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On: 27 August 2015, At: 16:34

Publisher: Routledge

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Journal of Mental Health

Publication details, including instructions for authors and subscription information:

<http://www.tandfonline.com/loi/ijmh20>

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Published online: 16 May 2011.

To cite this article: Vanessa Beavan, John Read & Claire Cartwright (2011) The prevalence of voice-hearers in the general population: A literature review, *Journal of Mental Health*, 20:3, 281-292

To link to this article: <http://dx.doi.org/10.3109/09638237.2011.562262>

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REVIEW

The prevalence of voice-hearers in the general population: A literature review

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Abstract

Background. It is increasingly understood that voice-hearing is neither a rare phenomenon experienced only by 'psychiatric patients' nor a meaningless symptom of a 'mental illness'.

Aims. To estimate the prevalence of voice-hearing in the adult general population.

Methods. PsycINFO and relevant literature reviews were searched for studies of the prevalence of verbal auditory hallucinations among adults.

Results. Seventeen surveys, from nine countries, were identified. Comparisons across studies were problematic due to differences in definitions, methodologies, and cultural factors. Prevalence ranged from 0.6% to 84%, with an interquartile range (excluding the highest and lowest quartiles) of 3.1%–19.5%, and a median of 13.2%.

Conclusions. Differences in prevalence can be attributed in part to differences in definitions and methodologies, but also to true variations based on gender, ethnicity and environmental context. The findings support the current movement away from pathological models of unusual experiences and towards understanding voice-hearing as occurring on a continuum in the general population, and having meaning in relation to the voice-hearer's life experiences.

Keywords: *Psychosis, auditory hallucinations, voices, epidemiology, literature review*

Introduction

Hearing voices tends to be regarded as rare and extraordinary, belonging to the realms of pathology (Beavan & Read, 2010; Leudar & Thomas, 1996, 2000). However, general population studies challenge the view that voices are necessarily a symptom of severe mental illness, and suggest that they may be a relatively common experience. These studies produce hugely varied prevalence estimates. Some authors estimate that only about one in 100 people experience auditory hallucinations (Johns et al., 2002; Ohayan, 2000) while others suggest that as many as 71% (Posey & Losch, 1983) or 84% (Millham & Easton, 1998) have this experience. The present review uses a comprehensive search of the international literature to analyse why

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such disparate numbers are reported and to present a comprehensive picture of the prevalence of hearing voices in the general population.

The rationale for the focus of the review is to increase the accuracy of the prevalence estimate of the specific phenomenon under investigation. This is in keeping with the growing awareness that it is more productive to research specific experiences rather than heterogeneous constructs such as ‘schizophrenia’ or ‘psychosis’. The ‘schizophrenia’ construct has poor reliability and validity, and is, moreover, disjunctive – meaning that two people can receive the diagnosis without having any symptoms in common (Read, 2004a). Researching more homogenous experiences, such as hallucinations or delusions, separately can lead to greater understanding of aetiology and treatment needs, and these benefits accrue if different types of hallucinations or delusions are studied (Bentall, 2009).

Understanding the frequency of voice-hearing can be helpful in several domains. Firstly it can reduce stigma. The popular notion that the phenomenon is rare and invariably indicative of ‘madness’ can lead to voice-hearers being subject to the toxic stereotype of dangerousness and unpredictability associated with ‘schizophrenia’ (Read et al., 2006). Medical/illness explanations of hallucinations and delusions have been demonstrated to be associated with negative attitudes (Read, 2007). A recent New Zealand study found that voice-hearers in the general population were greatly concerned about the stigma associated with hearing voices and that this often led to them feeling afraid to share their experience with other people (Beavan, 2011).

Secondly, clinicians’ efforts to normalise the experience of hearing voices (Kingdon & Turkington, 2005) can be facilitated by knowing and sharing with clients, that voice-hearing is more common than usually believed. How people interpret their voices, and the distress that accompanies negative interpretations, including ‘nobody else hears voices’ or ‘I must be mad’, are better predictors of clinical outcome than the experience itself (Bak et al., 2005; Morrison et al., 2003).

Thirdly, general population studies of specific phenomena are contributing to the development of a dimensional approach whereby psychosis in general, and specific examples thereof, are conceptualised as being a matter of degree rather than categorical constructs (Murphy et al., 2010).

Method

The literature review began with a search of the electronic database PsycINFO up to September 2009, with the key words ‘auditory hallucinations’. Of the 976 articles found, five were concerned with prevalence in the adult general population. Any references within these articles to additional prevalence studies were included in the initial review phase, along with studies cited in recent literature reviews of relevance. Studies that focussed on non-auditory hallucinations, or did not distinguish between the different sensory modalities of hallucinations, were excluded. Seventeen studies investigating the prevalence of auditory verbal hallucinations in the adult general population were included in the final analysis.

Results

General population studies

Europe. The first recorded attempt to estimate the frequency of hallucinations in a general population was in 1894. The report on the Census of Hallucinations (Sidgwick et al., 1894) gathered information from almost 17,000 individuals primarily in the UK, including large

numbers identifying as Russian and Brazilian. Although the project had the approval of the International Congress of Experimental Psychology, its authors and many of the interviewers belonged to the Society for Psychical Research. It was therefore prone to biases. The interviewers tended to use their own acquaintances as interview participants. The authors acknowledged this, and took precautions to minimise biased sampling. A strength of the Census is the clear way the authors defined their subject. They were interested in hallucinations of sight, touch and hearing, and in the case of the latter particular emphasis was put on sounds suggestive of the human voice. They ruled out experiences occurring in sleep-related states or due to 'delirium or insanity or any other morbid condition obviously conducive to hallucination'. They also ruled out experiences better understood as illusions, such as hearing footsteps or seeing lights, and other experiences that were not true hallucinations.

The Census found that 9.9% reported hallucinations of sight, touch and/or voices at least once in their lifetime. This included 3.6% who heard human voices when in a conscious wakeful state, and free of medical or psychiatric problems that might cause them (see Table I).

Table I. Studies of the frequency of hearing voices in the general population.

Author(s) and year	Place and sample	Method	N	Phenomena studied	%
Sidgwick et al., 1894	UK; Non-random sample	INT	17,000	Voices in conscious state	3.6%
West, 1948	UK; Biased data reporting	INT	1,519	Voices in conscious state	8%
Rees, 1971	Wales; Widow(er)s	INT	293	Voice of deceased loved one	13.3%
Jocano, 1971	Philippines; Epidemiological	INT	2000	Auditory hallucinations	13.3%
Posey & Losch, 1983	US; College students	QST	375	Voices in conscious state	71%
Bentall & Slade, 1985	UK; College students	QST	136	Voices	15.4%
Young et al., 1986	UK; College students	QST	204	Voices	13.2%
Tien, 1991	US; Epidemiological (Catchment Area Program)	INT	18,572	Voices in conscious state	1.5–3.2%
Barrett & Etheridge, 1992	US; College students	QST	345	Auditory hallucinations (including sleep-related)	45%
Grimby, 1993	Sweden; Widow(er)s	INT	50	Voice of deceased loved one	30%
Verdoux et al., 1998	France; Primary-care patients with no psychiatric disorder	QST	462	Voices	16%
Millham & Easton, 1998	UK; Mental health nurses	QST	55	Auditory hallucinations (including sleep-related)	84%
Ohayon, 2000	UK, Germany, Italy; Epidemiological	INT	13,057	Auditory hallucinations	0.6%
Johns et al., 2002	UK; Epidemiological (National Survey sample)	INT	7849	Voices saying quite a few words or sentences	1.1%
Dhossche et al., 2002	Netherlands; Epidemiological	QST	796	Auditory hallucinations	2.3%
Caspi et al., 2005	New Zealand; Epidemiological	INT	803	Auditory hallucinations in conscious state	3.4%
Shevlin et al., 2007	US; Epidemiological (National Comorbidity Survey)	QST	5907	Auditory hallucinations	8.3%

INT – Interview; QST – Questionnaire.

West (1948), replicating this study, reported that 14.3% of 1519 adults experienced one or more hallucinations, and approximately 8% heard voices. Many of the methodological flaws found in the Census were repeated. West acknowledges, for example, that an unknown number of interviewers reported only those cases in which respondents answered in the affirmative.

A more recent study, based on data from the Fourth National Survey of Ethnic Minorities conducted in England and Wales (Johns et al., 1998), found that between 2.3% and 9.8% of 7849 adults reported auditory or visual hallucinations in the previous year (South Asian 2.3%, Caribbean 9.8% and Caucasian 4%). In answer to 'Did you at any time hear voices saying quite a few words or sentences?' 1.2% of the Caucasian sample, 2.8% of the Caribbean sample and 0.6% of the South Asian sample responded in the affirmative. As the South Asian sample comprised almost half of the entire sample, the overall annual prevalence for this study is only 1.1%, which is probably significantly lower than the true UK annual prevalence. Also, the hallucinations questions were asked in the context of other questions about psychotic phenomena, which may, again, have decreased willingness to endorse them.

Ohayon (2000) reported a study of 13,057 participants from the United Kingdom, Germany and Italy who were interviewed by phone about disorders of sleep and psychopathology. The auditory hallucination question was relatively broad: 'Have you ever heard sounds, music or voices which other people can't hear?' Only 0.6% reported such an experience and all who did had an associated mental disorder. Slightly more reported experiencing sleep-related hallucinations, with 2% reporting hypnagogic auditory hallucinations and 0.4% hypnopompic auditory hallucinations. This is remarkably low. The author acknowledges 'almost everyone has experienced at least once in his or her life some form of hallucination at sleep onset or upon waking' (p. 160–161). The low figures may be due to the use of interviews designed to elicit reports of psychopathology, which may have biased participants against disclosing experiences they assumed would be evaluated as symptoms of mental illness.

Dhossche et al. (2002) used data from a longitudinal study. Seven hundred and ninety-six Dutch participants aged 19–26 were asked about auditory hallucinations ('I hear sounds or voices that other people think aren't there') in the context of 135 other questions from the Youth Self Report, which asks about competency, problems and social desirability. Eighteen (2.3%) endorsed this item. No statistical association was found with any psychotic disorder.

USA. In 1991 Tien collected data across five American cities, over 5 years. In a random sample of 18,572 adults, 13% reported hallucinations of sight, touch and/or vocal sounds at least once. The annual prevalence for auditory hallucinations varied according to age from 1.5% to 3.2% (no overall figure was reported). As in the two previous studies, Tien excluded experiences related to sleep-states, or where the participant believed the cause of the hallucination was drugs or alcohol or a medical condition. Most participants reported that their hallucinatory experiences did not cause them distress.

A second US study, using data from the National Comorbidity Survey, reported on the responses of 5907 participants across 48 states (Shevlin et al., 2007). Using a relatively broad definition ('Have you ever had the experience of hearing things other people could not hear, such as noises or a voice?'), they found that 8.3% reported having experienced auditory hallucinations at some time. The rate was highest in the Hispanic population (11.2%), followed by the Black population (9.5%).

New Zealand. In a longitudinal New Zealand study, 803 adults of European descent were assessed at age 26 using a standard psychiatric interview (Caspi et al., 2005). Thirteen

percent reported at least one hallucinatory experience (voices, strange smells or tastes, unusual bodily feelings and/or visions when completely awake), and 3.4% reported hearing things or voices that other people cannot hear.

Philippines. Jocanao (1971) reported that approximately 13.3% of the population of a village in Panay, the Philippines, reported having supernatural experiences that could be defined as auditory hallucinations. Hallucinations of the other senses were also frequent. For example, 21% reported visions.

Specific non-psychiatric populations

Other researchers have studied specific sub-populations of the general (i.e. non-psychiatric) population.

College students. Posey and Losch (1983) reported that 71% of 375 psychology undergraduates in the USA reported at least one experience of 'brief, auditory hallucinations of the voice type in wakeful situations' (p. 99). Barret and Etheridge (1992) replicated the study and reported that (45%) reported having auditory hallucinatory experiences on a regular basis.

Using a different measure (the Launay-Slade Hallucination Scale), Bentall and Slade (1985a) found lower rates of auditory hallucinations in students. In their first study, 15.4% of 150 British undergraduate psychology students reported hearing a person's voice and then finding that no one was there. These findings were replicated (13.2%) in a sample of 204 non-psychology students (Young et al., 1986).

Primary care patients. Verdoux et al. (1998) invited all patients of general practitioners to complete a self-report questionnaire with a section about hearing voices. Of all respondents who did not meet criteria for a psychiatric diagnosis, 16% endorsed this item.

Mental health nurses. Millham and Easton (1998) used the same questionnaire as the two USA student studies with 55 mental health nurses and found that 84% of their sample reported auditory hallucinatory experiences of some kind, including sleep-related and non-verbal hallucinations.

Bereaved. Two other studies with non-clinical populations suggest that in times of loss people may be particularly likely to experience hallucinations. Grimby (1993) found that 82% of recently bereaved elderly persons experienced hallucinations and/or illusions such as feeling the presence of their deceased spouse. Thirty percent reported hearing the voice of their loved one within the first month of their death, and 6% were still hearing them 12 months later. Grimby excluded doubtful answers, dreaming, falling asleep or awakening reactions.

Rees (1971) also found an increased level of hallucinations among widows and widowers. Overall, 46.7% of his sample had post-bereavement hallucinations and/or illusions and 13.3% heard the voice of their deceased spouse. These figures may be lower than in Grimby's study because Rees included in his sample people who had been widowed up to 40 years prior. His data show, as did Grimby's, that the rate of hallucinations declines with time. Only 31.8% of those persons widowed between 30 and 40 years ago experienced hallucinations, while 52.6% of those persons widowed less than 10 years before the interview did so.

Gender

Studies that have analysed their data by gender report a higher frequency of women reporting hallucinatory experiences of some kind (Grimby, 1993; Murphy et al., 2010; Sidgwick et al., 1984; Tien, 1991; West, 1948; Young et al., 1986). Only two studies have reported gender differences specifically for auditory hallucinations. Rees (1971) found that 14.1% of women and 10.1% of men reported hearing their dead spouse's voice. A recent re-analysis (Murphy et al., 2010) of the data on nearly 6000 adults from the USA National Comorbidity Survey found that significantly more women (9.0%) than men (7.5%) heard voices or noises. These findings are consistent with the tendency in clinical populations for more women than men to report auditory hallucinations (Goldstein & Lewine, 2000; Read, 2004b).

Ethnicity

Similarly, few studies have investigated differences in the frequency of reported hallucinations among different ethnic groups. Sidgwick et al. (1894) found that Brazilian respondents were more than twice as likely (23.9%) to report having experienced some form of hallucination in a conscious waking state than British respondents (9.4%). Russian participants fell in-between, with 15.9% responding in the affirmative. Only 3.2% of British respondents had heard voices, while 8% of Russian and 17% of Brazilian respondents reported having this experience. In samples of 2800 Caucasians and 5000 members of ethnic minorities, Johns et al. (2002) found that while only 4% of the Caucasian sample heard or saw things that others did not, the rate was two-and-a-half times higher in the Caribbean sample. Jocano (1971) found that a similar proportion, 13.3%, in his sample of Filipino villagers reported auditory hallucinations. The only data separating responses by both ethnicity and sensory modality found Hispanic (11.7%) and Black (9.5%) groups reporting the highest rates of auditory hallucinations and Caucasians (7.7%) the lowest (Shevlin et al., 2007).

Children

Two studies in the Netherlands have focussed on children. A recent study of 3870 children (aged 7 and 8) found a 1-year prevalence rate, for 'auditory vocal hallucinations', of 9%, with the additional finding that 'substantial suffering and problem behaviour' were reported in only 15% of the children who reported hallucinations (Bartels-Velthuis et al., 2010). Another study drew on data from a health screen administered to all children in the Netherlands (Lataster et al., 2006). Of the 1290 participants aged 12–16, 90 (7.0%) reported that they had 'ever heard voices that other people cannot hear'.

Discussion

Prevalence rates ranged from 0.6% to 84%, with an interquartile range (excluding the highest and lowest quartiles) of 3.1%–19.5%, and a median of 13.2%. The mean (unweighted for sample size, and therefore of minimal importance) was 19.3%.

Differences in prevalence can be attributed in part to differences in definitions and methodologies, but also to true variations based on gender, ethnicity and context. Voice-hearing appears to be more common in women and some non-Western populations. Studies employing strict definitions of hearing a voice that has no corresponding external stimulus, while in a conscious, wakeful state, report between 2 and 4%, but this is a conservative estimate given the probability of under-reporting of phenomena to which a great deal of

stigma is associated (Beavan & Read, 2010; Read et al., 2006). If the definition of voices is broadened to include those experienced in altered states of consciousness, such as hypnogogic and hypnopompic hallucinations and drug-induced states, or banal misinterpretations of ambiguous noise, such as hearing one's name called in a public place, then it seems the majority of people have had this type of experience.

Ethnicity and gender

Some ethnic groups are more likely than others to report hallucinatory experiences. Most Western societies fear and discriminate against voice-hearers, a perspective that is reflected in popular media portrayals of voice-hearers as mad and dangerous (Watkins, 1998). This contrasts with societies that revere voice-hearers and encourage their spiritual development (Jarvik, 1970). Among New Zealand Maori, hearing voices is often considered an unexceptional part of everyday life (Taitimu, 2008). Women appear to hear voices more often than men. The mechanisms behind this gender difference are unclear. Potential lines of enquiry include high rates of dissociation in women (Spitzer et al., 2003), often in response to trauma (Read et al., 2001).

Loss and trauma

Loss and trauma appear to be positively correlated with reports of hallucinatory experiences. For example, high rates of widow(er)s report hearing the voice of their deceased loved one (Grimby, 1993). The onset of voices (in both clinical and non-clinical populations) is very often preceded by either a traumatic event or an event that activated the memory of an earlier trauma (Beavan, 2007; Romme & Escher, 1989).

Lataster et al. (2006) found that adolescents' non-clinical psychotic experiences were strongly and independently associated with both bullying and sexual trauma. There is a great deal of research demonstrating the association between trauma history and psychosis, including hallucinations, in both clinical and non-clinical samples (Kilcommons & Morrison, 2005; Read et al., 2005, 2009). Sexual abuse, in particular, appears to be strongly associated with hearing voices (Bebbington, 2009; Offen et al., 2003; Read et al., 2003, 2005).

Associated psychopathology

Hearing voices is often assumed to be a symptom of severe 'mental illness', in particular, 'schizophrenia'. This association may be due to an exposure bias that has led many mental health professionals to use exclusively pathological models of voice-hearing (Boyd-Ritsher et al., 2004). One consequence is that some critics have interpreted the high rates of reported hallucinations in some general population studies as due to high rates of undetected psychopathology among participants. For example, a recent study of 103 'healthy individuals with auditory verbal hallucinations' found that they did not have clinically defined delusions, disorganisation or negative or catatonic symptoms (Sommer et al., 2010). The authors argued, nevertheless, that hearing voices is 'part of a general vulnerability for schizophrenia' because their participants did have a 'general increased schizotypal and delusional tendency'. A possible preconception is implied by use of the phrase 'auditory verbal hallucinations in otherwise healthy individuals' (p. 633). For some researchers and clinicians, hearing voices is, by definition, unhealthy.

However, the first general population study of hearing voices excluded responses from people with a known psychotic diagnosis and still reported an overall prevalence of 3.6%

(Sidgwick et al., 1894), higher than the estimated 1% lifetime prevalence for 'schizophrenia'. Neither Posey and Losch (1983) nor Barrett and Etheridge (1992) found a significant correlation between auditory verbal hallucinations and overt psychopathology. Similar results have been reported for non-student samples, including adolescents (Dhossche et al., 2002), and adults (Johns et al., 2002).

These findings suggest that hallucinations, including hearing voices, cannot automatically be attributed to psychopathology or assumed to be an exclusively negative experience. In his study of almost 20,000 people, Tien (1991) found that the proportion of non-distressing hallucinations was much higher than hallucinations associated with distress or interference with functioning for all modalities, including hearing voices. Bentall and Slade (1985b) found only a very small minority of their voice-hearing participants reported being troubled by the experience. Hanssen et al. (2003) found that while only 1.5% of their 7076 participants had a diagnosis of psychosis, 12 times as many (18.1%) reported having experienced some kind of psychotic-like symptom.

A continuum of meaningful experience

Many researchers have argued that auditory verbal hallucinations lie on a continuum (Bentall, 2009; Bentall & Slade, 1985a; Johns et al., 2002; Millham & Easton, 1998; Murphy et al., 2010; van Os et al., 2009), which might begin with revelations and imagination and move towards illusions and hallucinations (Liester, 1996).

Evidence comes in a variety of forms. Firstly, the high prevalences in the general population support the notion that hearing voices is not itself necessarily a pathological phenomenon. Instead, it seems that it is the distress associated with negative interpretations of these experiences (such as 'I must be mad'), and inadequate coping strategies, that are related to psychological disorder (Bak et al., 2005; Romme & Escher, 1989). The psychological and biological mechanisms underlying the development of hallucinations have recently become the focus of considerable research activity (Esher et al., 2003; Larkin & Morrison, 2006; Read et al., 2001, 2005, 2009; Varese et al., 2011).

Secondly, evidence suggests that hallucinations associated with psychosis and those associated with normal conscious functioning may manifest in similar ways and be produced by the same underlying mechanisms (Barrett & Caylor, 1998).

Thirdly, there is strong evidence of a continuum of other psychotic phenomena in the general population, which seems to have no correlation with a diagnosable psychotic disorder (Verdoux et al., 1998). Many more people experience psychotic or psychotic-like experiences than meet diagnostic criteria for a psychotic disorder (van Os et al., 2000). Different prevalences across sub-groups suggest that these experiences are influenced by cultural and environmental variables, rather than the simple presence or absence of psychopathology.

Methodological factors

One limitation of this review is the varying contexts in which participants were asked about hallucinatory experiences. Questions asked as part of a standard health assessment (Verdoux et al., 1998) tended to elicit more positive responses than those asked in the context of screening for mental disorders (Ohayon, 2000). A contributing factor to this discrepancy may be the stigma associated with hallucinatory experiences (Read et al., 2006; Read & Harre, 2001). Because of the association between hearing voices and schizophrenia, people who have this experience may under-report (Beavan, 2007; Hanssen et al., 2003).

A second limitation is the varying definitions used by investigators. Interestingly, definitions do not appear to predict response rates. Studies asking about auditory hallucinations of any kind reported both the lowest (0.6%) and highest prevalence (84%), while studies asking about auditory verbal hallucinations reported results between 1.1% and 71%. The suggestion that high reported rates might be due to participants referring to experiences that are not true hallucinations was rejected by Barret and Caylor (1998). In their study, over 50% of college students reported that their hallucinatory experience had all the reality characteristics of a perceptual experience precipitated by an external stimulus event.

The phrasing of questions, however, does seem to affect response rates. The measure used by Posey and Losch (1983), Barrett and Etheridge (1992) and Millham and Easton (1998), which yielded some of the highest prevalences (45–84%), included questions which encouraged affirmative responses, such as ‘Every now and then – not often – I think I hear my name on the radio. Has a similar experience happened to you?’ and ‘Almost every morning while I do my housework, I have a pleasant conversation with my dead grandmother. I talk to her and quite regularly hear her voice actually aloud. Anything similar happen to you?’ This contrasts with the question used by Johns et al. (2002) ‘Did you at any time hear voices saying quite a few words or sentences when there was no one around that might account for it?’ This yielded a much lower response rate of 1.1%.

A third limitation is the differing exclusion criteria used. Studies that did not specifically exclude sleep- or illness-related hallucinations or intoxication hallucinations tended to report higher rates than those that imposed these exclusion criteria. For example, Shevlin et al. (2007), who included hypnogogic and hypnopompic auditory hallucinations of voices and noises, reported a prevalence of 8.3%, while studies limited to auditory verbal hallucinations in a clear state of consciousness tended to report lower rates. Studies excluding experiences associated with mental illness (Sidgwick et al., 1894; Verdoux et al., 1998; West, 1948) are presumably under-estimating general population prevalence.

These various limitations limit the comparability of the studies’ results and, thereby, our ability to either examine the mechanisms that may contribute to cultural or gender differences or provide an accurate overall prevalence rate. The use of an interquartile range becomes desirable under these circumstances, to exclude estimates at either extreme.

Conclusions

Future research on the prevalence of voice-hearing, and of other experiences currently deemed indicative of psychosis (such as delusions), should try to use randomised samples of the general population, from a greater range of countries, that are large enough to analyse in relation to the demographic and environmental factors discussed in this paper.

Our best efforts to ascertain the ‘true’ prevalence of voice-hearing internationally have yielded rather unclear results. What is clear, however, is the unhelpfulness and inaccuracy of reductionist models of hearing voices as extremely rare, bizarre, pathological phenomena without cultural or subjective meaning or value (Beavan, 2011; Beavan & Read, 2010; Dillon, 2010; Intervoice, 2010; Geekie & Read, 2009; Geekie et al., in press; Romme et al., 2009). Mental health staff, and others, seeking to normalise the experience of voice hearing for their clients can safely tell them they are not alone, that ‘roughly 5%–15%’, or ‘about one in ten’, of the adult population hears voices. Sommer et al. (2010, p. 633) suggest ‘approximately 10–15%’. If this information were widely disseminated to the public voice hearing might be less stigmatised, thereby rendering it less frightening to tell other people about it (Beavan, 2010). This, in turn, might, by limiting the isolation, shame and fear that

currently tends to accompany the experience, reduce the chances, for some voice hearers, of needing mental health services at all.

Declaration of interest: The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

References

- Bak, M., Myin-Germeys, I., Delespaul, P., Vollebergh, W., de Graaf R. & van Os, J. (2005). Do different psychotic experiences differentially predict need for care in the general population? *Comprehensive Psychiatry*, *46*, 192–199.
- Barrett, T. & Caylor, M. (1998). Verbal hallucinations in normals. V. Perceived reality characteristics. *Personality and Individual Differences*, *25*, 209–221.
- Barrett, T. & Etheridge, J., (1992). Verbal Hallucinations in Normals. I. People who hear ‘voices’. *Applied Cognitive Psychology*, *6*, 379–387.
- Bartels-Velthuis, A., Jenner, J., van de Willige, G., van Os J., & Wiersma, D. (2010). Prevalence and correlates of auditory vocal hallucinations in middle childhood. *British Journal of Psychiatry*, *196*, 41–46.
- Beavan, V. (2007). *Angels at our Tables: New Zealanders’ Experiences of Hearing Voices*. Unpublished doctoral dissertation, University of Auckland.
- Beavan, V. (2011). Towards a definition of “hearing voices”: A phenomenological approach. *Psychosis: Psychological, Social and Integrative Approaches*, *3*, 63–73.
- Beavan, V. & Read, J. (2010). Hearing voices and listening to what they say: The importance of voice content in understanding and working with distressing voices. *Journal of Nervous & Mental Disease*, *198*, 201–205.
- Bebbington, P. (2009). Childhood sexual abuse and psychosis: Aetiology and mechanisms. *Epidemiologia e Psichiatria Sociale*, *4*, 284–293.
- Bentall, R. (2009). *Doctoring the Mind: Why Psychiatric Treatments Fail*. London: Penguin.
- Bentall, R. & Slade, P. (1985a). Reliability of a scale measuring disposition towards hallucination. *Personality and Individual Differences*, *6*, 527–529.
- Bentall, R. & Slade, P. (1985b). Reality testing and auditory hallucinations: A signal detection analysis. *British Journal of Clinical Psychology*, *24*, 159–169.
- Boyd-Ritsher, R., Lucksted, A., Otilingam, P., & Grajales, M. (2004). Hearing voices: explanations and implications. *Psychiatric Rehabilitation Journal*, *27*, 219–227.
- Caspi, A., Moffit, T., Cannon, M., McClay, J., Murray, R., Harrington, H., et al. (2005). Moderation of the effect of adolescent-onset cannabis use on adult psychosis by a functional polymorphism in the catechol-O-methyltransferase gene: Longitudinal evidence of a gene × environment interaction. *Biological Psychiatry*, *57*, 1117–1127.
- Dhossche, D., Ferdinand, R., van der Ende, J., Hofstra, M., & Verhulst, F. (2002). Diagnostic outcome of self-reported hallucinations in a community sample of adolescents. *Psychological Medicine*, *32*, 619–627.
- Dillon, J. (2010). The tale of an ordinary little girl. *Psychosis: Psychological, Social and Integrative Approaches*, *2*, 79–83.
- Escher, S., Delespaul, P., Romme, M., Buiks, A., & van Os, J. (2003). Coping defence and depression in adolescents hearing voices. *Journal of Mental Health*, *12*, 91–99.
- Geekie, J. & Read, J. (2009). *Making Sense of Madness: Contesting the Meaning of Schizophrenia*. London: Routledge.
- Geekie, J., Randal, P., Lampshire, D. & Read, J. (Eds.) (in press). *Experiencing Psychosis: Personal and Professional Perspectives*. London: Routledge.
- Geekie, J., Randal, P., Lampshire, D. & Read, J. (Eds.) (in press).
- Goldstein, J. & Lewine, R. (2000). Overview of the sex differences in schizophrenia. In D. Castle, J. McGrath, & J. Kulkarni (Eds.), *Women and Schizophrenia* (pp. 57–68). Cambridge, UK: Cambridge University Press.
- Grimby, A. (1993). Bereavement among elderly people: Grief reactions, post-bereavement hallucinations and quality of life. *Acta Psychiatrica Scandinavica*, *87*, 72–80.
- Hanssen, M., Bijl, R., Vollebergh, W., & Van Os, J. (2003). Self-reported psychotic experiences in the general population: A valid screening tool for DSM-III-R psychotic disorders? *Acta Psychiatrica Scandinavica*, *107*, 369–377.
- Intervoice. (2010). Making Sense of Voices. Retrieved from www.intervoiceonline.org
- Jarvik, M. (1970). Drugs, hallucinations and memory. In W. Keup W (Ed.), *Origin and Mechanisms of Hallucination* (pp. 271–301). New York: Wiley.

- Jocano, F. (1971). Varieties of supernatural experiences among Filipino peasants: Hallucination or idiom of cultural cognition? *Transcultural Psychiatry Research Review*, 8, 43–45.
- Johns, L., Hemsley, D., & Kuipers, E. (2002). A comparison of auditory hallucinations in a psychiatric and non-psychiatric group. *British Journal of Clinical Psychology*, 41, 81–86.
- Johns, L., Nazroo, J., Bebbington, P., & Kuipers, E. (1998). Occurrence of hallucinations in a community sample. *Schizophrenia Research*, 29, 23.
- Kilcommons, A. & Morrison, A. (2005). Relationships between trauma and psychosis: An exploration of cognitive and dissociative factors. *Acta Psychiatrica Scandinavica*, 112, 351–359.
- Kingdon, D. & Turkington, D. (2005). *Cognitive Therapy of Schizophrenia*. New York: Guilford Press.
- Larkin, W. & Morrison, A. (Eds.). (2006). *Trauma and Psychosis: New Directions for Theory and Therapy*. London: Routledge.
- Lataster, T., van Os, J., Drukker, M., Henquet, C., Feron, F., Gunther, N., et al. (2006). Childhood victimisation and developmental expression of non-clinical delusional ideation and hallucinatory experiences. *Social Psychiatry and Psychiatric Epidemiology*, 41, 423–428.
- Leuder, I. & Thomas, P. (1996). Verbal hallucinations or hearing voices: What does the experience signify? *Journal of Mental Health*, 5, 215–218.
- Leudar, I. & Thomas, P. (2000). *Voices of Reason, Voices of Insanity: Studies of Verbal Hallucinations*. London: Routledge.
- Lieber, M. (1996). Inner voices: Distinguishing transcendent and pathological characteristics. *Journal of Transpersonal Psychology*, 28, 1–30.
- Millham, A. & Easton, S. (1998). Prevalence of auditory hallucinations in nurses in mental health. *Journal of Psychiatric and Mental Health Nursing*, 5, 95–99.
- Morrison, A., Renton, J., Dunn, H., Williams, S., & Bentall, R. (2003). *Cognitive Therapy for Psychosis: A Formulation-Based Approach*. London: Psychology Press.
- Murphy, J., Shevlin, M., Adamson, G., & Houston, J. (2010). Positive psychosis symptom structure in the general population: Assessing dimensional consistency and continuity from “pathology” to “normality” *Psychosis: Psychological, Social and Integrative Approaches*, 2, 200–210.
- Offen, L., Waller, G., & Thomas, G. (2003). Is reported childhood sexual abuse associated with the psychopathological characteristics of patients who experience auditory hallucinations? *Child Abuse & Neglect*, 27, 919–927.
- Ohayon, M. (2000). Prevalence of hallucinations and their pathological associations in the general population. *Psychiatry Research*, 97, 153–164.
- Posey, T. & Losch, M. (1983). Auditory hallucinations of hearing voices in 375 normal subjects. *Imagination, Cognition, and Personality*, 2, 99–113.
- Read, J. (2004a). Does ‘schizophrenia’ exist? Reliability and validity. In J. Read, L. Mosher, & R. Bentall (Eds.), *Models of Madness: Psychological Social and Biological Approaches to Schizophrenia* (pp. 43–56). London: Routledge.
- Read, J. (2004b). Poverty, ethnicity and gender. In J. Read, L. Mosher, & R. Bentall (Eds.), *Models of Madness: Psychological Social and Biological Approaches to Schizophrenia* (pp. 161–194). London: Routledge.
- Read, J. (2007). Why promulgating biological ideology increases prejudice against people labelled “schizophrenic”. *Australian Psychologist*, 42, 118–128.
- Read, J., Bentall, R., & Fosse, R. (2009). Time to abandon the bio-bio-bio model of psychosis: Exploring the epigenetic and psychological mechanisms by which adverse life events lead to psychotic symptoms. *Epidemiologia e Psichiatria Sociale*, 4, 299–310.
- Read, J., Agar, K., Argyle, N., & Aderhold, V. (2003). Sexual and physical abuse during childhood and adulthood as predictors of hallucinations, delusions and thought disorder. *Psychology & Psychotherapy: Theory, Research and Practice*, 76, 11–22.
- Read, J. & Harre, N. (2001). The role of biological and genetic causal beliefs in the stigmatisation of ‘mental patients’. *Journal of Mental Health*, 10, 223–235.
- Read, J., Haslam, N., Sayce, L., & Davies, E. (2006). Prejudice and schizophrenia: A review of the ‘mental illness is an illness like any other’ approach. *Acta Psychiatrica Scandinavica*, 114, 303–318.
- Read, J., Perry, B., Moskowitz, A., & Connolly, J. (2001). The contribution of early traumatic events to schizophrenia in some patients: A Traumagenic Neurodevelopmental model’. *Psychiatry: Interpersonal and Biological Processes*, 64, 319–345.
- Read, J., van Os, J., Morrison, A., & Ross, C. (2005). Childhood trauma, psychosis and schizophrenia: A literature review with theoretical and clinical implications. *Acta Psychiatrica Scandinavica*, 112, 330–350.
- Rees, W. (1971). The hallucinations of widowhood. *British Medical Journal*, 210, 37–41.
- Romme, M. & Escher, S. (1989). Hearing voices. *Schizophrenia Bulletin*, 15, 209–216.
- Romme, E., Escher, S., Dillon, J., Corstens, D., & Morris, M. (Eds.). (2009). *Living with Voices: 50 Stories of Recovery*. Ross., UK: PCCS Books.

- Shevlin, M., Dorahy, M., & Adamson, G. (2007). Childhood traumas and hallucinations: An analysis of the National Comorbidity Survey. *Journal of Psychiatric Research, 41*, 222–228.
- Sidgwick, H., Johnson, A., Myers, F., Podmore, F., & Sidgwick, E. (1894). Report of the census of hallucinations. *Proceedings of the Society for Psychical Research 26*, 259–394.
- Sommer, I., Daalman, K., Rietkerk, T., Diederens, K., Bakker, S., Wijkstra, J., et al. (2010). Healthy individuals with auditory verbal hallucinations; Who are they? Psychiatric assessments of a selected sample of 103 subjects. *Schizophrenia Bulletin, 36*, 633–641.
- Spitzer, C., Klauer, T., Grabe, H. J., Lucht, M., Stieglitz, R., Schneider, W., et al. (2003). Gender differences in dissociation. *Psychopathology, 36*, 65–70.
- Taitimu, M. (2008). *Standing at the Crossroads: Maori Understandings of Psychosis*. Unpublished Doctoral Thesis. University of Auckland.
- Tien, A. (1991). Distributions of hallucinations in the population. *Social Psychiatry and Psychiatric Epidemiology, 26*, 287–292.
- van Os, J., Hanssen, M., Bijl, R., & Ravelli, A. (2000). Straus (1969) revisited: A psychosis continuum in the general population? *Schizophrenia Research, 45*, 11–20.
- van Os, J., Linscott, R., Myin-Germeys, I., Delespaul, P., & Krabbendam, L. (2009). A systematic review and meta-analysis of the psychosis continuum: Evidence for a psychosis proneness-persistence-impairment model of psychotic disorder. *Psychological Medicine, 39*, 179–195.
- Varese, P., Udachina, A., Myin-Germeys, I., Oorschot, M., & Bentall, R. (2011). The relationship between dissociation and auditory verbal hallucinations in the folow of daily life of patients with psychosis. *Psychosis: Psychological, Social and Integrative Approaches, 3*, 14–28.
- Verdoux, H., Maurice-Tison, S., Gay, B., van Os, J., Salamon, R., & Bourgeois, M. (1998). A survey of delusional ideation in primary-care patients. *Psychological Medicine 28*, 127–134.
- Watkins, J. (1998). *Hearing Voices: A Common Human Experience*. Melbourne: Hill of Content Publishing.
- West, D. (1948). A mass observation questionnaire on hallucinations. *Journal of the Society for Psychical Research, 34*, 187–196.
- Young, H., Bentall, R., Slade, P., & Dewey, M. (1986). Disposition towards hallucination, gender and EPQ scores: A brief report. *Personality and Individual Differences, 7*, 247–249.