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Auditory hallucinations and the presence of depression in chronic schizophrenia

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**AUDITORY HALLUCINATIONS AND THE
PRESENCE OF DEPRESSION IN
CHRONIC SCHIZOPHRENIA**

By

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A Thesis submitted in partial fulfilment of the requirements for the award of
Master of Psychology (Clinical)

At the Faculty of Community Services, Education and Social Sciences,
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USE OF THESIS

The Use of Thesis statement is not included in this version of the thesis.

ABSTRACT

This exploratory study examined the predictive relationship among the dimensions of auditory hallucinations and the presence of depression in chronic schizophrenia. Forty seven out-patients from the Inner City Community Mental Health Service participated, all of whom had a diagnosis of chronic schizophrenia and reported experiencing auditory hallucinations. The measures included the Calgary Rating Scale for Schizophrenia, the Auditory Hallucinations Rating Scale, the Beliefs About Voices Questionnaire and three questions relating to insight into auditory hallucinations from the Schedule for the Assessment of Insight – Expanded Edition. Consistent with other reports, the present study found a prevalence of depressive symptoms in over 40% of the sample. All of the dimensions of auditory hallucinations together accounted for 42% of the variance in depression scores but there was no salient individual dimension that could account for a significant proportion of the variance. It was concluded that other factors, not just auditory hallucinations, are likely to have a role in determining the presence of depression in chronic schizophrenia.

DECLARATION

I certify that this thesis does not, to the best of my knowledge and belief:

- i. Incorporate without acknowledgement any material previously submitted for a degree or diploma in any institution or higher education;
- ii. Contain any material previously published or written by another person except where due reference is made in the text; or
- iii. Contain any defamatory material

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TABLE OF CONTENTS

	Page No.
Abstract	ii
Declaration	iii
Acknowledgments	iv
Table of Contents	v
List of Tables	vii
Chapter One	
1. Introduction	i
1.1 Schizophrenia	1
1.2 Depression in Schizophrenia	2
1.3 Aetiology of Depression in Schizophrenia	4
1.3.1 Depression Secondary to the Disease Process	4
1.3.2 Depression as Integral to the Disease Process	7
1.3.3 Summary of Aetiology of Depression in Schizophrenia	17
1.4 The Present Study	17
1.4.1 Rationale	17
1.4.2 Research Objectives	18
Chapter Two	
2. Method	20
2.1 Participants	20
2.2 Measurement Instruments	22
2.3 Procedure	28
Chapter Three	
3. Results	29
3.1 Data Screening	29
3.2 Reliability of Measures	29
3.3 Preliminary Analyses	31
3.4 Hierarchical Regression Analyses	39
Chapter Four	
4. Discussion	41
4.1 Findings	41
4.2 Limitations of the Research	50
4.3 Implications and Further Research	51
4.4 Conclusion	52

	Page No.
References	53
Appendices	
Appendix A: Inclusion Criteria and Diagnostic Questions Sheet	64
Appendix B: SAI-E Selected Questions	65
Appendix C: Demographic Information Form	66
Appendix D: Patient Information Sheet	67
Appendix E: Consent Form	68

LIST OF TABLES

		Page No.
Table 1.	Demographic Characteristics of Participants	21
Table 2.	Psychiatric History of Participants	22
Table 3.	Cronbach Alpha Reliability Coefficients for Internal Consistency of the BAVQ	31
Table 4.	Means, Standard Deviations and Range of Scores for the Analysis Variables	32
Table 5.	Comparison Percentages of the Beliefs About the Voices Intent from the BAVQ	33
Table 6.	Correlations of the Analysis Variables with Predictor Variable	34
Table 7.	Correlations Among AHRS Items	35
Table 8.	Correlations Among AHRS items, the SAI-E and the BAVQ Scales	37
Table 9.	Correlations between the SAI-E and the BAVQ Scales	38
Table 10.	Hierarchical Regression Analysis for Prediction of CDSS score	40

CHAPTER ONE

1. Introduction

1.1 Schizophrenia

Schizophrenia is a profoundly disabling and long-term mental health problem, affecting approximately 1% of the population (American Psychiatric Association, (APA), 1994). People with schizophrenia often have difficulties maintaining employment, maintaining interpersonal relationships and achieving life goals. They may be intermittently admitted to hospital, sometimes against their own wishes and for long durations. The negative effects of schizophrenia also pervade the lives of the family and friends of those with the disorder. It imposes a large financial and social cost to the community; hence research on schizophrenia has substantially grown over the past century.

People with schizophrenia can suffer from a range of severe disturbances in thought, perception, behaviour and affect, for example hearing voices or believing that people are controlling their minds. However, no single symptom is sufficient to make a diagnosis of schizophrenia. The diagnostic criteria set out in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV, APA, 1994) provide a constellation of signs and symptoms from which a diagnosis can be made. Consequently, schizophrenia presents as one of the most heterogeneous of all mental health disorders. Andreasen, Arndt, Alliger, Miller, and Flaum (1995) consider the heterogeneity of schizophrenia to represent that the disorder is not one, but a set of disorders. DSM-IV recognises this diversity by defining five subtypes of schizophrenia: paranoid, disorganised, catatonic, undifferentiated and residual. Not only is there diversity in

presentations, but differing courses of the disorder and differing responses to treatment, all of which have posed challenges to research on schizophrenia.

As one way to group the range of schizophrenic symptoms into a structure, Crow (1980) conceptualised a distinction between positive and negative symptoms. This dichotomy continues to be used extensively in the research literature. Positive symptoms reflect behavioural excesses that deviate from normal functioning and include delusions, hallucinations, disorganised speech and disorganised or catatonic behaviour (APA, 1994). Negative symptoms reflect an absence of behaviours from normal functioning and include affective flattening, alogia and avolition (APA, 1994).

The distinction between the two types of symptoms has been criticised as being too simplistic (Van der Does, Dingemans, Linszen, Nugter & Scholte, 1995). Evidence from cognitive and neurological measures has suggested that there are three dimensions: a hallucinations and delusions dimension (reality distortion syndrome), a negative symptoms dimension (psychomotor poverty) and a disorganisation dimension (Liddle 1987; Minas, Stuart, Klimidis, Jackson, Singh & Copolov, 1992; Andreasen, Nopoulos, Schultz, Miller et al. (1994); Malla, Norman, Williamson, Cortese & Diaz, 1994). Van der Does et al. (1995) suggested in a factor analytic study that a fourth dimension of depression also be included.

1.2 Depression in Schizophrenia

The presence of depressive symptoms in people with a primary diagnosis of schizophrenia has long been recognised (Johnson, 1981). Both Kraepelin and Bleuler considered the depressive syndrome to be an important part of schizophrenic

psychopathology (Nakaya, Komahashi, Ohmori & Suwa, 1998). Depressive symptoms may occur at any stage of the disorder, including the prodromal period before the first psychotic episode (Hafner, Löffler, Maurer, Hambrecht, & an der Heiden, 1999), the acute phase of the illness (Koreen, Siris, Chakos, Alvir, Mayerhoff, & Lieberman, 1993), and during the later chronic longitudinal course of the illness (Sands & Harrow, 1999). The DSM-IV (APA, 1994) included 'post-psychotic depression disorder' as a possible diagnostic category requiring further research.

The prevalence of depression in schizophrenia varies in research samples from 6% to more than 50% (Siris, 1991). The rate varies depending on the diagnostic criteria and assessment scales used, as well as whether the populations sampled are acute in-patients or chronic out-patients (Sands & Harrow, 1999). Markou (1996) found a prevalence of 47.7% for mild to moderate depressive symptoms in an Australian sample of 44 out-patients with chronic schizophrenia, as rated by the Hamilton Rating Scale for Depression (HRSD, Hamilton, 1960). Birchwood, Mason, MacMillan and Healy (1993) found a prevalence of 29% for depression in a cross-sectional sample of 49 individuals with chronic schizophrenia using the cutoff score of 15 on the Beck Depression Inventory (BDI, Beck, 1978). Similar results were found in Sands and Harrow's (1999) sample of 70 people with schizophrenia at 4.5 and 7.5 year follow-ups, of whom 30-40% had a depressive syndrome according to Research Diagnostic Criteria (RDC, Spitzer, Endicott and Robbins, 1978).

Although relatively common, symptoms of depression in people with schizophrenia are often overlooked by their carers, yet it is often these symptoms which most distress the sufferers (Markou, 1996). Sands and Harrow (1999) report that people

with schizophrenia who are depressed are more likely to have higher levels of unemployment, higher rates of suicidal ideation and behaviour, more psychotic symptoms, and worse overall outcome than people with schizophrenia without the presence of depression, even several years after the initial hospitalisation.

Many studies have investigated the nature of this depression (Roy, Thompson & Kennedy, 1983; Barnes, Curson, Liddle, & Patel, 1989; Norman & Malla, 1991). Koreen et al. (1993) suggests that depression in schizophrenia may be as heterogeneous as schizophrenia itself. The aetiology of depression in schizophrenia is also a debated topic.

1.3 Aetiology of Depression in Schizophrenia

Although there are many theories that describe the aetiology of depression and schizophrenia as separate disorders, there is no accepted theory explaining the co-occurrence of the two disorders. However, several hypotheses have been put forward to account for the presence of depression in schizophrenia. Broadly these hypotheses either consider depression as an integral part of the schizophrenic process or depression as secondary to the process. The hypotheses and the research evidence supporting them are examined in turn.

1.3.1 Depression as Secondary to the Schizophrenic Process

Depression as a response to a chronic illness

A hypothesis that has recently featured in the literature views ongoing depression after an acute psychotic episode as a psychological response to an uncontrollable chronic illness (Birchwood et al., 1993; Rooke & Birchwood, 1998). A schizophrenic

illness can result in loss of employment, and in compulsory hospital admissions, both of which are negative life events. Further to this hypothesis, it was suggested by Birchwood et al. (1993) that the level of acceptance of the labelling and stigma attached to having a mental illness as well as the individual's lack of feeling able to control their illness may lead to depression in chronic schizophrenia. Their study suggested that the highest level of concern for participants was in their perception that the illness was "beyond their control" (p.392). This factor provided the most statistically significant difference between depressed and non-depressed groups. Belief in 'entrapment' (perceived loss of control over schizophrenic illness) was the predominant predictor of depressive symptoms for schizophrenic patients, along with having had a compulsory admission, in a 30 month follow-up study by Rooke and Birchwood (1998).

Depression due to neuroleptic medications

The effects of the neuroleptic medications used to treat schizophrenia have been implicated in the development of depressive symptoms (Azorin, 1995). Neuroleptic dysphoria, pharmacogenic depression, dysphoric akathisia and akinetic depression and disturbances secondary to tardive syndromes have all been terms associated with the presence of depressive symptoms in schizophrenia (Harrow, Mc Donald, Sands and Silverstein, 1995). Decreases in the neuroleptic dosage or increases in anticholinergic drugs can diminish these symptoms (Azorin, 1995). Although the symptoms of such neuroleptic induced syndromes appear similar to depressive symptoms, studies have shown that by themselves they do not solely account for the presence of depression in schizophrenia (Johnson, 1981; Barnes et al., 1989).

Depression due to improved insight

Markou (1996) discusses that depression may develop when the person with schizophrenia becomes more aware of the nature of their illness and its distressing and disabling symptoms. In support of this claim, some studies have found a positive relationship between the presence of depression in schizophrenia and high levels of insight (Becker, 1988; Amador, Flaum, Andreasen, Strauss, Yale, Clark & Gorman, 1994; Rooke & Birchwood, 1998; Smith, Hull & Santos, 1998). However, there is debate in the literature more generally on the nature of the relationship between insight and the symptoms of schizophrenia. Some studies have found a relationship between poor insight and negative symptoms (Peralta & Cuesta, 1994, Kemp & Lambert, 1995), but there appears to be more evidence for a relationship between poor insight and positive symptoms (Collins, Remington, Coulter & Birkett, 1997; Schwartz, 1998; Carroll, Fattah, Clyde, Coffey, Owens & Johnstone, 1999). Schwartz (1998) assessed 64 out-patients with schizophrenia and in a multiple regression analysis found that the positive symptoms score was the only significant predictor of level of insight. Schwartz proposes that improving insight about positive symptoms may lead to either a reduction in overall symptoms or better control over the symptoms. Schwartz assessed global symptomatology in his study but suggests future research also examine other factors such as neurocognitive performance and demographic variables.

Carroll et al. (1999) also investigated the relationship between symptoms and insight in schizophrenia and added the variables of depression and cognitive functioning. They assessed 100 people with schizophrenia who were either in-patients or day patients soon to be discharged. In a backward step-wise multiple regression analysis, only the positive symptom score and the depression score made significant

contributions to the variance in insight scores. Their study then randomly assigned participants to either a control group or a group that received an educational intervention aimed at improving their insight. Upon completion of the intervention, the same analyses were applied to the data and depression was the only significant predictor of insight. Carroll et al. concluded, "improvement in insight was related to a worsening in mood" (p.251). There were limitations in this study, such as using the same rater across all measures who was therefore not blind to depression and insight scores. The participants in the study had only a short duration of illness and it would be important to replicate this finding for patients with a longer duration of illness.

1.3.2 Depression as Integral to the Schizophrenic Process

Depression due to life events

Norman and Malla (1991) raise another possible relationship between depression and psychosis. They suggest that for individuals who are biologically at risk of developing schizophrenia, a major life event may produce a depressive reaction which serves as a base for the development of psychotic symptoms. This suggestion is consistent with the stress-diathesis model of the aetiology of schizophrenia (Meehl, 1962). Roy et al. (1983) found a high level of undesirable life events, commonly considered a risk factor for depression, in individuals suffering from chronic schizophrenia and experiencing symptoms of depression. This group also had 50% more admissions than non-depressed people with schizophrenia. It is important to note that the undesirable life events in this study did not include those that were due to hallucinations or delusions. Norman and Malla (1994a) found that the recorded number of daily stressors predicted both the rate of depression and symptom levels (particularly

positive symptoms) in people with chronic schizophrenia. They suggest that daily stressors have a stronger influence on symptom levels than major life events.

Depression as a part of negative symptoms

Another hypothesis put forward to account for depression in chronic schizophrenia purports that depression symptoms are a 'phenomenological overlap' with negative symptoms (Barnes et al., 1989). There has been much debate in the literature over the boundaries between depression and negative symptomatology which requires explanation.

Several studies have produced results suggesting a correlation between high rates of negative symptoms and depressive symptoms (Zubin, 1985; Lindenmayer & Kay, 1989; Markou, 1996). Certainly there has been difficulty in differentiating depressive and negative symptoms, but Norman and Malla (1991) suggest that the correlation is more likely to reflect an interviewer bias due to previous studies employing the same interviewer to rate both symptoms. When interviewers were blind to the depression scores, studies provided no relationship between depressive and negative symptoms (Barnes et al., 1989; Norman & Malla, 1991). Kibel, Laffont and Liddle's (1993) results also suggest depression is distinct from negative symptomatology both empirically and conceptually. Their results suggest that symptoms such as subjective sadness, pessimism and suicidal intent are not a part of the negative syndrome but of a depressive syndrome. At the same time, observed sadness, lassitude and inability to feel were not considered to be reliable indicators of depression in the presence of negative symptoms.

Norman, Malla, Cortese and Diaz (1998) partialled out the unique variance that depression contributes when anxiety is controlled for and found that it was more related to psychomotor poverty (a negative symptom) than to other symptoms of schizophrenia. The specific items of depression that were correlated with psychomotor poverty were the items on the BDI (Beck, 1978) that refer to loss of interest in other people and feelings of being punished and on the HRSD (Hamilton, 1960) that refer to psychomotor retardation and weight loss. Collins et al. (1996) state that the BDI and the HRSD do not delineate depression from negative symptoms as well as does the Calgary Depression Scale for Schizophrenia (CDSS, Addington, Addington, Maticka-Tyndale & Joyce, 1992). Of the four items mentioned in Norman et al.'s (1998) study, only 'feelings of being punished' is an item included on the CDSS. Norman et al.'s results need to be replicated with the CDSS as the depression measure before they can be considered conclusive.

Depression related to positive symptoms

Several recent studies have described a correlation between positive symptoms and depression in schizophrenia (Barnes et al., 1989; Koreen et al., 1993; Norman & Malla, 1991; Norman & Malla, 1994a; Sax, Strakowski, Keck, Upadhyaya, West & McElroy, 1996; Emsley, Oosthuizen, Joubert, Roberts & Stein, 1999). Following from this, each of the above studies proposed that depression is an intrinsic part of the process of the schizophrenic disorder itself. Further supporting this claim, the review by Birchwood et al. (1993) of studies of acute episodes of schizophrenia reports that depressive symptoms occur in the phase preceding an episode, coexisting with an episode and also following it.

When examining more specifically the component of positive symptomatology that correlates with depression, Norman and Malla (1994b) found a closer relationship between depression and the reality distortion syndrome (hallucinations and delusions) than for other syndromes. The reality distortion syndrome is common and striking in schizophrenia. The prevalence of delusions is high, with 90% of individuals with schizophrenia experiencing them at some stage of their disorder (Taylor, Garety, Buchanan, Reed, Wessely, Ray, Dunn & Grubin, 1994). At times there is great difficulty in determining what are delusional beliefs as opposed to “normal” beliefs. Taylor et al. (1994) aptly note that “the concept of validity of a delusion might well be considered as almost delusional in itself” (p.167). This study will not focus on the role of delusions in the development of depression in schizophrenia due to the difficulties of accurately measuring such a concept.

The presence of hallucinations was reported in 66% of a sample of 187 individuals with schizophrenia (Fenton & McGlashan, 1991). Hallucinations most commonly occur in the auditory modality and are often described as ‘hearing voices’. Auditory hallucinations can be defined as “a sensory perception that has the compelling sense of reality of a true perception but that occurs without external stimulation of the relevant sensory organ” (APA, 1994, p.767). Slade and Bentall (1988) reviewed 16 schizophrenia studies and found an average prevalence of auditory hallucinations in 60.2% of the participants. For a significant proportion of these people (25-30%), auditory hallucinations persist in spite of neuroleptic medication treatment (Meltzer, 1992). Although some people find their voices helpful and reassuring, for many the experience is distressing and there are varying degrees and ways in which they may or may not cope with the experience.

Depression related to auditory hallucinations

Barnes et al. (1989) reported that the auditory hallucinations score provided the highest level of significant difference ($p = 0.008$) between depressed and non-depressed groups with schizophrenia. Other symptom scores were less discriminatory, including the overall positive symptom score ($p < .06$). Since this study, other researchers have focused on the relationship between auditory hallucinations and depression in schizophrenia (Hustig & Hafner, 1990; Birchwood et al., 1993; Birchwood & Chadwick, 1997; Soppitt & Birchwood, 1997).

Birchwood and Chadwick (1997) found at least 53% ($n = 62$) of their sample of participants who experienced auditory hallucinations and had diagnoses of either schizophrenia or schizoaffective disorder to be moderately depressed as measured by the BDI (Beck, 1978). Soppitt and Birchwood (1997) found 62% ($n=21$) of their sample of people who experienced auditory hallucinations and had a diagnosis of schizophrenia to be depressed according to their assessment with the Schedules for Clinical Assessment in Neuropsychiatry (SCAN, World Health Organisation, 1992). In a discriminant function analysis, Rooke and Birchwood (1998) found the presence of auditory hallucinations to be one of the principal contributors to depression scores for 47 participants with schizophrenia at 30 month follow-up.

Possible explanatory models for the development of depressive symptoms in people who have schizophrenia and experience auditory hallucinations are listed as follows (adapted from Soppitt & Birchwood, 1997):

1. The specific content and topography of the voices heard may lead to distress and subsequent depression.
2. The beliefs that a person ascribes to the voices' identity, authority and power may lead to distress and depression (Chadwick & Birchwood, 1994).
3. Being in a depressed state may lead to the development of negative content in auditory hallucinations and related topography.
4. A combination of 1 and 2 above, mediated by the individual's past experience of critical life events and their resulting schemata.
5. A cognitive explanation suggesting people who experience auditory hallucinations mislabel negative automatic thoughts as external to the self, thus resulting in depression.

Each of these models are described below, along with the available supporting research.

Depression due to content and topography of auditory hallucinations

The content and topography of auditory hallucinations have been implicated in the development of depressive symptoms in schizophrenia by several researchers. Barnes et al. (1989) tentatively suggested that the content of auditory hallucinations experienced in depressed people with schizophrenia is more similar to the content of the hallucinations experienced in psychotic depression (mood-congruent voices), than of typical schizophrenia (commenting voices). However, this similarity has not been investigated in later research.

Hustig and Hafner (1980) suggest that particular characteristics of voices such as voice loudness, clarity, intrusiveness, and the level of distress experienced are important in determining the level of depression in people with schizophrenia and persistent auditory hallucinations. In their study of 12 people with schizophrenia and persistent auditory hallucinations, they report that the more intrusive and distressing the voices, the higher the level of subjective depression reported by participants. Soppitt and Birchwood (1997) were in part interested in the relationship between the derogatory content of voices, voice topography and the presence of depression in schizophrenia. They found that people in their sample (n=21) who heard voices with derogatory content had a significantly higher level of depressive symptoms (BDI score) than those whose voices were considered to be non-derogatory in content. In a separate analysis on the same sample, loudness and intrusiveness also correlated significantly with depression scores. Unfortunately, in both of these studies sample sizes were too small to conduct analyses to determine the relative importance of these variables in determining depression levels.

Depression due to beliefs about auditory hallucinations

Chadwick and Birchwood (1994) propose that that it is not the characteristics or content (antecedents) of auditory hallucinations that determines the behavioural and affective responses to them, but the beliefs a person with schizophrenia holds about their auditory hallucinations. In a study of 26 participants diagnosed with either schizophrenia or schizoaffective disorder and experiencing chronic auditory hallucinations, Chadwick and Birchwood found preliminary support for their model. Auditory hallucinations that were believed to be persecutory or 'malevolent' in intent were resisted and evoked negative emotions such as anger and depression. On the other

hand, people with helpful or 'benevolent' voices engaged them and they evoked positive emotions such as happiness and confidence. They noted that the malevolent beliefs were held, even when the content of the voices was incongruent with their beliefs.

Birchwood and Chadwick (1997) conducted a further study with 67 participants who were diagnosed with schizophrenia or schizoaffective disorder and who had heard voices for at least two years. In this sample, participants who believed their voices to be malevolent were significantly more likely to be at least moderately depressed (BDI score >15) than those that believed their voices to be benevolent or benign. Those who believed their voices to be powerful were also more likely to be depressed than those who stated that their voices were not powerful. A step-wise discriminant function analysis was conducted with their sample split into depressed and non-depressed groups. They examined the relative importance of several variables including: socio-demographic variables, voice topography, voice parameters, voice form, beliefs about voices (powerful, malevolent, benevolent), and positive and negative symptoms. Three variables were identified to be significant in the equation; positive symptoms, malevolence and powerful respectively.

Depression leads to negative content in auditory hallucinations and related topography.

Soppitt and Birchwood (1997) suggest the possibility that depression as a disorder itself leads to the development of negative content and related topography in auditory hallucinations. This suggestion was put forward as the direction of causality has not yet been determined for the development of depression and schizophrenia.

However, the hypothesis does not appear yet to have been tested in the research literature. Thus there is no evidence either for or against it.

Depression due to the combination of auditory hallucination content, topography, beliefs and other factors

Close and Garety (1998) conducted a replication of Chadwick and Birchwood's (1994) research, with 30 people who had chronic auditory hallucinations and schizophrenia. In comparing the results, there were both similarities and differences to the original findings. Close and Garety did not find beliefs about voices that were incongruent with the content of voices, i.e. all malevolent voices had negative content and all benevolent voices had positive content whereas Chadwick and Birchwood had both positive and negative content for malevolent voices. Close and Garety also found a difference in the results between beliefs about voices and negative affect, in that negative affective response was not dependent upon whether the voice was believed to be benevolent or malevolent. Close and Garety suggest that other factors must also be operating for benevolent voice hearers to be experiencing high levels of negative affect, such as the stigma of their schizophrenia diagnosis, perceiving no control over their voices or low self-esteem. Yet this suggestion was based on the results of only one person who heard benevolent voices in their sample. Unfortunately, Close and Garety did not report their BDI measures, so a closer comparison of the data in respect of the relative severity of depressive symptoms to the Chadwick and Birchwood (1994) study is not possible.

Cognitive models of auditory hallucinations explaining the presence of depression

Several cognitive models have been put forward suggesting that people who hear auditory hallucinations misattribute their own internal cognitive events to an external source (Bentall, 1990; David, 1994; Frith, 1992; Morrison, Haddock & Tarrier, 1995; Morrison, 1998). Morrison et al.'s (1995) model may also explain the presence of depressive symptoms. In this model, if a person has unwanted intrusive thoughts, they may experience cognitive dissonance due to the content of the intrusive thoughts (e.g. "kill mother"). To reduce the dissonance the person may misattribute the source of the intrusive thought to an external source (e.g. the devil) and hence the person experiences the intrusive thought as an auditory hallucination. The person's appraisal (i.e. their belief about their hallucinatory experience, not the intrusive thought) produces an affective response, which if negative, may further trigger intrusive thoughts and hence maintain a vicious cycle. Maintenance of a vicious cycle with negative affect is likely to lead to further development of depressive symptoms.

Morrison (1998, p. 296) adds a further dimension to this model in which the person utilises "safety seeking behaviours" in a reaction to their interpretation of their auditory hallucinations. The "safety seeking behaviour" that is utilised (for example hypervigilance, not sleeping) may both trigger further auditory hallucinations and prevent the disconfirmation of their beliefs about it. This addition to the model gives further explanation of the maintenance of auditory hallucinations through the impact of unhelpful attempts to cope with the experience.

1.3.3 Summary of Aetiology of Depression in Schizophrenia

In summary, there is a mix of hypotheses that attempt to explain the presence of symptoms of depression in schizophrenia. It is not yet clear whether depression is an integral part of the schizophrenic process or whether depression is secondary to the process. However, a relationship between auditory hallucinations and depressive symptoms in schizophrenia has been reported in several studies (Barnes et al. 1989; Norman & Malla, 1994b); Rooke & Birchwood, 1998) and has provoked further research to explore this relationship. This area of research provides the background to the present study.

1.4 The Present Study

1.4.1 Rationale

It is clear from the literature that a significant proportion of people with schizophrenia experience depressive symptoms. These symptoms are often distressing for the person and can be related to suicidal tendencies. This relationship highlights the practical clinical importance of this area of study, in addition to the interest in determining the causal role of depression in schizophrenia. Bentall (1990) argues that schizophrenia research should focus on the characteristics and correlates of specific aspects of psychotic behaviour and experience rather than on the syndrome in its entirety. Birchwood et al. (1993) suggest that research in this area should focus on the examination of the intrinsic illness variables in schizophrenia and their role in the development of depression in chronic schizophrenia. The emergence in the research literature of a relationship between auditory hallucinations and depressive symptoms in schizophrenia provides the background to the present study.

The study that follows was an attempt to explore the predictive relationship of the dimensions of auditory hallucinations with the presence of depressive symptoms in chronic schizophrenia. The dimensions of auditory hallucinations were the characteristics (frequency, duration, loudness, location and controllability), the content (amount and degree of negative and distressing content), the emotional and behavioural consequences, and the beliefs about power and malevolent intent of auditory hallucinations as reported by the participants. The study trialed the use of new measures of the dimensions of auditory hallucinations to determine the generalisability of the measures on a sample that was separate from the populations sampled by the authors of the measures.

Given that insight is considered to be a multidimensional construct (David, 1990), it was an additional aim of the study to specifically examine if insight into the presence of auditory hallucinations, in the form of awareness and attribution of the symptom, made an additional contribution to the prediction of depression scores. It was also of interest to determine the proportion of participants in the sample who were taking anti-depressant medication, given that the use of anti-depressant medication was seldom reported in the studies mentioned in this review of literature. An exception was Sands and Harrow (1999) who reported that 7% of their sample of 70 out-patients with schizophrenia were on anti-depressants.

1.4.2 Research Objectives

Given the scarcity of research in this area, the following study is exploratory in nature and without specific hypotheses. At this point the literature does not suggest

which variable is likely to be the best predictor of depression as the majority of studies have been correlational in design.

In the study that follows, four research questions were investigated:

- 1.a What proportion of participants in the sample of people with chronic schizophrenia who hear voices experience a significant level of depressive symptoms?
- b What proportion of the sample were taking anti-depressant medication?
2. How much of the variance in depression scores can be accounted for by the dimensions of auditory hallucinations?
3. What specific dimensions of auditory hallucinations are salient predictors of depression scores?
4. Does the level of insight into auditory hallucinations add to the prediction of depression scores?

CHAPTER TWO

2. Method

2.1 Participants

All participants involved in the study were out-patients under the regular care of the Inner City Mental Health Service (ICMHS), Perth, Western Australia. The participants were selected sequentially from all current out-patients of the ICMHS as of the 1st January 1998. Selection for the study was based on the following acceptance criteria: a Diagnostic and Statistical Manual for Mental Disorders, 3rd edition revised (DSM-III-R, American Psychiatric Association, 1987) diagnosis of chronic schizophrenia, an ability to give voluntary informed consent, aged between 18 and 70, presence of auditory hallucinations, no gross brain disease or head injury, no significant drug or alcohol dependence, and stabilised on the same dose of anti-psychotic medication for at least one month as out-patients.

The DSM-III-R diagnosis of chronic schizophrenia was made jointly by a Consultant Psychiatrist and the participant's case manager. The process of determining the diagnosis involved a review of the participant's medical file utilising the questions identified in the Structured Clinical Interview for Diagnosis for DSM-III-R, Patient Edition (Spitzer, Williams, Gibbon & First, 1990, see Appendix A).

A total of 70 patients were approached to participate in the study. Five patients did not provide consent to participate, sixteen denied experiencing auditory hallucinations at the interview and the interview was stopped for two patients due to the presence of severe active thought disorder. The final sample consisted of 47 patients

whose ages ranged from 24-70 years (mean age = 41.30, *SD* 10.73). Further demographic information is presented in Table 1.

Table 1.
Demographic Characteristics of Participants

Variables	n	% of total
<i>Gender</i>		
Male	38	80.9
Female	9	19.1
<i>Education completed</i>		
Primary School	13	27.7
Lower High School	15	31.9
Upper High School	7	14.9
Technical education	10	21.3
Tertiary education	2	4.3
<i>Employment Status</i>		
Full-time	2	4.3
Part-time	2	4.3
Home Duties	0	0
Student	0	0
Unemployed	43	91.5

The psychiatric history of the participants is summarised in Table 2. Patients of the ICMHS are case managed as they require a high level of support to maintain stability in the community and many are on a community treatment order to receive their medications.

Table 2.
Psychiatric History of Participants

Variables	Mean	SD	Range
Number of Psychiatric Admissions	9.89	9.22	0 - 45
Years since most recent discharge	2.39	4.17	0.08 - 17
Duration of Disorder (years)	16.66	8.83	1 - 43
Number of years hearing voices	16.05	9.31	1 - 40
Age of Onset of Disorder (years)	24.94	7.03	14 - 41
Dosage of Anti-psychotics (Average daily chlorpromazine equivalent)	634.02	420.22	0 - 2100
Anti-depressants	16 yes (34%) 31 no (66%)		

2.2 Measurement Instruments

Assessment of Depression

The Calgary Depression Scale for Schizophrenia (CDSS, Addington et al., 1992) is a rating scale delivered by means of a structured interview. It was developed specifically to assess levels of depression in people with schizophrenia. Based on responses to questions asked by the interviewer, the participant is assigned a score ranging from 0 to 3 on each of nine symptoms of depression occurring in the last two weeks. Items assess depressed mood, sense of hopelessness, self-depreciation, guilty ideas of reference, pathological guilt, heightened depression in the morning, early wakening, suicidal intent and an interviewer assessment of depression based on the entire interview.

A self-report measure of depression such as the BDI (Beck, 1978) was not selected for use in the present study due to studies reporting practical problems in their use for this population (Addington, Addington & Maticka-Tyndale, 1993a; Markou, 1996). Over 35% of the participants with schizophrenia in Addington et al.'s (1993a) study required assistance to complete the BDI. Markou (1996) found that several participants in their sample with schizophrenia interpreted questions in a delusional manner and did not accurately report their subjective state of depression.

In a reliability and validity study of the CDSS by Addington et al. (1992), the scale had high inter-rater reliability (intra-class correlation coefficient 0.895) derived from joint interviews of 10 patients with schizophrenia (5 in-patients and 5 out-patients). Addington et al. determined good internal reliability (Cronbach's alpha of 0.79) in their sample of 150 people with schizophrenia (100 out-patients, 50 in-patients). Collins, Remington, Coulter & Birkett (1996) found that the CDSS correlates highly with the Hamilton Depression Rating Scale (HDRS, Hamilton, 1960) with a Pearson product moment correlation of $r = 0.636$ ($p < 0.005$), as well as the depression sub-scale of the Positive and Negative Syndrome Scale (PANSS, Kay, Fiszbein & Opler, 1987) with $r = 0.321$ ($p < 0.025$). Collins et al. (1996) concluded that the CDSS was unique in its ability to distinguish between depressive symptoms, negative symptoms and extrapyramidal symptoms and therefore the most suitable measure of depression in schizophrenia.

In Addington, Addington and Maticka-Tyndale's (1993b) study of 150 patients with schizophrenia, a CDSS score of 8 had 91% specificity and 85 % sensitivity on a

receiver-operator curve. In their study, 13 out of the 150 participants met the criteria of a major depressive disorder in their study (diagnosis from the Present State Examination, PSE, Wing, Cooper and Sartorius, 1974).

Assessment of Auditory Hallucinations

The Auditory Hallucinations Rating Scale (AHRS, Haddock, 1994) of the Psychotic Symptom Rating Scales (PSYRATS, Haddock, Mc Carron, Tarrrier & Faragher, 1999) is a structured interview that is designed to examine the severity of the different dimensions of auditory hallucinations. One week is taken as a reference point for most questions except the beliefs and loudness questions where the time of interview or last experience for loudness is assessed. Items assess frequency, duration, location, loudness, beliefs as to the origin of the voices, amount of negative content of voices, degree of negative content, amount of distress, intensity of distress, disruption to life caused by the voices and controllability of voices. These items are rated on a severity scale of 0 to 4 on each item.

Haddock et al. (1999) reported high inter-rater reliability for the AHRS, with intra-class correlation coefficients on the items ranging between 0.788 and 1.00. Spearman correlation coefficients estimated that the items of the scale are independent of each other with few inter-item correlations. Inter-rater reliability was determined from six video-taped interviews of three in-patients and three out-patients who had been experiencing auditory hallucinations for at least 10 years. Haddock et al. (1999) also compared the AHRS with a modified version of the Psychiatric Assessment Scale (Krawiecka, Goldberg & Vaughan, 1977), but few relationships were found between the items on the modified Krawiecka et al. scale and the AHRS. Haddock et al. (1999)

suggests that this result emphasises the need for assessment of the multi-dimensionality of symptoms, not just their severity on a uni-dimensional scale.

The Beliefs About Voices Questionnaire (BAVQ, Chadwick & Birchwood, 1995) is a self-report measure of respondents' understanding of and response to their auditory hallucinations. Respondent's answer 'yes' or 'no' about their dominant voice to: six items about their belief that the voices are malevolent, six for benevolence, one for omnipotence, eight items to determine if they engage their voices and nine for resistance to voices. In the present study, the engagement items were broken into 'positive emotion' and 'behavioural engagement' sub-scales and the resistance items were broken into 'negative emotion' and 'behavioural resistance' subscales. This was to reflect the different emotional and behavioural components within each of the two scales.

Chadwick and Birchwood (1995) report that the test-retest reliability of the BAVQ after one week was high (0.85 to 0.93, intraclass correlation coefficient, $n=15$) in their sample of 15 people with schizophrenia or schizoaffective disorder. Good internal reliability was determined (Cronbach's alpha 0.82 to 0.87) from a sample of sixty people with schizophrenia or schizoaffective disorder who had been hearing voices for at least two years. A principal components analysis extracted one primary factor for each scale (variance between 44.6 and 59.2 for the scales, $n=60$). The omnipotence item was excluded from this analysis. Independent classifications of voices as 'malevolent', 'benevolent' and 'neither' were compared to BAVQ responses and established good concurrent validity for the scale.

Assessment of Insight

Three items from the Schedule for the Assessment of Insight - Expanded version (SAI-E, Kemp and David, 1996) were used in this study. The three items examine the patient's insight into their auditory hallucinations and include a hypothetical contradiction question to evaluate if the respondent can take into account other people's perspective of their symptoms (see Appendix B). The SAI-E is a semi-structured interview, and scores on the items range from 0 to 4 as assigned by the interviewer. The three questions from the SAI-E along with one item from the AHRS relating to belief of origin of auditory hallucinations were combined to measure insight into auditory hallucinations in the present study.

No data on the inter-rater reliability or internal reliability of the SAI-E was reported in this review of the literature. In a comparative study of insight scales, Sanz, Constable, Lopez-Ibor, Kemp and David (1998) report high correlations of the SAI-E with the insight item of the PANSS (Kay et al., 1987) and the eleven item Insight and Treatment Attitudes Questionnaire (ITAQ, McEvoy, Apperson, Applebaum, Ortlip, et al., 1989). The Pearson product moment correlations were $r = 0.89$ ($p < 0.001$) and $r = 0.845$ ($p < 0.001$) respectively, lending the SAI-E concurrent validity. The Scale to Assess Unawareness of Mental Disorder (SUMD, Amador, Strauss, Yale, Flaum, Endicott & Gorman, 1993), although utilised in insight research, was criticised by Sanz et al. as having variable inter-rater reliability on some items and as requiring extensive training for its use.

Demographic Information

A form to record demographic information was devised (see Appendix C). Each participant was asked the demographic questions and any unanswered questions were later completed by examining their client file with their consent. Demographic information included: age, gender, education level, employment status, current psychiatric medications (anti-psychotics were converted to chlorpromazine equivalents), total number of past admissions for psychiatric treatment, length of time since most recent discharge, the age of onset of the disorder, and the diagnosis and duration of the disorder.

Preliminary Training in Measures

Adequate training in the use of the measures was established prior to data collection according to the suggestions made in the instruction manuals of each measure. There were ten interviewers in the study: eight case managers (social workers and mental health nurses), one senior mental health nurse and the researcher. All had experience in working with people with schizophrenia and all were familiar with structured assessments. Three hours of training in the use of the CDSS was undertaken, comprising discussion, role plays and rating three videos of CDSS assessments of depression in schizophrenia to establish inter-rater reliability. The senior mental health nurse and the researcher undertook further training in the SAI-E and the AHRS through consultation with a Consultant Psychiatrist, role play and assessing three volunteer patients with schizophrenia.

Inter-rater reliability across the duration of data collection for the study was conducted. The senior psychiatric nurse and the researcher established inter-rater

reliability for the AHRS, CDSS and the SAI-E in the first three interviews and then approximately every 10th interview. The senior psychiatric nurse scored the CDSS and the researcher sat in and observed the interview, and the researcher scored the AHRS and the SAI-E whilst the senior community mental health nurse observed.

2.3 Procedure

After the case review process to determine eligibility for the study, the researcher accompanied the case manager of the prospective participants on a scheduled visit to their place of residence. The case manager introduced the researcher to the participant and explained that the researcher was conducting a study as a part of the requirements of a Master of Psychology Degree at Edith Cowan University. Each prospective participant was fully informed of the aim of the research, the confidentiality of his or her information, the voluntary nature of his or her participation and that no aversive procedures were involved.

Each participant was provided with an information sheet to read (see Appendix D) and a consent form to sign (see Appendix E). The case manager then proceeded with administering the CDSS whilst the researcher left the room. When complete, the researcher re-entered the room, the case manager left the room and the demographics form, AHRS, SAI-E and BAVQ were completed (in that order) followed by the qualitative question. The total interview took between 20 minutes and 45 minutes to complete. The participant was thanked for their time and told that they would receive a summary of the findings when the study was complete.

CHAPTER THREE

3. Results

3.1 Data Screening

Prior to analysis, variables were screened to determine the accuracy of data entry, presence of outliers and to ensure that the assumptions for linear regression were met. No significant outliers were found and all the assumptions required for a linear regression were met.

3.2 Reliability of Measures

Calgary Depression Scale for Schizophrenia (CDSS)

Before data collection, inter-rater reliability was established for the ten. Intra-class correlation coefficients ranged from .92 to .99 across the nine items of the questionnaire. The inter-rater reliability of this measure was calculated utilising intra-class correlation coefficients. Inter-rater reliability between the senior community mental health nurse and the researcher taken throughout the data collection period was .9987 for a total of seven joint ratings. The inter-rater reliability in the present study compares well to an intra-class correlation coefficient of .895 that was established by Addington et al. (1992) from joint interviews of 10 patients with schizophrenia (5 in-patients and 5 out-patients).

The internal consistency of the CDSS was determined in the present study by the Cronbach alpha reliability coefficient, with a value of $\alpha = 0.84$. In the study by Addington et al. (1992), Cronbach's alpha was $\alpha = 0.79$, for a sample of 150 people with schizophrenia (100 out-patients, 50 in-patients).

Schedule for the Assessment of Insight - Expanded

The inter-rater reliability of the three questions of the SAI-E was established between the senior community nurse and the researcher both at the beginning and throughout the data collection. An intra-class correlation coefficient was established of 1.0 across the seven joint assessments. The internal reliability of the three questions of the SAI-E was a Cronbach's alpha value of .85.

Auditory Hallucinations Rating Scale

The inter-rater reliability of the AHRS was established between the senior community nurse and the researcher both at the beginning and throughout the data collection over seven joint sessions. Intra-class correlation coefficients of .96 to 1.0 were obtained across the eleven items of the measure. Haddock et al. (1999) reported intra-class correlation coefficients between .79 to 1.0 across six raters for six video-taped interviews selected from their sample of 71 individuals with schizophrenia.

A Cronbach's alpha of .71 was calculated for the internal reliability of the AHRS. The Haddock et al. (1999) study did not report on the internal reliability of the measure.

Beliefs About Voices Questionnaire

As this is a self-report measure, no inter-rater reliability analysis was possible. The internal reliability of the measure is reported in Table 3. The majority of the alpha coefficients obtained in the ICMHS sample are sufficiently high for the scales to be considered reliable for use. The Negative Emotion scale has a lower alpha score (0.68) but for the purpose of the study it was considered to be sufficient, given the low

number of items in the scale. Twenty nine participants (61.7%) did not complete the BAVQ without assistance.

Table 3.
Cronbach Alpha Reliability Coefficients for Internal Consistency of the BAVQ

Scale	No. of items	ICMHS sample (n=47) Alpha Coefficient	Chadwick et al.(1995) sample (n=60) Alpha Coefficient
Malevolence	6	.84	.82
Benevolence	6	.83	.86
Negative Emotion	4	.68	-
Positive Emotion	4	.83	-
Behavioural Resistance	5	.72	-
Behavioural Engagement	4	.83	-
Total Resistance	9	.78	.84
Total Engagement	8	.89	.87

3.3 Preliminary Analyses

The means and standard deviations for the analysis variables are presented in Table 4. The receiver-operator curve from a study by Addington et al. (1993b), was used to determine the percentage of patients in the current sample that were likely to have a major depressive disorder. With a CDSS score of eight or above, 42.6 % of the participants in the present sample are likely to meet the criteria for a major depressive disorder.

Independent samples *t* tests showed that there was no statistical difference between the means of the CDSS scores for those patients who described powerful voices versus those who did not ($t(45) = 1.481, p = 0.145$). Also, there was no

statistical difference between those patients who were on anti-depressants and those who were not ($t(45) = 1.771, p = 0.083$). However, 62.5% of the participants who were taking anti-depressants had CDSS scores of eight or above, in comparison to only 32.3% of the participants who were not taking anti-depressants.

Table 4.
Means, Standard Deviations and Range of Scores for the Analysis Variables

Scale	Mean	SD	Observed Range
CDSS Total Score (0-36)	7.87	6.10	0 - 23
SAI-E Total Score (0-12)	3.23	3.67	0 - 12
AHRS Total Score (0-44)	28.32	7.08	12 - 41
- Degree Frequency (0-4)	2.85	1.33	1 - 4
- Duration (0-4)	3.00	1.22	1 - 4
- Location (0-4)	2.27	1.14	1 - 4
- Loudness (0-4)	2.23	0.96	1 - 4
- Belief of Origin (0-4)	3.17	1.19	1 - 4
- Amount Negative (0-4)	2.68	1.32	0 - 4
- Degree Negative (0-4)	2.62	1.38	0 - 4
- Amount of Distress (0-4)	2.00	1.64	0 - 4
- Intensity of Distress (0-4)	2.17	1.55	0 - 4
- Disruption to Life (0-4)	2.04	0.69	0 - 3
- Controllability (0-4)	2.83	1.29	0 - 4
BAVQ - Malevolence (0-6)	2.77	2.23	0 - 6
- Benevolence (0-6)	2.36	2.18	0 - 6
- Negative Emotion (0-4)	2.32	1.43	0 - 4
- Positive Emotion (0-4)	1.62	1.61	0 - 4
- Behavioural Resistance (0-5)	2.66	1.70	0 - 5
- Behavioural Engagement (0-4)	1.28	1.51	0 - 4
- Total resistance (0-9)	4.98	2.71	0 - 9
- Total Engagement (0-8)	2.89	2.92	0 - 8

Table 5 provides the percentages of participants reporting the beliefs about the intent of their voices in the current sample, the Close and Garety (1998) sample and the

Birchwood and Chadwick sample (1997). Chadwick and Birchwood (1995) provided the cut off scores for malevolence (4 or more), and benevolence (3 or more). No cut off scores were provided for the resistance and engagement scales in either the Chadwick and Birchwood study (1995) or the Birchwood and Chadwick (1997) and so these are not reported in the present study.

Table 5 also shows that the proportion of participants across the three samples that rated their voices as 'benevolent' or 'both malevolent and benevolent' was significantly different. It is important to note that the Birchwood et al. (1997) sample reported no participants in their sample as rating their voices as 'both malevolent and benevolent'.

Table 5.
Comparison Percentages of the Beliefs About the Voices Intent from the BAVQ

Beliefs About Voice Intent	ICMHS (n=47)	Close and Garety (1998) (n=30)	Birchwood et al. (1997) (n=62)	χ^2
Malevolent	40% (19)	50% (15)	45% (28)	0.68 (n.s.)
Benevolent	32% (15)	3% (1)	27% (17)	9.02 *
Both malevolent and benevolent	9% (4)	23% (7)	0% (0)	14.93***
Benign	19% (9)	23% (7)	27% (17)	1.04 (n.s.)
Omnipotent	72% (34)	67% (21)	81% (50)	1.68 (n.s.)

* $p < .05$ ** $p < .01$ *** $p < .001$

Table 6 shows the correlations of the auditory hallucination variables with the CDSS score. For the AHRS, there was a low correlation between the CDSS score and two items of the AHRS: amount of distress and degree of distress (both $p < 0.05$). There was a high correlation between CDSS score and the malevolence scale of the BAVQ and a moderate correlation between CDSS score and negative emotion ($p < 0.01$). There was a low correlation between CDSS score and total resistance ($p < 0.05$), but it is important to note that the negative emotion score is a part of the total resistance score.

Table 6.
Correlations of the Analysis Variables with Predictor Variable

Scale	CDSS
SAI-E total score	.042
AHRS total score	.266
- Frequency	-.050
- Duration	-.032
- Location	-.030
- Loudness	.221
- Belief of Origin	-.096
- Amount Negative	.232
- Degree Negative	.266
- Amount of Distress	.361*
- Degree of Distress	.354*
- Disruption to Life	.156
- Controllability	.003
BAVQ - Malevolence	.462***
- Benevolence	-.201
- Positive Emotion	-.231
- Negative Emotion	.394**
- Behavioural Resistance	.258
- Behavioural Engagement	-.107
- Total resistance	.369*
- Total Engagement	-.183

* $p < .05$ ** $p < .01$ *** $p < .001$

Table 7.
Correlations Among AHRs Items

	AHRs Total	Freq.	Dura- tion	Loca- tion	Loud- ness	Belief Origin	Amount Neg.	Degree Neg.	Amount Distress	Intens. Distress	Disrupt Life
Frequency	.440**										
Duration	.702***	.536***									
Location	.298*	-.085	.047								
Loudness	.401**	.045	.093	.280							
Belief of Origin	.110	.222	.106	-.077	-.189						
Amount Negative	.704***	-.003	.271	.259	.266	-.020					
Degree Negative	.589***	.075	.273	.223	.053	-.052	.589***				
Amount Distress	.743***	.069	.370**	.175	.358*	-.290*	.712***	.414**			
Intensity Distress	.696***	.044	.404**	.027	.235	-.264	.547***	.520***	.760***		
Disruption To Life	.393**	.267	.492***	-.040	.181	.177	.063	.018	.134	.156	
Control- ability	.365*	.351*	.360*	-.077	.085	.232	-.045	-.123	.072	.069	.179
	* $p < .05$	** $p < .01$	*** $p < .001$								

Table 7 shows the correlations among the items of the AHRS. Belief of the origin of auditory hallucinations was the only item that was not correlated with the AHRS total score. Several high correlations among the items were revealed: the amount of negative voices, the degree of negative content, the amount of distress and the intensity of distress were all highly correlated with one another; duration was highly correlated with frequency and disruption to life, and moderately correlated with amount of distress and intensity of distress.

Table 8 shows the correlations among the items of the AHRS, the SAI-E total score and the BAVQ scales. The SAI-E total score was highly correlated with the belief of origin item of auditory hallucinations of the AHRS and had a low correlation with the controllability item of the AHRS. The SAI-E total score was not correlated with the AHRS total score, suggesting insight is a separate dimension from severity.

Table 8 also shows several other correlations worthy of note. Both the amount of negative voices and amount of distressing voices were highly positively correlated with malevolence, negative emotion and behavioural resistance, and highly negatively correlated with benevolence, positive emotion and behavioural engagement. The intensity of distress item was highly positively correlated with negative emotion, and behavioural resistance, and moderately negatively correlated with positive emotion and behavioural engagement. The degree of negative voices was highly positively correlated with behavioural resistance, moderately positively correlated with malevolence and moderately negatively correlated with behavioural engagement.

Table 8.
Correlations Among AHRS items, the SAI-E and the BAVQ Scales

	AHRS Total	Freq.	Dura- tion	Loca- tion	Loud- ness	Belief Origin	Amount Neg.	Degree Neg.	Amount Distress	Intens. Distress	Disrupt Life	Control
SAI-E Total	.266	-.214	-.180	-.005	.225	-.823***	-.038	.005	.130	.153	-.150	-.308*
Malevolence	.429**	-.034	.128	-.018	.067	-.001	.587***	.417**	.559***	.358*	.063	.016
Benevolence	-.246	.303*	.057	-.099	-.197	.329*	-.540***	-.286	-.522**	-.443*	.221	.154
Negative Emotion	.483**	-.009	.225	.096	.150	-.263	.538***	.273	.638***	.494***	.162	.160
Positive Emotion	-.363*	.236	-.011	-.178	-.222	.172	-.632***	-.303*	-.560***	-.444**	.035	.135
Behavioural Resistance	.301*	-.196	.011	.018	.037	-.284	.494***	.501***	.491***	.526***	-.099	-.186
Behavioural Engagement	-.388**	.150	-.083	-.245	-.165	.082	-.640***	-.418**	-.464***	-.335**	.176	.058
Total Resistance	.443**	-.127	.125	.061	.102	-.316*	.592***	.458***	.644***	.590***	.024	-.032
Total Engagement	-.401**	.208	-.049	-.225	-.208	.137	-.680***	-.384**	-.548***	-.418**	.110	.105

* $p < .05$

** $p < .01$

*** $p < .001$

Table 9 shows the correlations between the BAVQ scales and the SAI-E total score. The SAI-E total score only correlated with one scale of the BAVQ, benevolence ($r = -.380, p < .01$). Similar to the results of previous studies (Chadwick & Birchwood, 1994, 1995; Birchwood & Chadwick, 1997), there were significant positive correlations between the malevolence and resistance (negative emotion and behavioural resistance) scales and between the benevolence and engagement (positive emotion and behavioural engagement) scales, and significant negative correlations between the malevolence and engagement (positive emotion and behavioural engagement) scales and between the benevolence and resistance (negative emotion and behavioural resistance) scales.

Table 9.
Correlations between the SAI-E and the BAVQ Scales

	Malev- olence	Benev- olence	Neg Emotion	Pos Emotion	Beh Resist	Beh Engage	Total Resist	Total Enga
Benevolence	-.532***							
Negative Emotion	.692***	-.525***						
Positive Emotion	-.407**	.709***	-.522***					
Behavioural Resistance	.467***	-.571***	.502***	-.701***				
Behavioural Engagement	-.438**	.779***	-.463***	.750***	-.614***			
Total Resistance	.657***	-.634***	.841***	-.714***	.890***	-.628***		
Total Engagement	-.451***	.794***	-.527***	.939***	-.705***	.931***	-.719***	
SAI-E Total	-.139	-.380**	.134	-.213	.257	-.153	.232	-.196

* $p < .05$

** $p < .01$

*** $p < .001$

3.4 Hierarchical Regression Analyses

Hierarchical regression was employed to determine which combination of variables independently added to the predictability of CDSS score. Given the exploratory nature of the study, the independent variables were entered into the equation in an order that related to a logical sequence for questioning patients about their experience of auditory hallucinations.

The topographical characteristics (frequency, duration, location, loudness and controllability) of auditory hallucinations were entered in as the independent variables in the first step. The content (amount and intensity of distress, amount and degree of negative content) experienced due to the auditory hallucinations were entered at the second step. The third step related to the consequences of auditory hallucinations (negative emotion and behavioural resistance). The fourth step was the beliefs about the malevolence and omnipotence of the auditory hallucinations and the fifth step was the level of insight regarding the auditory hallucinations. After step 5, with all independent variables in the equation, a multiple R of .647 was yielded from the analysis ($F(15,31) = 1.486, p < 0.172$) accounting for 42% of the variance in CDSS scores.

Table 10 shows the unstandardised regression coefficients (B), the standardised regression coefficients (Beta), R^2 and significance levels (p) at each step and for each variable in the final equation of the analysis. At step one, the characteristics did not predict a significant amount of the variance in CDSS scores. R^2 did not increase significantly with the addition of each of the other steps. An examination of all variables entered into the equation indicates that there were no singular significant predictors of CDSS score in this equation.

Table 10.

Hierarchical Regression Analysis for Prediction of CDSS score

Predictor Variables	B	Beta	R^2	R^2 change	p
Step 1: Characteristics			.063	.063	.736
Frequency	.195	.043			.812
Duration	-1.506	-.300			.134
Location	.194	.036			.840
Loudness	.712	.112			.527
Control	1.292E-02	.003			.987
Step 2: Content			.243	.180	.088
Amount Distress	.301	.081			.795
Intensity Distress	1.365	.347			.197
Amount Negative	-.945	-.205			.440
Degree Negative	.510	.115			.610
Step 3: Consequences			.307	.063	.217
Behavioural Resistance	-.514	-.143			.486
Negative Emotions	1.227	.288			.264
Step 4: Beliefs			.407	.101	.075
Malevolence	.760	.278			.284
Omnipotence	-3.846	-.285			.117
Step 5: Insight			.418	.011	.750
SAI-E	.216	.130			.651
Belief of Origin	1.065	.207			.466

CHAPTER FOUR

4. Discussion

4.1 Findings

The present study indicates that the presence of depressive symptoms is prevalent for people who experience auditory hallucinations and have chronic schizophrenia. While the dimensions of auditory hallucinations accounted for 42% of the variance in CDSS scores, no salient predictors of the level of depression were revealed in the regression equation. Insight into auditory hallucinations did not significantly add to the prediction of depression scores. Before further discussing the predictability of depression from the dimensions of auditory hallucinations, the presence of depression in the study sample will be discussed.

Presence of depression

A relatively high proportion of participants in this sample experienced depressive symptoms with 42.6% having a CDSS cut off score of 8 or above. This proportion is likely to be an underestimate when the high use of anti-depressants in the sample (34%) is taken into account. It is difficult to make direct comparisons with other research samples when researchers have used a variety of measurement scales with different cut-off points for the diagnosis of a depressive disorder or have only reported the proportion experiencing mild to moderate depressive symptoms. However, given that Siris (1991) suggests that the prevalence of depression in schizophrenia varies from 6% to more than 50%, it appears that the current sample reported a high rate of depression.

Sands and Harrow (1999) was the only study found in this review of the literature that reported the proportion of their sample of people with schizophrenia who were taking anti-depressants (7%). In comparison to their sample, the current sample had a relatively high proportion taking anti-depressants (34%) which may have diluted the effect size of the results in this study. Given that 62.5% of those on anti-depressants scored above 8 on the CDSS, it is possible that anti-depressants have only a small effect on CDSS scores. However, CDSS scores for the period before the prescription of anti-depressants would be required for examination before this possibility could be tested. Dosage and compliance with anti-depressants would also need to be considered for potential effect on the CDSS scores.

The predictive power of auditory hallucinations

Altogether, the dimensions of auditory hallucinations and insight into auditory hallucinations accounted for 42% of the variability in CDSS scores in this study. Therefore, 58% of the variability could not be explained by the auditory hallucination measures, suggesting that other factors have a substantial influence on the variance of depression scores. It is possible that the range in severity and chronicity of the sample may have lead to higher levels of variance in CDSS scores. Although thought disturbance was not specifically measured, there was a high proportion of people who presented in the interview with severely disordered thinking. It is possible that this led to inconsistent response styles and therefore more variance in the scores across all measures.

A step-wise multiple regression might have been chosen as an alternative method of analysis to determine whether there was a specific dimension that best predicted depression score. However, a single dimension would only account for a small amount of the variance and it would ignore the complexity of the relationship of other dimensions in predicting depression scores. It is likely that depressive symptoms are due to several different variables and the specific combination of variables might vary from individual to individual. For some it may be certain characteristics of the auditory hallucinations that most relate to depression, while for others it could be other factors that were not examined in this study. For example, one participant who scored highly on the CDSS stated, "the voices are not depressing, only the psychiatrists telling me I have to take medication".

Topographical Characteristics and Content

In the present study, the topographical characteristics of the auditory hallucinations were not significantly correlated with CDSS scores. Therefore, the results do not support the findings of the study by Soppitt and Birchwood (1997) in which loudness and intrusiveness were correlated with depression scores.

In the present study, the perception of control over auditory hallucinations was also not correlated with CDSS scores. This finding does not support the studies by Birchwood et al. (1993) and Rooke and Birchwood (1998) in which a lack of control over the schizophrenic illness was the most powerful indicator of depression. It is possible that there are aspects of 'loss of control' in schizophrenia other than auditory hallucinations that relate to higher depression levels. Involuntary hospitalisations and

compulsory medication treatment provide two examples of factors that could influence depression.

Although Soppitt and Birchwood (1997) found that the presence of derogatory content was related to higher levels of depression, derogatory content was not measured in the present study due to the lack of a reliable measure of it. The amount and degree of negative content was rated, yet this was not significantly correlated with CDSS scores. Ratings of the amount and degree of distressing voices were correlated with CDSS scores. A few participants stated that having 'good' and 'bad' voices battling at the same time caused them distress. This finding partially supports the study by Hustig and Haffner (1980), in which people with intrusive and distressing auditory hallucinations reported higher levels of depression. The perception of the voices as being 'intrusive' was not measured in the present study.

Consequences and Beliefs

As with previous studies (Chadwick & Birchwood, 1994; Birchwood & Chadwick, 1997), beliefs about the malevolence of auditory hallucinations were significantly correlated with both behavioural resistance and negative emotion. Furthermore, beliefs about the benevolence of auditory hallucinations was significantly correlated with both behavioural engagement and positive emotions. These findings suggest that malevolent voices are most often resisted and result in negative emotions, whereas benevolent voices are most often engaged and result in positive emotions. However, the type of analysis chosen does not indicate the particular path of causality for these correlations.

The results of the present study do not provide support for the suggestion made by Chadwick and Birchwood (1994) that both malevolent and benevolent voice hearers experience both negative and positive content. In the present study, those with malevolent voices had a significant positive correlation with the amount of negative voices they heard and those with benevolent content had a significant negative correlation with the amount of negative voices heard. Therefore the content of the auditory hallucinations (not just the beliefs about the voices intent) is likely to have an impact on the behavioural and emotional consequences.

As there were no significant correlations between voice beliefs and voice characteristics, the present study provides support for Chadwick and Birchwood's (1994) model. Voice characteristics appear less likely to have an effect on the behavioural and emotional consequences of auditory hallucinations.

Birchwood and Chadwick (1997) found that malevolence and omnipotence were predictive of depressed and non-depressed groups in a step-wise discriminant function analysis. Given that depression is commonly considered to be a continuous variable, splitting a sample into depressed and non-depressed groups results in a loss of information in the data. The present study utilised a regression analysis in which depressive symptoms are scored as a continuous variable, but the significance of omnipotence and malevolence as predictors of depression was not evident. In the current study there was also no significant difference between depression scores for those who reported that their auditory hallucinations were powerful or not.

Insight

The present study did not find that the level of insight into auditory hallucinations added further to the predictability of depression in schizophrenia. Although previous research has found a positive relationship between the presence of depression and high levels of insight in schizophrenia (Becker, 1988; Amador et al., 1994; Rooke & Birchwood, 1998; Smith et al., 1998), the present study did not find a significant correlation between insight into auditory hallucinations and the presence of depressive symptoms. It is possible that the particular dimension of insight chosen in this study is not the dimension(s) that is related to depression. It may be that the awareness of the disorder itself, rather than the symptoms, is more related to the presence of depressive symptoms.

Another possible explanation for the results is that the relationship between depression and insight is more significant in the earlier stages of the schizophrenia disorder or just after a relapse. The participants in the current sample reported an average duration of the disorder of 16.66 years and an average of 2.39 years since the most recent discharge. The participants in the sample of Carroll et al. (1999) had an average duration of the disorder of 9.2 years and they were recruited just before discharge. Therefore the current study sample is considerably more chronic and the majority of participants were not in an immediate recovery phase of an acute episode of their disorder.

In the present study, measures of insight into auditory hallucinations were significantly correlated with beliefs that the voices were benevolent in intent. The insight score from the SAI-E was also significantly correlated with the reported degree

of control over auditory hallucinations. The results suggest that those participants who have auditory hallucinations that they considered to be benevolent in intent are less likely to gain control over them and are less likely to attribute the voices to their disorder. In other words, participants generally do not want to control good voices and do not believe that they are caused by a mental disorder.

The AHRS item regarding the belief of origin of auditory hallucinations was negatively correlated with the amount of distressing voices, therefore with higher levels of insight the voices were less distressing for participants in this sample. The 'belief of origin' item was not correlated with the total AHRS, suggesting that this question represents a separate dimension of the overall severity of auditory hallucinations.

The measures

This study also provided an opportunity to utilise relatively new measures to determine the generalisability of these measures with a chronic, highly dependent sample of people with schizophrenia. The CDSS continued to provide good inter-rater reliability and internal consistency results and positive comments were received from the case managers that utilised this measure. The CDSS was relatively quick to administer and was considered a valuable tool for monitoring depression levels over time.

The AHRS had good inter-rater reliability and reasonable internal reliability. Haddock et al. (1999) do not report internal reliability data for their measure but state that the items on the measure "are independent of each other with few inter-item correlations" (p.886). They state that each item of the AHRS measures a different

dimension of auditory hallucinations, and their factor analysis identified three weak factors. The present study reported several high correlations among the items of the AHRS. It was contemplated in the present study to conduct a factor analysis for this measure but the number of participants was too low for the result to be meaningful. It appears that further examination of the dimensions of auditory hallucinations is warranted to further inform the construction of items for measurement of dimensions of auditory hallucinations.

The main difficulty with administering the BAVQ in the present study was that participants required a great deal of assistance to complete the measure. Over 60% requested that the researcher read out the items, compromising the self-report nature of the measure. Similar problems have been described in previous research utilising other self-report measures with this population (Addington et al., 1993). The BAVQ was the final measure administered to participants and it is possible that the requests to read out the questions was due to their familiarity with this mode of questioning in the study. Several reasons for not completing the questionnaire by self-report included: forgetting their glasses, not being able to read, problems concentrating when reading, and a preference for the interview format.

The present study had slightly lower internal consistency results for the BAVQ than Chadwick et al. (1995), but the results were still adequate. Separating the resistance and engagement scales into positive emotion, negative emotion, behavioural engagement and behavioural resistance scales resulted in lower internal consistency scores. All were considered adequate except the negative emotion scale ($\alpha = 0.68$)

which was marginally acceptable. The low alpha score is possibly due to there only being 4 items in the scale and that the particular emotions (frightened, angry, down, anxious) although are all negative emotions, they are qualitatively different and perhaps in this case internal consistency is not the best indicator of reliability.

The power of auditory hallucinations is determined by one item in the BAVQ, with a 'yes' or 'no' response. It appears to be an important variable in other studies (Chadwick & Birchwood, 1994) and more items that assess the variable would assist its analysis and its relationship with other variables.

Many respondents stated that they wanted more than the 'yes' or 'no' response choice that the BAVQ offered. There was particular difficulty for those respondents who stated that they heard both 'good' and 'bad' voices without there being a clearly dominant voice. It was noticeable that the response style of these respondents was not consistent, adding to the variability in the data. Birchwood and Chadwick (1997) did not report any participants in their sample to hear both benevolent and malevolent voices unlike the current sample and Close and Garety (1998). It is possible that either Birchwood and Chadwick by chance had participants in their sample all with clear beliefs about the intent of their dominant voice or, they were more directive in their instructions to the participants before they completed the measure.

The SAI-E questions were relatively easy to administer except the final question, the hypothetical contradiction. The options provided often did not match the responses given and therefore a degree of judgment from the researcher was required.

In hindsight, it may have been helpful to administer the full version of the questionnaire to determine if the other dimensions of insight were predictive of depression scores.

4.2 Limitations of the Research

One limitation of the study was the low number of participants. It is possible that salient predictors of depression scores may have emerged with more participants. More participants would have increased the power of the statistical tests conducted in the study. Not all potential participants that attended the Inner City Mental Health Service and met the criteria for the study were approached. A few potential participants were difficult to locate due to their transient habits. Setting up the interviews took a long period of time as the case managers were often unavailable to interview respondents due to the high number of crises they had to attend. Approaching another mental health site was considered, but potential participants from the suburbs of Perth may have had slightly different characteristics to the inner city sample. This in turn highlights another potential limitation of the study in that the results may not be generalisable to other chronic populations with schizophrenia.

There are notable differences between the current study's sample and other samples reported in the literature that might account for differences in the results between studies. For example, other studies have included in their samples people with a diagnosis of schizoaffective disorder (Birchwood & Chadwick, 1997) or bipolar disorder (Birchwood et al., 1993), a shorter duration of illness (Carroll et al., 1999), and fewer number of psychiatric admissions (Birchwood et al., 1993; Rooke & Birchwood, 1998). It is difficult to determine more precisely the chronicity and severity of other

research samples due to a lack of participant information reported in the literature. Certainly, the present sample was generally both severely symptomatic and chronic.

The variability in the use of assessment measures across studies might also explain the difference in results across studies, in particular the wide range of depression measures. The CDSS was not used as the depression measure in any of the studies the results of the present study were compared to.

4.3 Implications and Further Research

Depressive symptoms affect a significant proportion of people with chronic schizophrenia and therefore assessment of depression should be routine. The CDSS in this study provided a reliable, valid and easy to administer measurement scale for this purpose. Given the raters' positive experience using this measure leads me to recommend for its use in preference to other more general depression measures for this population.

Although there were several significant correlations between the dimensions of auditory hallucinations and depression scores, no singular dimension of auditory hallucinations was found to be a significant predictor of depression scores. Given this, it is suggested that research should focus on understanding the role of the many factors involved in the development of depression in chronic schizophrenia. Clinical assessments should examine broadly the factors that might have led to the development of depressive symptoms for each individual.

It is recommended that future studies involve larger numbers of participants to be able to conduct a path analysis. This would allow more extensive examination of the correlations in a structured equation model of the various factors influencing depression in schizophrenia. Other variables (social factors and cognitive style factors) should be included in the equation for a more complete picture and comparisons should be made with those who do not experience auditory hallucinations. Further exploration is required to determine if depression is qualitatively different in schizophrenia at different stages, and levels of severity and chronicity. This is one possible explanation for the differences found in the results of this study compared to previous studies.

4.4 Conclusion

Consistent with other reports, the results of the present study indicate that depressive symptoms are prevalent in chronic schizophrenia. The study found a prevalence of over 40% in people with chronic schizophrenia who also experience auditory hallucinations. Several of the dimensions of auditory hallucinations were significantly correlated with depression scores and overall these dimensions accounted for 42% of the variance in depression scores. However, there was no salient individual dimension that could account for a significant proportion of the variance. Insight into auditory hallucinations did not significantly add to the prediction of depression scores. It appears that other factors, not just auditory hallucinations, are likely to have a role in determining the presence of depression in chronic schizophrenia. Thus, tentative support was given for the hypothesis that depression in schizophrenia is a heterogeneous syndrome that has many etiological causes (Koreen et al., 1993). Future research should include prospective designs to clarify issues of causation.

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Inclusion Criteria and Diagnosis Form

Inclusion Criteria

- able to give valid informed consent
- aged between 18 and 50
- experiences auditory hallucinations
- no known brain disease/injury
- no known alcohol/drug dependence
- at least one admission for a schizophrenic episode
- stabilised on same dose of anti-psychotic for > 3 months
- out-patient for > 3 months

Diagnosis of Schizophrenia *(from Spitzer et al., 1990)*

- Psychotic symptoms occur at times other than during mood syndromes
- Presence of characteristic psychotic symptoms during the active phase; either (1), (2), or (3) for at least 1 week:
 - (1) bizarre delusions *
 - (2) prominent hallucinations (as defined in **) of a voice with content having no apparent relation to depression or elation, or a voice keeping up a running commentary on the person's behaviour or thoughts, or two or more voices conversing with one another.
 - (3) two of the following; delusions, prominent hallucinations**, incoherence or marked loosening of associations, catatonic behaviour, flat or grossly inappropriate affect.
- No major depressive or manic syndromes occurred during an active phase of the disturbance.
- Continuous signs of the disturbance for at least six months. Must include an active phase during this time, may include a prodromal or residual phase.
- During the course of the disturbance, functioning in such areas as work, social relations, and self-care is markedly below the highest level achieved before onset of the disturbance.

* ie. involving a phenomenon that the person's subculture would regard as totally implausible, e.g., thought broadcasting.

** throughout the day for several days or several times a week for several weeks, each hallucinatory experience not being limited to a few brief moments.

Appendix: B

**Schedule for the Assessment of Insight (SAI-E) – Expanded Version
Kemp and David (1996)**

Extracted questions used for the study:

9. “Do you think that the ‘voices’ you hear are actually real people talking, or is it something arising from your own mind?”

Definitely (full awareness)	4
Probably (moderate awareness)	3
Unsure (sometimes yes, sometimes no)	2
Possibly (slight awareness)	1
Absolutely not (no awareness)	0

10. “How do you explain why you hear voices?”

Part of my illness	4
Due to a nervous condition	3
Reaction to stress/fatigue	2
Unsure, maybe one of the above	1
Can't say, or delusional/bizarre explanation	0

11. “How do you feel when people do not believe you?”

They are lying	0
I'm still sure despite what others say	1
I'm confused and I don't know what to think	2
I wonder whether there is something wrong with me	3
That's when I know that I am sick	4

Appendix: C

Demographic Information Sheet

___ Consent form completed and viewed.

1. Participant Number _____
2. Age of the participant _____
3. Gender _____
4. Current medications and dose _____

5. Total no. of past admissions for psychiatric Tx _____
6. Length of time since most recent discharge _____
7. Age of onset of the disorder _____
8. Duration of the disorder _____
9. Education attained: completed primary school/ completed Year 10 or
 equivalent/ completed Year 12/ completed technical
 education/ completed tertiary education.
10. Employment status: fulltime/part-time/home duties/ student/ unemployed

Appendix: D**PATIENT INFORMATION SHEET****Auditory Hallucinations and Depression in Chronic Schizophrenia**

Dear Participant,

My name is Julie Proctor. I am currently doing research at Royal Perth Hospital for a few months as part of the requirements for my Masters degree in Clinical Psychology at Edith Cowan University.

The aim of the research is to investigate the different aspects of auditory hallucinations (e.g. loudness, amount of distress, amount of negative content) and the presence of depression in chronic schizophrenia. It is anticipated that the information obtained from this research will aid our understanding of auditory hallucinations and depression, and help to design appropriate psychological treatment for people experiencing auditory hallucinations. I would be grateful of your assistance in this research.

Participation in the study will involve two interviews that will last a total of approximately one hour with breaks if necessary. In both interviews you will be asked questions about the symptoms you experience due to your illness. The first interview will be conducted by your caseworker and the second interview will be conducted by myself. For research purposes, one in ten participants will also have a psychiatric nurse present to ensure that all information is gathered in the same manner. If at any time you wish to withdraw from the study you are free to do so without it influencing your medical care. Your participation is entirely voluntary.

If you decide to take part in this research, you will not be identified in the research files. Any details and information that may identify you as an individual will remain completely confidential and your responses will be kept separate from your medical files.

There are no known adverse effects of the questions, however, if you have any concerns about this research, or if you require further information, please do not hesitate to contact me, Julie Proctor at Edith Cowan University on 9400 5863 or Dr. Jeremy Hyde at the Community Assessment and Treatment Team on 9224 1720. If so desired, correspondence regarding any concerns about this project can be directed to Dr W. Beresford, Chairperson, Ethics Committee, c/- Medical Administration, Royal Perth Hospital, Wellington Street, Perth, WA, 6001.

Yours sincerely,

Julie Proctor
Ph: 9400 5863

Associate Professor Ed Helmes
School of Psychology
Edith Cowan University
Ph: 9400 5543

Appendix: E

CONSENT FORM**Auditory Hallucinations and Depression in Schizophrenia**

Participant's Name:

Name of Researcher: Julie Proctor

Name of Research Supervisor: Associate Professor Ed Helmes

The aim of the research is to investigate the different aspects of auditory hallucinations (e.g. loudness, amount of distress, amount of negative content) and the presence of depression in chronic schizophrenia. The ethics committee at this hospital has given approval for this study.

1. I consent to participate in the above project. The nature of the project, including the interview, has been explained to me.
2. I consent to my psychiatrist to release certain information from my medical records. This information will only include: that I have no known brain disease or head injury, no significant history of drug or alcohol dependence, the age of onset of my schizophrenia, the number of hospital admissions I have had, the number of months since I was last discharged from hospital and my current dose of anti-psychotic medication.
3. I understand that:
 - a) If at any time I wish to withdraw from the study, I am free to do so without influencing my medical care.
 - b) The project is for the purpose of research, and not for individual treatment.
 - c) The confidentiality of the information I discussed in the interviews will be safeguarded, no names will appear on the interview forms.
 - d) The information will be kept in a locked filing cabinet at Edith Cowan University and will be destroyed at the end of the study.
 - e) There are no known adverse effects of the questions I will be asked in the interviews.

I understand that information gained from my psychiatrist and from the interviews will be kept separate from this consent form.

Signed:..... Date:.....

Investigator:..... Date:.....