

Chapter 5

HALLUCINATIONS

Perception is the process of converting physical stimulation, such as light waves arriving at the eye, or airwaves arriving at the ear, into psychological information.

Hallucinations are **false sensory perceptions** – that is, perceptions in the absence of external stimuli – i.e., hearing voices or seeing people when no one else is present.

Hallucinations may result in secondary delusions – that is, they may lead in inaccurate “explanations” of what is happening.

“Hallucinations” in healthy people

Similar phenomena may be experienced in the absence of mental disorder. Such experiences have been recorded over hundreds of years.

Not to offend anyone – but the religious traditions describe similar phenomena.

The hearing of a family member’s voice when separated from them is not uncommon among recently bereaved people and those lost in the wilderness. Sigmund Freud, the father of psychoanalysis wrote, “During the days when I was living alone in a foreign city....I quite often heard my name suddenly called by an unmistakable and beloved voice....” In such circumstances being alone and wishing to be with loved individuals appears to have greater explanatory power than supernatural factors and mental disorders.

Mahatma Gandhi relied on an “inner voice” for guidance. Toward the end of his life the voice said, “You are on the right track, move neither to your left, nor right, but keep to the straight and narrow.” Other people of great resolve have described similar “inner voices”.

Healthy, ordinary individuals may hear voices. Professor Henry Sidgewick conducted the “International Census of Waking Hallucinations in the Sane”, in the 1890s. Seventeen thousand people from England, Russia and Brazil were surveyed. Nearly 10% reported they had experienced an unexplained perception; 2.9% of the total reported having heard a voice. A recent review of publications about “voice-hearing” by healthy individuals was frustrated by the different definitions employed and the very wide ranges reported, but found a median of 13.2% (Beavan et al, 2011).

A recent study of healthy 12-19 year olds, in Ireland, found auditory hallucinations in 13.7%, and visual hallucinations in 13.1% (Dolphin et al, 2015).

Hallucinations, usually of the name being called, are sometimes heard by healthy people as they pass from waking to sleeping (hypnogogic) and from sleeping to waking (hypnopompic hallucinations).

Thus, healthy people may, from time to time, hear voices. Care has been taken in these paragraphs to avoid calling these experiences, hallucinations - but these experiences do satisfy the technical definition.

Briefly, there are usually differences between the voices heard by healthy individuals and the hallucinations of those with mental disorders. In healthy individuals, the voice is usually as if from one person, speaking comprehensibly, in a helpful and comforting manner. Auditory hallucinations in mental disorders, in contrast, may involve more than one voice, sometimes arguing, sometimes commenting about the patient, frequently making little sense, often in a threatening or frightening manner.

Hallucinations associated with non-mental disorder conditions

Epilepsy may feature hallucinations. Frederic Chopin experienced hallucinatory episodes throughout his life – possibly the result of epilepsy (Vazquez & Branas, 2011).

Charles Bonnet syndrome is the experience of nonthreatening visual hallucinations experienced by patients who free of neurological and psychiatric disorder, but who have significant visual impairment secondary to ocular disease (Jackson & Madge, 2011).

Other forms of **sensory deprivation and fatigue** may also lead to hallucinations.

Hallucinations occur in **Neurocognitive disorders**. Among people with Parkinson's disease and psychosis, 92.5% experienced hallucinations – most commonly, visual, and there are rare cases of olfactory hallucinations (Amar et al, 2014). In Parkinson's and Alzheimer's disease, and Dementia with Lewy bodies, the frequency of visual hallucinations is significantly associated with the density of Lewy bodies, and in Parkinson's the frequency of visual hallucinations is also significantly associated with the density of plaques and tangles (Jacobson et al, 2014).

Hallucinations may occur with many **other brain disorders** including tumour, multiple sclerosis, and the very recently described Autoimmune Encephalitis (see Chap 36) – in these organic conditions, visual hallucinations are the most common.

Hallucinations and medication/drugs

Hallucinations occur with some medically prescribed medications, for example, the anaesthetic drug ketamine, and some drugs used in the treatment of Parkinson's disease.

Illegal drug use is commonly motivated by the desire to experience hallucinations and illusions (visual, auditory, somatic, tactile; Cruz & Dominguez, 2011); but frequently descends into psychosis.

Three models of psychosis (Dopamine, Glutamate and Serotonin) have been proposed, based on the triggering substance (Rolland et al, 2014).

Hallucinations – three models		
Pharmacological trigger		Molecular effects
1. Dopamine Model	Psychostimulants: cocaine, amphetamine	Increased dopamine transmission, and hyperactivation of dopamine D2 receptor.
2. Glutamate Model	‘Dissociative anaesthetics’: phencyclidine (PCP), ketamine	Blockade of glutamate NMDA receptor
3. Serotonin Model	Psychedelics: lysergic diethylamid (LSD), psilocybin	Stimulation of the serotonergic 5HT2A receptor

Table. Hallucinations – three potential neurobiological mechanisms, based on the production of hallucinations by pharmacological triggers.

Hallucinations in mental disorders

Pathological hallucinations take many forms.

Auditory hallucinations are usually of voices. However “non-verbal” auditory hallucinations do occur, and include clicking and mechanical noises, muttering or mumbling, and music. (In musical hallucinations the patient often hears a complete piece of music.) Auditory hallucinations are most common in psychotic disorders such as schizophrenia, but can occur in other disorders including mood disorders, organic mental disorders and of course, drug induced states.

In the case of verbal auditory hallucinations (voices), these may be heard inside or outside the head. (Voices inside the head are associated with better patient insight/understanding of their condition, than voices hear outside the head (Lera et al, 2011).)

One or more different voice may be heard. In the case of more than one, these can be heard sequentially or simultaneously. Two or more voices may conduct a conversation between themselves. A voice or voices may speak to the patient or about the patient. They may comment on his or her thoughts or actions. Voices are usually heard as speaking, but they may be heard singing or shouting. Voices rarely speak in complete sentences - they usually say a few disjointed words in brief utterances. While the content of auditory hallucinations may be understood by the patient, frequently it is not.

The patient may recognize the voice because it has been heard before, either first hand or via the media. Voices usually do not introduce themselves, e.g., “This is God speaking”, is almost never heard. It may be that the patient has never heard the voice before, but nevertheless “knows” who is speaking. It is often God, Jesus, Satan, a member of a covert spy agency, criminals or the leader of a bikie gang. Voices can be from relatively benign sources such as a former next-door neighbour, but they are almost never from kindly disposed individuals such as a favourite early school teacher, Mary Poppins or Peter the Rabbit.

A photograph of a handwritten note on lined paper. The text is written in cursive and reads: "Why are you talking to me at night. Leave me alone!"

Illustration. This note was pushed under the office door of the author, by a known patient. The patient began to hallucinate the author’s voice at night. While there had been a good patient-doctor relationship, the last line “Leave me alone!” suggests irritation. It is easy to understand how uninvited, disturbing voices may be resented. On the other hand, voices (even insulting ones) may become “company” for the isolated individual, in which case they may become welcome.

Voices may instruct or command the patient to perform an act. Usually this is a trivial act such as making a cup of tea, but it may be to injure him/herself or others. Importantly, patients do not automatically comply with command hallucinations. When a command is first given, the words are usually spoken, perhaps with a hint of insistence. For some patients, when command hallucinations are ignored, there are no consequences, the command is not repeated, or may be repeated essentially in the same relatively benign manner. In these conditions the patient is able to continue with his or her activities. In other cases, however, when commands are ignored, they are repeated with much insistence, perhaps shouted with abuse. Generally, patients do not like complying with command hallucinations, perhaps because to do so threatens their sense of autonomy. However, it is very distressing to be subjected to repeated, raised, abusive voices. A common response of patients is to comply with the trivial commands such as, “Look out of the window”, and to resist the uncomfortable or dangerous ones such as, “Jump out of the window”. Command hallucinations are not a common factor in homicide.



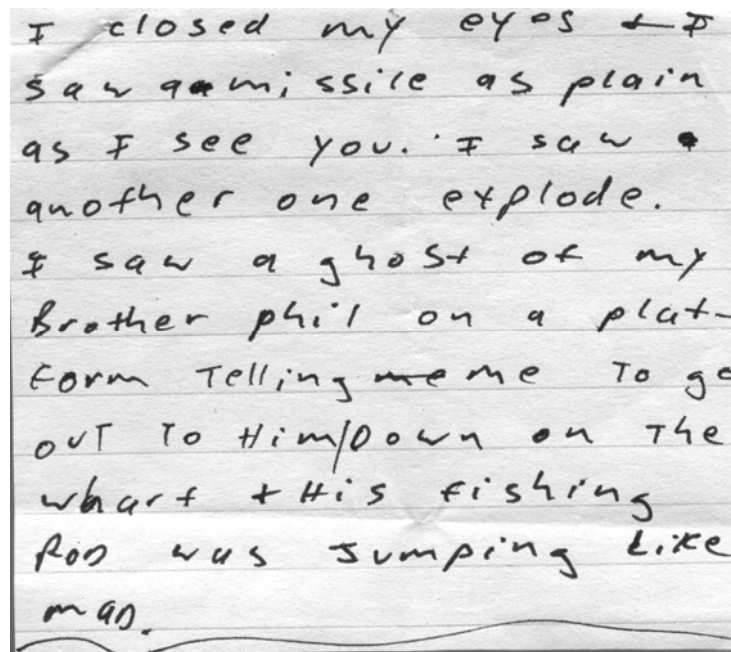
Illustration. In forty years in clinical practice, the author has known only two or three cases in which a person with hallucinations telling him/her to seriously injure him/herself has done so. This is one; a man with schizophrenia was instructed to chop his arm off.

Verbal hallucinations may be a feature of elevated or depressed mood, in which case the adjective 'psychotic' is attached to mania or depression. In the case of elevated mood the hallucination may assert the patient has exceptional beauty, intelligence or other qualities: "We know you're the king". In the case of depressed mood the hallucinations may denigrate, "You rat. You should die". They may suggest or command suicide. The patient may comply, but usually resists.

A recent study (Woods et al, 2015) studied people who experienced voices (various psychiatric disorders and some healthy individuals). 66% "reported bodily sensations while they heard voices, and these sensations were with experiences of abusive or violent voices". [This topic needs further examination]. These authors also reported that around 1/3 of individuals positive emotions, and around another 1/3 reported neutral emotions associated with voices.

Visual hallucinations may occur in a range of disorders. They occur more frequently than auditory hallucinations in people with neurological disorders. In some types of **epilepsy** visual hallucinations may form complex scenes such as two trucks and a rickshaw driving through the room. In migraine, a common disorder of people who do not have a mental disorder, visual hallucinations may have the form of circles or lines in space across the visual field.

In **schizophrenia**, visual hallucinations occur in about 27% of patients (Cachia et al, 2015) - they are often indistinct or distinct figures, often humanoid, standing to one side of the patient.



I closed my eyes & I saw a missile as plain as I see you. I saw another one explode. I saw a ghost of my brother phil on a platform telling me to go out to him down on the wharf & his fishing rod was jumping like mad.

Illustration. This note was written by a man with schizophrenia. It tells of seeing a visual hallucination of “a missile as plain as I see you”. In schizophrenia, detailed visual hallucinations such as this are much less common than auditory hallucinations.

Tactile hallucinations are the experience of being touched or of a crawling sensation under the skin. These are common in drug withdrawal states, but may occur in schizophrenia.

Somatic hallucinations are the sensation of things happening inside the body, such as organs moving from one region of the body to another. These are rare, but may occur in schizophrenia.

Gustatory/Olfactory hallucinations, the hallucinations of taste and smell, are more common in neurological disorders, particularly epilepsy, but may occur in schizophrenia. A study by Langdon et al (2011) found olfactory hallucinations in 15% of patients with schizophrenia, and some patients with social anxiety and depression. The authors suggested that people are more reluctant to talk about smells than voices, and that this type of hallucination may be more common than is generally accepted.

Autoscopic (self see) hallucinations are the visual experience of the subject/patient seeing an image of him/herself (or parts of him/herself). This is a rare symptom which takes many forms, and is mentioned only as a curiosity – no student will fail an exam through unfamiliarity with autoscopic hallucinations.

Brugger et al (1997) reviewed the literature and developed a classification containing 6 types: 1) only parts of a 'double' are seen (e.g., face, torso), 2) the 'double' is complete (this is the "*doppelganger*" which appears in folklore and literature), 3) the feeling of a presence (no double is actually "seen"), 4) out-of-body experience (the individual is outside and looks back at their own body), 5) negative autoscopia (the individual is unable to see their own body either when looked at directly, or in a mirror), and 6) inner (internal) autoscopia (the inner organs are seen outside the body).

Autoscopic hallucinations occur more frequently in neurological disorders (Denning & Berrios, 1994), but can occur in psychotic disorders and stressful situations.

Illusions are perceptions that are associated with an outside stimulus, but the stimulus is wrongly interpreted. For example, lapping water may be heard as laughter. Technically, illusions are not hallucinations, because they are associated with a stimulus. Illusions are frequently visual, and they are usually the result of a neurological disorder. The condition which most commonly causes illusions is delirium tremens (DTs), the disturbed state which can complicate alcohol withdrawal. Objects such as creases in bed covers may be perceived as snakes, insects or other animals. Folk law says that people in DTs see "pink elephants". In clinical practice, however, small organisms are more commonly "seen".

Other perceptual difficulties include heightened and changed perceptions. By heightened perceptions is meant sounds seem unnaturally clear, loud or intense, colours appear more brilliant or beautiful, or details of the environment seem to stand out in a particularly interesting way. By changed perceptions is meant changes are perceived in the shape or size of people and inanimate objects in the environment. Changes may continue while the patient watches. These phenomena may occur in psychotic disorders; on occasions psychotic patients may be difficult to engage in conversation because they are distracted by continuously changing perceptions. Patients may spend long periods looking in a mirror, watching their own face change. Heightened and changed perceptions may occur in other disorders, including the non-psychotic, anxiety disorders.

Summary: Circumstances and disorders associated with hallucinations.

"Normal Hallucinations"

- Religious experiences, often in group settings
- Sleep deprivation, voluntary or forced
- Sensory deprivation (Charles Bonnet Syndrome)
- Bereavement
- Hypnogogic and hypnopompic

Drug Induced

- Illegal drugs, LSD, volatile substances
- Legal drugs, Ketamine, Parkinson's disease treatments

Drug Withdrawal

Alcohol – these are generally illusions rather than hallucinations

Neurological Disorders

Temporal lobe epilepsy

Parkinson's and Alzheimer's diseases

Dementia with Lewy bodies

Various others, uncommon: multiple sclerosis, brain tumour

Mental Disorders

Schizophrenia, usually voices, but other types also

Mood elevation (mania) not common

Mood depression, in severe forms only.

Table. Circumstances and disorders in which hallucinations may be experienced.

Neuroimaging

Hallucinations in schizophrenia have been studied using a range of neuroimaging techniques.

Not surprisingly, both the Wernicke (left superior temporal gyrus; STG) and the Broca (left inferior frontal gyrus; IFG) speech areas have been implicated. In groups of people with schizophrenia who experience auditory hallucinations, a significant reduction in the volume of the left STG has been demonstrated (Sun et al, 2009). Also, significantly increased activity has been demonstrated in left STG, IFG, the anterior cingulate cortex, and the parahippocampal gyrus (Allen et al, 2008; Northoff & Quin, 2011).

Recent theory is that the auditory hallucinations in schizophrenia are due to disruption of connections between the frontal and temporo-parietal language areas. Using diffusion tensor imaging (DTI) and magnetic transfer imaging (MTI), de Weijer et al (2011) studied the arcuate fasciculus and 3 other white matter tracts (cortical spinal tract, cingulum, and uncinate fasciculus) in people with schizophrenia and severe hallucinations. Consistent with theory, they found abnormalities in all fibre tracts, and a correlation with both DTI and MTI findings in the arcuate fasciculi and the severity of positive symptoms.

The following illustrations are presented as a reminder of the anatomy of these tracts.

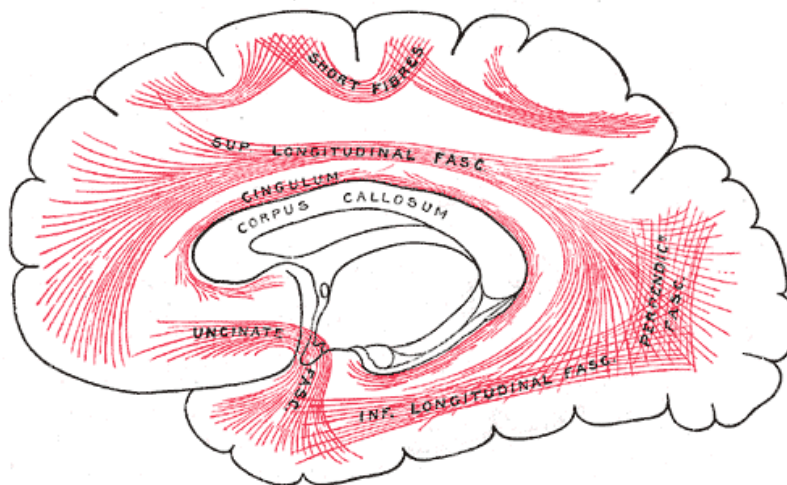


Illustration: the superior longitudinal fasciculus (of which the arcuate fasciculus is an anterior component), the cingulum, and the uncinate fasciculus.

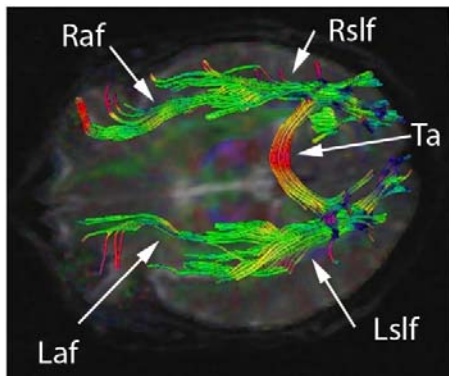


Illustration: This diffusion tensor imaging (DTI) image (generously provided for public use by Aaron G. Filler, MD, PhD) shows the right and left arcuate fasciculus (Raf & Laf), and the right and left superior longitudinal fasciculus (Rslf & Lslf) as separate entities (they can be conceptualized as continuous).

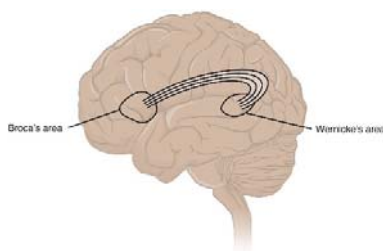


Illustration: An older lateral view of the arcuate fasciculus, bi-directionally connecting Broca's and Wernicke's speech centres.

A recent meta-analysis of functional imaging studies of people with schizophrenia and auditory hallucinations (Geoffroy et al, 2014) confirmed disruptions of the white matter integrity in the left arcuate fasciculus.

Horga et al (2011) studied first-presentation, drug-free patients with schizophrenia. Using positron emission tomography (PET), they compared patients with commenting auditory hallucinations to patients without auditory hallucinations. Patients with auditory hallucinations demonstrated significantly increased metabolic rates in the left superior and middle temporal cortices, bilateral medial frontal cortex and the left caudate nucleus. In addition, there was decreased activity in the hippocampal-parahippocampal, cerebellar and parietal cortices during hallucinations.

This work suggests that failure to deactivate the temporal cortex allows increased spontaneous activity, and auditory hallucinations. It is possible that decreased activity in hippocampus-parahippocampal gyrus and possibly the cerebellum allows the increased spontaneous activity of the temporal cortex. Horga et al (2011) drew attention to a possible central role for the caudate, in auditory hallucinations.

Recent work (Amad et al, 2013) suggests abnormal connectivity patterns, involving the hippocampus, in people with schizophrenia and visual hallucinations.

Whitford et al (2014) studied the brains of people with schizophrenia in a similar manner to de Weijer et al (2011), above. They used Diffusion Tensor tractography to examine the 'cingulum bundle' (labelled the 'cingulate' in the line drawing, above). The cingulum is a bundle of white matter fibres in the cingulate gyrus, extending from the subgenual region of the anterior cingulate around the corpus callosum and on to the parahippocampal gyrus and uncus (raised cortex overlying the amygdala) of the temporal lobe. It sends off extensions and functions as a communications system between components of the (grey matter) limbic system.

Whitford et al (2014) wished to substantiate that the cingulate bundle is, in fact, a series of sub-connections, and to identify which, if any are faulty in schizophrenia. They identified 5 (at least) sub-connections and one of these, which connects the rostral (front) and caudal (back) regions of the anterior cingulate gyrus was abnormally constructed (Fractional Anisotropy (FA)) in people experiencing psychosis (delusions and hallucinations). They also identified a separate sub-connection which was abnormally constructed in people experiencing negative symptoms of schizophrenia (this will be further discussed in Chapter 7).

The primary **auditory cortex** is a bilateral region located on the upper sides of the temporal lobes (within the lateral sulcus) and extending into the lateral fissure of the temporal lobe – in old terminology, in Brodmann areas 41, 42 and 22. A central region (within the lateral sulcus) is termed Herschel's gyrus.

An interhemispheric pathway which connects the bilateral auditory areas has a crucial role in the processing of acoustic stimuli.

A recent study (Wigand et al, 2015) of this interhemispheric pathway in schizophrenia patients with verbal hallucinations concluded that this symptom was the result of microstructural changes in the interhemispheric auditory pathway.

When patients with **Alzheimer's disease**, with and without auditory hallucinations are compared using imaging techniques (Blanc et al, 2014) – the right anterior insula was identified as a region involved in hallucinations.

Case histories

Case history: 1

Cynthia Campbell was 17 years of age and attended a local Catholic school. She lived with her parents and 15 year old sister, Melissa, in a middle class suburb of a large city. Her only other sibling, Libby, was older, in the Army, and stationed overseas. Cynthia's mother was a dentist and her father was a fireman.

Cynthia had been distressed. She was about to leave high school but didn't have a clear plan for the future. She had found schoolwork difficult, and although she had daydreamed about becoming a teacher and helping children like herself, who had struggled, she was adamant that she would not go to university. She liked the idea of a job in a plant nursery. That would mean a part-time Technical College course, but she thought she could probably manage. She knew some sort of qualification was essential for a comfortable working life. The problem was that jobs were few and far between. If all else failed, she could join the Army, like Libby. Although, her father had said he didn't want her to go in that direction.

She had just broken up with Sam, an 18 year old who was attending a different school. She had loved him, he was her first intimate lover, but he had found someone else.

When she was going out with Sam she started smoking some marihuana at parties on Saturday nights. On one occasion she took one "speed" (amphetamine/stimulant) tablet. Since the break-up she had sought a supplier of marihuana and had smoked after school two or three times a week.

A week ago, when she was smoking at her girl-friends house she heard her father's voice. She quickly stubbed her "joint" out, grabbed Emily's joint and stubbed that out, pushed the ashtray under the bed, and pretended to be reading a magazine. Emily looked at her quizzically, "What's up your knickers?" she asked.

“Shhh. My father’s out there,” Cynthia replied, flapping her magazine to disperse the residual smoke. For a moment, Emily was startled,

“How do you know?” she whispered.

It soon became clear that Mr. Campbell was not in or near the house.

“I just thought I heard his voice,” said Cynthia, making an effort to sound nonchalant.

A week later, while the family was having dinner, “That’s Libby.... She must be home!” Cynthia interrupted, dropping her cutlery and standing up from the table. She turned as if to run out of the room, but froze, standing, listening.

“I didn’t hear anything,” said her father.

“No. It couldn’t be,” said her mother. “She didn’t say she was coming.”

“Yes. Yes it is,” said Cynthia. She continued to listen.

Then they all went quiet and listened. Only Cynthia heard something.

There was a common sense of alarm. There was something wrong. Melissa was frightened and cowered down into her chair. Her parents stood up, not quickly, as when faced by an attacker, but questioningly. Cynthia’s expression changed from surprise and pleasure to bewilderment, through some level of comprehension to terror.

“What’s happening! What’s happening!” she wailed, and began crying. Her parents took her from the table to the sofa and sat on either side.

Cynthia’s experience was of a voice from outside her head, which she heard. She could not say if it was a male or a female voice, but she heard her name clearly called. There were some other words and short sentences, most of which were muffled. What she heard did not seem to make much sense. As when she had heard her father’s voice at Emily’s house, the experience was totally convincing, but once it stopped Cynthia could agree, she had been mistaken. That is, she lacked insight while she was hallucinating, but she gained insight into her situation when the hallucination stopped and she was able to check with her companions.

Learning that this was the second of these events, and distressed by her distress, Cynthia’s parents insisted that she stay at home and rest the next day, which was Saturday. That morning she saw a palomino horse walk through the kitchen wall, turn left and walk down the hall before disappearing. She was calm and interested in the sight while this was happening, but terrified when it was over. She sensed that she had lost control over her mind and her environment.

Cynthia’s palomino horse experience startled her parents. They immediately arranged for her to see a general practitioner. They thought the roots of the problem may have been the break-up of her relationship with Sam and the pressure she was under to make decisions about what she wanted to do in life. Secretly, her father thought she could be pregnant. The general practitioner thought schizophrenia was the most likely diagnosis. A possibility which avoided them all was drug induced hallucinations.

A series of investigations were performed, including an electroencephalogram (EEG; attaching electrodes to the head to measure the electrical activity of the brain). The EEG

revealed Cynthia was suffering a form of epilepsy. She was treated with medication for epilepsy and advised to avoid illegal drug. The hallucinations ceased. Epilepsy is associated with a physical brain abnormality, but can be worsened by emotional stress and the use of certain drugs, particularly mind-altering substances.

Case history: 2

Michael Wells was a twice married chef of 29 years of age. He lived with Holly, his second wife and her child from another relationship, in an inner Sydney tenement house. He had a son, Ned, from his first marriage; he rarely saw the boy as his ex-wife had moved interstate. Michael had a good job at a chef in a restaurant near his home.

“You’re not getting sick again, are you?” asked Bob, without smiling, as he pinned another order on the board.

“Absolutely not! Why? What’s the problem?”

Five years ago Michael had suffered an attack of schizophrenia. He had the delusion that Ned was going to be sold by his ex-wife, and hallucinations of voices and sirens. The most disabling symptom, however, had been his inability to think clearly. His thoughts kept slipping off track. He could not orchestrate his cooking, he could not get everything coming together and ready to serve at the same time. He would start thinking about one dish and then be distracted by another, and then another, and in the end, they would all be spoiled. Bob had very kindly kept Michael’s job open for three months, till he had recovered and was able to return to work. But now there was a note of apprehension and irritation in his voice, which suggested he would be reluctant to do the same again.

“You’re slow today. We’ll talk about it later,” Bob said over his shoulder, as he went back out to smile and greet and reassure people that their meals were well in hand.

Michael shook his head as if to clear it of sleep, and the look of concentration on his face increased. He pushed on, “Fuck off, fuck off, fuck off, fuck off...” he muttered, like a muted machine gun, to himself, from time to time. But not when Bob was in the kitchen. Michael’s output increased and the promised discussion did not eventuate.

He got an earlier appointment with his psychiatrist.

“I need to go back to the higher dose,” he said.

One month earlier, Michael had wanted to stop his medication. He discussed this with his psychiatrist. He made the point that he had been well for five years and that his medication had side effects: it reduced his sexual drive and made him tired. His doctor said that he was still at risk of a recurrence of acute schizophrenia, that things were going well for him, and that his relationship and his job could be at risk if he got sick again. In the end they decided it would be reasonable, in the first instance, to reduce his medication by half, and to reassess the situation in a month or so.

Michael found that he had felt much better on the reduced dose. He had more energy and he felt as if he was making progress. There had been no delusions and his thinking was still clear. The auditory hallucinations, however, had returned. He had two voices, both male. Sometimes they seemed to be outside his head, sometimes they seemed to be inside. It was similar to when he was sick, and he had known they were hallucinations from the day they came back, a week ago. Although he knew they were illness symptoms and not “real”, it was hard not to listen to them, and they distracted him from what he was doing. They often commented on what he was doing and told him what to do. They sometimes got loud, insistent and abusive if he failed to comply.

“He’s separating the egg white,” one voice might say, when he was separating egg white for a sweet. Michael would find himself listening, to see if they were going to say what he should do next. It was comforting, in a way, they were company, even flattering. But then,

“Add a teaspoon of water,” they might say. If a teaspoon of water was not a good idea, and he failed to comply, the voices, which usually spoke separately, might speak in unison.

“Hey! Add a teaspoon of water!”

If he still failed to comply, the voices might shout (sometimes Michael was concerned that folks sitting in the restaurant would hear) and add insulting words.

“ADD SOME WATER, YOU FUCKING PRICK!”

On occasions, even though he knew they were hallucinations, he would comply, just to shut them up. He resisted if their commands would ruin the meal, and thereby, his reputation.

The Psychiatrist explained that staying on the half dose of medicine had prevented a full relapse with loss of insight, but that there was now an immediate risk of a full relapse, which would probably mean further hospitalization. This warning was unnecessary. Michael’s recognized that his reduced productivity was threatening his job and returned to the higher dose of medication. The hallucinations quieted, then disappeared. He never had that talk with Bob. A year later he took Holly and his stepdaughter over the border to visit Ned.

Case history: 3

Pho Robertson was a 51 year old Australian citizen who was born in Vietnam. Her husband, Bill, died of an unexpected heart attack, two months previously. She lived in a comfortable four-bedroom home in a middle class suburb of Sydney. They had two children, both now married: Janice was in the Australian Embassy in Washington and Ken was unemployed and lived to surf.

Pho, the daughter of a schoolteacher and his wife, was raised in Saigon (Ho Chi Minh City). She had a good education, learning English and French and become a teacher in her late teens. For reasons which were never clear, her parents were imprisoned and she

was exiled to a rural district. She did not see her father again; he died or was killed within a year of being imprisoned. She did not see her mother for another fifteen years.

Bill completed training as a surveyor. He found the last years boring and the thought of going directly into practice did not appeal. He joined the Army for some excitement. He was given a commission and was among the first Australian soldiers sent to Vietnam in 1967. He spent much of his time in the field, exposed to the danger of land mines and enemy fire.

Bill met Pho in a small village close to Nui Dat, the Australian task force base. She was beautiful; he was afraid. She was sad and fatalistic, but a comfort to him. In spite of his neediness, he was protective toward her. They talked of marriage, but there would be huge hurdles. Bill finished his tour of duty and came home. Although psychologically afflicted by his war experience, he volunteered for a second tour so that they could be together, at least for small amounts of time.

When he finished his second tour he came home, and Pho followed six months later. They settled in Bill's hometown, Brisbane. There were many problems. Bill's parents and siblings were not supportive. Many Australians thought Pho was Chinese or Japanese; when they learned she was Vietnamese, they behaved as if she was a communist and an enemy.

Bill and Pho were delighted when the children came along, and they could form their own complete, if somewhat socially isolated family. When the children were entering secondary school, Pho's letter writing paid off and she regained contact with her mother. Bill had built up his own surveying company, they were doing well financially, and Pho was able to get the next plane to Vietnam to visit her mother. The old lady would not leave her native land, so over the years the family went to visit her three times.

Both the children were clever at school. Both had straight black hair and looked part Asian, but neither spoke of suffering significant racial prejudice. The girl was ambitious and proud of her heritage. She went to university with the intention of joining the diplomatic service. Her life had run according to plan. The boy was less ambitious. He started taking drugs in high school and did not seek further education. He married a waitress. It was an open secret that the couple made a fair living growing marihuana, drifting from one coastal town to the next, staying one step ahead of the law.

Bill suffered posttraumatic stress disorder following the war. He felt like a weakling because Pho's experiences seemed worse than his, but she had not been damaged. Along with most other Australian Vietnam War Veterans, Bill felt betrayed by his country. They had been sent to fight and risk their lives overseas, but on return, they were criticized rather than appreciated for carrying out their orders. Then, along with others, either out of guilt or wisdom, Bill got involved in rebuilding Vietnam. Gangs would go, taking tools and materials, and build a school or orphanage or anything else they could put up in about a month.

He was buying roofing materials for a dormitory when, at fifty-five, he fell down dead in a Sydney parking lot.

Pho cried little. The children had come home for a week and she had looked after them. She was sad, had lost her appetite and had difficulty sleeping. She expected and accepted these difficulties. She did not expect to ever be happy again, or to eat or sleep well. She was in a foreign country and had lost the husband who had been her best friend, her financial supporter and only lover. But, she had not expected hallucinations.

On the night of Bill's death she did not sleep, she did not go to bed, she sat in the living room, she had his picture on the coffee table but she stared at the wall. About four in the morning she heard Bill say,

"Don't worry sweetheart... We can fix it."

For a cruel instant, she was bewildered.

"He is alive, it's a big mistake", she thought. But then, she realised that Bill was indeed dead, and thought she must have heard his ghost. Then she concluded that it must have been a dream, and she must have drifted off to sleep for a moment, without noticing.

Next afternoon, she was sitting in the same chair, staring at the wall. She glanced over at Bill's chair, and there he was in his dressing gown reading something. He raised his head and smiled back at her. He was calm and loving. He went back to his reading. She looked away, not knowing what to do, when she looked back, he was gone.

Pho heard and saw nothing of Bill in the week the children were at home. Or any other time when people were around. She only saw him twice more. One Saturday afternoon she went into their bedroom and he was having his afternoon nap on the bed. She froze. Not out of fright, but so as not to wake him. She looked at him, he was perfect in every way. There was grease on his cheek from the lawnmower. After a good long drink of looking at him she backed out of the room to let him sleep. It felt warm to have him there. When she went back half an hour later, sadly, he was gone.

The last time she saw him was a week later. She had been to the lawyer to finalize something she didn't understand about the company. As she came slowly up the drive, he was standing on the lawn. Their eyes met and his look of concentration softened and he raised his eyebrows in recognition. She drove into the garage, when she came out, he was gone.

Pho didn't believe in ghosts. Vietnamese culture is awash with various deities, but these experiences did not fit with anything she could accept. She knew little of mental disorder. In the first few weeks she did not care if she was mad or not. The day before going to the doctor, she heard Bill speak to her again.

The earth had settled on his grave. She had gone to the stone mason to talk about a headstone and was undecided about black or red granite. It was something which once done could not easily be undone. As she sat in the car, after the drive home she heard him say,

“Black or red? It’s not worth worrying about.”

She looked over to the passenger seat and the back seats, she would have liked to see him, but he wasn’t there.

“I’m going mad,” she told the doctor. “But, I like hearing his voice. I know I shouldn’t. Is there something you can do, to stop me getting worse?”

Pho was given reassurance by her doctor and seen twice a week to talk and keep working through the grieving process. The doctor later recommended Pho spend some time with a psychotherapist to look at the other losses of her life. At one point she took a small amount of sedation to help her sleep. Her hallucinations ceased without antipsychotic or antidepressant medication. Pho eventually visited her daughter in Washington, which she enjoyed greatly, and on return, she started corresponding with an American Vietnam veteran.

The hearing or seeing of a close, recently deceased friend or relative is not a mental disorder. Figures are not available, but this is a common experience. Usually these hallucinations become less frequent and cease over weeks or months. They are comforting and benign. Perhaps they have a role in helping the individual adjust to the loss. Pho was raised in social, political and military turmoil. Although she had been an adult when she lost her parents, the circumstances were still damaging. She was powerless, she did not have reliable information regarding their fate; thus her grieving for them was disrupted and protracted. She was traumatized by war. She migrated to a foreign land, peopled by another race, where she experienced prejudice. She was relatively isolated. Her main social network and support was her family. Her children left home and the vicinity. When her husband died she lost most of her human contact. While there is no clear evidence that persons with limited social supports experience more hallucinations during bereavement than those people with extensive social supports, such a finding would not be unexpected.

The grieving process is also normal and should not be confused with a depressive disorder (major depressive disorder or dysthymia). A depressive disorder may, however, develop following bereavement, and should be considered when the suffering persists for months or progressively worsens rather than improves.

References

Allen P, Laro F, McGuire P, Aleman AI The hallucinating brain: a review of structural and functional neuroimaging studies of hallucinations. *Neuroscience Biobehavior Review* 2008; 32:175-191.

Amad A, Cachia A, Gorwood P, Pins D, Delmaire C, Rolland B, Mondion M, Thomas P, Jardri R. The multimodal connectivity of the hippocampal complex in auditory and visual hallucinations. *Molecular Psychiatry* 2013 Jan 15 [Epub ahead of print]

- Amar B, Yadav R, Janardhan Reddy Y, Pal P. C clinical profile of patients with Parkinson's disease and psychosis. *Ann Indian Acad Neurol* 2014; 17: 187-192.
- Beavan V, Read J, Cartwright C. The prevalence of voice-hearers in the general population. *Journal of Mental Health* 2011; 20:281-292.
- Blanc F, Noblet V, Philippi N, et al. Right anterior insula: core region of hallucinations in cognitive neurodegenerative diseases. *PLoS One* 2014; 9: e114774.
- Brugger P, Regard M, Landis T. Illusory reduplication of one's own body: phenomenology and classification of autoscopic phenomena. *Cognitive Neuropsychiatry* 1997; 2:19-38.
- Cachia A, Amad A, Bruelin J, et al. Deviations in cortex sulcation associated with visual hallucinations in schizophrenia. *Mol Psychiatry* 2015; 20: 1101-1107.
- Cruz S, Dominguez M. Misusing volatile substances for their hallucinatory effects: a qualitative pilot study with Mexican teenagers and a pharmacological discussion of their hallucinations. *Substance Use and Misuse* 2011; 46 Suppl 1: 84-94.
- Dening T, Berrios G. Autoscopic phenomena. *British Journal of Psychiatry* 1994; 165:808-817.
- Dolphin L, Dooley B, Fitzgerald A. Prevalence and correlates of psychotic like experiences in a nationally representative community sample of adolescents in Ireland. *Schizophr Res* 2015 Sept. [Epub ahead of print].
- Geoffroy P, Houenou J, Duhamel A, et al. The arcuate fasciculus in auditory-verbal hallucinations: a meta-analysis of diffusion-tensor-imaging studies. *Schizophr Res* 2014; 159: 234-237.
- Horga G, Parellada E, Lomena F, et al. Differential brain glucose metabolic patterns in antipsychotic-naïve first-episode schizophrenia with and without auditory verbal hallucinations. *Journal of Psychiatry and Neuroscience* 2011. DOI: 10.1503/jpn.100085.
- Jackson T, Madge S. Acute Charles Bonnet syndrome secondary to eye patching. *General Hospital Psychiatry* 2011; 33:303.e1-303.e3.
- Jacobson S, Morshed T, Dugger B, et al. Plaques and tangles as well as Lewy-type alpha synucleinopathy are associated with formed visual hallucinations. *Parkinsonism Relat Disord* 2014. [Epub ahead of print]
- Langdon R, McGuire J, Stevenson R, Catts S. Clinical correlates of olfactory hallucinations in schizophrenia. *British Journal of Clinical Psychology* 2011; 50:145-163.
- Lera G, Herrero N, Gonzalez J, et al. Insight among psychotic patients with auditory hallucinations. *Journal of Clinical Psychology* 2011; 67:701-708.
- Northoff G, Quin P. How can the brain's resting state activity generate hallucination? A 'resting state hypothesis' of auditory verbal hallucinations. *Schizophrenia Research* 2011; 127:201-214.
- Rolland B, Jardri R, Amad A, et al. Pharmacology of hallucinations: several mechanisms for one single symptom. *BioMed Research International* 2014, Article ID 307106, 9 pages.
- Sun J, Maller J, Guo L, Fitzgerald P. Superior temporal gyrus volume change in schizophrenia: a review of region of interest volumetric studies. *Brain Res Rev.* 2009; 61:14-32.
- Vazquez Caruncho M, Branäs Fernandez F. The hallucinations of Frederic Chopin. *Med Humanit* 2011; 37:5-8.

- de Weijer A, Mandl R, Diederik K, et al. Microstructural alterations of the arcuate fasciculus in schizophrenia patients with frequent auditory verbal hallucinations. *Schizophrenia Research* 2011 Jun 3. [Epub ahead of print].
- Whitford T, Lee S, Oh J, et al. Localized abnormalities in the cingulum bundle in patients with schizophrenia: a Diffusion Tensor tractography study. *Neuroimage: Clinical* 2014; 5: 93-99.
- Wigand M, Kubricki M, et al. Auditory verbal hallucinations and the interhemispheric auditory pathway in chronic schizophrenia. *World Journal Biological Psychiatry* 2015; 16: 31-44.
- Woods A, Jones N, Alderson-Day B, et al. Experiences of hearing voices: analysis of a novel phenomenological survey. *Lancet Psychiatry* 2015; 2: 323-331.