weeks after initial completion, and results analysed for stability in scores across time.

Internal Consistency

Internal consistency will be examined using Cronbachs' alpha and item deletion methods that assess the stability of the scale when items are removed through the computation of a coefficient for the total scale and for the scale minus each item individually.

Data Analysis

The data will be analysed using the Statistical Package for the Social Sciences (SPSS) version 9, available within the Department of Psychological Medicine. Internal consistency of the scale will be analysed through the calculation of alpha-coefficients (Cronbach's alpha). The factorial structure of the scale will be analysed using Principal Components Analysis (PCA). Inter-correlations between the scale and other sleep measures will be computed to explore its relationship to other insomnia scales, subjective and objective data obtained, and inter-correlations between factors of the scale examined.

Settings & Equipment

Facilities within the Department of Psychological Medicine will be utilised in the production of questionnaires, interviewing participants, administrative

requirements, and data analysis.

Ethical Approval

Ethical approval (Appendices 3.11, 3.12) will be sought through the submission of this proposal to Greater Glasgow Primary Care NHS Trust Ethics Committee.

Time Scale

Action	Estimated Date
1. Proposal submitted to Ethics Committee.	Completed April 2000.
2. Phase 1 – Pilot study & generation of scale.	Start July 2000.
3. Phase 2 – Psychometric evaluation (main study).	Start October 2000.
4. Data analysis.	Start March 2001.
5. Project Write-Up.	Completed July 2001.

Approval from the University of Glasgow

Following approval from the Ethics Committee, the proposal, proof of ethical approval, and proof of approval from the Research and Development Directorate were sent to the Deans of Faculties for the Faculty of Medicine, the Faculty of Arts, and the Faculty of Divinity. Formal approval was obtained from each Faculty (Appendices 3.13, 3.14) allowing students to be contacted via e-mail regarding the study.

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Major Research Project Paper

Development and Validation of the Glasgow Intrusive Thoughts Inventory: A New Measure For The Assessment Of Pre-Sleep Cognitive Intrusions

Prepared in accordance with the requirements for submission
to the *British Journal of Clinical Psychology*
(see Major Research Project Literature Review - Appendix 2.1)

Title: Development and validation of the Glasgow Intrusive Thoughts Inventory: a new measure for the assessment of pre-sleep cognitive Intrusions.

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Abstract

Purpose: To develop a self-report measure (the Glasgow Intrusive Thoughts Inventory - GITI) to aid the assessment of pre-sleep cognitive intrusions in adults with sleep-onset insomnia.

Method: Over 3 consecutive nights, 12 insomniacs provided "live" audio-recordings of pre-sleep cognitive intrusions, which were used to generate an item pool. The results were compared to the content and categorical structure of pre-sleep cognitive intrusions identified by Wicklow & Espie (2000), and commonalities in thought content used to generate a draft scale. Following further piloting, a 25-item scale was developed and administered to 2 groups (29 insomniacs and 29 good sleepers), along with other self-report measures, objective (actigraphic recordings), and subjective (diary) sleep indices, and results analysed to evaluate the psychometric properties of the scale.

Results: The GITI demonstrated evidence of construct validity, successfully discriminated between insomniacs and good sleepers, and was significantly correlated with existing measures of sleep disturbance. A GITI total score of 42 yielded a sensitivity of 100% and specificity of 83%. The GITI demonstrated good test-retest reliability and satisfactory internal consistency. Factor analysis identified 3 subscales that also possessed high internal consistency, with insomniacs scoring significantly higher on all three subscales than good sleepers.

Conclusions: The GITI is a valid and reliable instrument for use with clients who present with sleep-onset insomnia.

Title: Development and validation of the Glasgow Intrusive Thoughts Inventory: a new measure for the assessment of pre-sleep cognitive intrusions.

Introduction

Insomnia is defined as a "heterogeneous complaint reflecting reduced quality, duration, or efficiency of sleep" (Morin, Hauri, Espie, Spielman, Buysse, & Bootzin, 1999). Primary insomnia is reported by up to 30% of the population, with the prevalence of chronic insomnia estimated at 10-15% (Ohayon, Caulet, & Guilleminault, 1997). This makes insomnia, or complaints of sleep loss, a common presenting problem that often persists relatively unchanged over many years (Morin *et al,* 1999).

Pre-sleep cognitive arousal in sleep-onset insomnia

In a survey of causal attributions of insomnia, Lichstein & Rosenthal (1980) found that insomniacs were ten times more likely to blame excessive cognitive activity rather than somatic activity for their sleep disturbance. Experimental work by Gross & Borkovec (1982) demonstrated that increased sleep-onset latency (SOL) could be induced in good sleepers by increasing cognitive arousal (telling participants that they had to give a presentation on wakening), with the effect occurring independently of physiological activity (heart rate and skin conductance measures). Haynes, Adams and Franzen (1981) obtained similar results, demonstrating that estimates of SOL increased for both

objective measures (polygraph recordings) and subjective measures (sleep diary) of sleep disturbance following cognitive arousal.

Pre-sleep cognitive intrusions: research findings

Pre-sleep cognitive intrusions (e.g. concerns about sleep, physical sensations, environmental cues) also lead to increased SOL (Van Egeren, Haynes, Franzen, & Hamilton, 1983). Watts, Coyle and East (1994) defined insomniacs as either "worrying insomniacs", whose pre-sleep cognitions focused on various topics (e.g. thoughts about sleep, trivial topics, plans, work, family and recent concerns, bodily sensations), or "non-worrying insomniacs" whose pre-sleep cognitions focused specifically on concerns about sleep loss. Harvey (2000) analysed focus of attention, content, and process characteristics of pre-sleep cognitions in good sleepers and insomniacs. Insomniacs' attention focused on solving problems, worries, concerns, reviewing events of the day, thinking about their sleep pattern, and environmental noises. Ratings of cognitive interference, estimated duration, and intrusiveness (preoccupation and effect on sleep) were higher for insomniacs than good sleepers.

Wicklow & Espie (2000) used voice-activated tape-recorders to obtain "live" recordings of insomniacs' pre-sleep cognitive intrusions. They identified eight thought categories reflecting three factors – "active problem-solving", "present state-monitoring" and "environmental reactivity". Subjective measurement (sleep diary) and objective measurement of SOL (wrist actigraphic recordings -

a device which, based on the amount of movement, can differentiate between sleep and wake periods thereby providing a estimate of SOL) were also taken. Only the latter was significantly correlated with the categorical content of pre-sleep cognitive intrusions. The authors concluded that the use of "live" recordings of pre-sleep cognitive intrusions merited further investigation, and that the categorical and factorial structure might be used to develop a scale to assess pre-sleep cognitive intrusions.

The assessment of pre-sleep cognitive dysfunction – limitations of existing measures & potential benefits of a new scale

Harvey (2001) reviewed four existing self-report measures assessing pre-sleep cognitive arousal and dysfunction (the *Pre-Sleep Arousal Scale (PSAS)* (Nicassio, Mendlowitz, Fussell, and Petras (1985); the *Sleep Disturbance Questionnaire (SDQ)* (Espie, Brooks, & Lindsay, 1989); the *Dysfunctional Beliefs and Attitudes About Sleep Scale-10 item version* (DBAS-10) (Espie, Inglis, Harvey & Tessier, 2000; Morin, 1993; Morin, Stone, Trinkle, Mercer, & Remsberg, 1993); the *Self-Statement Test:60+ (SST:60+)* (Fichten, Creti, Amsel, *et al,* 1995; Fichten, Creti, Bailes, *et al,* 1997; Fichten, Libman, Creti, *et al,* 1998). The scales were critically evaluated according to scale design, their psychometric properties, and ability to assess pre-sleep cognitive intrusions. It was concluded that, although the scales possessed adequate psychometric properties, the PSAS, SDQ and DBAS-10 were unsuitable for the assessment of pre-sleep cognitive intrusions as they provide a global assessment of cognitive

dysfunction and arousal, and as such fail to reflect the specific content of pre-sleep cognitive intrusions as identified by Harvey (2000) and Wicklow and Espie (2000). Although the SST:60+ assessed pre-sleep cognitions, it was only validated for use with older adults. Furthermore, scale items for all four measures were obtained through retrospective analysis (e.g. thought records, diaries, semi-structured interviews), which may be subject to inaccuracies (e.g. low specificity of thought content, response limitation due to pre-defined interview questions, omissions or distortions through forgetting) (Harvey, 2001), and again may fail to highlight the content specificity of pre-sleep cognitive intrusions as identified by Wicklow and Espie (2000) using live voice-activated tape-recordings. The identification and treatment of pre-sleep cognitive intrusions forms an integral component of cognitive behavioural treatment of sleep-onset insomnia (Espie, Inglis, Tessier, & Harvey, 1999; Morin *et al,* 1999). SOL due to pre-sleep cognitive intrusions can be reduced by encouraging insomniacs to spend time (e.g. 15-20 minutes) in the early evening identifying and then addressing the specific types of pre-sleep cognitive intrusions that typically interfere with their sleep through, for example, rehearsing the day, planning the next day, and dealing with "unfinished business". Nicassio *et al* (1985) did not evaluate the treatment utility of the PSAS, although they suggest that it may be utilised to evaluate the effects of treatment interventions. However the specific content of pre-sleep cognitive intrusions is not directly accessed by the PSAS, therefore the development of a more content specific scale may provide clinicians with more information on

specific areas of pre-sleep cognitive intrusion that need to be addressed in treatment. The development of a scale that can reliably assess and quantify pre-sleep cognitive intrusions in terms of their nature, content, and frequency of interference on sleep would therefore be beneficial not only in the initial assessment of an individuals' sleep problem, but may also prove useful to the process of devising appropriate treatment packages and monitoring treatment outcome more effectively (Harvey, 2001).

The aim of this study was therefore to develop and evaluate the psychometric properties of a self-report measure designed to assess pre-sleep cognitive intrusions in adult insomniacs.

Method and Results

For the purpose of clarity, methods and results are integrated. A flow chart outlining the experimental design is provided in Appendix 4.1.

Stage 1: Derivation of the item pool

Rationale

Wicklow & Espie (2000) used "live" audio tape-recordings of insomniacs' pre-sleep cognitive intrusions to analyse the categorical nature and factorial structure of thought content. It was felt that a replication of their design would provide an adequate item pool for the current study, and allow for detailed

analysis of the scales' content validity by comparing results of the current study with those obtained by the previous researchers.

Participants – Scale development group

Participants were recruited from the student population using the university e-mail service, requesting those with "current sleep problems interested in taking part in sleep research" to contact the researcher. Participants were included if they were 16-65 years old; complained of significant problems falling asleep; had a minimum SOL of 30 minutes occurring on 4 out of 7 nights with or without disruption to other sleep variables (International Classification of Sleep Disorders Revised (ICSD-R), 1997); and obtained a Pittsburgh Sleep Quality Index Score (PSQI) of 5 or above (Buysse, Reynolds, Monk, Berman, & Kupfer (1989). The PSQI possesses good diagnostic sensitivity in discriminating good sleepers from poor sleepers (Espie, 1991). The cut-off score of 5 has a diagnostic sensitivity of 89.6% and specificity of 86.5% (Buysse *et al,* 1989).

Participants were excluded if they were receiving psychological treatment for sleep difficulties; if they were currently, or in the past 3 months, taking medication known to affect sleep; if they were suffering from a psychopathological disorder; had a chronic medical condition known to impact on sleep; experienced intermittent wakening without difficulty falling asleep; or scored 20 or above on the Beck Depression Inventory (BDI) (Beck, Ward,

Mendelson, Mock, & Erbaugh, 1961) to exclude participants with suspected clinical depression (Espie *et al,* 2000).

Prior to inclusion, participants were sent an information leaflet explaining the study and a consent form to complete (Major Research Project Proposal - Appendices 3.2 & 3.3). A screening interview was then arranged to complete the following measures and aid participant selection: *Sleep History Questionnaire (SHQ),* Morin, 1993, Major Research Project Proposal - Appendix 3.5; *Pittsburgh Sleep Quality Index (PSQI),* Buysse *et al,* 1989, Major Research Project Proposal - Appendix 3.6; *Beck Depression Inventory (BDI),* Beck *et al,* 1961; *Penn State Worry Questionnaire (PSWQ),* Meyer, Miller, Metzger, & Borkovec, 1990; *State-Trait Anxiety Inventory (STAI),* Spielberger, Gorusch, & Lushene, 1970. The results from these measures are presented later in Table 1.

Of the 19 respondents, 7 were excluded (2 failed to meet inclusion criteria, 1 excluded through medication use, 1 reported sleep difficulties due to nightmares, 2 retracted from the study, 1 excluded due to missing data). Twelve insomniacs (9 females, 3 males) with mean age 26 years (average duration of sleep disturbance = 12 years, s.d.=4.6) were recruited to participate in the derivation of an item pool. Insomniacs who took part in the scale development phase were excluded from subsequent stages of the study.

Measures & Procedure

The following measures were completed by participants at home over 3 consecutive nights:

1. Participants used voice-activated tape-recorders (Sony Cassette Recorder TCS-580 V) placed at their bedside to record their thoughts as they tried to sleep. Wicklow & Espie (2000) conclude that participants find this procedure relatively non-intrusive, with no evidence of a first night effect occurring. Only 3% of the total number of reported thoughts related to the procedure (e.g. thoughts related to using the tape-recorder, the actiwatch). As in Wicklow & Espie (2000), participants were instructed to say aloud whatever was going through their mind when having difficulty sleeping. To minimise performance anxiety and allow participants to speak freely, no instructions were given regarding thought content.
2. Participants completed a sleep diary each morning ("Major Research Project Proposal" - Appendix 3.7). The sleep diary is a well-documented, retrospective self-report instrument providing a subjective measure of an individuals' sleep parameters. Espie (1991) cites evidence from previous research demonstrating their high test-retest reliability ($r = 0.93$ poor sleepers; $r = 0.58$ good sleepers).
3. To provide an objective measure of participants' sleep, wrist actigraph recordings were obtained over 3 nights using the "Actiwatch" (Cambridge Neurotechnology Ltd). The actigraph records "sleep" or "wakefulness" by accumulating activity counts during a specified time interval (the epoch

length). As in Wicklow & Espie (2000), an epoch length of 1 minute was chosen, which is the recommended interval for accurate sleep analysis (American Sleep Disorders Association (ASDA), 1995). The actigraph has an event marker which participants were instructed to press when they put the lights out and when they got up the next day. Actigraphy is considered a useful adjunct to sleep diaries (American Sleep Disorders Association (ASDA), 1995), and is highly correlated (r = 0.98) with polysomnography (PSG) (Kripke, Mullaney, Messin, & Wybourney, 1978). Hauri and Wisbey (1992) reported accuracy difficulties for actigraph recordings of "total sleep time", however the error was only half that normally associated with sleep diaries, therefore the use of actigraphy is thought to considerably improve sleep studies.

Subjective and objective measures of SOL were taken for subsequent comparisons with the insomniac group recruited to the validation phase (see Table 1).

Content analysis of pre-sleep cognitive intrusions

Data were available for 27 subject nights. Data were analysed by the author according to the procedure for content analysis adopted by Wicklow & Espie (2000) as follows:

1. Tape-recorded material was transcribed.

2. Transcripts were segmented into single ideas or statements.

3. Segments were allocated to 1 of 8 thought categories (Wicklow & Espie, 2000) (Appendix 4.2).

4. An independent reliability check on the allocation of thought segments to categories was conducted on 4 (25%) transcripts.

Content Validity

The procedure generated 423 thought segments over 27 nights (mean per night = 15.67). This is comparable to Wicklow & Espie (2000) who obtained 1090 thought segments over 63 nights (mean per night = 17.30). The distribution per category was similar to Wicklow & Espie (2000) with "rehearsal/planning, problem-solving" accounting for the majority of thought segments (32.4%, n=137), followed by "sleep and its consequences" (20.8%, n=88), "autonomic experiences" (14.9%, n=63), "reflection on quality of thoughts" (11.3%, n=48), "rising from bed" (7.3%, n=31), "arousal status" (6.9%, n=29), "external noise" (5.0%, n=21), and "procedural factors" (1.4%, n=6). Appendix 4.3 displays the distribution per category for the present study and for Wicklow and Espie (2000). Inter-rater reliability was satisfactory, with 95% agreement between independent raters.

Stage 2: Refinement of the item pool & development of the scale

Refinement of the item pool and development of the scale was conducted using the 6 stage process outlined below –

1. The 423 thought segments generated from the content analysis were specific in nature and content therefore, in order to generate items for the scale, it was necessary to re-group individual thought segments according to their general theme. Following visual analysis of the data, each category was broken down into sub categories (Appendix 4.4), and individual thought segments re-allocated to the appropriate sub category, thereby forming a more general potential scale item. "Procedural thoughts" were excluded from the analysis as they were unsuitable for inclusion as potential scale items.
2. The procedure was repeated on a sample of data (7 participants; 16 subject nights) from Wicklow & Espie (2000) (345 thought segments identified - see Appendix 4.5 for number of thoughts per category).
3. The results from both studies were then compared for commonalities between the top 5 most frequently endorsed potential scale items (Appendix 4.5). This process yielded 34 potential scale items (marked with an "*") frequently reported by participants from both studies, and which accounted for the majority of thoughts reported (category range = 77.3% - 100%).
4. The potential scale items were reviewed by the author and an expert clinician, and re-worded as statements. A draft scale was produced

containing the 34 items randomly ordered. Instructions were devised that requested responders to indicate using a 4 point response (1="never", 2="sometimes", 3="often", 4="always") how often (over the past 7 nights) each thought had kept them awake. A 4 point response scale was adopted because (unlike an odd numbered response scale) the use of an even numbered response scale prevents raters from choosing to express no opinion i.e. there is no middle, or neutral value (Streiner & Norman, 1995).

5. The draft scale was administered to a sample of insomniacs from the scale development group (n = 6), and a sample of normal sleepers (n = 6). A semi-structured response sheet was provided, asking participants to comment on what they thought the scale was measuring, their understanding of how to complete the scale, ease of completion, and their views on individual items (e.g. ease of understanding, overlap between items, possible omissions). Informal interviews were conducted to expand on responses.
6. Following feedback, 6 items were dropped, the wording of 4 items was altered, and 5 items were reorganised into 2 items (see Appendix 4.6 for items omitted and/or altered).

The final 25-item scale, named the **Glasgow Intrusive Thoughts Inventory (GITI)**, is presented in Appendix 4.7.

Stage 3: Field testing & psychometric evaluation of the GITI

In order to examine the psychometric properties of the GITI, 2 groups (insomniacs and good sleepers) were recruited.

Participants – Validation phase

As outlined for the scale development group, participants were recruited through the university e-mail service. Over 150 e-mail responses from potential insomniacs were obtained however, due to time constraints, only a sample could be selected. From this pool, 44 individuals were contacted. Fifteen were excluded due to no further response. A lower response rate was obtained for good sleepers (n = 45). Fourteen individuals were excluded due to no further response, and 2 individuals were excluded due to missing data. The same inclusion and exclusion criteria for insomniacs were used as cited for the scale development group. Good sleepers were included if they did not meet ICSD-R criteria for insomnia, and scored less than 5 on the PSQI. Prior to inclusion participants were sent an information sheet explaining the study and a consent form to complete (Major Research Project Proposal – Appendices 3.3 & 3.4). A screening interview to assess suitability was then conducted using the screening questionnaires previously outlined.

The final sample comprised 29 insomniacs (24 females, 5 males) and 29 good sleepers (19 females, 10 males). Following checks for skewness and kurtosis, both groups were compared on participant characteristics and screening results

using independent sample t-tests (2-tailed) or Mann-Whitney U tests (2-tailed) as appropriate (SPSS, version 9). The insomniac group was also compared to the scale development group (n = 12). Due to faulty equipment and incomplete data, missing actiwatch data was incurred for 3 participants (1 from the scale development group, and 2 insomniacs from the validation phase). Four participants also failed to complete sleep diaries (1 from the scale development group, 1 good sleeper, and 2 insomniacs from the validation phase). Table 1 presents summary data for each group.

<<< INSERT TABLE 1 HERE >>>

Results suggest that the insomniac group did not differ from the scale development group on age (U=128.0, p=0.195) or gender (χ^2 = 0.352, df=1, p=0.553 [as only 3 males took part in the scale development group a Fisher's exact test was conducted p = 0.719]. No significant differences arose between the insomniac group and scale development group for problem duration (U=165.0, p=0.810), PSQI (t = 1.066, df=39, p=0.293), BDI (U=152.5, p=0.543), PSWQ (t = 0.445, df=39, p=0.659), STAI-state anxiety (t = 0.724, df=39, p=0.473), STAI-trait anxiety (t = 0.15, df=39, p=0.988), subjective SOL (t = 0.461, df=33, p=0.648), and objective SOL (U=118.0, p=0.339).

No significant differences emerged between good sleepers and insomniacs for age (U=299.5, p=0.059), or gender (χ^2 = 2.248, df=1, p=0.134). Good sleepers

scored significantly lower than insomniacs on problem duration (U=0.00, p<0.001), PSQI (t=12.696, df=46, p<0.001), BDI (U=171.5, p<0.001), PSWQ (t = 2.269, df=49, p=0.028), STAI-state anxiety (t = 2.981, df=56, p=0.004), STAI-trait anxiety (t = 3.586, df=56, p=0.001), subjective SOL (U=45.0, p<0.001), and objective SOL (t = 3.057, df=54, p=0.003).

Table 1 also presents comparative sample characteristics for Espie *et al* (2000). With the exception of age, the mean scores for both the scale development group and the insomniac group were close to those obtained by Espie *et al* (2000). It is concluded that both groups are similar with regards to patient characteristics and sleep variables, and are also highly representative of clinically presenting insomniacs' performance on the specified scales.

Measures & Procedure

To examine the psychometric properties of the GITI, the following measures were completed by participants at home:

1. The ***GITI*** (Appendix 4.7) - completed once with the measures outlined, and again approximately 3 weeks later to analyse test-retest reliability.
2. The cognitive sub-scale of the ***Pre-Sleep Arousal Scale (PSAS-cog)*** (Nicassio *et al,* 1985) (Major Research Project Proposal - Appendix 3.8). The PSAS-cog is an 8 item self-report measure assessing the intensity of pre-sleep cognitive arousal. The PSAS-cog has satisfactory internal consistency (α = 0.76), and acceptable construct validity when

compared to other sleep indices, particularly sleep-onset measures (range of r = 0.34 - 0.45) (Nicassio *et al,* 1985).

3. The ***Dysfunctional Beliefs & Attitudes About Sleep scale (10 item version) (DBAS-10)*** (Espie *et al,* 2000; Morin, 1993; Morin *et al,* 1993) (Major Research Project Proposal - Appendix 3.9). The original 30 item-analogue-scaled DBAS was developed by Morin (1993) to aid the assessment of pre-sleep cognitions, pre- and post-treatment. Analysis of its psychometric properties by Espie *et al* (2000) suggested that a 10-item version displayed sensitivity to change following treatment, and achieved satisfactory internal consistency ($\alpha = 0.69$).
4. The ***Sleep Disturbance Questionnaire (SDQ)*** (Espie *et al,* 1989) (Major Research Project Proposal - Appendix 3.10). The SDQ is a 12 item self-report measure assessing 4 areas of sleep disturbance (physical tension, sleep incompatible behaviour, anxious effort to sleep, general cognitive intrusion). Results from Espie *et al* (2000) suggest that 4 factors accounted for 61% of the variance (F1="restlessness/agitation"; F2="mental over-activity"; F3="consequences of insomnia"; F4="lack of sleep readiness"). Factor 2 (SDQ-F2) possessed high internal consistency ($\alpha = 0.82$). SDQ-F2 reflects cognitive arousal and comprises 3 items (2, 6, 10).
5. Participants kept sleep diaries for 3 consecutive nights (as for the scale development group, Major Research Project Proposal - Appendix 3.7).

6. Wrist actigraph recordings were taken for 3 consecutive nights (as for the scale development group).

Following checks for skewness and kurtosis, results were again analysed using SPSS (version 9).

Construct Validity

The PSAS-cog is significantly correlated with subjective SOL (r = 0.42), and specific categories of pre-sleep cognitive intrusions (Wicklow & Espie, 2000). It also correlates with measures of affect and sleep-onset difficulties, a finding congruent with the theory that increased arousal contributes to sleep disturbance. The PSAS is therefore considered to possess evidence of construct validity (Nicassio *et al,* 1985). The correlation between the GITI (total) and PSAS-cog was computed to provide preliminary evidence of the GITI's construct validity (n=58). The GITI (total) was significantly correlated with the PSAS-cog ($r = 0.879$, $p<0.001$, 2-tailed), suggesting that increased frequency of pre-sleep cognitive intrusions is associated with increased pre-sleep cognitive arousal.

Concurrent Validity

The relationship between GITI (total) and measures of sleep disturbance were examined using Pearson's correlations for the SDQ-F2, and DBAS-10 (total) (n=58). The GITI significantly correlated with both measures (SDQ-F2: r =

0.815, P<0.001, 2-tailed; DBAS-10: r = 0.732, p<0.001, 2-tailed). Similarly, the relationship between GITI (total) and subjective (sleep diary) measures (n = 55), and objective measures (actigraph recordings) of SOL (n = 56) was investigated using Spearman's correlations. Diary estimates of SOL were more strongly associated with the GITI (total) (r = 0.650, p<0.001, 2-tailed) than actigraph estimates of SOL (r = 0.484, p<0.001, 2-tailed).

Scatter plots illustrating the relationship between the GITI (total) and the above measures are presented in appendix 4.8, while appendix 4.9 presents the inter-correlations between measures.

Discriminant Validity

The ability of the GITI (total) to discriminate insomniacs (n=29) from poor sleepers (n=29) was investigated using an independent samples t-test. Insomniacs scored significantly higher than good sleepers (good sleepers: mean = 35.2, s.d. = 8.37; insomniacs: mean = 58.0, s.d. = 10.08) (t = 9.396, df = 56, p<0.001, 2-tailed). Figure 1 illustrates the distribution of the GITI (total score) for both groups using a box and whiskers plot and demonstrates that the median value for good sleepers (35.2) is lower than that obtained for insomniacs (58.0). As distributional data indicate, there is some overlap between the highest scoring good sleepers and the lowest scoring insomniacs. Scores for good sleepers also appear to be more closely grouped (as indicated by the box highlighting the interquartile range) than those obtained for insomniacs.

<<< INSERT FIGURE 1 HERE >>>

Sensitivity & Specificity

The *sensitivity* of a scale is defined as the probability that an individual with the condition will be classified correctly as having the condition, while *specificity* is the probability that a person without the condition will be classified as not having the condition (Fleiss, 1981). Analysis of the GITI (total) suggested that a score of 42 correctly identified 100% (i.e. 29) insomniacs, and correctly identified 83% (i.e. 24 out of 29) good sleepers (see Appendix 4.10 for information on the specificity and sensitivity of the GITI).

Using the cut-off score of 42, the sample (n=58) was split into 2 groups - those experiencing "high frequency pre-sleep cognitive intrusions" (n=34), versus those with "low frequency pre-sleep cognitive intrusions" (n=24). Differences between groups on the PSAS-cog, SDQ-F2 and the DBAS-10 were analysed using independent samples t-tests (2-tailed). Participants experiencing high frequency pre-sleep cognitive intrusions scored significantly higher on all 3 measures than participants with low frequency pre-sleep cognitive intrusions: **PSAS-cog**: [mean = 26.0 (s.d. = 6.0) vs 13.2 (s.d. = 5.1)], $t = 8.615$, $df=56$, $p<0.001$; **DBAS-10**: [mean = 53.3 (s.d. = 15.2) vs 32.0 (s.d. = 12.0)], $t = 5.699$, $df=56$, $p<0.001$; **SDQ-F2**: [mean = 12.8 (s.d. = 1.8) vs 6.7 (s.d. = 2.2)], $t = 11.538$, $df=56$, $p<0.001$.

Participants with high frequency pre-sleep cognitive intrusions also scored significantly higher on subjective ratings of SOL (n=23), than those with low frequency pre-sleep cognitive intrusions (n=32) (U=84.0, p<0.001, 2-tailed). Results for objective SOL were also significant (U=199.0, p=0.002, 2-tailed; high frequency pre-sleep cognitive intrusions n = 32, low frequency pre-sleep cognitive intrusions n = 24).

Test-retest Reliability

Test-retest scores were available for 26 insomniacs (89.7%). Test-retest reliability of the GITI (total) was examined using Pearson's correlation and appeared highly satisfactory (r = 0.879, p<0.001, 2-tailed).

Internal Consistency

Using the insomniac group (n = 29), Cronbach's alpha was calculated to assess the internal consistency of the scale. The GITI possessed high internal consistency (α = 0.870). Guttman split-half reliability was also acceptable (α = 0.851). Item deletion alphas give an indication of the stability of a measure when items are systematically eliminated. Item-deletion alphas for the GITI were high, with very little variation between values (mean = 0.87, range = 0.855–0.874). A criterion of 0.800 is usually considered acceptable (Nunnally & Bernstein, 1994), therefore the results obtained are satisfactory. The corrected item-total correlation is the correlation of a single item with the sum of all other items (Nunnally & Bernstein, 1994) and, ideally, will be modest

(approximately r = 0.4) rather than high to ensure that a range of items is retained (Nunnally & Bernstein, 1994). The mean corrected item-total correlation was 0.43 (range = 0.12 - 0.73). Appendix 4.11 (Fig. i) displays the item-deletion values for each item, and the corrected item-total correlation values for each item (Fig. ii).

Principal Component Structure of the GITI

Insufficient sample size prevents any firm conclusions to be drawn on the factorial structure of the GITI. However a principal component analysis (PCA) with varimax rotation was conducted (n=58) to examine consistencies between factor loadings on the GITI and the results of Wicklow & Espie (2000). As found by Wicklow & Espie (2000), 3 factors accounted for 63% of the total variance (Table 2).

<<< INSERT TABLE 2 HERE >>>

Factor 1 (9 items; 24% of total variance), was similar to factor 1 identified by Wicklow and Espie (2000) ("active problem solving"), and included items concerning events of the day, plans for the next day, thoughts about ones' personal life, and work/responsibilities. Factor 1 was labelled "subscale 1 (SS_1) - problem-solving cognitive intrusions". Factor 2 (8 items; 24% of total variance) was also similar to Wicklow and Espies' 2nd factor ("present state monitoring"), and contained items regarding the individuals' awareness of their

sleep pattern, and attempts to induce sleep. Factor 2 was labelled "subscale 2 (SS_2) - sleep-related cognitive intrusions". The 3rd factor (7 items; 15% of total variance) resembled Wicklow & Espies' third factor "environmental reactivity", however it also included additional items focusing on physical and autonomic cognitions (e.g. feeling tired/sleepy, hot/cold, health concerns). Factor 3 was labelled "subscale 3 (SS_3) - physical/autonomic cognitive intrusions". Subscales 1 and 2 possessed high internal consistency (SS_1 α = 0.929; SS_2 α = 0.938), while the internal consistency of subscale 3 was lower but acceptable (SS_3 α = 0.783).

Independent t-tests (2-tailed) were used to compare insomniacs' (n=29) and good sleepers' (n=29) performance on the 3 derived subscales. On all 3 subscales, insomniacs scored significantly higher than good sleepers: **SS_1**; [mean = 24.3 (s.d. = 4.6) vs 14.3 (s.d. = 4.0)], t = 9.187, df=56, $p<0.001$; **SS_2**; [mean = 18.6 (s.d. = 4.7) vs 10.0 (s.d. = 2.4)], t = 8.8664, df=56, $p<0.001$; **SS_3**; [mean = 13.2 (s.d. = 3.7) vs 9.6 (s.d. = 2.4)], t = 4.435, df=56, $p<0.001$.

Discussion

The purpose of this study was to develop and psychometrically evaluate a self-report measure designed to aid researchers and clinicians in the assessment of pre-sleep cognitive intrusions in sleep-onset insomnia. The GITI would appear to offer considerable potential in quantifying the nature and frequency of pre

sleep cognitive intrusions, thereby filling the gap between research findings and clinical assessment of sleep-onset insomnia.

Participants

Participants for the study were drawn from the student population. This may cast doubt on the representativeness of the sample as being typical of clinically presenting insomniacs. However, results from the screening measures employed suggests that, apart from age, participants recruited to the scale development phase and the validation phase were not only reflective of each other, but were also highly similar to clinically-presenting insomniacs (e.g. Espie *et al*, 2000), supporting the GITI's potential use in clinical settings.

Validity of the GITI

Scale items were derived through direct replication of the experimental design employed by Wicklow & Espie (2000). Detailed analysis of thought content suggests that scale items are representative of the main themes identified by the previous authors. Scale items also appear to be highly reflective of other research findings highlighting that pre-sleep cognitive intrusions typically focus on solving problems, worries/concerns, external noise, reviewing the day, and thinking about ones' sleep (Van Egeren *et al*, 1983; Watts *et al,* 1994; Harvey, 2000). Additional support for the content validity of the GITI can be drawn from these studies, and the development of the GITI could prove useful in

promoting further research into the content and process characteristics of pre-sleep cognitive intrusions.

A test is considered to be measuring the same attribute as existing measures if the inter-correlations fall between 0.4 and 0.8 (Streiner & Norman, 1995). Field testing of the GITI using insomniacs and good sleepers produced preliminary evidence of the GITI's construct validity, as it was highly correlated with the PSAS cognitive subscale ($r = 0.879$), an established measure of general pre-sleep cognitive arousal. The GITI also demonstrated acceptable correlations with other measures of pre-sleep cognitive arousal and dysfunction (SDQ $r = 0.815$; DBAS-10 $r = 0.732$; sleep diary $r = 0.650$; actigraphic recordings $r = 0.484$). Significant differences in GITI total scores were obtained between insomniacs and good sleepers, supporting its ability to discriminate between these groups. Informal feedback from insomniacs suggests that the GITI is particularly relevant to their awareness of specific pre-sleep cognitive intrusions, providing good evidence of the GITI's face validity.

Exploration of the sensitivity and specificity of the GITI highlighted that a cut-off score of 42 yielded good sensitivity (100%) and specificity (83%). The derived cut-off score may be useful in identifying insomniacs who experience high rates of pre-sleep cognitive intrusions. This latter group appeared to experience significantly higher rates of pre-sleep cognitive arousal and dysfunction as assessed using other sleep indices (PSAS-cog, SDQ F2, DBAS-

10, objective, and subjective measures). The utility of the cut-off score identified in the current study is limited, however, as participants were identified as insomniacs and good sleepers solely on the basis of their self-report data. The "gold standard" for the identification of insomniacs and good sleepers relies on the additional use of laboratory diagnosis (Buysse *et al,* 1989). For example, in their analysis of the sensitivity and specificity of the PSQI, Buysee *et al* (1989) used subjective data (e.g. sleep diaries, self-report measures) alongside laboratory assessment (e.g. polysomnography) to identify a diagnostic cut-off score of 5 which was found to provide a sensitive and specific indication of poor sleep quality. The validity of the cut-off score identified in the present study is therefore limited as no such laboratory-based data were obtained, although the actigraph data gathered could have provided an alternative source of objective data independent from the subjective self-report measures used to analyse sensitivity and specificity. Further research utilising objective measures would provide stronger evidence on the sensitivity and specificity of the GITI, and may provide a more reliable cut-off score that could be used during treatment to monitor change.

Reliability of the GITI

Streiner and Norman (1995) suggest that to achieve acceptable standards of reliability, internal consistency should exceed r = 0.8, while stability (i.e. test-retest reliability) should exceed 0.5. The GITI demonstrates high internal consistency (α = 0.870), and possesses high test-retest reliability (r = 0.879).

Item-deletion values and corrected item-total correlation values are also within the acceptable ranges (Nunnally & Bernstein, 1994). The three derived subscales ("problem-solving cognitive intrusions"; "sleep-related cognitive intrusions"; "physical/autonomic pre-sleep cognitive intrusions") also demonstrate satisfactory internal consistency, suggesting that scale items are assessing the same underlying dimension (Nunnally & Bernstein, 1994; Streiner & Norman, 1995). The third subscale achieved a lower, yet acceptable level of internal consistency. This may be because the items in this subscale focus predominantly on arousal due to physical and autonomic cognitive intrusions, while subscales one and two focus on problem-solving and sleep-related cognitive intrusions. It may that, once insomnia is established, the pre-sleep cognitive intrusions identified in subscales one and two are perceived by insomniacs to be more influential on their sleep than those in subscale three. As such, they may be less likely to rate such items as interfering highly on their sleep. This is supported by the development of a cut-off score demonstrating that those experiencing high frequency pre-sleep cognitive intrusions also experienced increased cognitive arousal and dysfunction.

Principal Component Structure of the GITI

At present, no firm conclusions can be drawn regarding the factorial structure of the GITI as a larger sample is required. However, exploration of the factorial structure of the GITI produced three subscales and, as discussed earlier, all three subscales possess satisfactory internal consistency, with insomniacs

scoring significantly higher than good sleepers on all three subscales. The derived subscales are considered similar to the three factors identified by Wicklow and Espie (2000). However the sample used by Wicklow & Espie (2000) was smaller (n = 21) than that used in the current study (n = 58), therefore only tentative conclusions can be drawn at present as to the factorial structure of the GITI. For Principal Components Analysis (PCA), a large sample size (e.g. over 300) is considered "good" (Comrey & Lee, 1992; Tabachnick & Fidell, 1996). Thus, although the results of the present study are promising, a significantly larger sample is required to support the findings of both studies.

Application of the GITI

Although the utility of the GITI in clinical settings was not explored, the GITI's simple format suggests that it is easily understood by recipients, and quick to administer (less than 5 minutes). The straightforward 4-point rating scale allows for immediate interpretation, the results of which could be utilised during sessions to guide treatment (e.g. cognitive restructuring, stimulus control techniques). The high return rate for the test-retest examination suggests that insomniacs also find it easy to complete. Information obtained from the GITI will therefore be useful in the process of assessment and treatment, and may also be applicable to monitoring treatment effectiveness.

Limitations of the GITI & Suggestions for Future Research

It is recommended that the following limitations of the GITI be explored in future research:

- Recruitment of a larger sample would allow for further exploration of the GITI's factorial structure, the utility of identified subscales, and clarification of whether or not a shorter version of the GITI is desirable.
- This study was not conducted as part of a wider study into the cognitive-behavioural treatment (CBT) of sleep-onset insomnia. Multi-component CBT packages typically use cognitive restructuring and altering pre-bedtime rituals to reduce the effect of pre-sleep cognitive intrusions (e.g. Espie *et al,* 1999). Analysis of the GITI's sensitivity to change over time and in response to CBT would therefore increase its applicability in clinical settings.

Conclusion

The development and evaluation of the GITI has provided strong and promising results regarding its validity and reliability. Suggestions are made for future research that could further develop the GITI into a useful measure applicable for both research and clinical practice.

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Table 1 : Participant Characteristics & Screening Measures

	Scale Development Group (n=12) Mean (SD)	Insomniacs (n=29) Mean (SD)	Good Sleepers (n=29) Mean (SD)	Espie et al (2000) (n=178) Mean (SD)
Age****	26 (4.6) median = 26	24.8 (6.9) (median = 23)	25.5 (3.8) (median = 25)	49.8 (17.9)
Problem Duration (years)****	6.6 (4.8) (median = 4.5)	6.9 (5.9) (median = 5.5)	0.0 (0.0) (median = 0)	-
PSQI	12. 1 (2.5)	11.1 (2.7)	3.5 (1.7)	-
BDI****	10.8 (6.9) (median = 9.0)	9.4 (7.4) (median = 9.0)	2.8 (2.8) (median = 2.0)	12.2 (9.3)
PSWQ	48.8 (15.1)	46.5 (14.9)	39.0 (9.8)	47.7 (15.0)
STAI (state)	36.3 (16.6)	39.4 (11.1)	31.7 (8.6)	36.7 (13.1)
STAI (trait)	43.4 (15.2)	43.5 (11.6)	33.8 (8.8)	43.5 (12.8)
Subjective estimate of SOL (diary)****	57.3 (37.1)* (median = 55)	64.7 (40.8)** (median = 55)	13.8 (12.5)*** (median = 10)	61.5 (55.1)
Objective estimate of SOL (Actigraphic recording)****	24. 8 (30.0)* (median = 10)	32.1 (26.9)** (median = 26)	12.7 (20.2) (median = 9.3)	-

* - Scale development group: missing data for subjective SOL = 1; objective SOL = 1
** - Insomniac group: missing data for subjective SOL = 2; objective SOL = 2
*** - Good sleepers group: missing data for subjective SOL = 1
**** - medians are provided for those tests on which non-parametric tests were conducted.

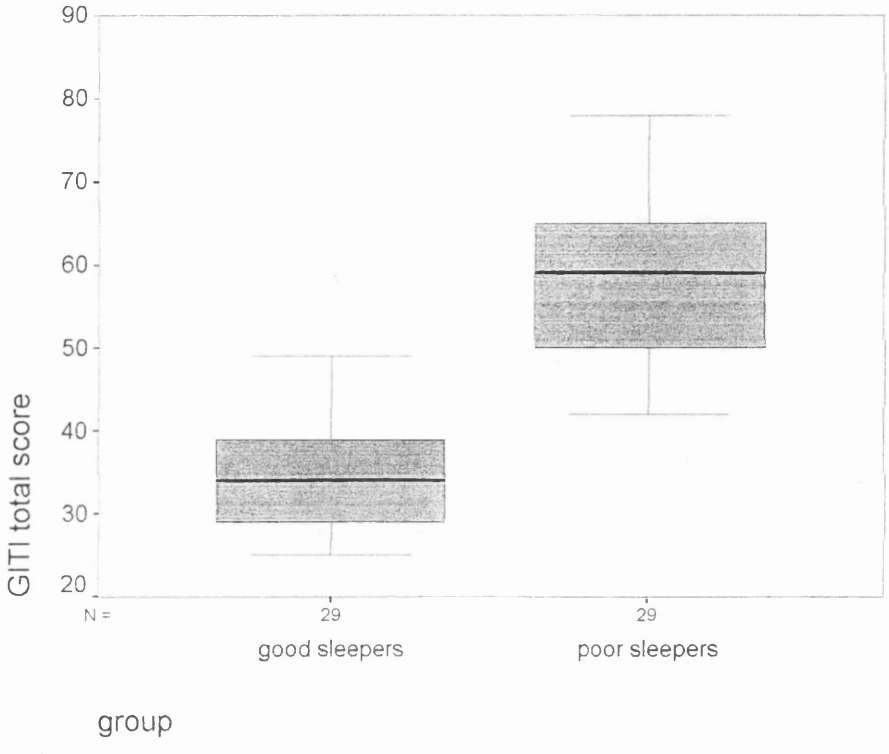
Table 2: Results of Principal Components Analyses for derived factors & factor loadings -(significant values in bold)

	Eigenvalue	% of variance	Cumulative variance	% explained variance
Factor 1	12.339	24.123	24.123	38.268
Factor 2	1.947	23.757	47.879	37.687
Factor 3	1.473	15.157	63.037	24.045

	Factor 1	Factor 2	Factor 3
GITI#1-things in the future	**0.727**	0.396	0.158
GITI#2 - how tired/sleepy you feel	0.301	0.242	**0.592**
GITI#3 - things that happened that day	**0.824**	0.112	0.127
GITI#4 - how nervous/ anxious you feel	0.371	0.109	**0.486**
GITI#5 - how mentally awake you feel	0.459	**0.617**	0.234
GITI#6 - checking the time	0.289	**0.536**	0.522
GITI#7 - trivial things	0.522	**0.592**	0.125
GITI#8 - how you can't stop your mind from racing	**0.664**	0.541	-
GITI#9 - how long you've been awake	0.376	**0.670**	0.285
GITI#10 - your health	0.310	0.151	**0.418**
GITI#11 - ways you can get to sleep	0.188	**0.827**	0.199
GITI#12 - things you have to do tomorrow	**0.761**	0.273	0.204
GITI#13 - how hot/cold you feel	-	-	**0.775**
GITI#14 - your work/ responsibilities	**0.793**	0.334	0.287
GITI#15 - how frustrated/ annoyed you feel	**0.546**	0.374	0.444
GITI#16 - how light/dark the room is	-	0.268	**0.702**
GITI#17 - noises you can hear	0.269	0.136	**0.341**
GITI#18 - being awake all night	0.275	**0.692**	0.370
GITI#19 - pictures in your mind	**0.581**	0.238	0.386
GITI#20 - the effects of not sleeping well	0.190	0.515	**0.661**
GITI#21 - your personal life	**0.721**	0.283	0.185
GITI#22 - how thinking too much is the problem	0.509	**0.674**	0.111
GITI#23 - things in your past	**0.597**	0.429	0.139
GITI#24 - how bad you are at sleeping	0.261	**0.758**	0.433
GITI#25 - things to do to help you sleep	0.268	**0.851**	0.127

Factor 1 (subscale 1) = problem-solving cognitive intrusions
Factor 2 (subscale 2) = sleep-related cognitive intrusions
Factor 3 (subscale 3) = physical/autonomic cognitive intrusions

Figure 1: Box & whiskers plot demonstrating GITI's ability to discriminate between good sleepers & insomniacs



Box reflects interquartile range for each group (black line = median). "Whiskers" represent range of scores for each group.

Single Clinical Case Research Study

Involving nursing staff in treatment: A single subject experimental investigation of the effects of structured activity on the rate of dysfunctional repetitive verbal requests in an adult with severe learning disabilities

(Structured summary only – full study bound in Research Portfolio Part II)

Prepared in accordance with the requirements for submission to the "*Journal Of Applied Research in Intellectual Disabilities*" (see Research Portfolio Part II - Appendix 1.1)

Structured Summary

Background: This study examined the experimental introduction of structured activity by nursing staff with a severely learning disabled individual with dysfunctional repetitive verbal requests.

Method: A within-series reversal design ($A_1B_1A_2B_2$) conducted over one afternoon was used to evaluate treatment effects on repetitive verbal requests, and 4 other pre-defined target behaviours (appropriate/ inappropriate communication, appropriate/inappropriate behaviour).

Results: Results were analysed using interrupted time series analysis, and presented graphically. For repetitive verbal requests, a statistically significant difference emerged between the 2nd baseline and 2nd treatment phase. Observed rates of repetitive verbal requests repeatedly fell during treatment phases. Statistically significant differences emerged between the 1st baseline and 1st treatment phase, and between the 1st treatment and 2nd baseline phase for rates of appropriate behaviour. No discernable differences emerged between consecutive phases for appropriate communication, however carry-over effects were evident. For inappropriate behaviour and inappropriate communication, the results obtained demonstrated floor effects across consecutive phases.

Conclusions: Structured activity is an effective, yet simple treatment strategy easily applied by nursing staff in clients' naturalistic environment.

APPENDICES

Small Scale Service Evaluation Project

Appendix 1.1 – Guidelines for contributors to the *Journal of Mental Health.*

Appendix 1.2 – Patient information sheet.

Appendix 1.3 – Patient consent form.

Appendix 1.4 – Patient Attendance Questionnaire.

Appendix 1.5 – Categorisation of responses – Figures (i) to (vii).

Appendix 1.1: Guidelines for contributors to the *Journal of Mental Health*

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 (to include full first name) 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, telephone and fax numbers 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. Names of all authors are required.

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.

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Appendix 1.2 - Patient Information Sheet

Please read the following information before filling in the questionnaire.

Thank you for attending your appointment with clinical psychology. Unfortunately, many people do not keep their appointment. As a result, people who are keen to attend often find they have to wait much longer than we would like for their first appointment.

We are interested in what influenced your decision to attend today. The information you give will be extremely useful in helping us improve the service we provide for people referred to clinical psychology.

Everything you write in the questionnaire will remain confidential.

Your decision to take part or not take part in the study will not affect your treatment in any way.

If you are willing to take part in the study, please sign the consent form and return it with your completed questionnaire in the envelope provided.

Thank you for your co-operation.

Appendix 1.3 - Consent Form

I ..... Have read the information sheet and agree to take part in the study.

I understand that my decision to take part or not take part in the study will have no effect on my treatment in any way.

Signature .....

Date .....

PLEASE ENCLOSE THE CONSENT FORM WITH YOUR QUESTIONNAIRE IN THE ENVELOPE PROVIDED

Appendix 1.4 - Patient Attendance Questionnaire

General Information

1) Date of birth :

2) Male or Female (circle one)

3) Marital Status (circle one of the following) :

Married Divorced Single Separated Living with Partner

Widow

4) Are you working at the moment ? (circle one of the following) :

Employed (full-time) Employed (part-time) Self-employed

Unemployed

Sick Leave Student Disabled

5) How many children do you have (under 16) ? _____

6) What are the main problems you have at the moment ?

-
-
-
-

7a) Did anyone explain to you what a clinical psychologist is ? What did they tell you ?

_____

_____

_____

7b) Did they explain how seeing a clinical psychologist might help you ? What did they tell you ?

_____

_____

_____

We are interested in your decision to attend your appointment with clinical psychology.
Below is a list of statements that other people have identified as being important in their decision to attend. When thinking about your own decision to attend -

A) Read the statement on the left hand side.
B) Decide if it made you think you **WOULD** or **WOULD NOT** attend your appointment.
C) Decide how much of your decision to attend was based on it - **A LITTLE** or **A LOT.**

Mark your answer in the box provided by placing a cross (**X**) in the appropriate box.

	Made me think I WOULD attend			**Made me think I WOULD NOT attend**	
	A little	**A Lot**		**A Little**	**A Lot**
1) The place where the appointment was held					
2) The time of the appointment					
3) The length of time waiting for an appointment					
4) Having to arrange for someone to look after the children					
5) Having to arrange time off work					
6) The letter I got from clinical psychology					
7) My Doctor's reaction to my problem					
8) How bad the problem is					
9) The length of time I have had the problem					
10) The effect of the problem on my life					
11) How I thought coming to see a psychologist would affect my problems					

For questions 12 - 14 choose either (a) or (b) depending on your situation.

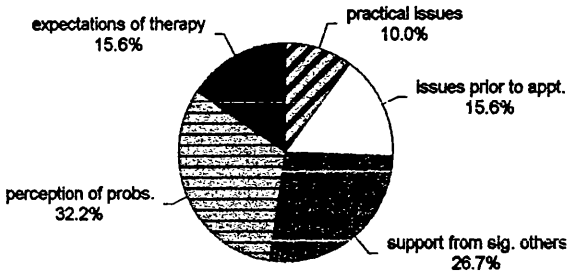
	Made me think I WOULD come			**Made me think I WOULD NOT come**	
	A little	**A lot**		**A little**	**A lot**
12a) Knowing what a clinical psychologist is **OR**					
12b) Not knowing what a clinical psychologist is					
13a) Knowing how clinical psychology could help me **OR**					
13b) Not knowing how clinical psychology could help me					
14a) Having previous contact with psychiatry or psychology **OR**					
14b) Having no previous contact with psychiatry or psychology					
15) The views of my family					
16) The views of my friends					
17) My psychologist being male or female - on your appointment letter					

Thank you for filling in the questionnaire.
Put your questionnaire & consent form in the envelope provided, seal it & return it to the secretary.

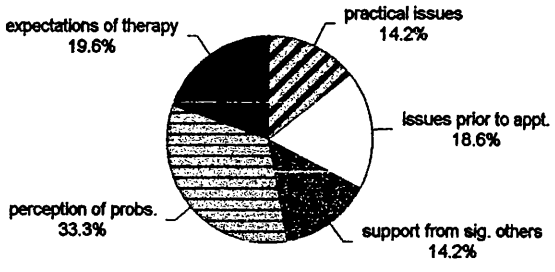
Appendix 1.5

Figures (i) & (ii) - Categorisation of Responses on "Would Attend (a lot)" by Gender

males (n=13)

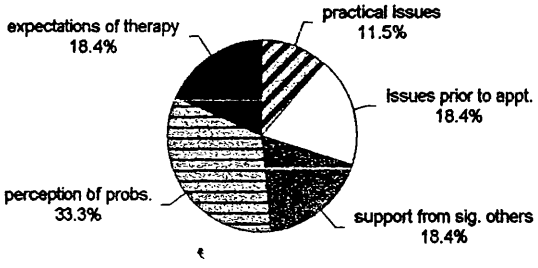


females (n=27)

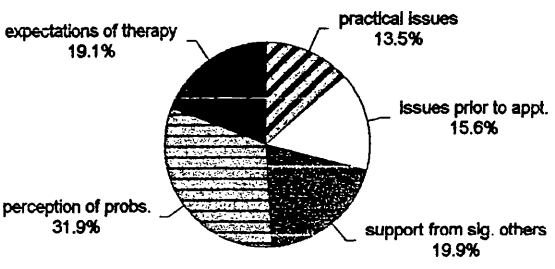


Figures (iii), (iv) & (v) - Categorisation of Responses on "Would Attend (a lot)" by Age

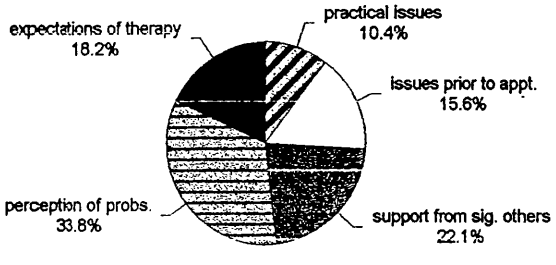
16-30 years (n=12)



31-45 years (n=16)

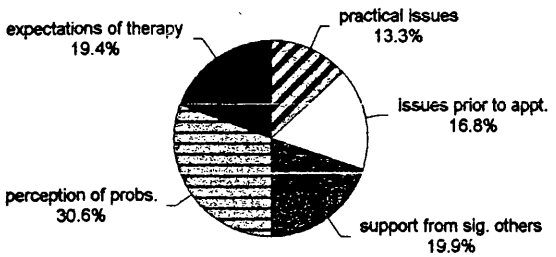


45+ years (n=12)

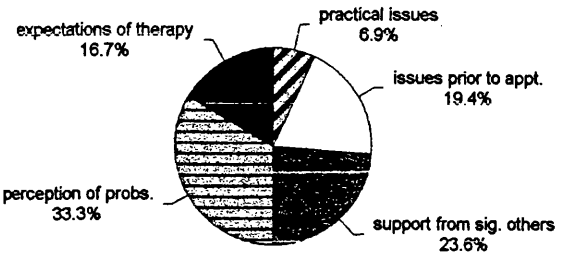


Figures (vi) & (vii) - Categorisation of Responses on "Would Attend (a lot)" by Disorder

mood disorders (n=25)



anxiety disorders (n=8)



Major Research Project Literature Review

Appendix 2.1 – Guidelines for contributors to the *British Journal of Clinical Psychology.*

Appendix 2.1: Guidelines for contributors to the *British Journal of Clinical Psychology*

NOTES TO CONTRIBUTORS

1. The *British Journal of Clinical Psychology* publishes original contributions to scientific knowledge in clinical and health psychology. Topics covered reflect the broad role of clinical psychologists and include descriptive studies as well as studies of the aetiology, assessment and amelioration of disorders of all kinds, in all settings and amongst all age groups. Empirical investigations from any theoretical perspective of the relation of intrapersonal and interpersonal processes to disorder are welcome, as are studies of the delivery of health care in hospital or community settings. Relevant populations include people with psychiatric and neuropsychological disorders, and people with learning difficulties/mental retardation. Studies with samples not currently experiencing any disorder may be considered if they bear directly on clinical theory or practice.

The Health Psychology Section of the Journal will be launched in 1996 as a separate journal—*British Journal of Health Psychology*—in recognition of the growing importance of the applications of psychology outside the traditional psychiatric domain. Submissions are encouraged of clinical and experimental research on the development and management of medical conditions. Empirical research into psychosocial responses to illness, and the behaviours that put health at risk, is also welcome.

2. The following types of paper are invited:

(*a*) Papers reporting original empirical investigations.

(*b*) Theoretical papers, provided that these are sufficiently related to empirical data

(*c*) Review articles which need not be exhaustive, but which should give an interpretation of the state of the research in a given field and, where appropriate, identify its clinical implications.

(*d*) Brief Reports and Comments (see paragraph 6).

Case studies are normally published only as Brief Reports. Papers are evaluated in terms of their theoretical importance, contributions to knowledge, relevance to the concerns of practising clinical psychologists, and readability. Papers generally appear in order of acceptance, except for the priority given to Brief Reports and Comments.

3. The circulation of the Journal is worldwide, and papers are reviewed by colleagues in many countries. There is no restriction to British authors, and papers are invited from authors throughout the world.

4. The Code of Conduct of The British Psychological Society requires psychologists 'Not to allow their professional responsibilities or standards of practice to be diminished by considerations of religion, sex, race, age, nationality, party politics, social standing, class or other extraneous factors'. The Society resolves to avoid all links with psychologists and psychological organizations and their formal representatives that do not affirm and adhere to the principles in the clause of its Code of Conduct. In cases of doubt the Journals Office asks authors to sign a document confirming their adherence to these principles.

5. Papers should be prepared in accordance with The British Psychological Society's *Style Guide*, available at £3.50 per copy from The British Psychological Society, St Andrews House, 48 Princess Road East, Leicester LE1 7DR, England. Contributions should be kept as concise as clarity permits, and illustrations kept as few as possible. Papers should not normally exceed 5000 words. A summary of up to 200 words should be provided, but a shorter abstract with shorter papers. The title should indicate exactly but as briefly as possible the subject of the article, bearing in mind its use in abstracting and indexing systems.

(*a*) Contributions should be typed in double spacing with wide margins and only on one side of each sheet. Sheets should be numbered. The top copy and at least three good duplicates should be submitted and a copy should be retained by the author.

(*b*) The Journal operates blind review; authors are required to eliminate clues to their identity. Information revealing authorship (such as authors' names and institutional affiliations, and personal acknowledgements) must be confined to a removable front page, and the text must be free of such clues as identifiable self-citations ('In our earlier work...') and the names of localities or institutions. The paper's title should appear at the top of the first page of text.

(*c*) Tables should be typed in double spacing on separate sheets. Each should have a self-explanatory title and should be comprehensible without reference to the text. They should be referred to in the text by arabic numerals. Data given should be checked for accuracy and must agree with mentions in the text.

(*d*) Figures, i.e. diagrams, graphs or other illustrations, should be on separate sheets numbered sequentially 'Fig. 1', etc., and each identified on the back with the title of the paper. They should be carefully drawn, larger than their intended size, suitable for photographic reproduction and clear when reduced in size. Special care is needed with symbols: correction at proof stage may not be possible. Lettering must not be put on the original drawing but upon a copy to guide the printer. Captions should be listed on a separate sheet.

(*e*) Bibliographical references in the text should quote the authors name and the date of the publication thus; Hunt (1993). They should be listed alphabetically by author at the end of the article according to the following format:

Moore, R. G. & Blackburn, I.-M. (1993). Sociotropy, autonomy and personal memories in depression. *British Journal of Clinical Psychology*, 32, 460–462.

Steptoe, A. & Wardle, J. Cognitive predictors of health behaviour in contrasting regions of Europe. In C. R. Brewin, A. Steptoe & J. Wardle (Eds), *European Perspectives in Clinical and Health Psychology*, pp. 101–118. Leicester: The British Psychological Society.

Particular care should be taken to ensure that references are accurate and complete. Give all journal titles in full.

(*f*) SI units must be used for all measurements, rounded off to practical values if appropriate, with the Imperial equivalent in parentheses (see BPS *Style Guide*).

(*g*) Authors are required to avoid the use of sexist language.

(*h*) Supplementary data too extensive for publication may be deposited with the British Library Document Supply Centre. Such material includes numerical data, computer programs, fuller details of case studies and experimental techniques. The materials should be submitted to the Editor together with the article, for simultaneous refereeing.

6. Brief Reports and Comments are limited to two printed pages. These are subject to an accelerated review process to afford rapid publication of research studies, and theoretical, critical or review comments whose essential contribution can be made within a small space. They also include research studies whose importance or breadth of interest is insufficient to warrant publication as full articles, and case reports making a distinctive contribution to theory or method. Authors are encouraged to append an extended report to assist in the evaluation of the submission and to be made available to interested readers on request to the author. To ensure that the two-page limit is not exceeded, set typewriter margins to 66 characters maximum per line and limit the text, including references and a 100 word abstract, to 150 lines. Figures and tables should be avoided. Title, author name and address for reprints and data of receipt are not included in the allowance. However deduct three lines from the text each and every time any of the following occur:

(*a*) title longer than 70 characters,

(*b*) author names longer than 70 characters,

(*c*) each address after the first address,

(*d*) each text heading (these should normally be avoided).

A character is a letter or space. A punctuation mark counts as two characters (character plus space) and a space must be allowed on each side of a mathematical operator.

7. Proofs are sent to authors for correction of print, but not for introduction of new or different material. They should be returned to the Journals Manager as soon as possible. Fifty complimentary copies of each paper are supplied to the senior author on request: further copies may be ordered on a form supplied with the proofs.

8. Submission of a paper implies that it has not been published elsewhere and is not currently under consideration for publication elsewhere. Authors are responsible for getting written permission to publish lengthy quotations, illustrations etc., of which they do not own copyright.

9. The tendency is growing for articles to be reproduced abroad without permission. To protect the interests of authors and journals the BPS requires copyright to be assigned to the Society (by signing a form), on the express condition that authors may use their own material elsewhere at any time without permission.

Major Research Project Proposal

Appendix 3.1 – D.Clin.Psy. Guidelines for Major Research Project Proposal

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

2. Title – no more than 15 words.

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

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.

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

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.

    6.1) subjects – a brief statement of inclusion and exclusion criteria and anticipated number of participants.

    6.2) measures – a brief explanation of interviews/observations/rating scales etc. to be employed, including references where appropriate.

    6.3) design and procedure – a brief explanation of the overall experimental design with reference to comparisons to be made, control populations, timing measurements etc. A summary chart may be helpful to explain the research process.

    6.4) settings and equipment – a statement on the location(s) to be used and resources or equipment which will be employed (if any).

    6.5) data analysis – a brief explanation of how data will be collated, stored and analysed.

7. Practical applications – the applicants should state the practical use to which the research findings could be put.

8. Timescales – the proposed starting date and duration of the project.

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

Appendix 3.2

Participant Information Sheet - Pilot Study

GREATER GLASGOW PRIMARY CARE NHS TRUST

The Assessment of Pre-Sleep Cognitive Intrusions - Scale Development & Validation.

What Is The Study About?
The aim of the study is to develop a scale to accurately assess the type of thoughts that interfere with people's sleep.
As there is no scale currently available to assess people's thoughts before falling asleep, the development of such a scale would be extremely useful to clinical psychologists, and other professionals who work with people who have problems falling asleep.

Are There Any Potential Hazards/Discomforts I Might Experience?
Taking part in the study involves no risk to you. All aspects of the study will be completed at home.

What Do I Have To Do?
If you decide to take part in the study, you will be given 5 questionnaires to complete to assess how suitable you are for the study. If included, you will then be given a device called an "Actigraph" which looks like a watch. It is worn round the wrist for 3 consecutive nights afterwhich it is removed and returned to the researcher. This measures the amount of activity, or movement, occurring before and during sleep. You will also be given a voice-activated tape-recorder to record what you are thinking about when you are trying to get to sleep. The tape-recorder is placed at your bedside for three consecutive nights. Once activated, all you need to do is say out loud what you are thinking. Following each night, when you get up you will need to complete a sleep diary which provides some basic information on your sleep. All participants will be offered the chance to receive feedback on their performance, and advice on how to improve their sleep if required.

What About Confidentiality?
Your decision to take part or not take part in the study will remain entirely confidential - that means nobody other than the researcher will know that you are taking part in the study. All the information you provide will be kept in a secure place.

What If I Decide Not To Take Part?
You do not have to take part in the study if you don't want to, and you don't have to give any reason why you don't want to take part.

What If I Decide To Take Part And Then Change My Mind?
You are free to withdraw from the study at any point and do not have to give any explanation of your reasons for doing so.

Who Can I Contact If I Want More Information?
If you wish to discuss any points covered in the information sheet, or wish to ask any questions about the specific aspects of the study, please do not hesitate to telephone **Karen Harvey** at the number or address given below, who will be happy to answer any questions you may have - **Mrs Karen Harvey**

Clinical Psychologist in Training
Department Of Psychological Medicine
Gartnavel Royal Hospital
1055 Great Western Road
Glasgow G12 0XH, Tel No. - 0141 211 0344

Appendix 3.3: Consent Form

GREATER GLASGOW PRIMARY CARE NHS TRUST

The Assessment of Pre-Sleep Cognitive Intrusions - Scale Development & Validation

CONSENT FORM

- **I have read the "Participant Information Sheet" and understand the information contained in it.**
- **I have had the opportunity to discuss any points I wish to with the researcher.**
- **I understand that I am free to withdraw from the study at any point, and that I do not have to give any reason for doing so.**
- **I understand that any information I provide will be confidential, and known only to myself and the researcher.**

I ..... agree to take part in the study.

Name (please print) .....

Signature .....

Date .....

Appendix 3.4

Participant Information Sheet - Main Study

GREATER GLASGOW PRIMARY CARE NHS TRUST

The Assessment of Pre-Sleep Cognitive Intrusions - Scale Development & Validation.

What Is The Study About?
The aim of the study is to develop a scale to accurately assess the type of thoughts that interfere with people's sleep.
As there is no scale currently available to assess people's thoughts before falling asleep, the development of such a scale would be extremely useful to clinical psychologists, and other professionals who work with people who have problems falling asleep.

Are There Any Potential Hazards/Discomforts I Might Experience?
Taking part in the study involves no risk to you. All aspects of the study will be completed at home.

What Do I Have To Do?
If you decide to take part in the study, you will be given 5 questionnaires to complete to assess how suitable you are for the study. If included, you will then be given a device called an "Actigraph" which looks like a watch. It is worn round the wrist for 3 consecutive nights afterwhich it is removed and returned to the researcher. This measures the amount of activity, or movement, occurring before and during sleep. . Following each night, when you get up you will need to complete a sleep diary which provides some basic information on your sleep. You will also be given 4 more questionnaires to complete once. Two to three weeks later, you will be asked to complete one questionnaire again - no other measures need to be repeated. All participants will be offered the chance to receive feedback on their performance, and advice on how to improve their sleep if required.

What About Confidentiality?
Your decision to take part or not take part in the study will remain entirely confidential - that means nobody other than the researcher will know that you are taking part in the study. All the information you provide will be kept in a secure place.

What If I Decide Not To Take Part?
You do not have to take part in the study if you don't want to, and you don't have to give any reason why you don't want to take part.

What If I Decide To Take Part And Then Change My Mind?
You are free to withdraw from the study at any point and do not have to give any explanation of your reasons for doing so.

Who Can I Contact If I Want More Information?
If you wish to discuss any points covered in the information sheet, or wish to ask any questions about the specific aspects of the study, please do not hesitate to telephone **Karen Harvey** at the number or address given below, who will be happy to answer any questions you may have - **Mrs Karen Harvey**

Clinical Psychologist in Training
Department Of Psychological Medicine
Gartnavel Royal Hospital
1055 Great Western Road
Glasgow G12 0XH, Tel No. - 0141 211 0344

Appendix 3.5: The Sleep History Questionnaire

Name : Date of birth :

Address : Marital Status :

Occupation :

Phone No. :

1. Nature of Sleep-Wake problem

Do you have a problem with falling asleep? No Mild Moderate Severe

Do you have a problem with staying asleep? No Mild Moderate Severe

Do you have a problem with waking up too early in the morning? No Mild Moderate Severe

Do you have a problem with staying awake during the day? No Mild Moderate Severe

2. Current Sleep-Wake Schedule

What is your usual bedtime on weekdays ? _____ o'clock

At what time do you last awaken in the morning? _____ o'clock

What is your usual rising time on weekdays? _____ o'clock

Do you have the same sleep-wake schedule on weekends? YES NO

How often do you take naps (including unintentional naps)? _____ days/week

Do you ever fall asleep at inappropriate times/places? YES NO

How many nights/week do you have a problem with falling asleep/staying awake? _____ nights

On a typical night (past month), how long does it take you to fall asleep after you go to bed & turn the lights off? _____ hours ____ min

On a typical night (past month) how many times do you wake up during the middle of the night? _____ times

What wakes you up at night? Pain Child Noise Spontaneous

On a typical night, how long do you spend awake in the middle of the night (total no. of min/hrs for all wakenings)? _____ hours _____ min

How many hours of sleep per night do you usually get ? _____ hours _____ min

3. Sleeping Aids

In the past 4 weeks have you used sleeping pills? YES NO

Which drugs?

Which dosage?

How many nights/week?

If no, have you ever?

When did you first use sleep medication?

When did you last use sleep medication?

In the past 4 weeks have you used alcohol as a sleep aid? YES NO

If no, have you ever? YES NO

4. *History of Sleep Problems (onset, course, duration)*

How long have you been suffering from insomnia? _____ years _____ months

Were there any stressful life events related to it's onset (e.g. death of a loved one, divorce, retirement, medical or emotional problems etc)?

Gradual or sudden onset?

What has been the course of your insomnia problem since it's onset (e.g. persistent, episodic, seasonal etc)?

5. Bedroom Environment

Are you sleeping with a bed partner? YES NO

Do you have a TV, radio, phone in your bedroom? YES NO

Is there a desk with paperwork to be done in the room? YES NO

Do you read in bed before bedtime? YES NO

What is your room temperature at night? Hot Warm Cool Cold

6. Lifestyle

How many times per week do you exercise? _____ times per week

Do you sometimes exercise prior to bedtime? YES NO

How many caffeinated drinks do you drink per day? _____ per day

How many cigarettes per day do you smoke? _____ per day

How many units of alcohol per day do you drink? _____ per day

7. General

What is your pre-bedtime routine like?

What do you do when you can't fall asleep, or return to sleep?

Is your sleep better/worse/same when you go away from home?

Is your sleep better/worse/same on weekends?

What types of factors exacerbate your sleep problem (e.g. stress at work, travel plan etc)?

What types of factors improve your sleep?

How concerned are you about sleep/insomnia?

What impact does insomnia have on your life (e.g. mood, alertness, performance)?

How do you cope with these daytime sequelae?

Have you received treatment in the past other than sleeping aids?

If you would like to add any further information that you think would be relevant, then please do so in the space provided below.

Thank you for answering these questions.

Appendix 3.6

Pittsburgh Sleep Quality Index

Name _____ Date _____ ID No _____

Instructions :
The following questions relate to your usual sleep habits during the past month **only.** Your answers should indicate the most accurate reply for the **majority** of days and nights in the past month.

Please answer all of the questions.

1. During the past month, when have you usually gone to bed at night?
USUAL BED TIME _____
2. During the past month, how long (in minutes) has it taken you to fall asleep each night?
NUMBER OF MINUTES _____
3. During the past month, when have you usually got up in the morning?
USUAL GETTING UP TIME _____
4. During the past month, how many hours **actual** sleep did you get at night (this may be different than the number of hours you spend in bed).
HOURS OF SLEEP PER NIGHT _____

For each of the remaining questions, check the one best response. Please answer all the questions.

5. During the past month, how often have you had trouble sleeping because you .....

(a) Cannot get to sleep within 30 minutes

Not during the past month ____	Less than once a week ____	Once or twice a week ____	Three or more times a week ____

(b) Wake up in the middle of the night or early morning

Not during the past month ____	Less than once a week ____	Once or twice a week ____	Three or more times a week ____

(c) Have to get up to use the bathroom

Not during the past month ____	Less than once a week ____	Once or twice a week ____	Three or more times a week ____

(d) Cannot breathe comfortably

Not during the past month ____	Less than once a week ____	Once or twice a week ____	Three or more times a week ____

(e) Cough or snore loudly

Not during the past month ____	Less than once a week ____	Once or twice a week ____	Three or more times a week ____

(f) Feel too cold

Not during the past month ____	Less than once a week ____	Once or twice a week ____	Three or more times a week ____

(g) Feel too hot

Not during the past month ____	Less than once a week ____	Once or twice a week ____	Three or more times a week ____

(h) Had bad dreams

Not during the past month ____	Less than once a week ____	Once or twice a week ____	Three or more times a week ____

(I) Have pain

Not during the past month ____	Less than once a week ____	Once or twice a week ____	Three or more times a week ____

(j) Other reason(s), please describe

_____

_____

6. During the past month, how would you rate your sleep quality overall?

Very good _____
Fairly good _____
Fairly bad _____
Very bad _____

7. During the past month, how often have you taken medicine (prescribed or "over the counter") to help you sleep?

Not during the past month ____	Less than once a week ____	Once or twice a week ____	Three or more times a week ____

8. During the past month, how often have you had trouble staying awake while, driving, eating meals, or engaging in social activity?

Not during the past month ____	Less than once a week ____	Once or twice a week ____	Three or more times a week ____

9. During the past month, how much of a problem has it been for you to keep up enough enthusiasm to get things done?

Not a problem at all _____
Only slight problem _____
Somewhat of a problem _____
A very big problem _____

10. Do you have a bed partner or roommate?

No bed partner or roommate _____
Partner/room-mate in other room _____
Partner in same room, but not same bed _____
Partner in same bed _____

SLEEP HISTORY

1. How long have you had your sleep problem?

_____

_____

2. Has your sleep problem been constant over the years or does it come in spells?

Constant _____
spells _____

3. Do you know the cause? If so, please explain. E.g. were you undergoing a major life event (death of a loved one, illness, change of job) at the time of the initial episode of insomnia?

4. Have you sought help before? If so, when was the last time?

5. If you have tried different methods or techniques please indicate below what worked a bit, well and not at all.

Worked a bit :

Worked well :

Did not work at all :

Thank you.

Appendix 3.7: Sleep Diary

Name : Date of investigation :

	Day 1	**Day 2**	**Day 3**
At what time did you get up this morning?	____	____	____
At what time did you go to bed last night?	____	____	____
How long did it take you to fall asleep (minutes)	____	____	____
How many times did you awaken up during the night?	____	____	____
How many times were you awake for longer than 10 min?	____	____	____
How long were you awake during the night (in total)?	____	____	____
How long did you sleep altogether (hours/minutes)?	____	____	____

Appendix 3.8

PRE-SLEEP AROUSAL SCALE : COGNITIVE SUBSCALE

Please describe how intensely you experienced each of the symptoms mentioned below as you attempted to fall asleep.

	Not at all	**Slightly**	**Moderately**	**A Lot**	**Extremely**
Worry about falling asleep	1	2	3	4	5
Review or ponder the events of the day	1	2	3	4	5
Depressing or anxious thoughts	1	2	3	4	5
Worry about problems other than sleep	1	2	3	4	5
Being mentally alert, active	1	2	3	4	5
Can't shut off your thoughts	1	2	3	4	5
Thoughts keep running through your head	1	2	3	4	5
Being distracted by sounds, noise in the environment	1	2	3	4	5

Appendix 3.9

The DBAS-10

Several statements reflecting people's beliefs and attitudes about sleep are listed below. Please indicate to what extent you personally agree or disagree with each statement. There is no right or wrong answer. For each statement place a mark (/) along the line wherever your *personal* rating falls. Try to use the whole scale, rather than placing your marks at one end of the line.

1. I need 8 hours sleep to feel refreshed and function well during the day.

strongly disagree _____ strongly agree

2. When I don't get the proper amount of sleep on a given night, I need to catch up on the next day by napping or on the next night by sleeping longer.

strongly disagree _____ strongly agree

3. I am concerned that chronic insomnia may have serious consequences on my physical health.

strongly disagree _____ strongly agree

4. When I have trouble getting to sleep, I should stay in bed and try harder.

strongly disagree _____ strongly agree

5. I am worried that I may lose control over my abilities to sleep.

strongly disagree _____ strongly agree

6. After a poor night's sleep, I know that it will interfere with my daily activities on the next day.

strongly disagree _____ strongly agree

7. When I feel irritable, depressed or anxious during the day, it is mostly because I did not sleep well the night before.

strongly disagree _____ strongly agree

8. When I sleep poorly on one night, I know it will disturb my sleep schedule for the whole week.

strongly disagree _____ strongly agree

9. When I feel tired, have no energy, or just seem not to function well during the day, it is generally because I did not sleep well the night before.

strongly disagree _____ strongly agree

10. I get overwhelmed by my thoughts at night and often feel I have no control over this racing mind.

strongly disagree _____ strongly agree

Appendix 3.10

The Sleep Disturbance Questionnaire

Please put an X in the appropriate box, depending upon how *true* you feel each of the statements is for your typical sleep pattern.

On the nights when I don't sleep well the problem seems to be that :

	Never True	Seldom True	Sometimes True	Often True	Very Often True
1. I can't get into a comfortable position in bed.					
2. My mind keeps turning things over.					
3. I can't get my sleep pattern into a proper routine.					
4. I get too "worked up" at not sleeping.					
5. I find it hard to physically "let go" & relax my body.					
6. My thinking takes a long time to "unwind".					
7. I don't feel tired enough at bedtime.					
8. I try too hard to get to sleep.					
9. My body is full of tension.					
10. I am unable to empty my mind.					
11. I spend time reading/watching TV in bed when I should be sleeping.					
12. I worry that I won't cope tomorrow if I don't sleep well.					

Which one of the above statements is most relevant to you?

Are there any other factors associated with your poor sleep pattern? If so, please write a short note below.

Thank You.

Ref: AmcM/0015

GREATER GLASGOW
PRIMARY CARE
NHS TRUST

17 May, 2000

Mrs K Harvey
Academic Centre
Gartnavel Royal Hospital
1055 Gt Western Road
Glasgow
G12 0XH

Dear Mrs Harvey

PROJECT: ***The assessment of pre-sleep cognitive intrusions - scale development and validation***

Many thanks for sending the above named submission to the Research Ethics Committee - it was formally discussed at our meeting on 13 April, 2000. I am pleased to be able to tell you that apart from one slight alteration the Committee has no objections from an ethical point of view, to this project proceeding and ethical approval is formally granted.

- The Committee would request that an insertion be made into the Patient Information Sheet to clearly indicate to the participant exactly how many questionnaires they would be required to complete.

Before your project commences you will also require to obtain management approval via the Research & Development Directorate, Gartnavel Royal Hospital.

I would also like to take this opportunity to remind you that you should notify the Committee if there are any changes, or untoward developments, connected with the study – the Committee would then require to further reconsider your application for approval. The Committee expect to receive a brief regular update every 6 months, and then a brief final report on your project when the study reaches its conclusion. (Failure to keep the Committee abreast of the status of the project can eventually lead to ethical approval being withdrawn)

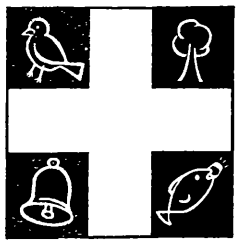
May I wish you every success with your study.

Yours sincerely

A W McMahon

A W McMAHON
Administrator – Research Ethics Committee

Our Ref: BR/AW/APP



GREATER GLASGOW
PRIMARY CARE
NHS TRUST

23 May 2000

Mrs K J Harvey
Clinical Psychologist in Training
Deprtment of Psychological Medicine
Gartnavel Royal Hospital
1055 Great Western Road
Glasgow
G12 0XH

Dear Mrs Harvey

Project Reference Number: **00CP02**
Project Title: **The assessment of pre-sleep cognitive intrusions - scale development and validation**

The above research project has now received the approval of the Research and Development Directorate. Therefore when you receive the approval of the Ethics Committee, your research may commence.

The enclosed computer print-out shows your project details which have been entered on the Trust's R & D database. The information we collect follows Chief Scientist Office guidelines and will be entered on the National Research Register in due course. You should therefore check the information entered, correct any errors and return to the Research & Development Directorate as soon as possible.

Information on the database will be up-dated from time to time and I would appreciate if you would inform the R & D office of any change of details, including the ethics committee decision. A final report should also be submitted when the project is complete.

Do not hesitate to contact the R & D office if you need any assistance in submitting the necessary information.

Your help is much appreciated.

Yours sincerely

pp.

BRIAN RAE
Research Manager

Enc.

Research & Development Directorate, Gartnavel Royal Hospital, 1055 Great Western Road, Glasgow, G12 0XH
Tel 0141 211 3661 Fax 0141 211 3814 e.mail annette.watt@gartnavel.glacomen.scot.nhs.uk

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Appendix 3.13

UNIVERSITY
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Ext: 4238

AKS/AH

11 July 2000

Mrs Karen Harvey
Department of
Psychological Medicine
Gartnavel Royal Hospital
Glasgow

Dear Mrs Harvey

Thank you for providing the details of your proposed research into sleep disorders. The Dean has studied the project proposal and has agreed that medical students may be invited to participate in the project.

Yours sincerely

Mrs A K Spurway
Clerk to the Faculty of Medicine

FACULTY OF MEDICINE
University of Glasgow, 12 Southpark Terrace, Glasgow G12 8LG
Clerk: Mrs A K Spurway *Tel:* 0141-330 4238 *E-mail:* A.K.Spurway@clinmed.gla.ac.uk
Administrative Secretary: Ms A Hillis *Tel:* 0141-330 6498 *E-mail:* a.m.hillis@clinmed.gla.ac.uk
Fax: 0141-330 5440

UNIVERSITY
of
GLASGOW

Memorandum

To: Mrs Karen Harvey, Division of Clinical Psychology, Department of Psychological Medicine

cc: Professor J Caughie, Dean of the Faculty of Arts
Professor David Jasper, Dean of the Faculty of Divinity

From: Aileen O'Neil, Clerk of the Faculty of Arts

Date: 11 January 2001

Sleep Research: Contact permission

Thank you for your letter of 18 December 2000 which arrived early in the new term with accompanying documentation about the project you are undertaking.

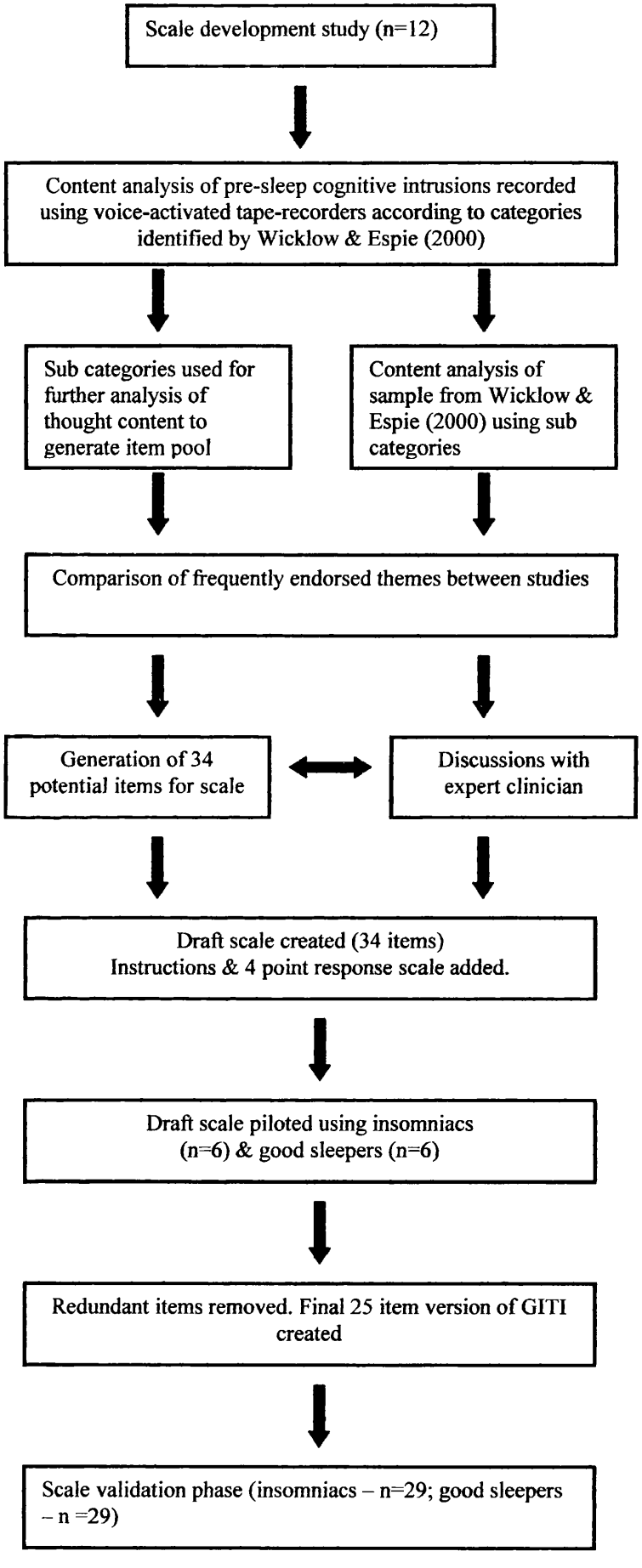
I have spoken with the Deans of both Faculties and they have given their permission for you to contact by e-mail students in the Faculties of Arts and Divinity for the above project.

Aileen O'Neil

FACULTY OF ARTS
6 University Gardens, Glasgow G12 8QH
Faculty Clerk: Ms Aileen O'Neil *Direct Line*: 0141-330 4363 *E-mail*: A.O'Neil@arts.gla.ac.uk
Faculty Office: 0141-330 6319 *E-mail*:clerk@arts.gla.ac.uk *Fax*: 0141-330 4537

Major Research Project Paper

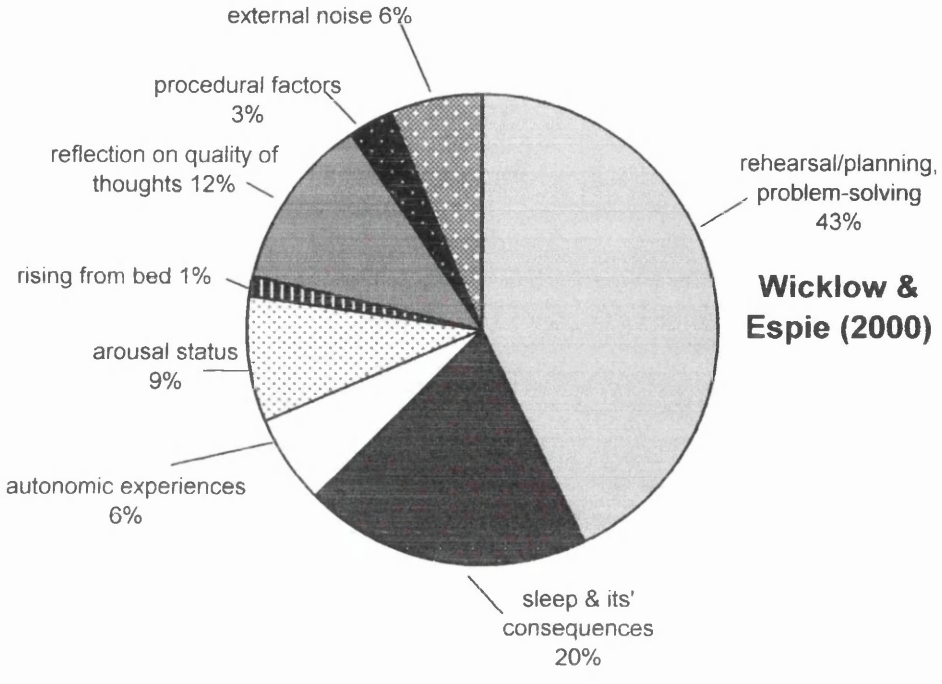
Appendix 4.1: Flow Chart of Experimental Design

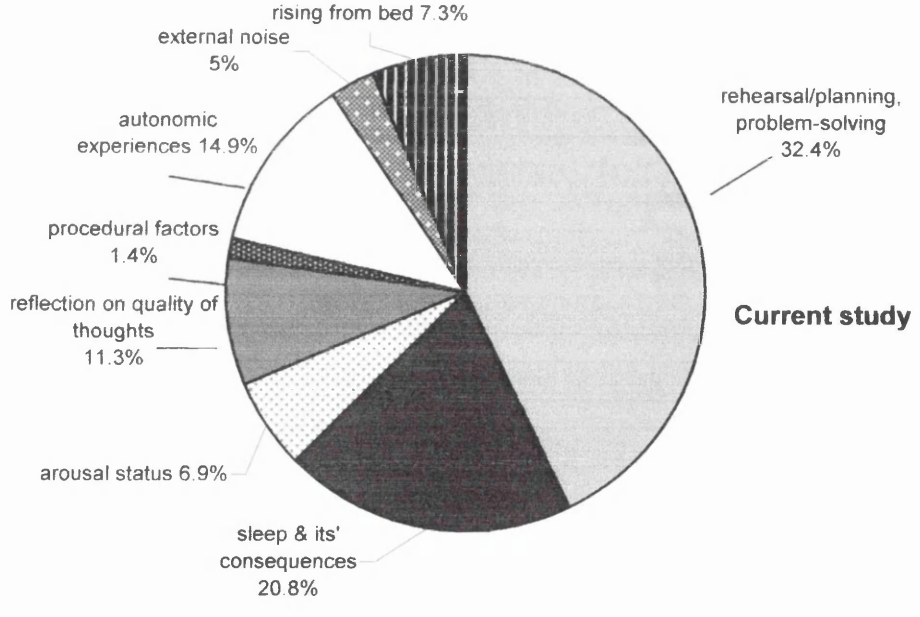


Appendix 4.2: Definitions of Thought Categories (reproduced from Wicklow & Espie 2000)

Thought Category	Definition
Rehearsing/planning, problem-solving	Thinking about the past day, past experiences, next day, things to do, planning things, forthcoming events, work-related & social issues, friends & family.
Sleep & it's consequences	Thinking about need/desire to sleep, efforts/time/expectancy to fall asleep, ease/difficulty of falling asleep quickly, importance of sleep, consequences of not sleeping, having a sleep problem, past experiences of sleep.
Reflection on quality of thoughts	"Thinking about thinking", mind buzzing, thoughts rushing, darting thoughts, visual imagery, random/dream-like thoughts, reference to own type of thinking, uncontrollability, unpleasantness.
Arousal status	Thinking about feeling exhausted, experiencing sleepiness, preoccupation with physical tiredness.
External noise	Thinking about the wind, wood creaking, traffic, clock, telephone ringing.
Autonomic experiences	Thinking about heart rate, headache, tension, body movement, feeling cold, hot feet, breathless, itching, restless.
Procedural factors	Thinking about procedure of the research itself, need to press actigraph button, thinking about what to say aloud.
Rising from bed	Thinking about getting up, putting the lights on.

Appendix 4.3: Distribution of thoughts per category for Wicklow & Espie (2000) & for current study





Appendix 4.4: 39 potential scale items originally developed from analysis of thought segments by category

Category	Subcategories of Potential Scale items
Rehearsal, planning, problem-solving	1. Going over events of that day 2. Thinking about future events 3. Planning for the next day 4. Thinking about previous events 5. Thinking about personal issues 6. Thinking about work/responsibilities
Sleep & its' consequences	7. Desire/hope to fall asleep 8. Feeling mentally awake 9. Efforts/strategies to induce asleep 10. Length of time taken to fall asleep 11. Expecting to fall asleep that night 12. Expecting not to fall asleep that night 13. Thinking about ones' sleep pattern 14. The effects of sleep loss 15. Things to do when you can't sleep 16. Thinking about being a poor sleeper 17. Thinking about things that keep you awake
Reflection on quality of thoughts	18. Awareness of "mind buzzing" 19. Thoughts are uncontrollable 20. Playing things over in your mind 21. Awareness of the connection between inability to sleep & thinking 22. Awareness that thoughts are nonsense/jumbled 23. Thinking about trivia, e.g. "nothing in particular", "same old stuff" 24. Pictures/images going through mind
Arousal status	25. Feeling tired/sleepy 26. Feeling nervous/anxious 27. Feeling uptight 28. Feeling frustrated/annoyed 29. Awareness of how light/dark the room is
External noise	30. Listening to noises outside the house 31. Listening to noises inside the house
Autonomic experiences	32. Feeling hot 33. Feeling cold 34. Feeling uncomfortable/restless 35. Awareness of bodily sensations 36. Awareness of aches & pains
Rising from bed	37. Thinking about putting the light on 38. Thinking about getting up (general) 39. Getting up to check the time

Appendix 4.5: Rank order of sub categories for scale development group (n=12) & sample from Wicklow & Espie (n=7).

1. **Rehearsal, planning, problem-solving**

Current sample (n=12, 27 subject nights) 137 thought segments			**Wicklow & Espie (2000) sample (n=7, 16 subject nights) 163 thought segments**		
Rank	**Item**	**n of thoughts**	**Rank**	**Item**	**n of thoughts**
1	*Thinking about personal issues	47	**1**	*Planning for the next day	42
2	*Thinking about work/responsibilities	36	**2**	Thinking about future events	39
3	*Thinking about future events	27	**3**	Thinking about personal issues	35
4	*Going over events of the day	18	**4**	Going over events of the day	31
5	*Thinking about previous events	9	**5**	Thinking about previous events	16
TOTAL = 137 (100%)**			TOTAL = 163 (100%)**		

2. **Sleep & its consequences**

Current sample (n=12, 27 subject nights) 88 thought segments			**Wicklow & Espie (2000) sample (n=7, 16 subject nights) 83 thought segments**		
Rank	**Item**	**n of thoughts**	**Rank**	**Item**	**n of thoughts**
1	*Efforts/strategies to fall asleep	17	**1**	Efforts/strategies to fall asleep	19
2	*Thinking about things that keep you awake	14	**2**	Thinking about own sleep pattern	17
3	*The effects of sleep loss	11	**3**	The length of time taken to fall asleep	14
4	*Thinking about own sleep pattern	10	**4**	Feeling mentally awake	13
5.5	*Feeling mentally awake	8	**5**	*Expecting not to fall asleep	12
5.5	*The length of time taken to fall asleep	8			
TOTAL = 68 (77.3%)**			TOTAL = 75 (90.4%)**		

* = scale item retained in draft questionnaire.
** = the overall percentage of thought segments (per category) accounted for by the sub categories shown.

3. Reflection on quality of thoughts

Current sample (n=12, 27 subject nights) 48 thought segments			Wicklow & Espie (2000) sample (n=7, 16 subject nights) 50 thought segments		
Rank	**Item**	**n of thoughts**	**Rank**	**Item**	**n of thoughts**
1	*Thoughts are nonsense/ jumbled	11	1	Thoughts are uncontrollable	13
2	*Mind buzzing	10	2	Mind buzzing	11
3	*Thoughts are uncontrollable	8	3	Thoughts are nonsense/ jumbled	8
4	*Thinking about trivia	7	4.5	Pictures/images in mind	7
5	*Picture/images in mind	5	4.5	*Awareness of connection between thoughts & inability to sleep	7
			5	Thinking about trivia	4
TOTAL = 41 (85.4%)**			TOTAL = 50 (100%)**		

4. Arousal status

Current sample (n=12, 27 subject nights) 29 thought segments			Wicklow & Espie (2000) sample (n=7, 16 subject nights) 16 thought segments		
Rank	**Item**	**n of thoughts**	**Rank**	**Item**	**n of thoughts**
1	*Feeling tired/sleepy	14	1	Feeling tired/sleep	8
2	*Feeling nervous/ anxious	7	2	Feeling nervous/anxious	5
3	*Feeling uptight	5	3	*Feeling frustrated annoyed	3
4	*Awareness of how light/dark the room is	3			
TOTAL = 29 (100%)**			TOTAL = 16 (100%)**		

5. External noise

Current sample (n=12, 27 subject nights) 21 thought segments			Wicklow & Espie (2000) sample (n=7, 16 subject nights) 14 thought segments		
Rank	**Item**	**n of thoughts**	**Rank**	**Item**	**n of thoughts**
1	*Noises outside the house	6	1	Noises outside the house	9
2	*Noises inside the house	9	2	Noises inside the house	5
TOTAL = 21 (100%)**			TOTAL = 14 (100%)**		

* = scale item retained in draft questionnaire.
** = the overall percentage of thought segments (per category) accounted for by the sub categories shown.

6. Autonomic experiences

Current sample (n=12, 27 subject nights) 63 thought segments			Wicklow & Espie (2000) sample (n=7, 16 subject nights) 11 thought segments		
Rank	**Item**	**n of thoughts**	**Rank**	**Item**	**n of thoughts**
1	*Feeling uncomfortable/ restless	23	**1**	Awareness of bodily sensations	4
2	*Feeling hot	14	**2**	Feeling incomfortable/ restless	3
3	*Feeling cold	10	**3.5**	Feeling hot	1
4.5	*Awareness of bodily sensations	8	**3.5**	Feeling cold	1
4.5	*Awareness of aches & pains	8	**5**	Awareness of aches & pains	1
TOTAL = 63 (100%)**			TOTAL = 11 (100%)**		

7. Rising from bed

Current sample (n=12, 27 subject nights) 31 thought segments			Wicklow & Espie (2000) sample (n=7, 16 subject nights) 8 thought segments		
Rank	**Item**	**n of thoughts**	**Rank**	**Item**	**n of thoughts**
1	*Getting up (general)	14	**1**	Getting up to look at the clock	5
2	*Getting up to look at the clock	9	**2**	Getting up (general)	2
3	*Putting the lights on	8	**3**	Putting the lights on	1
TOTAL = 31 (100%)**			TOTAL = 8 (100%)**		

* = scale item retained in draft questionnaire.
** = the overall percentage of thought segments (per category) accounted for by the sub categories shown.

Appendix 4.6: Chart of Excluded/Altered Items & Reasons for Exclusion/Alteration

Item(s) Removed/Altered	Reason For Removal/Alteration
thinking about putting the lights on	removed as not understood by responders.
something playing over in your mind	changed to "trivial things" (Q'n 7) due to low understanding by responders.
awareness that thinking is uncontrollable awareness of mind buzzing awareness that thoughts are non-sensical	combined into "how you can't stop your mind from racing" due to low understanding by responders & overlap in questions.
how uncomfortable/restless you feel awareness of bodily sensations	removed as responders felt Q'n 13 "how hot/cold you feel" was more specific response.
awareness of aches and pains in your body	changed to "your health" (Q'n 10) due to overlap with the previous 2 items.
thinking about ones' past sleep pattern	removed because too general - not understood by responders.
thinking about how thinking keeps you awake	changed to "how thinking too much is the problem" (Q'n 22) due to low understanding by responders.
thinking about things that keep you awake	changed to "being awake all night".
expecting not to sleep that night	removed due to overlap with "how bad you are at sleeping" (Q'n 24).
noises inside the house noises outside inside the house	combined into "noises you can hear" (Q'n 17) due to overlap.
expecting to fall asleep that night	removed due to overlap with other questions (Q'n 24).

Appendix 4.7 – The Glasgow Intrusive Thoughts Inventory

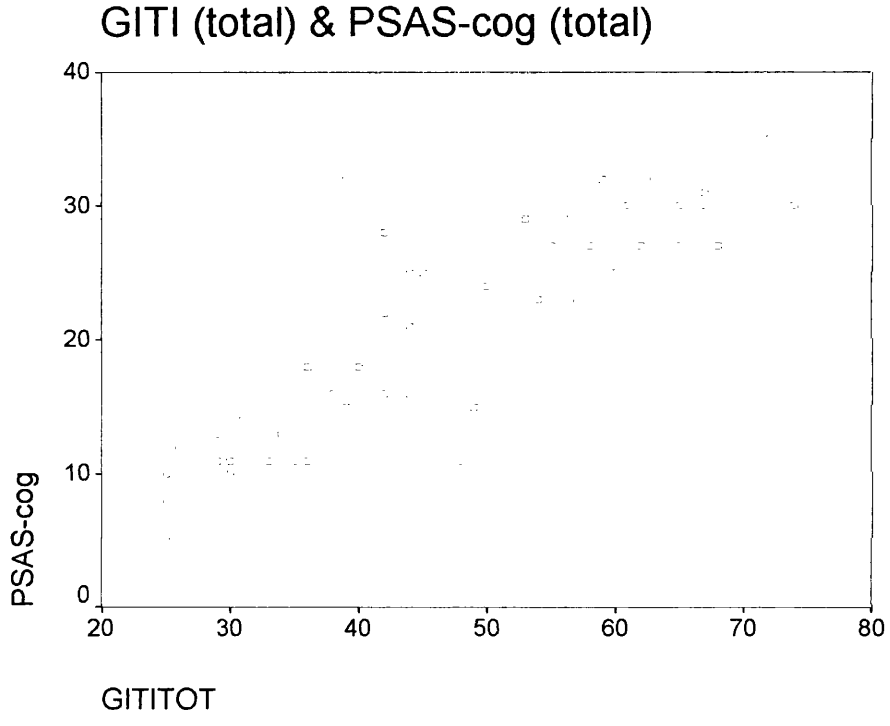
Name: Date:

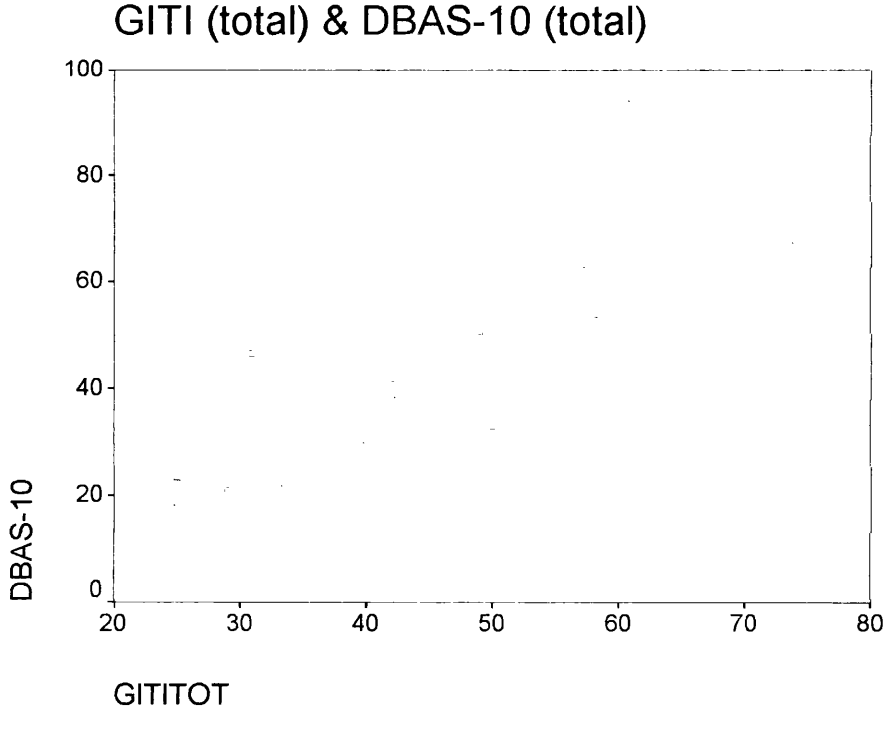
Here are some thoughts that people have when they can't sleep. Please indicate by placing a tick in the appropriate box how often **over the past 7 nights** the following thoughts have kept you awake.

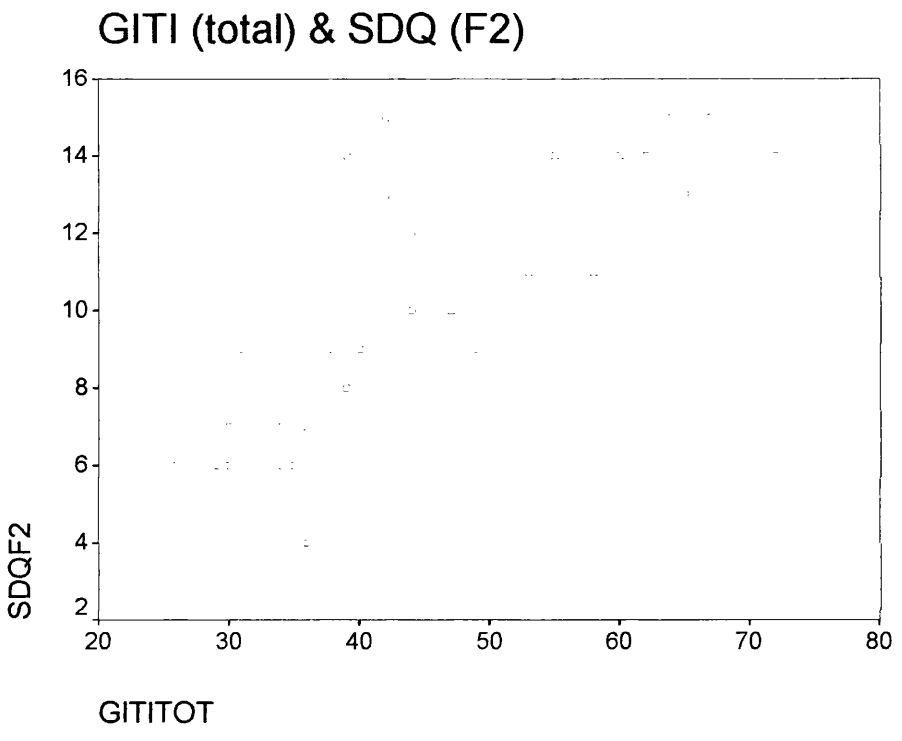
Thinking about :

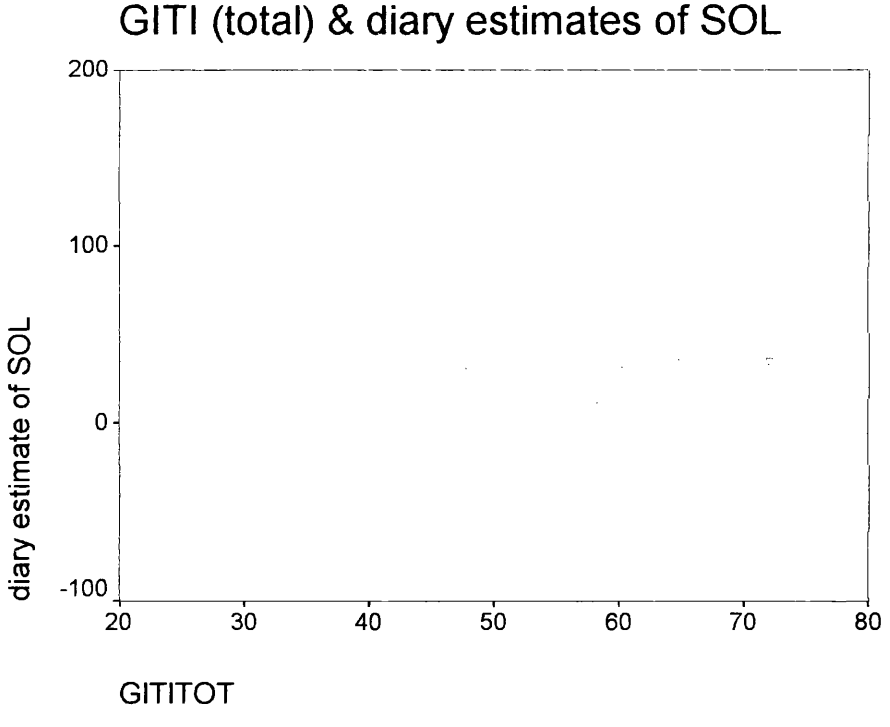
	Never	**Sometimes**	**Often**	**Always**
1. things in the future				
2. how tired/sleepy you feel				
3. things that happened that day				
4. how nervous/anxious you feel				
5. how mentally awake you feel				
6. checking the time				
7. trivial things				
8. how you can't stop your mind from racing				
9. how long you've been awake				
10. your health				
11. ways you can get to sleep				
12. things you have to do tomorrow				
13. how hot/cold you feel				
14. your work/responsibilities				
15. how frustrated/annoyed you feel				
16. how light/dark the room is				
17. noises you can hear				
18. being awake all night				
19. pictures in your mind				
20. the effects of not sleeping well				
21. your personal life				
22. how thinking too much is the problem				
23. things in your past				
24. how bad you are at sleeping				
25. things to do to help you sleep				

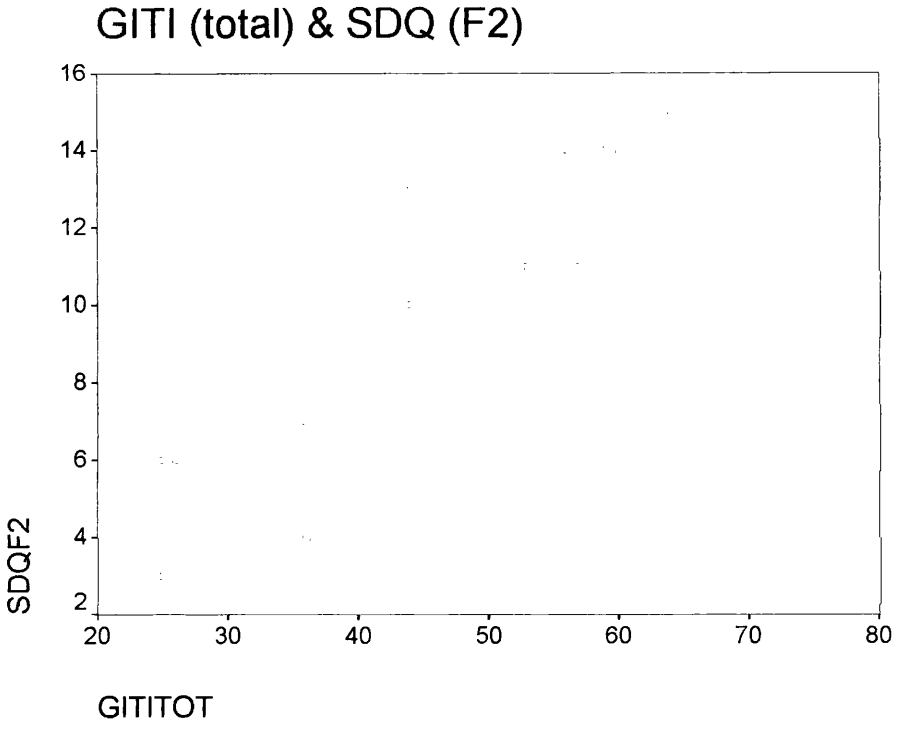
Appendix 4.8: Scatter plots for GITI (total score) & other measures of sleep disturbance

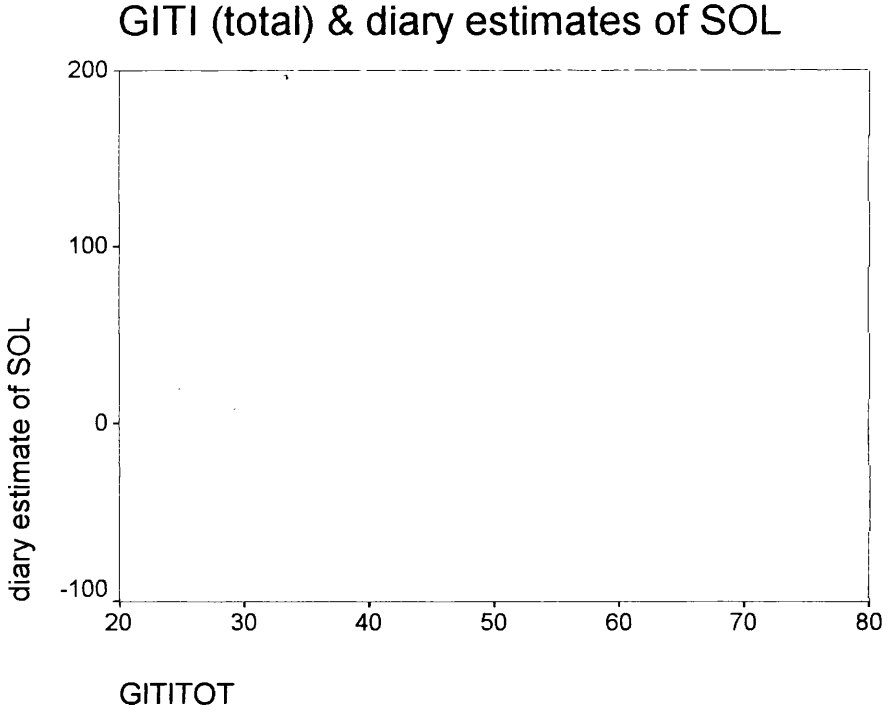





GITI (total) & SDQ (F2)
16
14
12
10
8
6
4
2
SDQF2
20
30
40
50
60
70
80
GITITOT


GITI (total) & diary estimates of SOL
200
100
0
-100
diary estimate of SOL
20
30
40
50
60
70
80
GITITOT


GITI (total) & SDQ (F2)
16
14
12
10
8
6
4
2
SDQF2
20
30
40
50
60
70
80
GITITOT


GITI (total) & diary estimates of SOL
200
100
0
-100
diary estimate of SOL
20
30
40
50
60
70
80
GITITOT

Appendix 4.9 - Inter-correlations between GITI (total) & Existing measures of sleep disturbance

	PSAS (cognitive subscale)	**SDQ (factor 2)**	**DBAS-10 (total)**	**Subjective SOL (diary)**	**Objective SOL (actigraphic recording)**
GITI (total)	0.879*	0.815*	0.732*	0.650*	0.484*
PSAS (cognitive subscale)		0.902*	0.675*	0.645*	0.524*
SDQ (factor 2)			0.609*	0.715*	0.533*
DBAS-10 (total)				0.500*	0.294**
Subjective SOL (diary)					0.494*

* $p < 0.01$ (2-tailed), ** $p < 0.05$ (2-tailed)

Appendix 4.10: Sensitivity & specificity of GITI

Score	Sensitivity (n insomniacs correctly identified)	Specificity (n good sleepers correctly identified)
25	1 (29)	0 (0)
26	1 (29)	0.21 (6)
27	1 (29)	0.21 (6)
28	1 (29)	0.21 (6)
29	1 (29)	0.28 (8)
30	1 (29)	0.34 (10)
31	1 (29)	0.38 (11)
32	1 (29)	0.38 (11)
33	1 (29)	0.41 (12)
34	1 (29)	0.55 (16)
35	1 (29)	0.59 (17)
36	1 (29)	0.69 (19)
37	1 (29)	0.69 (19)
38	1 (29)	0.69 (20)
39	1 (29)	0.76 (22)
40	1 (29)	0.79 (23)
41	1 (29)	0.79 (24)
42	1 (29)	0.83 (24)
43	0.93 (27)	0.83 (24)
44	0.83 (24)	0.86 (25)
45	0.79 (23)	0.86 (25)
46	0.79 (23)	0.86 (25)
47	0.79 (23)	0.89 (26)
48	0.79 (23)	0.89 (27)
49	0.79 (23)	0.93 (28)
50	0.72 (21)	0.97 (28)
51	0.72 (21)	0.97 (28)
52	0.72 (21)	0.97 (28)
53	0.69 (20)	0.97 (28)
54	0.66 (19)	0.97 (28)
55	0.59 (17)	0.97 (28)
56	0.55 (16)	0.97 (28)
57	0.52 (15)	0.97 (28)
58	0.52 (15)	1 (29)
59	0.48 (14)	1 (29)
60	0.45 (13)	1 (29)
61	0.41 (12)	1 (29)
61	0.38 (11)	1 (29)
63	0.34 (10)	1 (29)
64	0.31 (9)	1 (29)
65	0.24 (7)	1 (29)
66	0.24 (7)	1 (29)
67	0.14 (4)	1 (29)

68	0.10 (3)	1 (29)
69	0.10 (3)	1 (29)
70	0.10 (3)	1 (29)
71	0.10 (3)	1 (29)
72	0.07 (2)	1 (29)
73	0.07 (2)	1 (29)
74	0.03 (1)	1 (29)
75	0.03 (1)	1 (29)
76	0.03 (1)	1 (29)
77	0.03 (1)	1 (29)
78 – 100	0 (0)	1 (29)

Appendix 4.11

Fig. (i): Alpha deletion values for GITI

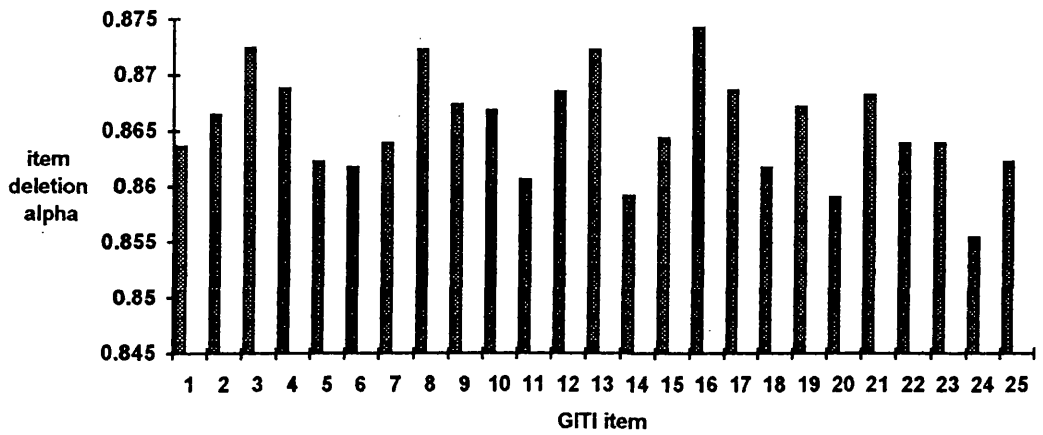


Fig. (ii): Corrected item-total correlations