A STUDY TO EXPLORE THE SENSITIVITY AND SPECIFICITY OF THE DENTAL ANXIETY INVENTORY:

A comparison between the Dental Anxiety Inventory, the Modified Dental Anxiety Scale, and a structured clinical interview.

And Research Portfolio

PART ONE

(Part Two bound separately)

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Part 1 (this bound copy)

Chapter 1: Small Scale Research Project

A Profile of Glasgow's Adult Head Injured Population: Epidemiology and Use of Services

Small Scale Research Project submitted in partial fulfilment of the requirements

for the degree of Doctor of Clinical Psychology

Prepared in accordance with requirements for submission to Brain Injury

(Appendix 1.1)

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Abstract

Research carried out in Glasgow recently has provided a unique database of the head injury population. Traditional studies of this population have been somewhat limited by the strict inclusion criteria they have applied. However, the Hospitalised Head Injury Study included all people who received a head injury in Glasgow over a 12-month period, and attempted to gain information from a sample population about the consequences of the injury after discharge from hospital. This paper reports the characteristics of the sample, and their use of psychology, psychiatry and GP services post injury. The sample consisted of mainly young, single males who had acquired their injury through either an assault or fall. A large proportion reported a detrimental change in many of their symptoms and relationships 12 months post-injury, but a surprisingly small proportion had accessed the services being examined. Possible reasons for this discrepancy are discussed.

Introduction

Improvements in acute medical care have reduced the fatality rate of head injury, and it is known that such an injury does not affect life span.[1] However, survivors of moderate and severe head injury, are likely to be left with physical and cognitive disabilities, which can compromise their personal safety. Therefore such people have an increased likelihood of acquiring more than one head injury during their adult life due to further accidents.

Epidemiological studies have suggested that the number of people admitted to hospital with a head injury within Britain each year is approximately 300 per 100 000 of the population.[2] Traditionally, studies of the head injured population have employed very restrictive exclusion criteria, such as previous/current use of drugs or alcohol, mental health problems, or history of previous head injuries.[3,4] However, if a person's lifestyle and circumstances were detrimental to their health prior to the head injury, it is reasonable to assume the consequences of the head injury will further compromise the quality of their life. As a result, they are more likely to place a demand on the limited services available.

Furthermore, the strict exclusion criteria applied to existing research mean that research so far has focused on a skewed sample of the head injury population. In order to provide suitable services, it is necessary to know exactly what the characteristics of the head injury population are.

Due to the restrictive nature of previous research, the Hospitalised Head Injury Study[5] was set up in Glasgow. This aimed to provide enough information to

compile a detailed profile of the head-injured population admitted to hospital in Glasgow over a 12-month period. Unlike previous studies, this project included all adults with a diagnosis of head injury, irrespective of premorbid characteristics.

People who have suffered a severe head injury (usually classified by Glasgow Coma Scale score[6]) are likely to experience physical difficulties post-injury. However, the psychological consequences of a head injury account for the greatest degree of handicap in patients, and problems generally increase in the 6-12 months following the injury.[7] Such difficulties are not restricted to those who have had a severe head injury, and it has been estimated that up to 50% of mild and moderate head injured people develop a combination of psychological and physical symptoms, often referred to as 'post-concussion' symptoms.[8] Since the estimated incidence of head injury in Britain is high, it has been suggested that many clinical psychologists will encounter such patients in day to day practice, especially as post-concussion symptoms tend to disrupt interpersonal and psychosocial functioning.[9]

Therefore, in addition to the incidence rate and epidemiology of head injury in Glasgow, the Hospitalised Head Injury Study aimed to examine difficulties experienced by patients after discharge from hospital, and the use of services by a cross-section of the head-injured population. The study has high ecological validity, and the results will give an accurate assessment of the incidence of head injury in Glasgow. It will also provide information about the types of difficulties suffered by survivors (irrelevant of the severity of the injury), and an indication

of their knowledge and use of services.

The present study aimed to use the data collected for the Hospitalised Head Injury Study to examine the profile of the sample population followed-up at 12 months post-injury. It explored their causes of injury, previous medical history, and socio-demographic details. This study also used the data available to outline the sample's use of psychology, psychiatry and General Practitioner (GP) services up to 12 months after their injury.

Method

Information was collected from databases compiled for the Hospitalised Head Injury Study, at the Institute of Neurological Sciences, Southern General Hospital, Glasgow. The database is complete, and no additional information could be sought.

Table 1 outlines the database, and the sources of data for the present study.

INSERT TABLE 1 ABOUT HERE

The hospitals involved in collecting data about the head injury population (Feb.1995 - Feb. 1996) were: Western Infirmary

Southern General Hospital

Royal Infirmary

Stobhill Hospital

Victoria Infirmary

The first phase of the study was designed to collect information from the five major hospitals in Glasgow about all adults who were admitted to a bed with a diagnosis of head injury. Research nurses carried out the data collections over a 12-month period. They visited the hospitals on a daily basis and collected information about each patient. This was recorded on an 'Acute Care Proforma' (*Appendix 1.2*).

The Acute Care Proforma provided a comprehensive synopsis of demographic details, previous medical history, social factors, and details of the current injury. There was also a section to record follow-up plans that were made prior to discharge from the hospital.

This first phase of the Hospitalised Head Injury Study indicated that over 3000 adults were admitted to hospital in Glasgow with a diagnosis of head injury over the 12 months. Approximately 90% of these were classified as 'mild' head injuries (according to their Glasgow Coma Scale Score). The remaining 10% were classified as 'moderate' or 'severe'.

The second and third phases of the Hospitalised Head Injury study followed up a sample of the 3000 people at 1, 3, 6, and 12 months post-injury. The sample was made up of all moderate and severe head injuries, and a random sample of the mild head injuries.

At the 12-month follow-up, 409 people out of the 786 selected for follow-up (527 mild; 259 moderate/ severe) responded. This represents 52% of the follow-up sample. When the people who had died, or declined the opportunity to participate in the study at the 1, 3, or 6-month follow-up are extracted from the original figures, there was a response rate of approximately 70% at 12 months.

The 12-month data were the most complete, and therefore were selected for use in the present study.

Follow-up at 12 months consisted of two questionnaires. The first questionnaire asked subjects about the type of symptoms that they were experiencing since their head injury (*Appendix 1.3*). It was based on the McKinlay Relatives Questionnaire [7], and had a forced-choice format. The second questionnaire enquired about their use of services since the head injury (*Appendix 1.4*).

Questionnaires were distributed by post. If there was no response, subjects were contacted by telephone, and the questionnaires were administered verbally. Patients who indicated they were having a substantial number of problems since their head injury, were then invited to the department for a detailed interview about these. (This information was not included in this present paper - only the postal/ telephone information was used, as the data were stored in a format that was relatively easy to access.)

Present Study:

The present study aims to outline the profile of the two sample populations (mild and moderate/ severe) from details collected on the Acute Care Proformas.

The study will also establish how many had had contact with psychology, psychiatry, and/or GP services by 12 months post injury (using the data collected from the questionnaire relating to 'use of services'). The questionnaire asked about the reason for seeing the GP so that those that had used the service for reasons other than their head injury could be identified and excluded from analysis.

Results

Follow-up was achieved with 287 mild cases, and 113 moderate/ severe cases. Data were missing in 9 cases.

INSERT TABLE 2 ABOUT HERE

Table 2 shows the socio-demographic details of the two groups. There are very few differences between the two groups. Within both groups, the majority of subjects were male and single. The average age of subjects was 38 - 39 years.

INSERT TABLE 3 ABOUT HERE

Table 3 looks at the frequency of symptoms experienced prior to the current head injury. Again the profile of the two groups is very similar. Approximately a third of subjects in both groups reported having suffered a previous head injury, and a quarter reported physical limitations prior to the current head injury. ('Physical Limitations' incorporates any lasting impairment that might interfere with mobility and independence e.g. visual deficits, arthritis, hemiplegia.)

INSERT TABLE 4 ABOUT HERE

Table 4 outlines the drinking habits of each group. The profiles of the two groups are again similar, although 10% of the Mild Head Injury group were non-drinkers, in comparison to only 5% of the Moderate/ Severe Head Injury group.

INSERT TABLE 5 ABOUT HERE

From Table 5, which shows the causes of head injury within the groups, it can be seen that the majority of head injuries were due to falls and assaults. It is possible that some of the falls may have been preceded by assaults and therefore the figures for these groups may be slightly confused.

Specific questions within the "Questionnaire" (*Appendix 1.3*) were looked at, and frequencies were calculated for the number of people who reported a detrimental change in specific symptoms post injury. The questions were selected according to their applicability to psychological/ psychiatric assessment. The questionnaire was a forced choice design, consisting of three columns - 'no change'; 'worse'; 'much worse' since injury. For this part of the study, the latter two columns were collapsed, as both reflect a detrimental change. The results are summarised in Table 6.

INSERT TABLE 6 ABOUT HERE

Table 6 shows that within the two groups (mild head injury, and moderate/ severe head injury) there are a high number of people reporting a detrimental change to a variety of symptoms.

INSERT TABLE 7 ABOUT HERE

No one reported waiting to receive psychology, psychiatry or GP services 12-months post-injury.

The majority of people within both groups had not received input from psychology, psychiatry, or their GP (for the head injury) by 12 months post injury. The severity of the initial injury does not appear to have any influence on the extent to which these services are accessed by this sample population. Within the Mild Head Injury sample, and the Moderate/ Severe Head Injury sample only 9.4% and 11.5% (respectively) reported having used these services.

Table 6 shows that over a quarter of the mild head injury group report a need for help to cope with the changes they have experienced since their head injury, yet the figures from Table 7 show that less than 10% received psychological, psychiatric or GP services. Similarly, over a third of the moderate/ severe head injury group reported feeling unable to cope alone with the changes, but only 11.5% received input from the three services examined.

Discussion

The current study has shown that the profile of a sample population, taken from the Glasgow head injury population over a 12-month period, supports the common understanding that those who receive a head injury are most likely to be male, single and fairly young adults. Within Glasgow, the most common causes of head injury are assaults and falls, and it would be interesting to know how this compares with other British cities.

Other characteristics of this sample population include a high rate of previous head injuries, and/ or physical limitations. It is perhaps not surprising that those who have had their abilities compromised, are more likely to experience a further physical insult.

This study did not look at the number of head injuries that had alcohol involved in the cause, but the figures are likely to be high. This is supported by the evidence that over a third of both groups (mild and moderate/ severe head injury) were described as 'excessive' drinkers at the time of the head injury. The data suggests that the people acquiring head injuries are among those who are most in need of help from the health services - they were not a healthy population prior to their present injury, and they certainly are not any better off after it.

Despite this, when the data for use of psychology, psychiatry, and GP services were examined, a surprisingly small proportion of the sample populations had been in receipt of these services. Within the moderate/ severe head injury group, only 11.5% reported using any of these services. The use of services by the mild

head injury group was similarly small. When it is considered that recent research has indicated that a large percentage of mild and moderately head injured people will develop psychological (as well as physical) symptoms post injury, the question remains about whether or not adequate systems are in place to meet their needs.

The lack of use of specialist services by this population highlights a number of issues. Firstly, as GP's tend to be the first point of contact with health services for many people, it is possible that people are not being referred on to services because GP's are unsure whether or not an adult primary health department is the most applicable to this population. The reality is that the quality of service (in terms of treatment outcome) that the head injured population is likely to receive from a general adult department will be limited due to the diversity of needs of the head injury population.

The physical, social and psychological needs of this population imply a multi-disciplinary approach to each case would be far more effective. As part of a dedicated team, each person could be treated in a holistic manner. This must be preferable to a 'piecemeal' approach that may lead to people placing an increasing number of demands on limited services as they move from one discipline to another in an attempt to relieve their distress at the consequences of the injury/ injuries. So, the small number of people using services may reflect uncertainty on behalf of the GPs, and a general lack of services dedicated to this large population.

Similarly, it would be interesting to investigate how comfortable clinical psychologists would be taking on such cases without additional training. The opportunities for support and shared knowledge would be far greater in a specific team, than if working within a busy adult outpatient service. Given that the Hospitalised Head Injury Study only looked at injuries that occurred within Glasgow, and collected data on approximately 3000, the figure for Scotland is will be larger. Yet within Scotland, there are very limited resources specifically for head injury. In particular, the long term services available are sparse. Opportunities for rehabilitation decline once the acute care of the injury has finished.

By 12 months post-injury, spontaneous recovery will have almost stopped, and any remaining impairments are likely to be permanent. With rehabilitation, it may be possible to reduce the chances of a further injury occurring, and the number of people in this study who were hospitalised due to a second, third, or even fourth head injury may be reduced.

The final part of this study indicates there may be a need for a more proactive role by psychologists, and psychiatrists to aid adjustment to the consequences of the injury. The figures show that although very few patients received a service, many seem to be reporting a change in aspects of their lives/ cognitive functioning that would benefit from some kind of psychological intervention. Since these patients are not finding their way into the health system as it currently works, a case could be made for introducing an alternative system, with a view to reducing long-term costs for the health service. Ideally, a screen

assessment at the time of injury may go some way to identifying those who are most likely to need additional support on leaving the hospital (e.g. those with poor social supports, severe impairments due to the injury/ impairments prior to the injury, etc.), and would introduce them to a point of contact for further help if they required it. It is possible that although very few people were seen by psychologists or psychiatrists, many more may have been seen by occupational therapists or physiotherapists. Therefore liasing with these professions might provide a useful source of information about patient well-being after discharge from hospital.

Additionally, work could be carried out with acute care staff to educate them about the role a psychologist or psychiatrist might have in the long-term recovery of these clients. As already stated, in an ideal world this would be within the context of a multi-disciplinary team.

Further research is needed into the consequences of head injury, using more appropriately designed questionnaires. The purpose of the Hospitalised Head Injury Study was to highlight the size of the head injury population in Glasgow alone, and to provide an introduction to some of the problems they suffer post-injury. It has certainly provided a base upon which more intensive research can (and should) be carried out. With additional knowledge, each discipline could accurately assess the role they should be playing/ are playing in easing the demands this population are placing on the limited resources available.

The final point that this study raises, is that the traditional means of categorising the head injury (Glasgow Coma Scale) is not particularly useful when trying to predict the outcome of the head injury. It would certainly appear that those diagnosed with a mild head injury may need the same post-injury support as those with a moderate head injury. Again, more research is needed to validate this possibility.

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TABLES

Table 1: Summary Details of the Hospitalised Head Injury Study Databases:

Sources of data and size of samples.

PART ONE February 1995 - February 1996: Information was collected about all adults (age >14 years old) who were admitted to a bed in hospital in Glasgow with a diagnosis of head injury.	**n = >3000** Approximately: 90% mild head injury 10% moderate or severe head injury
PART TWO February 1996 - February 1997: Follow-up was carried out on a sample of the original population based on the following criteria.	
1. A random sample of those diagnosed with a **mild** head injury.	**n = 527***
2. Everyone diagnosed with a **moderate** or **severe** head injury (defined by GCS score).	**n = 259***
PART THREE These two samples were followed-up at 1,3, 6, and 12 months post injury. Data from the 12 month follow-up were used in the current study as this period had the highest response rate.	Responded to both questionnaires: **n = 409** (Response rate = 70%)

* Not all subjects selected were able to complete follow-up at 12-months post -injury. Some had died, others had moved and were unable to be traced, or refused to participate in the study.

Table 2: Socio-Demographic Details of 'Mild' and 'Moderate/ Severe' Groups: Data presented as frequency and percentage values.

	MILD	**MODERATE/ SEVERE**
Male	232 (80.8%)	97 (85.8%)
Female	55 (19.2%)	16 (14.2%)
Married	80 (27.8%)	28 (24.8%)
Single	138 (48.1%)	56 (49.6%)
Divorced	28 (9.8%)	19 (16.8%)
Widowed	21 (7.3%)	4 (3.5%)
Missing	20 (7%)	6 (5.3%)
Age (Mean)	38.8	39.9
Standard Deviation	18.11	18.53

Table 3: Details of Previous Impairments and/or Illnesses within Groups:

Data presented as frequency and percentage values.

		MILD	MODERATE/ SEVERE
Previous Stroke	Yes	6 (2.1%)	2 (1.8%)
	No	244 (85%)	106 (93.8%)
	Missing	37 (12.9%)	5 (4.4%)
Previous Head Injury	Yes	97 (33.8%)	43 (38.1%)
	No	124 (43.2%)	51 (45.1%)
	Missing	66 (23%)	19 (16.8%)
Previous Other Neurological Illness	Yes	36 (12.5%)	22 (19.5%)
	No	189 (65.9%)	75 (66.4%)
	Missing	62 (21.6%)	16 (14.1%)
Previous Symptoms of Psychological Disorder	Yes	50 (17.4%)	16 (14.2%)
	No	148 (51.6%)	70 (61.9%)
	Missing	89 (31%)	27 (23.9%)
Previous Physical Limitations	Yes	71 (24.7%)	29 (25.7%)
	No	177 (61.7%)	79 (69.9%)
	Missing	39 (13.6%)	5 (4.4%)

Table 4: Drinking Habits (recorded via self-report or taken from case notes):

Data presented as frequency and percentage values.

	MILD	**MODERATE/ SEVERE**
Non - Drinker	29 (10.1%)	6 (5.3%)
'Normal' Drinker	112 (39%)	45 (39.8%)
'Excessive' Drinker	90 (31.4%)	39 (34.5%)
Previous Treatment	18 (6.3%)	9 (8%)
Missing	38 (13.2%)	14 (12.4%)

Table5: Cause of Injury within Groups:

Data presented as frequency and percentage values.

	MILD	**MODERATE/ SEVERE**
Car Accident	14 (4.9%)	3 (2.7%)
Pedestrian Accident	16 (5.6%)	13 (11.5%)
Motorcycle Accident	1 (0.3%)	1 (0.9%)
Bicycle Accident	4 (1.4%)	1 (0.9%)
Fall	111 (38.7%)	48 (42.5 %)
Sport Injury	2 (0.7%)	0
Work Related Accident	2 (0.7%)	0
Assault	109 (38%)	23 (20.4%)
Other	24 (8.4%)	17 (15%)
Missing	4 (1.3%)	7 (6.1%)

Table 6: Number of people reporting a detrimental change in symptoms.

Data presented as frequency and percentage values.

	MILD	MODERATE/ SEVERE
Interpersonal Functioning		
Relationship with friends	51 (18%)	47 (42%)
Relationship with wife/ husband	55 (19%)	19 (17%)
Ability to cope with family demands	92 (32%)	45 (40%)
Maintain previous workload standard	92 (32%)	39 (35%)
Affective/ Cognitive Functioning		
Finds work more tiring	101 (35%)	50 (44%)
Difficulty sleeping/ disturbed sleep	119 (41%)	44 (39%)
Anxiety or panic attacks	99 (34%)	39 (35%)
Irritability or temper	117 (41%)	51 (45%)
Ability to converse with one person	77 (27%)	44 (39%)
Ability to converse with two people	76 (26%)	44 (39%)
Poor concentration	96 (33%)	52 (46%)
Depression	114 (40%)	52 (46%)
Problems with memory	111 (39%)	54 (48%)
Difficulty making decisions	87 (30%)	34 (30%)
Ability to cope with the changes since having the head injury	80 (28%)	42 (37%)

Table 7: 12-Month Follow-Up

The use of Psychology, Psychiatry and/or GP services within Groups

RECEIVED SERVICES	MILD	MODERATE/ SEVERE
Yes	27 (9.4%)	13 (11.5%)
No	260 (90.6%)	100 (88.5%)

Chapter 2: Literature Review

A Review of Dental Anxiety:

Models and Measurements

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

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Prevalence of Dental Anxiety

According to the research carried out to date, dental anxiety is a very common problem among the western adult population. It can affect psychological well being, social relationships, and oral health (Cushing et al, 1986). Research suggests that the two most prominent reasons for failing to attend the dentist are anxiety and financial cost. Anxiety may be related to situation-specific fears, or be more generally based and less easily defined or articulated (Finch et al, 1988).

However, establishing the figures for the percentage of the population nervous about attending the dentist is not easy. Existing studies suggest that anywhere between 3% and 50% of the population suffer from anxiety relating to dental situations (Schuurs et al, 1984; Stouthard & Hoogstraten, 1990). Many different measures of dental anxiety exist, and consequently the wide variation in the figures quoted could be caused by the variations in assessment routines and assessment measures used.

Locker et al (1996) explored the overlap between 3 measures of dental anxiety in terms of who would be identified as being dentally anxious. The 3 measures of dental anxiety studied were: Dental Anxiety Scale (Corah, 1969); Single item for the Seattle Study (Milgrom et al, 1988); Gatchel's 10-point Fear Scale. They posted surveys to 6360 adults, and the results from 2729 were used in the final analysis. The results of the survey are shown in *Table 1.*

INSERT TABLE 1 ABOUT HERE

Concurrence between the 3 measures used occurred in only 145 cases, and from the figures presented in *Table 1* it can be seen that prevalence rates varied from 8.2% to 23.4%. One explanation for this variation is that the measures may be identifying different sub-groups of what has traditionally been called a 'dental anxiety' population.

Consequences of Dental Anxiety and Avoidance

Research into dental anxiety is important because dental health is actively encouraged from a very early age. The government has advised us that we should attend the dentist once every six months, and school dentists actively pursue this by contacting families to remind them of the need for their children to attend the dentist as soon as the child is of school age.

While it is acceptable to not like attending the dentist, active avoidance may carry with it the constant concern that one's teeth might start causing pain at any moment. Avoidance of the dentist carries a social consequence (dental caries, halitosis, etc.) and a regular reminder of the lack of control over one's own feeling and emotions. A dental phobic may be reminded of their fear every time they brush their teeth.

Dentistry is designed to be pro-active rather than reactive, and consequently improving dental attendance is a constant goal of oral health initiatives.

Concept of Dental Anxiety

Within the literature the terms "dental anxiety", "dental fear" and "dental phobia" are used interchangeably. Many measures of "dental anxiety" have been developed, yet explicit definitions of the term are surprisingly sparse. Schuurs et al (1986) suggest that anxiety is an "...unpleasant emotional reaction to stress experienced and interpreted as threatening and not aimed at a specific object" (pg.228). They then postulate that fear is also an unpleasant emotional state, but it is caused by a "circumscribed threat".

Within a clinical context, anxiety is not considered to be an abnormal emotional state, but phobia is. Using DSM-IV criteria, an anxious state is considered to be a phobia if the emotions cause the person to avoid the situation, or endure it "...with intense distress" (American Psychiatric Association, 1994: 300.29).

The neglect of definitions of dental anxiety in the literature is related to the lack of theoretical models explaining the concept of dental anxiety. Since the term 'dental anxiety' is used to describe anxiety, fear, and phobia, it is best viewed as an umbrella term that may also include other anxiety disorders such as blood-injury

phobia, agoraphobia, and generalised anxiety disorder. Using existing psychological models of anxiety and phobias, a model of dental anxiety/ fear/ phobia has been drafted, and is shown in *Figure 1*.

INSERT FIGURE 1 ABOUT HERE

The model shows the significance of past experiences, present beliefs, and situation specific cues in the activation of apprehension relating to the dental situation. Dental anxiety is defined within this model as a combination of negatively interpreted cognitive, physiological, and behavioural symptoms. Each of these will vary in intensity and presentation within, or in anticipation of, a dental setting. The strength of these feelings, and the behavioural, cognitive and physiological consequences of them determine whether the emotions are termed 'anxiety', 'fear' or 'phobia'.

Figure 1 demonstrates that the psychological concept of dental phobia is no different from any other form of specific phobia. Like other anxiety states, dental phobia causes somatic and cognitive symptoms (e.g. racing heart, sweating, dry mouth, negative thoughts about ability to cope, expectation of pain, etc.) which often compel the sufferer to carry out safety behaviours such as avoidance, or distraction techniques. These manifestations of increased arousal are also known to reinforce the original anxiety state, thereby perpetuating the cycle of increasing anxiety.

Perhaps one of the unique aspects of dental anxiety states is the social acceptance of a fear of the dentist. Many anxious people will have their fears confirmed by hearing other people's negative experiences. Such vicarious learning might start at a very young age if the child has a dentally anxious parent or sibling. By the time the child reaches its teenage years the fears will be entrenched, and therefore difficult to challenge.

Current beliefs, previous experiences, and situation specific factors are all important in the development and maintenance of dental anxiety. Manifestations of dental anxiety may reinforce negative schema and increase the belief that the dental situation is a particularly dangerous one.

Negative schema may relate to the dentist (e.g. his abilities; judgement; etc), to the person themselves (e.g. I am always the one things go wrong on; I cannot cope; I am out of control; etc). Such schemas adversely influence the interpretation of ambiguous information, and increase the likelihood that a negative meaning will be attributed to ambiguous information. Work by de Jongh et al (1995) supports the importance of assessing beliefs and thoughts in relation to dental anxiety, as these make a significant contribution to cognitive vulnerability.

The lack of models specific to dental anxiety means that the range of cognitive, physiological, behavioural and situational factors that contribute to the experience of

dental anxiety remain unaccounted for. The following review of existing assessments of dental anxiety demonstrates that only one measure has been developed that explicitly accounts for many of the factors contributing to dental anxiety and phobia.

Review of Self-Report Dental Anxiety Measures

Over the last 30 years, many measures of dental anxiety have been created. This review will discuss the most popular measures, namely the Dental Anxiety Scale (Corah, 1969), the Dental Fear Survey (Kleinknecht & Bernstein, 1978), the Dental Cognitions Questionnaire (de Jongh et al, 1995) and the Dental Anxiety Inventory (Southard et al, 1995).

In 1969, N.L. Corah developed one of the first measures of dental anxiety. The **Dental Anxiety Scale (DAS)** consists of 4 questions with forced choice responses. The first question asks how the client would feel if they had to go to the dentist tomorrow, with responses ranging from "I would look forward to it as a reasonably enjoyable experience", to "I would be very frightened of what the dentist might do". The remaining 3 questions ask about how the person would feel in the waiting room, in the dental chair while the drill is prepared, and in the dental chair waiting for a scale and polish. The responses to the 3 questions range from "relaxed" to "so anxious that I sometimes break out in a sweat or almost feel physically sick". A numerical value is awarded to each of these responses – one point for "relaxed"

through to five points for "so anxious that I...". All questions are scored the same way.

Corah's scale has been widely applied over the last 30 years in research concerning dental treatment and dental anxiety. The scale is very short, and therefore has practical appeal to researchers and clinicians alike. The questionnaire assigns a total score to the client, which is then used to categorise each subject as dentally anxious, or not. A score of 17 or more is considered to be indicative of dental phobia.

Unfortunately the DAS uses ambiguous language, and doubts were raised about the validity of including the response to the first question in the final score because it has a different format to the other questions. Internal consistency was assessed, and a coefficient of 0.86 was reported. The correlation for test-retest stability was reported to be 0.82. Validity of the measure was assessed by asking two dentists to rate the 'anxiety' behaviours of patients, and categorising them in terms of whether they fell into the upper, middle or lower third of the dentist's patients for degree of anxiety shown. The correlations between dentists ratings, and test scores were 0.41 and 0.42.

Humphris et al (1994) addressed the criticisms of the DAS, and extended the questionnaire to include a reference to anaesthetic injections (a major source of anxiety for many people). They altered the response options to the questions so that all questions had the same format, and amended the ambiguous language used. The

questionnaire was renamed the Modified Dental Anxiety Scale (MDAS). The internal consistency ranged from 0.72 to 0.93 (across sample populations), and the sensitivity and specificity of the measure were 0.85 and 0.91 respectively.

Despite these changes to the scale, the measure is still flawed. One of the major criticisms of the scale is that it is not based on an explicit theoretical construct. A consequence of this is that 'dental anxiety' is not clearly defined, despite the claims that the scale measures it. Furthermore, the scale is uni-directional, whereas literature on anxiety and dental anxiety has highlighted the multi-dimensional nature of the conditions. The DAS and MDAS therefore only provide limited information about someone's dental anxiety, and are probably best employed as a screening tool.

The **Dental Fear Survey (DFS)** was originally a 27-item self-assessment scale. It was later revised to a 20-item version. Two items focus on avoidance, five on self-reported signs of physiological arousal, twelve on fear of specific dental situations, and one item on dental fear in general. All questions have forced choice answers. The answers are placed on a scale ranging from 1 (never/ not at all) to 5 (nearly all of the time/ very much).

The summed scores range from 20 (no fear) to 100 (terrified), and individual items may also be considered separately to determine the level of fear induced by specific stimuli. Unlike the DAS and MDAS, the DFS examines physiological symptoms of anxiety, and the language used is much less ambiguous. However, like the DAS/

MDAS, the link between theoretical constructs and the questionnaire is not made explicit, and therefore definitions of dental fear and anxiety are absent. The final eight questions of the scale ask the respondent to consider how much "fear, anxiety or unpleasantness" each situation causes. These terms should not be used interchangeably, and a high score due to someone experiencing "very much...unpleasantness" is qualitatively different to someone who expresses "very much...fear". The psychometric data about the scale does not refer to this difference. Furthermore the DFS does not include items about extraction (which is also a common source of anxiety for clients). A review by Schuurs & Hoogstraten (1993) states the DFS is a good alternative to the DAS as it will identify which procedures are feared most, although it takes slightly longer to complete. The DFS is an improvement on the DAS, but still falls short of being a comprehensive measure of dental anxiety.

The **Dental Fear Interview (DFI)** was developed by Vrana et al (1986) to replace or supplement the Dental Fear Survey. The interview schedule includes questions about attendance patterns, avoidance, and specific situational factors, but does not ask about physiological responses or cognitive factors. The literature about the DFI does not indicate how responses to each question are integrated into making a quantitative judgement of someone's fear or anxiety, and again, neither of these concepts is clearly explained or theoretically described. Furthermore, although the DFI aims to replace paper and pencil measurements of dental anxiety, 4 of the 10 questions in the schedule have forced choice responses and are therefore simply an

oral version of a paper and pencil questionnaire. The validity of the DFI was established by correlating it with the DFS – however the DFI is based on the DFS, so a correlation of 0.89 is not surprising. The interview was not tested against any other measure of dental anxiety.

All of the measurements reviewed so far have ignored the importance of cognitive factors in the development and maintenance of dental anxiety. Research into other specific anxieties and phobias (e.g. social phobia, generalised anxiety, etc.) has demonstrated the importance of such factors. de Jongh et al (1995) supported the applicability of the cognitive approach to dental anxiety, and they have subsequently developed a **Dental Cognitions Questionnaire (DCQ)**.

The questionnaire focuses on thoughts and beliefs. Although the questionnaire does not include questions about physiological responses to dental situations, it does include questions relating to beliefs about physiological responses. The questionnaire would be of value to a clinical psychologist wishing to help a client identify and subsequently challenge their thoughts and beliefs about dentistry.

Correlations between the DCQ and the 'worrying' scale of the Irrational Beliefs Inventory (Koopmans et al, 1994) were modest, suggesting the DCQ taps unique cognitive aspects of dental anxiety, and not just trait anxiety or worrying about future events in general. However, the usefulness of this questionnaire is clearly

limited. It is too specific to be used as a measure of dental anxiety as it only measures one factor of the multi-factor concept.

The final measure to be reviewed is the **Dental Anxiety Inventory (DAI)** (Stouthard et al, 1995). This questionnaire was developed to overcome the shortcomings of the DFS and DAS/ MDAS – specifically the problems with construct definition. The DAI includes physiological, cognitive, behavioural and interpersonal aspects of anxiety in the dental setting. The measure consists of 36 statements. The responses are on a five-point scale ranging from 1 ('totally untrue') to 5 ('completely true').

The DAI was constructed using a facet approach. The author describes this approach as requiring "...that all relevant facets of a construct be measured, and all elements within each facet distinguished and combined into a definition of the content domain of that construct..." (Stouthard et al, 1995, pg.590). Three relevant content facets of dental anxiety were distinguished – a situation facet, a reaction facet, and a time facet. Each of these facets contained specific elements, and these are shown in Figure 2.

INSERT FIGURE 2 ABOUT HERE

This mapping sequence contains the vital elements recognised by psychologists as being fundamental aspects of a model of anxiety, i.e. cognitive, physiological and

behavioural manifestations of anxiety induced by situation specific stimuli. A definition of dental anxiety is explicit within this mapping sentence, and clarifies exactly what this questionnaire is reporting to measure.

Correlations between the DAI and other measures such as the Fear Survey Schedule and State/ Trait Anxiety Scale, as well as measures of personality factors showed good discriminant and convergent validity. Of the measures reviewed, the DAI is the most comprehensive, with a clear theoretical background, and good validation. However, adding supplementary questions about attendance behaviours could strengthen the scale.

The current study proposes to build on the existing validity and reliability studies of the DAI, and examine the specificity and sensitivity of the assessment measure. By using a structured clinical interview for anxiety disorders (SCID I: Anxiety Disorders (First et al, 1997)) it will be possible to explore what types of anxiety disorders are categorised under the term 'dental anxiety', and the extent to which the DAI accurately identifies people with a clinically significant dental anxiety disorder.

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Tables & Figures

Table 1: Prevalence as measured by 3 dental anxiety measures.

	DAS	Single Item	Fear Scale
Prevalence Rates	10.9%	23.4%	8.2%

Figure 1: Conceptual Model of Dental Anxiety and Phobia.

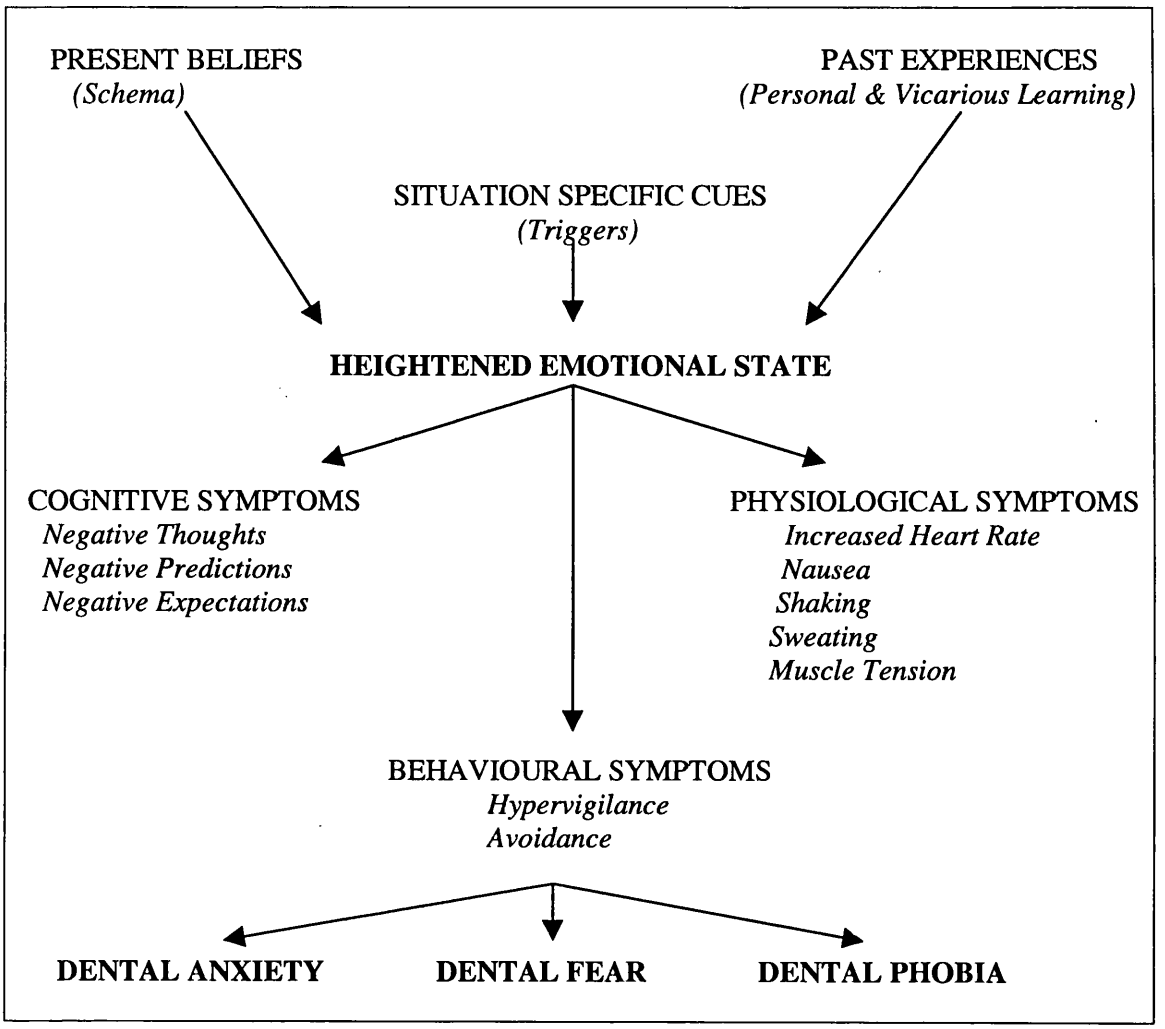
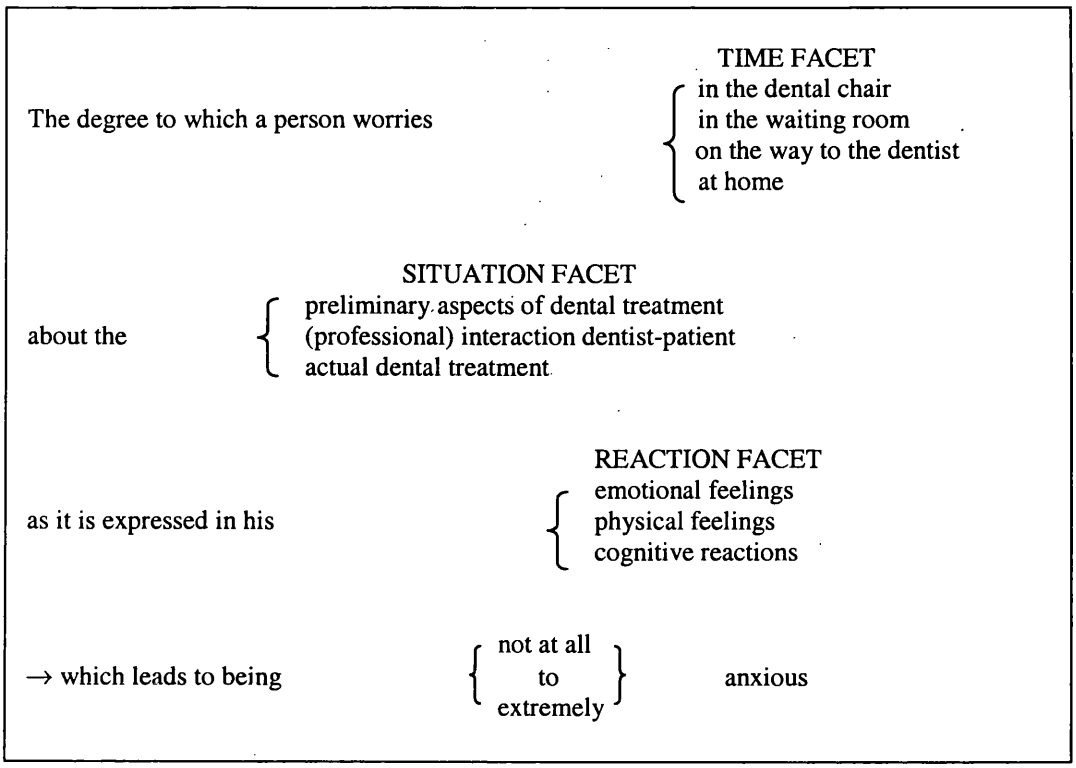


Figure 2: Mapping Sentence of Dental Anxiety (Stouthard et al, 1995).



Chapter 3: Proposal for Major Research Paper

A STUDY TO EXPLORE THE SENSITIVITY AND SPECIFICITY OF THE DENTAL ANXIETY INVENTORY:

A comparison between the Dental Anxiety Inventory, the Modified Dental Anxiety Scale, and a structured clinical interview.

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

Prepared in accordance with guidelines (See Appendix 2.1)

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Title of Proposed Study:

A Study to Explore the Sensitivity and Specificity of the Dental Anxiety Inventory: A comparison between the Dental Anxiety Inventory, the Modified Dental Anxiety Scale, and a structured clinical interview.

Summary:

Dental anxiety is a common problem among the western adult population, yet despite the development of many measures, very few are based on explicit conceptual models. Consequently, it is difficult to be explicit about what they are actually measuring. The Dental Anxiety Inventory (DAI) (Stouthard, 1995) has been constructed using facet theory, and therefore provides a basic, but not comprehensive, definition of dental anxiety. The mapping sentence used by the authors identifies three facets that are explored by the scale – a time facet, situation facet and response facet.

The current study proposes to study the specificity and sensitivity of the DAI by comparing it with the anxiety disorders section of the Structured Clinical

Interview Schedule for DSM-IV Axis I Disorders (SCID-I Anxiety Disorders). The DAI does not include a behavioural aspect, and it is therefore proposed that the current study will explore behavioural manifestations of dental anxiety and further understanding of the nature of dental anxiety. The results of this study will indicate the accuracy of the DAI in identifying clinically significant dental anxiety. The data should also enable us to refine the definition of dental anxiety, and examine co-morbid properties of the disorder.

The study will be carried out using a self-identified dentally anxious sample of the Glasgow population. They will be asked to fill in the DAI, MDAS and a Behaviour Checklist and return them to the Department of Psychological Medicine in a prepaid envelope. A sample of this population will then be interviewed by telephone. The interview will consist of administering the SCID-I: Anxiety Disorders.

Introduction:

It has been established that many people do not attend the dentist regularly, and that the reasons for this are wide ranging. The two most prominent reasons for failing to attend the dentist are "anxiety" and "financial cost" Anxiety may be related to situation-specific fears, or be more generally based and less easily identified or articulated (Finch et al, 1988).

The diversity of explanations for peoples' apprehensions about visiting the dentist reflects the broad spectrum of emotional states that the term 'dental

anxiety' may cover. Within the literature, the terms 'dental anxiety' and 'dental phobia' are used interchangeably. Many measures of 'dental anxiety' have been developed, yet definitions of the term are sparse. Clinically, anxiety is not considered to be an abnormal emotional state, but phobia is. Using DSM-IV (American Psychiatric Association, 1994), an anxious state is considered to be a phobia if the emotions cause the person to avoid the situation or endure it "...with intense distress" (300.29).

The neglect of definitions of dental anxiety in the literature is related to the lack of theoretical models explaining dental anxiety. Dental anxiety is an umbrella term which may encompass other anxiety disorders such as blood-injury phobia, agoraphobia, or generalised anxiety disorder. A model of dental anxiety and phobia has been created using aspects of general anxiety and is shown in *Figure 1*.

INSERT FIGURE 1 ABOUT HERE

The model shows the significance of past experiences, present beliefs, and situation specific cues in the activation of apprehension relating to the dental situation. Dental anxiety is defined within this model as a combination of negative cognitive, physiological and behavioural symptoms that vary in intensity and presentation in anticipation of, or within a dental setting.

Measures such as the Dental Anxiety Scale (DAS), (Corah, 1969), Dental Fear Survey (DFS), (Kleinknecht & Bernstein, 1978), and Dental Fear Interview (DFI), (Vrana et al, 1986) lack content validity due to an omission of one or more of these critical aspects of dental anxiety. The authors of these tools appear to have designed the measures before defining the construct under examination, and therefore the possibility of making a Type I or Type II error is increased.

Stouthard et al, (1995) recognised the shortcomings of these measures and developed the Dental Anxiety Inventory (DAI). The DAI was constructed using a facet approach, and three relevant content facets of dental anxiety were distinguished - a situation facet, a reaction facet, and a time facet. Each of these facets contains specific elements, and these are shown in *Figure 2*. The DAI includes questions about physiological, cognitive, and interpersonal aspects of anxiety in the dental setting.

INSERT FIGURE 2 ABOUT HERE

The mapping sentence (*Figure* 2) clarifies what this questionnaire is reporting to measure. Correlations between the DAI and measures such as the State/ Trait Anxiety Scale, as well as measures of personality factors, have shown good discriminant and convergent validity.

Although this mapping sentence covers many important aspects of dental anxiety and phobia, it does not include a behavioural component within the 'Reaction

Facet'. However the questionnaire itself does contain some behavioural statements. For example, "As soon as the dentist gets his/ her needle ready for the anaesthetic, I shut my eyes tight", and "I sleep badly when I think about having to make an appointment with the dentist". The questionnaire might be strengthened in its ability to distinguish anxious and phobic patients by incorporating statements relating to avoidance behaviours.

For research purposes, self-report measures like the DAI are often used to categorise participants into groups according to their score. Vague categorisations such as "high dental anxiety" or "low dental anxiety" do not clarify the significance of the range and intensity of symptoms typically experienced by each group. Since self-report measures are often used in the research setting as a quick diagnostic tool (i.e. to determine whether someone has a significant level of anxiety or not), it is important to establish their validity by comparison with a clinical diagnostic interview.

This study proposes to compare the results of the Structured Clinical Interview for DSM-IV Axis I: Anxiety Disorders (SCID-I), (First et al, 1997) with those obtained using the Dental Anxiety Inventory (DAI). In addition, questions relating to behavioural manifestations of dental anxiety will also be asked in order to explore the relationship between behaviour and level of anxiety.

Aims & Hypotheses:

Aim 1: To explore the specificity and sensitivity of the Dental Anxiety Inventory.

Hypothesis 1: Participants who score highly on the DAI will be diagnosed as having a specific dental phobia on the SCID-I: Anxiety Disorders.

Aim 2: To examine the types of anxiety disorder that may be covered by the term 'dental anxiety'.

Hypothesis 2: Some participants who are classified as dentally anxious by the DAI, will not have a specific dental phobia, but will have a diagnosis of another anxiety disorder, e.g. blood-injury phobia, or social phobia.

Aim 3: To examine the relationship between high anxiety levels and avoidance behaviours.

Hypothesis 3: There will be a positive relationship between the score on the DAI and the number of avoidance strategies used.

Plan of Investigation:

Participants:

The participant group will be a targeted sample of the general population. The sample will consist of male and female adults (>17 years old). Participants in the study will be recruited by advertising in a local newspaper (e.g. Evening

Times, Herald), and advertisements in Glasgow University, Glasgow Dental Hospital, and Gartnavel Royal Hospital (Trust Headquarters).

Sample Size:

A sample size has been calculated by estimating attrition rates at each stage of the study. Results from previous validations of the DAI have indicated that approximately 1 in 7 of the final sample size will have the highest scores on the DAI (*Appendix 2.2*). Therefore, in order to ensure 30-40 people who score 114 or more are included in the current study, a sample size of 200-300 participants will be needed.

Estimating attrition rates at each stage, the initial advertisements will need to attract approximately 800 responses. Assuming an attrition rate of 50% at this stage, 400 will return consent forms and correct telephone numbers. A further attrition rate of 20-30% at this stage will leave a final sample size of approximately 300 participants.

Measures:

- Dental Anxiety Inventory (Stouthard et al, 1995) (*Appendix 2.3)*

This measure was designed to assess level of dental anxiety. It has good concurrent validity. It has also been demonstrated to show convergent and discriminant validity with measures of neurotisism, anxiety, fear, self-esteem, and social desirability (Stouthard et al, 1995).

- Structured Clinical Interview for DSM-IV Axis I: Anxiety Disorders (First et al, 1997).

This structured interview has been designed to increase diagnostic reliability. Several versions of the SCID exist, and it is anticipated that the Research Version for anxiety disorders will be employed in this study. If this is not available, the Clinician Version will be used.

- Modified Dental Anxiety Scale (Humphries et al, 1995) (*Appendix 2.4)*

This measure is the most commonly used in dental anxiety research. It has poor content validity, and no theoretical basis. However, using this measure will allow easy comparison between demographic data in the current study and other studies.

- Listing of avoidance behaviours demonstrated by participants (*Appendix 2.5*).

A survey will be conducted using self-identified dentally anxious people known to the first applicant. Their responses will be collated into a questionnaire. The questionnaire used in the main study will include a question relating to frequency of dental visits, and a final question encouraging participants to identify any other dental anxiety -related behaviours they perform.

Design & Procedure:

1. Advertisements will be placed in the Evening Times newspaper, University of Glasgow library notice boards, Glasgow Dental Hospital, and Glasgow

Primary Health Care Trust Head Quarters. The advertisements will ask interested people to phone a dedicated answer-machine service at the Department of Psychological Medicine. They will be invited to leave their name and address.

2. Respondents will be contacted by letter with further details of the study, which will include an information letter, consent form, demographic details (*Appendix 2.6*), DAI, MDAS and Behaviour Checklist to be completed and returned .

3. A sample of consenting participants will be interviewed by telephone using the Scheduled Interview for DSM-IV Axis I: Anxiety Disorders. Only one interview session will be required.

5. The Behaviour Checklist questions will be taken from interview with self-identified dentally anxious people already known to the first applicant. It will include positive presentation (behaviours they do), and negative presentations (behaviours they do not do).

6. Information will be stored on paper, and transferred to computer disk. All information will be stored in an anonymous format, with each participant being allocated a study number.

7. If, during the course of the interview, a participant discloses information that

indicates they are in need of therapeutic intervention, advice will be given about how to access the necessary professionals (in most cases it is anticipated this will be the GP in the first instance).

Settings & Equipment:

The project will be based at the Academic Centre, Gartnavel Royal Hospital. The Department of Psychological Medicine will provide access to photocopying machines, and paper required. All interviews will be conducted from telephones based at the department.

Copies of the SCID I: Anxiety Disorders answer can be photocopied from the Research Version available in the Maria Henderson Library, Gartnavel Royal Hospital. (Photocopy rights have been checked and approved.) The author of the Dental Anxiety Inventory has been contacted and has provided administration details, norms, and a photocopyable version of the DAI.

Data Analysis:

Data will be stored in SPSS (Statistical Package for Social Sciences).

Descriptive statistics will be used to describe the results of the SCID I, DAI, and the Behaviour Checklist. A comparison between behavioural manifestations and the DAI scores will also be described.

Aim & Hypothesis 1:

Participants will be organised into three groups according to their own assessment of their level of anxiety (not anxious/ anxious/ highly anxious). Their DAI scores, and SCID-I diagnoses will then be described.

Concurrent validity of the DAI will be examined by exploring the relationship between the SCID-I results and DAI results. Correlation statistics will examine associations between these two assessments.

Convergent validity of the DAI will be supported if the outcome of the level of anxiety identified by the measure correlates with an appropriate anxiety diagnosis on the SCID-I (e.g. Blood-Injury phobia, Specific Phobia).

Aim & Hypothesis 2:

Participants will be categorised into groups according to their DAI score. The diagnoses of participants will be examined and presented using descriptive statistics. Where possible, the diagnosis of Specific Phobia will be elaborated to identify the nature of the specific phobia. Statistical analysis using correlation procedures will explore the sensitivity and specificity of the DAI.

Aim & Hypothesis 3:

Correlations between DAI scores and number of avoidance behaviours employed will be carried out.

Practical Implications:

It is anticipated that the results of this study will help to refine the model of dental anxiety/ phobia presented earlier. It is also hoped that some distinctions between dental anxiety and dental phobia will be exposed. In addition, if this study shows good correlations between the DAI and SCID I, the DAI can then be used with confidence to categorise subjects into anxious/ not anxious groups for future studies. It will also provide valuable information about the use of the DAI as a suitable tool to identify dentally anxious people - which will be beneficial to dental practitioners and clinical psychologists.

Timescales:

December 1999 – January 2000:	Ethical approval
January – March 2000:	Recruitment of participants
February – May 2000:	Data Collection
June – July 2000:	Data Analysis
August 2000:	Final Report

Ethical Approval:

Ethical application forms will be submitted to the Glasgow Primary Care Trust Ethics Board, and if necessary Dental Hospital Ethics Board.

Next applicable meeting:	Glasgow Primary Care Trust - 18/11/99
	Dental Hospital - approximately 13/11/99

Target Journal

Behaviour Research and Therapy

References:

American Psychiatric Association (1994), Diagnostic Criteria from DSM-IV, Washington.

Corah, N.L. (1969). Development of a dental anxiety scale. *Journal of Dental Research,* **48**, 596.

Finch, H., Keegan, J., Ward, K. & Sen, B.S. (1988). Barriers to the receipt of dental care: A qualitative research study. Social and Community Planning Research, Northern Field Office, Durham.

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Vrana, S., McNeil, D.W. & McGlynn, F.D. (1986). A structured interview for assessing dental fear. *Journal of Behaviour Therapy & Experimental Psychiatry,* **17**(3), 175-178.

Wolpe, J. & Lang, P.J. (1964). A Fear Survey Schedule for use in Behaviour Therapy. *Behaviour Research & Therapy.* **2**, 27-30.

Figures:

Figure 1: Conceptual Model of Dental Anxiety and Phobia.

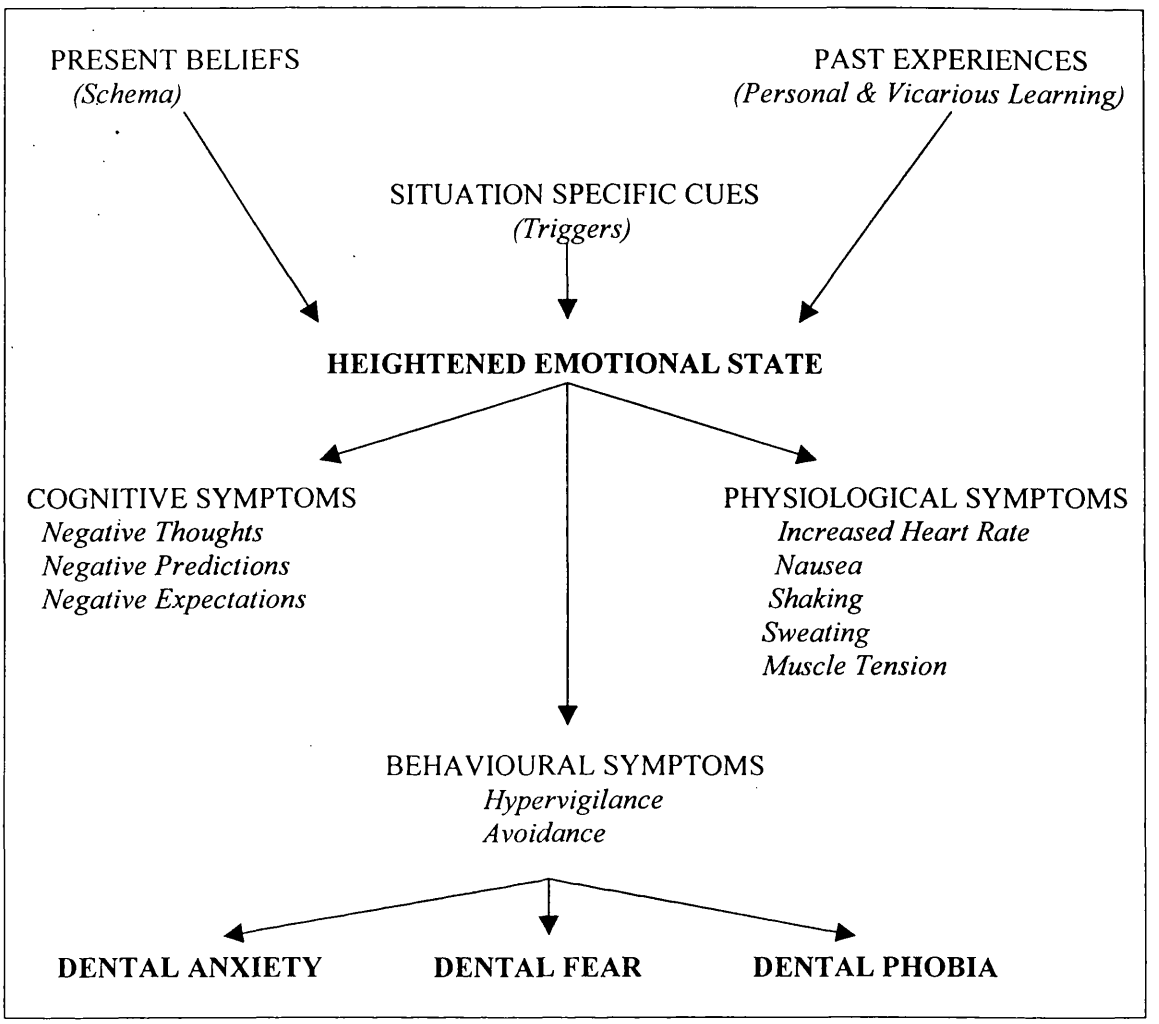
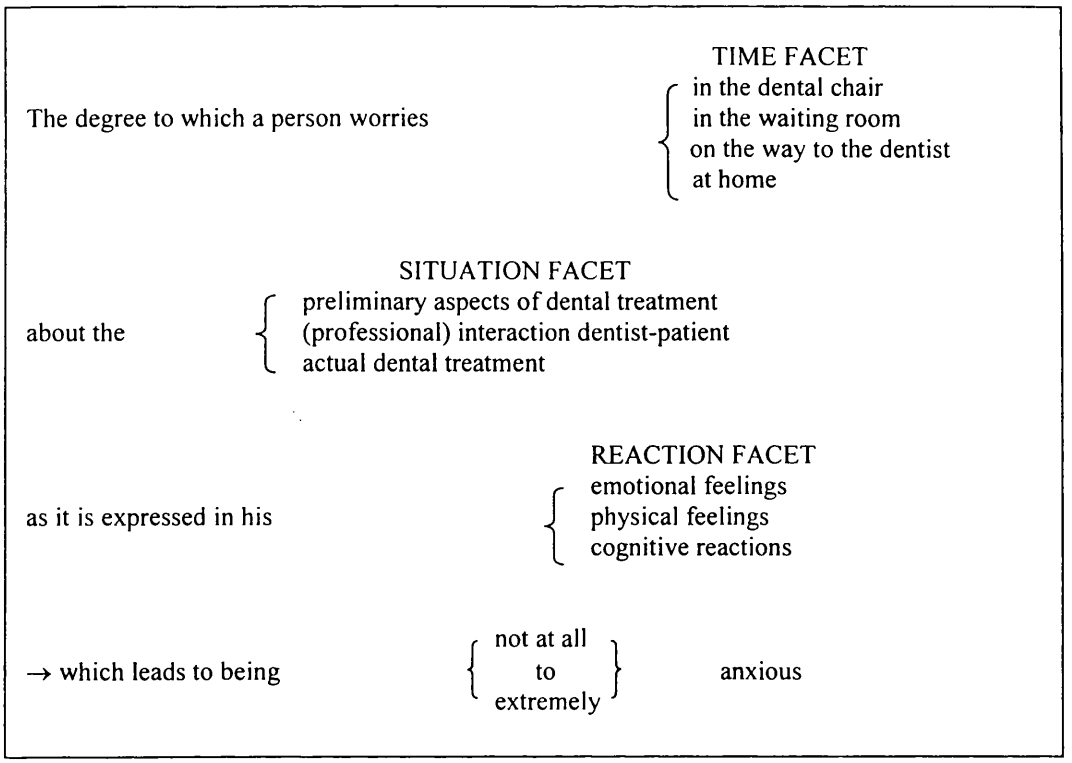


Figure 2: Mapping Sentence of Dental Anxiety (Stouthard et al, 1995).



Chapter 4: Major Research Paper

A STUDY TO EXPLORE THE SENSITIVITY AND SPECIFICITY OF THE DENTAL ANXIETY INVENTORY:

A comparison between the Dental Anxiety Inventory, the Modified Dental Anxiety Scale, and a structured clinical interview.

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

Prepared in accordance with requirements for submission to Behaviour Research and Therapy

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Abstract

There is a wide range of measures of dental anxiety available, but confidence in their validity is undermined by their lack of theoretical basis. Stouthard et al (1995) recognised the problems of construct definition inherent within previous measures of dental anxiety, and developed the Dental Anxiety Inventory (DAI). Using a facet approach, they produced a mapping sentence that defined the content domain of the construct. The current study explored the sensitivity and specificity of the DAI by comparing it with a structured clinical interview for anxiety disorders. 117 participants completed the questionnaires and demographic details, and a sample of 60 participants was interviewed using the structured clinical interview (30 with high scores on DAI; 30 with low scores on DAI). Chi Square analyses of the results indicate that there is a significant relationship between DAI score and diagnosis of specific dental phobia. Specificity of the scale is 0.9 and sensitivity, 0.96. The results imply the DAI is an accurate indication of level of dental anxiety, and can be used with confidence by practitioners and researchers alike.

Introduction

Dental anxiety is very common within the general population. Boulton (1996) suggested that as many as 1 in 10 people avoid the dentist due to dental phobia. Anxiety, fear, and phobia about dental treatment represent a major health problem for many people, which can affect oral health, psychological well being, and social relations (Cushing et al, 1985). A report by the National Dental Advisory Committee stated that between "... 30 – 50% of the adult population are nervous of visiting the dentist." (Millar et al, 1998).

There is a wide range of measures available to assess dental anxiety and phobia, but the concurrence between measures was questioned by Locker et al (1996), who studied three measures of dental anxiety and found that concurrence between the measures occurred in only 5.3% of cases. This finding calls into question the validity of the questionnaires used, and also highlights the possibility that dental anxiety may encompass many other forms of anxiety, rather than being a separate specific phobia.

Within the same study by Locker et al, prevalence rates varied from 8.2% to 23.4%. One of the difficulties encountered when trying to examine prevalence data within this field is the interchangeable use of the terms "dental anxiety" and "dental phobia" within the literature. Despite the many questionnaires and structured interviews claiming to measure these concepts, explicit definitions of the terms have been neglected.

Anxiety, fear, and phobia are interrelated concepts. Anxiety is "... a vague, unpleasant emotional state with qualities of apprehension, dread and uneasiness", whereas fear is an emotional state in the presence of a specific noxious stimulus (Reber, 1985). Both these emotions can vary in intensity, and only once they reach a clinically significant level can they be considered to be manifestations of a phobia. Phobia is defined by DSM-IV criteria as an anxious state where the emotions induce avoidance of the situation, or an endurance of it "...with intense distress" (American Psychiatric Association, 1994: 300.29).

From a clinical perspective, the concept of dental phobia is the same as other forms of specific phobia. It causes somatic and cognitive symptoms (e.g. racing heart, sweating, dry mouth, negative thoughts about ability to cope, expectation of pain, etc.) which often compel the sufferer to carry out safety behaviours such as avoidance, or distraction techniques. These manifestations of increased arousal reinforce the state of anxiety, thereby perpetuating the cycle of increasing anxiety.

However, despite the well established theoretical concepts relating to other anxiety disorders, many measures of dental anxiety, fear and phobia have been criticised for their lack of an explicit theoretical basis, and are therefore considered to have poor content validity (Schuurs et al, 1993). An exception to this is the Dental Anxiety Inventory (DAI), which was developed to overcome the problems of construct definition inherent within preceding measures of dental anxiety (Stouthard et al, 1995). It was developed using a facet approach, which requires that "...all relevant facets of a construct be measured, and all

elements within each facet distinguished and combined into a definition of the content domain of that construct..."(pp 590, Stouthard et al, 1995). The facets identified are a situation facet, a reaction facet, and a time facet. The fundamental elements of anxiety (cognitive/ physiological/ behavioural) are expressed within these facets and form a definition of the construct that the measure is targeting (*Figure 1*).

INSERT FIGURE 1 ABOUT HERE

The DAI is therefore a measure that should appeal to the scientist-practitioner who wants to identify people whose level of anxiety is clinically significant. However, the sensitivity and specificity of the DAI have not been established.

The aim of the current study is to explore the sensitivity and specificity of the DAI by comparing it to a structured clinical interview for anxiety disorders (SCID I: Anxiety Disorders, First et al, 1997). If the measure is sensitive to dental phobia, then subjects who have a high score on the DAI should also be identified as having a clinically significant anxiety using the SCID I: Anxiety Disorders. The SCID I: Anxiety Disorders will also provide details about the nature of that anxiety, and therefore clarify whether dental anxiety is a manifestation of other anxiety disorders.

In addition to the DAI, the Modified Dental Anxiety Scale (MDAS) (Humphris et al, 1995) will also be used. The original scale was developed by Corah in 1969, and has been widely used by researchers and clinicians alike. Humphris et

al recognised that the scale omitted to measure some important physiological symptoms of anxiety (e.g. heart palpitations), and that it also needed to be more explicit about aspects of anxiety relating to needles and dental drills, and consequently modified the existing scale to incorporate these important elements.

The MDAS consists of 5 questions, and is therefore quick to administer. However, like the original scale, theoretical basis for the scale has not been made explicit, and therefore its content validity is questionable. As the scale is very widely used as a clinical and research tool, it is important to assess it in relation to a structured diagnostic clinical interview, in order to help validate it.

Neither the MDAS nor the DAI examine behavioural aspects of dental anxiety or phobia. For the purpose of this study, a behavioural checklist has been developed to investigate this important aspect of anxiety and phobia. The results of the checklist will be compared to both the DAI and MDAS scores to determine if there is any relationship between dental anxiety and phobia, and avoidance behaviours.

Method

Participants

The sample consisted of male and female volunteers from the Glasgow population, who telephoned the Department of Psychological Medicine in response to advertisements about the study in the Glasgow Dental Hospital, dental surgeries, and local newspapers (n = 231). Respondents were sent a MDAS, DAI and behaviour checklist questionnaire to complete. They were also asked to provide basic information about their dental attendance, oral health, and a self-rated level of anxiety (not anxious/ anxious/ very anxious). Pre-paid envelopes were provided to maximise the return rate of the questionnaires.

From the sample that returned the completed questionnaires (n = 117), 60 participants were selected (30 participants who scored ≤ 113 on the DAI, and 30 who scored > 113 on the DAI) to be interviewed on the telephone using the anxiety section of the Structured Clinical Interview for DSM IV (SCID I: Anxiety Disorders). In addition to their DAI scores, the proportion of participants who fell into pre-determined age groups matched that of the total Glasgow population (i.e. the age profile of the sample matched the age profile of the Glasgow population).

The criteria of ≤ 113 and > 113 were selected from the original validity study carried out by Stouthard et al (1995). Scores greater than 113 on the scale are categorised as either "highly anxious" or " extremely anxious". Therefore, these labels should correlate with people who are identified with having a clinically

significant anxiety disorder on the SCID-I. Those who score lower than this should not be identified as having a clinically significant disorder.

Materials

The Dental Anxiety Inventory is a self-rated questionnaire about dental anxiety and contains 36 items that are answered on a 5-point Likert scale. Scores range from 39 (no dental anxiety) to 180 (extremely anxious). The questionnaire was originally developed in 1993, and empirical analysis of the internal structure of the DAI demonstrated "... a strong general dental anxiety factor with substantial factor loadings from all items" (Stouthard et al, 1995: pp 590). The reported reliability of the DAI is good (Cronbach's α: 0.98 and 0.96)

The Modified Dental Anxiety Scale is also a self-report questionnaire containing five questions that are answered on a 5-point Likert scale. Total scores range from 5 to 25, and the authors suggest that scores over 19 are indicative of dental phobia (Humphris et al, 1995). The scale is reported to have good internal consistency and stability.

60 participants were interviewed using the SCID I (First et al, 1997). This semi-structured clinical interview has been designed to enable the user to make a diagnosis based on DSM IV criteria. The interview covers all aspects of DSM IV identified disorders, but sections can be selected out of the interview without affecting the overall validity and reliability of the tool. For the purpose of the current study, the section on Anxiety Disorders (SCID I: Anxiety Disorders) was administered.

Statistical Procedures

Data were analysed using non-parametric statistics. Chi Square analyses explored the associations between DAI score categorisations and SCID diagnoses, and MDAS and SCID diagnoses. Spearmans Rank correlation examined the relationship between the DAI and behaviour checklist, and the DAI and MDAS.

Sensitivity and Specificity of the DAI and MDAS were assessed using the following formulae (Lockett, 2000):

Sensitivity:

$$\frac{\text{Total number of true positives}}{\text{Sum of true positives + false negatives}}$$

(high score and diagnosis of dental phobia)
(high score and no diagnosis of dental phobia)

Specificity:

$$\frac{\text{Total number of true negatives}}{\text{Sum of true negatives + false positives}}$$

(low score and no diagnosis of dental phobia)
(low score and diagnosis of dental phobia)

Power calculations based on Chi Square analysis were not available, so an appropriate sample size was estimated using a similarly designed published study by Beidel et al, (1989), who examined the concurrent validity of the Social Phobia and Anxiety Inventory (SPAI) in a clinical population. They compared the SPAI with the Anxiety Disorders Interview Schedule - Revised (ADIS-R), which, like the SCID, is a structured interview, designed to assist in differential diagnosis among the DSM-III-R anxiety disorders.

Results

Description of Total Sample

Of the 231 questionnaires sent out, 117 were completed and returned. The sample (n=117) consisted of 83 females (70.1%) and 34 males (29.9%). This female bias is consistent with results reported by Humphries et al (1995) (as measured by the Modified Dental Anxiety Scale). *Table 1* outlines the demographic and self-reported oral health details of the total sample.

INSERT TABLE 1 ABOUT HERE

The high percentage of respondents who attend the dentist regularly or attend for emergencies only, reflects the recruitment strategies within the local Dental Hospital (Accident & Emergency Department), and clinics specialising in treating anxious patients. This also explains the large number of people within this sample who reported having visited the dentist within the last 6 months.

Within this sample, 23% considered themselves to be highly anxious about attending the dentist, 33% reported being anxious, and 44% said they were not anxious about attending the dentist.

The mean DAI score was 87.4 (sd 37.1) and the mean MDAS score was 13.9 (sd 5.8) for the total sample.

Description of Sub-Sample

From the total sample of 117, two groups of 30 participants were interviewed using the SCID I: Anxiety Disorders. The groups were selected according to their total DAI score (≤ 113 or >113) and were matched for age.

Table 2 demonstrates the relationship within these two groups (total $n = 60$) between DAI score and outcome from the SCID I: Anxiety Disorders. Within the sample of interviewed participants, 15 did not have a diagnosis of an anxiety disorder.

INSERT TABLE 2 ABOUT HERE

Sensitivity and Specificity of DAI

It was hypothesised that high scores on the DAI were more likely to be associated with a diagnosis of specific dental phobia. Chi Square analysis was used as the data from the SCID I: Anxiety Disorders was nominal, and DAI scores were categorised as 'High dental anxiety' (>113) or 'Low dental anxiety' (≤ 113).

INSERT TABLE 3 ABOUT HERE

Table 3 shows that 32 people were diagnosed with a clinically significant dental phobia (as measured using the Structured Clinical Interview for DSM IV-Anxiety Disorders). Twenty-nine of these also scored above 113 on the Dental

Anxiety Inventory. Of those who scored 113 or lower on the Dental Anxiety Inventory, only 3 had a diagnosis of dental phobia.

Chi Square analysis indicated there was a significant relationship between DAI score and SCID diagnosis of specific dental phobia (chi square value, 45.286; $p< 0.001$). Cramer's *V*, which measures the strength of association between the two categorical variables (DAI score & Diagnosis) was 0.87 (range of test statistic = 0-1). This is highly significant ($p<0.001$). Therefore these results are unlikely to have occurred by chance.

From the data collected using the SCID I: Anxiety Disorder, 29 participants who had very high scores on the DAI also had a diagnosis of specific dental phobia. Figures in *Table 4* show that although some participants had co-morbidity with other anxiety disorders, dental phobia was a separate disorder for 32 of the 60 participants interviewed.

INSERT TABLE 4 ABOUT HERE

Only 1 participant who scored over 113 on the DAI had a diagnosis other than specific dental phobia. That participant had a diagnosis of social phobia and panic disorder. Specificity of the DAI was measured at 0.90. Futhermore, the sensitivity of the scale was calculated at 0.96. The sensitivity and specificity of the MDAS (when compared with the SCID I) was 0.72 and 1 respectively.

Association between DAI score and avoidance behaviours within the Total Sample (n = 117)

INSERT FIGURE 2 ABOUT HERE

The scatterplot graph (*Figure 2*) shows a positive linear relationship between the number of avoidance behaviours employed and scores on the DAI. Analysis using Spearman Rank Correlation was performed because the distribution of scores on the Behaviour Checklist Questionnaire did not have a normal distribution (69 participants reported < 2 avoidance behaviours). There was a significant correlation between DAI score and number of avoidance behaviours employed (correlation coefficient: 0.618, $p<0.01$), indicating that as DAI scores increased, the number of avoidance behaviours reported also increased.

INSERT FIGURE 3 ABOUT HERE

Figure 3 shows the pattern of responses to each question within the behaviour checklist. Question 11 ("I often check my teeth myself") was the most frequently reported behaviour (46 participants out of 117 ticked this response), followed by "If something about dentists is on the TV, I switch the TV off because it makes me anxious". Only 3 participants reported having asked their doctor for help with their dental fear (Question 18).

Concurrence between the DAI and MDAS

Using the cut off score of 19 on the MDAS (as used by Humphries et al, 1995) and 114 on the DAI to identify subjects who were dentally phobic, concurrence between the two measures was explored using Chi Square analysis. *Table 5* shows the crosstabulation details of the DAI categories by MDAS categories.

INSERT TABLE 5 ABOUT HERE

The results of Chi Square analysis were significant at the $p<0.001$ level (Chi Square value, 52.144). Cramer's *V* was calculated to assess the strength of the relationship and was 0.668, which was also significant ($p<0.001$).

Spearman Rank Correlation was used to assess concurrence between actual DAI and MDAS scores. The results of a one-tailed analysis were significant ($p<0.01$; correlation coefficient, 0.888) indicating that higher DAI scores are associated with higher MDAS scores within this population.

Chi Square analysis of the relationship between the MDAS and SCID I: Anxiety Disorders was significant (32.635, $p<0.001$) and the strength of association was 0.74 (Cramer's *V*). The strength of association between the MDAS and SCID I is marginally less than that between the DAI and SCID I, but both measures have produced highly significant results.

Discussion

The aim of this study was to explore the sensitivity and specificity of the Dental Anxiety Inventory (DAI) and Modified Dental Anxiety Scale (MDAS) by comparing them with a structured clinical interview for anxiety disorders (SCID I: Anxiety Disorders). The data indicate that the DAI is an accurate measure of dental phobia. Those participants who had high scores on the DAI (> 113) were more likely to have a diagnosis of dental phobia than those who had lower scores. The sensitivity of the scale was calculated as 0.96, and the specificity of the scale was 0.90

The correlation between the Modified Dental Anxiety Scale (MDAS) and DAI supports the use of the MDAS as a screening tool for dental phobia, and replicates results found by Stouthard et al (1995) in their assessment of the reliability and validity of the DAI. This will appeal to clinicians within dental practices, as it is much quicker to employ. However, the DAI provides more detailed information about the precise nature of the dental fear, and is therefore more useful for clinical psychologists.

Ratings on individual aspects of dental fear can be compared pre- and post-intervention. Furthermore, the apparently ad hoc development of the original Dental Anxiety Scale undermines its appeal to those who believe in practising as scientist-practitioners. The stronger association between the DAI and SCID I:

Anxiety Disorders should make it the questionnaire of choice for those studying dental anxiety and phobia in more detail.

Co-morbidity of anxiety disorders was common within this sample population. Previous research has suggested that rates of co-morbidity amongst people with a principal anxiety disorder are as high as 50% (Brown, 1996). Within the current study, co-morbidity of anxiety disorders occurred in 43% of cases, whereas diagnosis of a single anxiety disorder occurred in only a third of the sample.

Andrews (1996) reviewed existing literature and suggested that the high incidence of co-morbidity among anxiety disorders might be due to vulnerability factors within people who experience clinically significant anxiety. He comments that many patients attribute their multiple diagnoses to a fundamental trait in their personality e.g. being of a nervous nature, or handling stress badly. This supported Duncan-Jones (1987), who concluded that long-term vulnerability factors were more important than short-term stressors in the aetiology of neurotic illness. Andrews also suggests that the stress of having one disorder may have a causal role in the development of a second disorder.

The relationship between dental phobia and avoidance behaviours was also as expected, with those who had high scores on the DAI also employing the highest number of avoidance strategies. This supports existing psychological models of anxiety that state that increased arousal leads to the employment of behavioural techniques such as avoidance of the stimulus, or preventative behaviours. The

positive relationship between the number of behaviours employed and scores on the DAI is useful to clinical practice because it provides an objective form of measurement for the effectiveness of any intervention techniques used. The high rate of response to Question 11 ("I often check my teeth myself") indicates this question was too vague, and consequently did not distinguish those people who were demonstrating hyper-vigilant behaviour from those who were carrying out a normal dental hygiene exercise.

The development of the DAI using a facet approach appears to have ensured the scale has the strength to distinguish between clinically anxious and non-clinically anxious people. Furthermore, the results of this study suggest that the term 'dental anxiety' can be used to identify a discrete set of symptoms, and does not incorporate a set of symptoms that should be more appropriately labelled as any other type of anxiety disorder. Dental anxiety was classified as a separate disorder for most of those who had high scores on the DAI. However, the rate of co-morbidity present within this sample suggests that dental anxiety may be only one aspect of a more complex anxiety problem.

Although the results of this study support the use of the DAI and the MDAS within clinical and research settings, the study could be improved upon.

Firstly, the behaviour checklist used within this study was not piloted prior to the start of the study, and consequently some statements within the questionnaire

were not discriminatory between those who considered themselves dentally anxious/ phobic and those who did not identify themselves as being anxious.

For example, 39% of cases reported that they check their teeth regularly, irrespective of their level of anxiety. It would appear this behaviour is a routine part of many people's oral health routine. However, the consequences of checking one's own teeth may be quite different. For those without dental anxiety, it may be a proactive strategy to monitor oral health before any major problems arise. For those who are dentally phobic, the act of checking their teeth might reinforce their anxiety by anticipating the possibility they will have dental problems that require treatment. The roles and meanings of behaviours in the maintenance of dental anxiety states require further investigation.

Secondly, the sample size for this study was based upon a similarly designed published study by Beidel et al (1989), and therefore does not have a known statistical power. This means that there is an element of uncertainty about the confidence that can be placed in these findings. However, when statistical power cannot be calculated (due to the properties of the data collected, and statistics used) it is common practice to base sample size on previously published studies of a similar nature.

Thirdly, consideration should also have been given to whether or not alternative 'cut-off' scores within the DAI and MDAS would yield higher sensitivity or specificity scores. However, given that the sensitivity and specificity scores for

the DAI were already very high, it is questionable whether such manipulations are really necessary. The specificity of the MDAS cannot be improved upon, however the sensitivity could be. While manipulating the 'cut-off' score for this questionnaire might improve the sensitivity score, it is likely to reduce the specificity of the scale, and it is therefore necessary to prioritise the importance of sensitivity scores or specificity scores before carrying out such manipulations.

Finally, as with all studies using self-selecting samples, this study is prone to the biases inherent within this type of sample. Generalising from this sample to the general population has to be exercised with care. However efforts were made within this study to ensure that the sample used reflected the Glasgow population as a whole in terms of age.

Future research should consider using a larger sample size (to increase confidence in the power of the results), with a clearer distinction between the high anxiety group and low anxiety group (as measured by the DAI). It would also be preferable to incorporate some inter-rater reliability for the SCID I: Anxiety Disorders data.

Conclusions

From the data collected, the sensitivity and validity of the DAI as a tool for identifying dentally phobic people has been supported. Correlations between the DAI and MDAS were good, indicating that the MDAS can be used confidently as a brief screening tool. However, for more detailed investigations of dental anxiety, the depth of content, and theoretical underpinnings of the DAI make it the assessment of choice for clinicians and researchers.

Associations between increased levels of anxiety and employment of avoidance behaviours were also demonstrated, supporting the hypothesis that dental phobia shares the same characteristics as other specific phobias. There was evidence that the term 'dental anxiety' (as measured by the DAI and MDAS) is a discrete disorder, rather than an umbrella term that masks other anxiety disorders such as social phobia or generalised anxiety. However, co-morbidity of dental phobia with other anxiety disorders was high, and the possibility of co-existing disorders within people who are identified as dentally anxious should always be considered when planning treatment strategies for dentally anxious people.

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Tables & Figures

Figure 1: Mapping Sentence of Dental Anxiety (Stouthard et al, 1995).

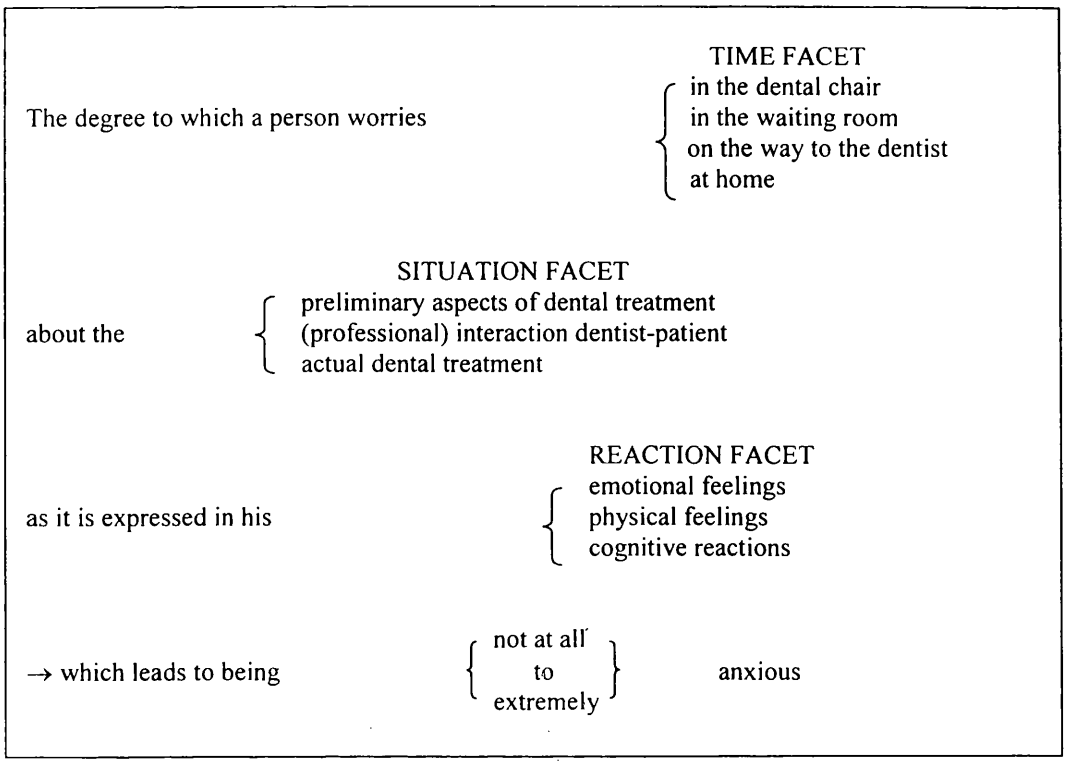

Table 1: Demographic Details and Self-Reported Oral Health of Total Sample (n=117).

	Male *(n)*	Female *(n)*
Age Group		
18 - 25	2	12
26 - 35	13	30
36 - 45	7	19
46 - 55	4	9
56 - 65	3	7
>65	5	6
Total	*34*	*83*
Self-Reported Level of Anxiety		
Not Anxious	17	35
Anxious	9	29
Very Anxious	8	19
Total	*34*	*83*
Frequency of Attendance at Dentist		
Every 6 months	15	51
Once a year	5	17
Emergencies only	12	15
Never	2	0
Total	*34*	*83*
Recency of Last Dental Appointment		
< 6 months	16	52
6 -12 months	1	18
1-2 years	4	8
2-3 years	1	1
3-4 years	4	1
>4 years	8	3
Total	*34*	*83*
Oral Status		
All natural teeth	21	42
Full set of dentures	1	4
Half set of dentures	4	8
Some crowns / bridge	8	29
Total	*34*	*83*

Table 2: Crosstabulation of Number of Diagnosed Anxiety Disorders and DAI score category

	DAI score		
Number of Anxiety Disorders	**≤ 113** (Low Dental Anxiety)	**>113** (High Dental Anxiety)	**Total**
0	15	0	15
1	7	12	19
2	6	10	16
3	1	7	8
4	0	1	1
5	1	0	1
Total	30	30	60

Table 3: Crosstabulation of Dental Anxiety Inventory Score (<114 or >/=114) and Diagnosis of Dental Phobia (Yes/No)

		Dental Anxiety Inventory Scores		
	Count	*Low DAI score (≤113)*	*High DAI score (> 113)*	*Total*
Dental Phobia				
Yes	Observed	3	29	32
	Expected	16	16	
No	Observed	27	1	28
	Expected	7.5	7.5	
Total		30	30	60

Table 4: Comorbidity of Anxiety Disorders.

Diagnoses	*n*
Dental Phobia Only	11
Dental Phobia + Social Phobia	4
Dental Phobia + Other Phobia	5
Dental Phobia + Needle Phobia	1
Dental Phobia + Blood Phobia	1
Dental Phobia + Panic Disorder	1
Dental Phobia + Social Phobia + Other Phobia	3
Dental Phobia + Social Phobia + Generalised Anxiety Disorder	2
Dental Phobia + Social Phobia + Obsessive Compulsive Disorder	1
Dental Phobia + Social Phobia + Generalised Anxiety Disorder + Panic Disorder	1
Dental Phobia + Generalised Anxiety Disorder + Other Phobia	2
Social Phobia Only	3
Social Phobia + Panic Disorder	1
Social Phobia + Generalised Anxiety Disorder + Panic Disorder + Obsessive Compulsive Disorder + Other Phobia	1
Needle Phobia Only	1
Needle Phobia + Panic Disorder	1
Needle Phobia + Other Phobia	1
Blood Phobia Only	1
Panic Disorder Only	1
Panic Disorder + Generalised Anxiety Disorder	1
Other Phobia Only (e.g. insect, heights, etc.)	2
No Diagnosis	15
TOTAL	60

Figure 2: Scatterplot Graph of DAI & Behaviour Checklist

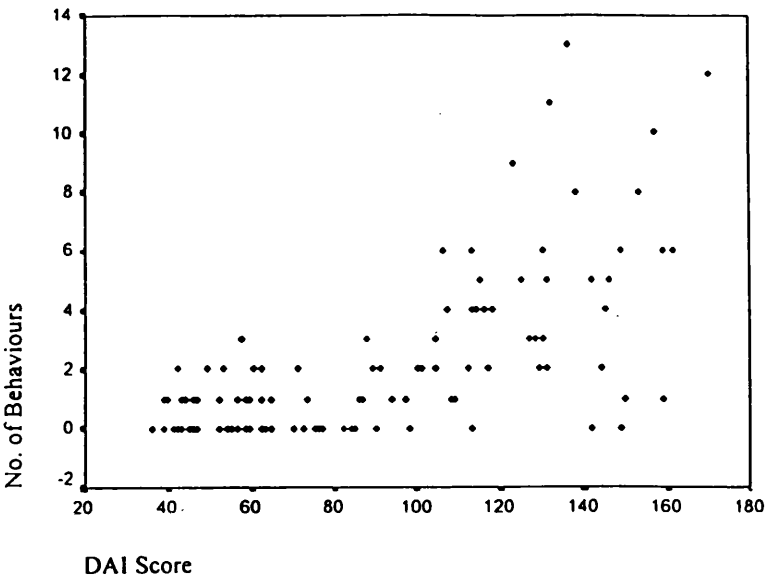

Figure 3: Behaviour Checklist: Number of Responses to Each Question (n=117)

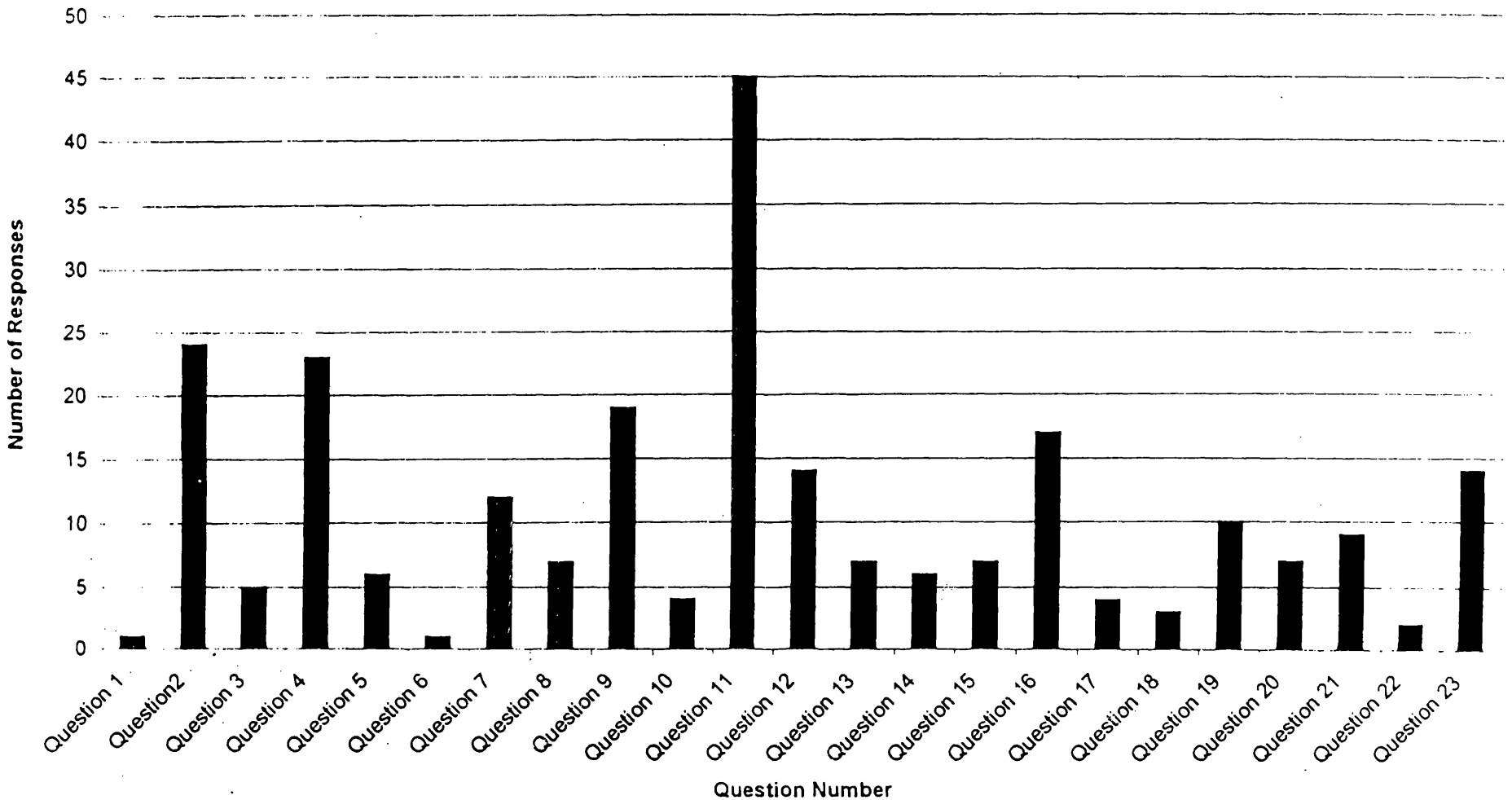

Table 5: Crosstabulation between DAI categories and MDAS categories.

		DAI Categories		
MDAS Categories	*Count*	*Low Dental Anxiety Inventory (score ≤113)*	*High Dental Anxiety Inventory (score (>113)*	*Total*
Dentally Phobic (score >18)	Observed	7	23	30
	Expected	22.1	7.9	
Not Dentally Phobic (score <19)	Observed	79	8	87
	Expected	63.9	23.1	
Total		86	31	117

Chapter 5: Clinical Research Case Study

A SINGLE CASE EXPERIMENTAL STUDY OF THE EFFECTS OF AUDITORY STIMULATION ON STEREOTYPIC BEHAVIOUR

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

Prepared in accordance with guidelines for contributors to the American Journal on Mental Retardation

(See Appendix A, Part 2)

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Abstract

Stereotypy is a common behaviour characteristic of severely and profoundly learning disabled people. Such behaviour can lead to increased stigmatisation, and is incompatible with more developmentally or educationally significant behaviour (La Grow & Repp, 1984). The homeostatic theory of stereotypic behaviour postulates that the behaviour provides an optimal level of stimulation when the environment is either over or under stimulating. The participant in this study has been living in a large institution from a young age. He repeatedly hits his hand off objects close to him and this has lead to his partial isolation within the ward setting. The ward environment is highly stimulating, and it was hypothesised that his behaviour served to reduce the amount of stimulation he was exposed to. This study explored the effect of minimum stimulation, and controlled auditory stimulation on the frequency of his stereotypic behaviour. Results are discussed in relation to the homeostasis theory of stereotypic behaviour.

Chapter 6: Appendices

BRAIN INJURY: Instructions for authors

Submission

Contributions, which may be in the form of reviews, original papers, case studies, programme developments or letters to the Editors, should be sent to Henry H Stonnington (Medical Director, Rehabilitation Center of Memorial Medical Center, Provident Office Building, 4750 Waters Avenue, Suite 307, Savannah, GA 31404, USA), Nathan Cope (Paradigm Health Corporation, 1001 Galaxy Way, Suite 400, Concord, California 94520, USA), William McKinlay (Case Management Services Ltd, 17a Main Street, Balerno, Edinburgh EH14 7EQ, UK) or to one of the regional editors listed on the inside front cover. Two complete copies should be submitted, typed double-spaced, on standard 8.5 x 11 in paper with ample margins. Manuscripts are accepted on the understanding that they are not already under consideration for publication by another journal.

Style and presentation

Manuscripts should be in English, typed or printed out, double-spaced on A4 or 8.5 x 11 in paper and the pages numbered. Pages should include a separate title page with a clear, specific, but brief title and a suggestion for a shorter title (40 characters or less) for running heads should be included. The names and present affiliations of each author should be given. One author should be designated as the corresponding author to whom proofs and offprint requests should be addressed and a full correspondence address, including telephone and fax numbers given as a footnote. All papers must have an abstract not exceeding 200 words and including a statement of purpose, methods used, results obtained and conclusions reached. No keywords are necessary. The text should be divided into sections; original papers should use headings in the order: Introductory paragraphs, Methods, Results, Discussion. All terms to be abbreviated should be spelled out at first mention with the abbreviation following in parentheses. Avoid obscure abbreviation, slang, jargon and other usage that decreases clarity. CITE REFERENCES CONSECUTIVELY BY NUMBER. ALL references must be cited in the text. Personal communications and unpublished data should be placed in parentheses in the text, not in the list of references. Also cite each figure and table in the text and indicate clearly where these are to be positioned. Use Arabic numbers for both figures and tables.

Tables

Tables should be cited in the text. Each table should be given a number and a brief informative title and should appear on a separate page. Omit vertical rules and use extra space to delineate sections of a table. Explain in footnotes all abbreviations used in the table. For footnotes, use the following symbols in this sequence, †, ‡, §, ‖, ¶, and then double symbols as necessary.

Illustrations

Use only those illustrations that clarify and augment the text. Authors are asked to provide glossy prints or good photocopies; computer printouts should be re-drawn wherever possible. Each figure should have a label pasted on its back indicating the figure number and the top of the figure. Legends should be on a separate sheet. Specific permission for facial photographs of patients is required. A letter of consent must accompany the photographs of patients in which a possibility of identification exists. It is not sufficient to cover the eyes to mask identity.

References

References must be cited in the text CONSECUTIVELY BY NUMBER, and listed at the end of the paper in the following styles (provide all authors' names for three or fewer; where there are three or more than three, add 'et al'):

1. BROOKS, N., MCKINLAY, W., SYMINGTON, K *et al.* Return to work within the first seven years of severe head injury. *Brain Injury*, **1**: 5-19, 1987.

For a book:

2. RIMEL, R. W. and JANE, J. A.: Characteristics of the head-injured patients. In M. Rosenthal, E. R. Griffith, M. R. Bond and J. D. Miller (editors) *Rehabilitation of the Head Injured Adult.* (Philadelphia: F. A. Davies Company), pp. 9-21, 1983.

Guidelines for animal and human research

When experimental animals are used, state the species, strain, number used and other pertinent descriptive characteristics. For human subjects or patients, describe their characteristics. When describing surgical procedures on animals, identify the pre-anaesthetic and anaesthetic agents used and state the amount of concentration and the route and frequency of administration for each. The use of paralytic agents such as curare or succinylcholine, is not an acceptable substitute for anaesthetics. For other invasive procedures on animals, report the analgesic or tranquillising drugs used; if none were used, provide justification for such exclusion. When reporting studies on unanaesthetised animals or on humans, indicate that the procedures followed were in accordance with institutional guidelines.

Proofs

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	Ward:	Hospital No:	Admission Date:
Trans:	Ward:	Hospital No:	Date of Transfer:
Return	Ward:	Hospital No:	Date of Return:
DC Date:	DRS:	Consent:	

HEAD INJURY ACUTE CARE PROFORMA

PATIENT INFORMATION

Patient ID: ☐☐☐☐

Name: _____

Address: _____

_____

Phone: _____

Age: ☐☐ yrs

Date of Birth: D D / M M / Y Y ☐☐/☐☐/☐☐

Sex: 1=Male 2=Female ☐

Occupation: ☐

Marital Status: 1=Married 2=Single 3=Widowed 4=Divorced ☐

Social Conditions: 1=Lives alone 2=Lives with family 3=Lives with friends 4=Other ☐ If *Other*, (specify) _____

Next of Kin: Name: _____

Address: _____

_____

Phone: _____ Relationship to Patient: _____

GP's Name: _____

Address: _____

_____

PREVIOUS MEDICAL HISTORY

Has the patient ever had:

1=No
2=Yes (only went to GP or A&E)
3=Yes (was admitted to hospital)
4=Yes (was admitted and required surgery)
If 2, 3 or 4 give dates

If multiple, give last date of event — Year

Stroke	☐	☐☐
Previous Head Injury	☐	☐☐
Other Brain/Neurological Illnesses	☐	☐☐

Did the patient have physical limitations prior to the head injury?

1=No 2=Yes ☐ If Yes, (specify) _____

Has the patient ever received treatment for a mental problem or illness?

1=No
2=Yes (medication only)
3=Yes (treatment from GP or Psychologist)
4=Yes (In hospital treatment) ☐

What are the patient's drinking habits?

1=Non-drinker
2=Normal
3=Excessive problem
4=Has required treatment in the past ☐

Does the patient remember the injury? 1=No 2=Yes ☐

Minutes Hours Days

HEAD INJURY ACUTE CARE PROFORMA

HEAD INJURY INFORMATION

Patient ID: [ ][ ][ ][ ]

Date of Injury: D D / M M / Y Y [ ][ ] / [ ][ ] / [ ][ ]

Time of Injury: Hours [ ][ ] Minutes [ ][ ]

Date of Arrival at A & E: [ ][ ] / [ ][ ] / [ ][ ]

Time of Arrival at A & E: [ ][ ] [ ][ ]

Cause of Injury:

1=Car accident
2=Hit by vehicle when walking
3=Motorcycle accident
4=Bicycle accident
5=Fall
6=Sport injury
7=Work related injury
8=Assault
9=Other

[ ][ ]

If *Other*, (specify) _____

Alcohol involved:

1=No
2=Yes
3=Suspected

[ ]

CLINICAL FEATURES ON ADMISSION

GCS on arrival to A & E: E [ ] V [ ] M [ ] Total GCS [ ]

GCS on admission to ward: E [ ] V [ ] M [ ]

Eye Opening	Verbal Response	Best Motor Response
1=Nil	1=Nil	1=Nil
2=To pain	2=Sounds	2=Extension
3=To sound	3=Words	3=Abnormal flexion
4=Spontaneous	4=Confused	4=Normal flexion
5=Closed by swelling	5=Orientated	5=Localise
	6=Tube or tracheostomy	6=Obey

CT Scan:

1=Not done
2=Yes/Normal
3=Yes/Abnormal

[ ]

Skull x-ray:

1=No
2=Yes

[ ]

Skull fracture:

1=No
2=Yes

[ ] If *Yes*, (specify) _____

Other injuries:

1=No
2=Minor (eg abrasion or bruising)
3=Moderate (eg fracture)
4=Major (eg required surgery)

Spine	Chest	Abdomen	Limb	Facial
[ ]	[ ]	[ ]	[ ]	[ ]

PROGRESS AFTER ADMISSION

Duration of Coma:

1=No coma
2=Coma <6 hours
3=Coma >6 hours

[ ]

Time to Orientation:

1=On admission
2=<1 hour
3=1-6 hours
4=6-24 hours
5=2-7 days
6=>7 days

[ ]

Worst GCS: E [ ] V [ ] M [ ]
(see above for codes)

Epilepsy 1st Week:

1=No
2=Focal
3=General

[ ]

Referral to NSU:

1=No
2=Yes

[ ]

Operation:

1=No
2=Neuro
3=Limb
4=Other

[ ]

HEAD INJURY ACUTE CARE PROFORMA

FINAL DISCHARGE

Patient ID: | | | | | -

Placement: 1=Died, 2=Home, 3=Hospital, 4=Other [ ]

Date of Discharge or Death: D D / M M / Y Y

Main factor in duration of stay over 48 hours:

1=Head injury
2=Social problems
3=Orthopaedic injuries
4=Medical problems
5=Combination
6=Other [ ]

If Other, (specify) _____

FOLLOW UP PLANS

	1=No, 2=Yes	GP	Hospital	Other
Medical:				

If Other, (specify) _____

	1=No, 2=Yes	OT	PT	ST	Psychology	Social Work	Other
Therapy/Psychology:							

QUESTIONNAIRE

After a head injury or accident some people experience problems which can cause them worry or nuisance. We would like to know if you have any difficulties with any of the activities listed below. We would like you to compare yourself now, with before the accident. Please do not leave any blanks.

1. Name of injured person: _____

2. Today's Date: _____

3. I was helped to complete the questionnaire by my:

No one	Parent	Son/Daughter	Brother/Sister	Girl/Boyfriend	Other	Wife/Husband

4. Where are you currently staying?

a) Home ☐ c) Hospital ☐
b) Nursing Home ☐ d) Other (Please Specify) ☐ _____

5. Do you need more help during the week?

a) No, I am just as independent as before the injury ☐ b) Yes, I need a little more help ☐
d) Yes, I need a lot more help ☐

Do you need more help than before the injury to: (*For every question, tick one*)

(Life Skills)	No Change	More help since injury	Much more help since injury
6. Eat, dress, bathe, or use toilet.	☐	☐	☐
7. Performance of ordinary domestic activities.	☐	☐	☐
8. Do grocery shopping.	☐	☐	☐
9. Make phone calls.	☐	☐	☐
10. Use public transportation	☐	☐	☐
(Interpersonal Functioning)	**No Change**	**Some Change**	**Major Change**
11. Do you participate in as many leisure Activities as you did before the injury?	☐	☐	☐
12. Has there been a change in your relationship with friends?	☐	☐	☐
13. Has there been a change in your relationship with your wife/ husband?	☐	☐	☐
14. Has there been a change in your ability to cope with family demands?	☐	☐	☐
15. Has there been a change in your ability to maintain your previous workload standards?	☐	☐	☐

(Physical Problems)	No Change	Worse since injury	Much worse since injury
16. Problems with vision and/or hearing	☐	☐	☐
17. Poor balance or dizzy spells	☐	☐	☐
18. Headaches	☐	☐	☐
19. Fits or blackouts	☐	☐	☐
(Affective/ Cognitive Functioning)			
20. Do you find work more tiring?	☐	☐	☐
21. Difficulty sleeping or disturbed sleep.	☐	☐	☐
22. Anxiety or panic attacks.	☐	☐	☐
23. Irritability or temper.	☐	☐	☐
24. Has there been a change in your ability to participate in conversation with one person?	☐	☐	☐
25. Has there been a change in your ability to participate in conversation with two people?	☐	☐	☐
26. Poor concentration.	☐	☐	☐
27. Depression.	☐	☐	☐
28. Problems with memory.	☐	☐	☐
29. Difficulty making decisions.	☐	☐	☐

30. How do you feel you are coping with the changes in your life since having had the head injury? (*Tick one*)

a) Fine, no problems.
b) Some problems are troubling, but seem to be able to handle them.
c) Some problems, could use help.
d) Depressed, overwhelmed.

Study No _____

HEAD INJURY SERVICES FOLLOW-UP

Have you seen your GP since you were discharged from the hospital?

Yes ☐ No ☐

How soon after leaving the hospital did you see your GP?

By the first week ☐
After 1 week but less than 1 month ☐
After 1 month, but less than 3 months ☐
After 3 months, but less than 6 months ☐
After 6 months, but less that 1 year ☐

How many contacts have you had with your GP since discharge?

At least once a week ☐
At least once a month ☐
At least once every 3 months ☐
At least once every 6 months ☐
At least once every year ☐

What have you seen your GP for?

Problems related to my head injury ☐
Medical problems not related to my head injury ☐
Repeat Prescriptions ☐
Sickness Certificate ☐

Have you attended or been asked to attend any outpatient clinics?

Yes ☐ No ☐

If yes, please tick:

Accident & Emergency ☐
Orthopaedic Department (or clinic) ☐
Neurosurgery ☐
Other ☐
I did not attend ☐

If you ticked 'I did not attend', please say why.

Have you received any other help since your discharge, eg Physiotherapy, Speech Therapy?

Yes ☐ No ☐

If Yes, please tick:

Occupational Therapy ☐
Physiotherapy ☐
Speech Therapy ☐
Psychology ☐
Psychiatry ☐
Social Work ☐
District Nurse ☐
Other ☐

PTO

For how long did you receive these services?

	weeks/months
Occupctional Therapy	
Physiotherapy	
Speech Therapy	
Psychology	
Psychiatry	
Social Work	
District Nurse	
Other	

Are you waiting for any services to start?

Yes ☐ No ☐

If yes, please state which service and how long you have waited:

Have you been attending any other services not mentioned previousiy?

Headway	☐
Head Injury Trust for Scotland	☐
Brain Injury Vocation Centre (Rehab Scotland)	☐
Counselling Services	☐
Other	☐

If Other, please say which

What type of improvements or services would you like to see implemented for people who have suffered a head injury?

Which services have you found helpful?

Thank you very much for completing the questionnaire. If necessary we may contact your GP, unless you indicate otherwise by ticking the box below that you do not wish this. ☐

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

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

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

1.2 Title – no more than 15 words.

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

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

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

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

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

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

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

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

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

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

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

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

Table of Raw Scores and Corresponding Categorisations

(Table copied from the Dental Anxiety Inventory Manual - Translation by M. Stouthard)

	Category	Raw Score	N	%
1.	Not Anxious	0 - 36	92	14.2
2.	Minimally Anxious	37 - 40	61	9.4
3.	Somewhat Anxious	41 - 48	98	15.1
4.	Borderline Anxious	49 - 66	143	22.1
5.	Anxious	67 - 90	113	17.4
6.	Quite Anxious	91 - 113	71	11.0
7.	Very Anxious	114 - 141	45	6.9
8.	Extremely Anxious	142 - 180	25	3.9

DAI

Dental Anxiety Inventory

ACTA

Academic
Centre for
Dentistry
Amsterdam

INSTRUCTIONS

This questionnaire consists of 36 statements about going to the dentist. Each statement represents a reaction to a particular situation. Read through all the statements carefully. For each statement, you are asked to indicate to what extent it applies to you personally. It is possible that you may not have been in the given situation before. In that case, try to imagine the situation as clearly as you can and indicate what your reaction would be. Please circle the number which matches your feelings best.

For example:

"I would like the dentist to explain the treatment to me."

1	2	3	4	5
totally untrue	hardly true	partly true	quite true	completely true

If you think this statement is quite true for you, then you would circle number 4: "quite true". If you would like to change your answer, for example if you strongly agree with the statement, then please cross out the wrong number (in this example number 4) and circle the correct number, which would be number 5: "completely true".

Although some statements may be similar, they are not the same. Please answer all the questions as best you can, even if you find it difficult to choose an answer. Please do not skip any questions. Try to answer quickly: your first response is likely to be the most accurate.

1	2	3	4	5
totally untrue	hardly true	partly true	quite true	completely true

1.	I become nervous when the dentist invites me to sit down in the chair.	1---2---3---4---5
2.	I need to go to the toilet more often when I sit in the waiting room thinking that the dentist will say my teeth look bad.	1---2---3---4---5
3.	When I'm on my way to the dentist and thinking about the anaesthetic, I would rather go back.	1---2---3---4---5
4.	I sleep badly when I think about having to make an appointment with the dentist.	1---2---3---4---5
5.	When I lie back in the dentist's chair I think about never coming back again.	1---2---3---4---5
6.	When I know the dentist is going to extract a tooth I am already afraid in the waiting room.	1---2---3---4---5
7.	When I think of the sound of the drilling machine on my way to the dentist, I would rather go back.	1---2---3---4---5
8.	I already feel uncomfortable at home when I think that the dentist will make a remark about my teeth.	1---2---3---4---5
9.	When the dentist is about to give me an anaesthetic I cling onto the arms of the chair.	1---2---3---4---5

1	2	3	4	5
totally untrue	hardly true	partly true	quite true	completely true

10. I become afraid in the waiting room when I hear sounds coming from the dentist's surgery. 1---2---3---4---5

11. On my way to the dentist, I sweat or freeze at the thought that the dentist will say I brush my teeth badly. 1---2---3---4---5

12. When I think of the moment when the dentist blows air into a cavity, I would like to cancel the appointment. 1---2---3---4---5

13. When the dentist looks into my mouth, my breathing becomes faster. 1---2---3---4---5

14. I want to walk out of the waiting room the moment I think the dentist will not explain what s/he is going to do in my mouth. 1---2---3---4---5

15. On my way to the dentist, I feel nervous when I know my teeth will be scaled. 1---2---3---4---5

16. I like to postpone making an appointment with the dentist as long as I can. 1---2---3---4---5

17. I feel uncertain when discussing the treatment of my teeth with the dentist. 1---2---3---4---5

18. When I am in the waiting room knowing the dentist is going to scale my teeth, I am unable to concentrate on a magazine. 1---2---3---4---5

1	2	3	4	5
totally untrue	hardly true	partly true	quite true	completely true

19. When I am on my way to the dentist and think of the smell of the practice I feel uncomfortable. 1---2---3---4---5

20. Before going to the dentist, I get palpitations when I think of how the dentist will be displeased at my teeth. 1---2---3---4---5

21. As soon as the dentist gets his/her needle ready for the anaesthetic, I shut my eyes tight. 1---2---3---4---5

22. In the waiting room, I sweat or freeze when I think of sitting down in the dentist's chair. 1---2---3---4---5

23. When I am on my way to the dentist and think that s/he will say my teeth look bad, then I want to go home again. 1---2---3---4---5

24. I already feel nervous at home when I know the dentist is going to give me an anaesthetic. 1---2---3---4---5

25. When the dentist's chair reclines backwards, I tell myself that the treatment will not take long. 1---2---3---4---5

26. In the waiting room, I feel nervous at the thought that the dentist will say my teeth are badly brushed. 1---2---3---4---5

27. On my way to the dentist, I get anxious at the thought that s/he will have to drill. 1---2---3---4---5

1	2	3	4	5
totally untrue	hardly true	partly true	quite true	completely true

28. I already feel uncertain at home thinking of the moment when the dentist will look into my mouth. 1---2---3---4---5

29. When I am sitting in the dentist's chair not knowing what is going on in my mouth, I break in a cold sweat. 1---2---3---4---5

30. When I am sitting in the waiting room and thinking about the checkup, I would prefer to go home. 1---2---3---4---5

31. When I am on my way to the dentist and I imagine his/her instruments, my hands become clammy. 1---2---3---4---5

32. I think about cancelling the appointment if I suspect the dentist will be displeased at my teeth. 1---2---3---4---5

33. I become nervous when the dentist is about to start checking my teeth. 1---2---3---4---5

34. When I'm waiting for the dentist's assistant to call me in, I try to think of something else. 1---2---3---4---5

35. On my way to the dentist, the idea of being in the chair already makes me nervous. 1---2---3---4---5

36. I sleep badly the night before I have to have a tooth extracted. 1---2---3---4---5

The Modified Dental Anxiety Scale

1. If you went to your dentist for TREATMENT TOMORROW, how would you feel?

	(Score)
a) Not anxious	1
b) Slightly anxious	2
c) Fairly anxious	3
d) Very anxious	4
e) Extremely anxious	5

2. If you were sitting in the WAITING ROOM (waiting for treatment) how would you feel?

a) Not anxious	1
b) Slightly anxious	2
c) Fairly anxious	3
d) Very anxious	4
e) Extremely anxious	5

3. If you were about to have a TOOTH DRILLED, how would you feel?

a) Not anxious	1
b) Slightly anxious	2
c) Fairly anxious	3
d) Very anxious	4
e) Extremely anxious	5

4. If you were about to have your TEETH SCALED AND POLISHED, how would you feel?

a) Not anxious	1
b) Slightly anxious	2
c) Fairly anxious	3
d) Very anxious	4
e) Extremely anxious	5

5. If you were about to have a LOCAL ANAESTHETIC INJECTION in your gum, above an upper back tooth, how would you feel?

a) Not anxious	1
b) Slightly anxious	2
c) Fairly anxious	3
d) Very anxious	4
e) Extremely anxious	5

The Modified Dental Anxiety Scale (Humphris et al., 1995) extends the original Dental Anxiety Scale (Corah, 1969) by the addition of a fifth question concerning fear of intra-oral injections.

DENTAL ANXIETY BEHAVIOUR CHECKLIST

Please read the following statements and tick the box if they describe something you have done.

1.	I cross the street to avoid walking past a dental surgery.	
2.	If something about dentists is on the TV, I switch the TV off because it makes me anxious.	
3.	I clean my teeth more than 4 times a day.	
4.	I have made an appointment with the dentist and then not attended because of my fear.	
5.	I have made excuses to avoid talking to someone who is a dentist or dental nurse.	
6.	I do not brush my teeth.	
7.	I have left the room when someone started talking about their last dental visit because I felt so uncomfortable.	
8.	I have not taken my children to the dentist because I am too anxious.	
9.	I have had nightmares about being at the dentist.	
10.	I have tried to put other people off going to the dentist.	
11.	I often check my teeth myself.	
12.	I have been given an injection in order to help me relax at the dentists.	
13.	I have been given tablets to control my fear when I go to the dentist.	
14.	I have used alcohol/ drugs to help me cope with my dental anxiety.	
15.	I have left the waiting room before being seen by the dentist, because I was so anxious.	
16.	I do not let my teeth show when I smile or talk in case they look rotten.	
17.	I have grown a moustache/ beard/ use my hand to hide my mouth and teeth.	
18.	I have asked my doctor to help me with my dental fear.	
19.	I have not registered with a dentist because of my dental anxiety.	
20.	I have pulled out one or more of my teeth (not baby/ milk teeth).	
21.	I have tried to fix my own dentures/ bridge/ cap.	
22.	I have gone to the casualty department in hospital when my toothache was extremely sore, rather than going to a dentist.	
23.	I have not continued with a course of dental treatment.	

Please give details of any other behaviours you carry out in order to avoid the dentist.

.....

.....

.....

.....

.....

.....

When was the last time you attended the dentist? (Please tick/ circle/ underline the one that applies to you.)

Less than 6 months ago
Between 6 and 12 months ago
Between 1 and 2 years ago
Between 2 and 3 years ago
Between 3 and 4 years ago
Over 4 years ago

If you have not attended the dentist in the last 12 months, please say why:

Cerys MacGillivray
Trainee Clinical Psychologist
Department of Psychological Medicine
Gartnavel Royal Hospital
1055 Great Western Road
Glasgow, G12 0XH.

Dear Sir/ Madam

STUDY: *Evaluating the sensitivity and specificity of the Dental Anxiety Inventory.*

Thank-you for responding to the publicity about my study. Please find enclosed an information sheet, consent form, and some questionnaires.

Please read the information sheet and consent form carefully.

If you decide to take part in this study, please fill in the consent form and questionnaires, and return them to me in the envelope provided. If you decide not to take part, please put this package in the bin. You will not be contacted again.

Please do not hesitate to contact me if you have any questions about potentially completing the study. You can call me on 0141 211 3920.

Thank-you for your time.

Yours sincerely

Cerys MacGillivray
Trainee Clinical Psychologist.

INFORMATION SHEET

STUDY: *Evaluating the sensitivity and specificity of the Dental Anxiety Inventory.*

This project is based at the **Department of Psychological Medicine, Gartnavel Royal Hospital.**

WHAT IS THE PURPOSE OF THE STUDY?

The study will look at how useful a questionnaire about dental anxiety is (**The Dental Anxiety Inventory**), and compare it with other questionnaires. Questionnaires like this one are often used in research to help us decide if someone has a particular problem. We need to be sure that measures do this accurately.

WHO IS ORGANISING THE STUDY?

The study has been organised by Cerys MacGillivray, who is currently training in the Department of Psychological Medicine, forms the substance of a research project she is undertaking.

WHAT WILL HAPPEN TO ME IF I TAKE PART?

If you decide to take part in this study, you should fill in the questionnaires enclosed. Some people may be interviewed by me once I have received their consent form and completed questionnaires. It is unlikely I will need to see you in person, as the questions I need to ask you can be answered over the phone. For the purposes of this project, you will not need to see a dentist or go into a dental surgery. You will have to agree to: (i) complete the questionnaires, and (ii) potentially being interviewed by me.

WHAT ARE THE POSSIBLE RISKS?

There are no foreseeable risks involved in this project. Some people might feel a little bit uncomfortable talking about their dental fears, and this is normal. If you feel too uncomfortable, you need not proceed to complete the questionnaires. If you are selected to be interviewed, and you feel uncomfortable, you may stop the interview. If you continue to feel upset, you should contact your doctor (GP) for further advice.

WHAT ARE THE POSSIBLE BENEFITS?

It is not anticipated that you will experience any direct benefit from participating in this study. The purpose of the study is to make sure we can use the Dental Anxiety Inventory with confidence in the future when we are assessing people with dental fears.

WHO WILL KNOW I AM TAKING PART IN THE STUDY?

I will be the only person who knows you are taking part in this study. Any information you give me will be treated in strict confidence, and will be stored in a safe place. Further details of confidentiality will be given to you before the interview.

IF YOU HAVE ANY FURTHER QUESTIONS ABOUT THE STUDY PLEASE CONTACT ME ON: **0141 211 3920**. My name is Cerys MacGillivray (my first name is pronounced "Kerris").

CONSENT FORM

STUDY: Evaluating the sensitivity and specificity of the Dental Anxiety Inventory.

- I have received a copy of the introductory letter and information sheet.
- I have read the letter and information sheet and understand what I will be asked to do for this study.
- I understand that I may contact Cerys MacGillivray and ask any questions I may have about the study.
- I understand that I may refuse to participate in the study at any time, without having to give a reason. I also understand that I will **not** be contacted again once I have informed Cerys MacGillivray that I wish to withdraw.
- I understand that any information I give to Cerys MacGillivray, relating to this study, will be strictly confidential, and will be stored in a safe place.
- My participation in this study will not affect my normal dental care.

I, ... (PRINT NAME), agree to participate in the above study.

SIGNED: ..... DATE: .....

Please use the enclosed envelope to return this form, the attached sheet, and your questionnaires to:

Cerys MacGillivray
Dental Research Project
Trainee Clinical Psychologist
Department of Psychological Medicine
Gartnavel General Hospital
1055 Great Western Road
GLASGOW G12 0XH.

YOUR NAME: .....

YOUR TELEPHONE NUMBER: .....

YOUR POSTCODE: .....

AGE:

18 - 25	
26-35	
36 - 45	
46 - 55	
56 - 65	
Over 65	

GENDER: MALE / FEMALE

When would be the most convenient time to phone you? (Please circle one)

ANYTIME / MORNING / AFTERNOON / EVENING

- I have: (Please underline/circle one)

ALL MY NATURAL TEETH/ A FULL SET OF DENTURES/ HALF SET OF DENTURES (top or bottom)/ A BRIDGE or SOME CROWNS.

- I consider my level of Dental Anxiety to be: (Please circle one)

NOT ANXIOUS / ANXIOUS / VERY ANXIOUS

- How often do you attend the dentist? (Please circle one)

EVERY 6 MONTHS / ONCE A YEAR / ONLY FOR EMERGENCIES

- Have you had to have a lot of dental treatment (e.g. fillings, extractions, braces, etc.)

YES / NO

- Has this work been painful: (Please circle one)

EVERY TIME / MORE OFTEN THAN NOT / OCCASIONALLY / NEVER

SIGNED:.....