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Chapter 19

# Assessment of hallucinations

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## Introduction

Although the classification of a hallucination as a 'sensory perception in the absence of sensory stimulation' (Sims, 1995) is, perhaps, one of the clearest definitions in psychiatry, it is also remarkably limited in its ability to capture fully the meaning and experience of the many perceptual distortions to which we are susceptible. To most clinicians, the distinction between hallucinations occurring in different senses, and with or without 'insight', will be familiar. This belies the fact that the experience of hallucination can entail a change to multiple realms of personal and environmental experience that are described in light of each person's personal, social, and cultural influences (Al-Issa, 1995; Thomas *et al*., 2007). These layers pervade not only the experience as described to the clinician, but also the development and emergence of perceptual change from the point where they may not even be describable or noticeable as perceptual anomalies to the a point where they are no longer just aberrant perceptions, but part of a fundamental change in the way in which the sensory world is perceived and understood (see Jaspers, 1963; Ey, 1973; Stanghellini, 2004).

One of the challenges of clinical psychology and psychiatry is to understand the lived experience of another person, which, as years of struggling with the problem of consciousness has told us, is still not even within our conceptual reach. Those wishing to understand the hallucinatory experience of another person are additionally challenged by the fact the person may be experiencing the world in a way that we cannot clearly conceive of, perhaps, by virtue of the fact that the experiences are beyond what the person has ever encountered before or what is considered to be within the possibilities of normal human experience.

Indeed, anomalous perceptions are anomalous not so much due to the fact that they occur in the absence of sensory stimulation (in this sense, we are all hallucinating to some degree owing to the constructive nature of visual perception itself) but by the fact that the perception is accompanied by other feelings, such as urgency, certainty, and vividness. Jaspers (1963, p. 66) illustrated this point when discussing hallucinations in psychosis by noting that 'hallucinations…spring up on their own as something quite new and occur simultaneously with and alongside real perceptions'. Here, he alludes to the fact that hallucinations can affect the experience of immersion in the world at such a deep level as to

share the same primitive immediacy of sensory experience but there are, of course, many ways in which a hallucinatory experience can be subjectively experienced. However, Jaspers' example illustrates why understanding the phenomenology of the experience, both in the mundane sense of 'symptoms' and the broader meaning of 'subjective experience', is critical in both clinical assessment and therapy.

This understanding will necessarily be incomplete but can be enriched by both clinical interview, grounded in the empathic quality of interpersonal rapport and focusing on narratives to 'situate particular experiences in the broader life context' (Stanghellini, 2004), and by the use of standardized assessments which attempt to quantify different aspects of the experience. A full exploration of the subtleties of the clinical interview in exploring atypical mental states is beyond the scope of this chapter, but we will focus on some of the better researched aspects of hallucinatory phenomena and indicate where standardized instruments exist to capture different facets of the experience. Thankfully, there are now a wide range of psychometrically validated assessments for this purpose, thanks both to the growing interest in a single-symptom approach to psychopathology (cf., Persons, 1986; Costello, 1992; Bentall, 2003) and to a resurgence of research activity examining hallucinations (cf., Aleman & Larøi, 2008).

It is important to note that not only should assessment include a detailed evaluation of the hallucinations themselves, as well as the contexts in which they appear, but also on the consequences for the person and their entourage (e.g., carers, family members, friends, etc.). The assessment of medical and psychiatric problems and the presence of adverse life events are also essential. See Goëb and Jardri (this volume) for a detailed presentation of recommended complementary examinations to be carried out in children and adolescents. Also, see Read *et al.* (2006, 2005) for discussions concerning the assessment of adverse life events (trauma) in psychotic patients.

Where appropriate, assessment of hallucinations should include instruments with documented adequate psychometric properties, including, for example, construct validity (i.e., whether a scale measures or correlates with the theorized psychological construct), internal consistency (whether items of a same scale correlate with each other), inter-rater reliability, and test-retest reliability. It is preferable that all hallucination modalities (e.g., verbal-auditory, visual, tactical, olfactory, and gustative) are assessed. It is also recommended that the following hallucination characteristics be evaluated: Frequency, severity, duration, physical characteristics (e.g., localization, volume, clarity), hallucination triggers, coping strategies, role of medication, beliefs concerning the origin of the hallucination, and degree of controllability of hallucinations (ability to make them appear and disappear). Also emotional aspects should be included in assessments including emotional reactions (e.g., distress, depression, anxiety, worry) that hallucinations may elicit in individuals experiencing them and in those in contact with the person, emotional content of hallucinations (negative and positive or an absence of emotional content), and emotional states preceding hallucinations (e.g., distress, depression, anxiety, worry). This chapter will not provide an exhaustive list of available instruments (for a more complete list, see Aleman & Larøi, 2008), but we hope to highlight how an

understanding of the phenomenology of hallucinations can translate into practical strategies for assessment.

## Clinical considerations

There are significant clinical implications of taking the multitude of hallucination characteristics into account, as can be done with some of the aforementioned assessment strategies (also see Larøi, 2006; Aleman & Larøi, 2008). For instance, it may provide patients with important information regarding their own experiences. Patients who are assessed with a (comprehensive) assessment instrument may gain new insight regarding their anxieties and fears, and perhaps even offer them new or different coping strategies for dealing with them. On the contrary, not taking these experiences into account might have disastrous effects. In many patients, for example, these experiences have been going on for a number of years and have become a part of their identity. Therefore, allowing the patient to talk about these experiences may have important positive clinical implications, whereas not being able to talk about them could have serious negative consequences.

The therapeutic alliance may also be improved if one takes into account the phenomenological diversity of hallucinations. Indeed, this may convey to the patient some understanding of the hallucinatory experience, which may ease communication with patients, in turn increasing empathy with patients. Taking into account the phenomenological diversity of hallucinations may help individualize treatment and management. For instance, treatment would be fundamentally different for a patient with primarily disturbing hallucinations versus patients with pleasurable hallucinations. In the latter case, the patient might not be very motivated to change because he or she does not perceive the hallucinations as negative or problematic. Also, in such patients, noncompliance with treatment might be related to this.

Research shows that it is the phenomenological characteristics of hallucinations (and not simply, for instance, the presence of hallucinations) that are improved after effective treatment or that are associated with important risk factors (e.g., Miller, 1996). Indeed, change is often not simply an on–off switch phenomenon but in most cases involves a qualitative change with, for example, changes in intensity, frequency, control, duration, or emotional impact.

Finally, taking into account the phenomenological diversity of hallucinations may also help provide important information concerning changes in the patient's condition. Research shows that localizations of hallucinations may change over time (e.g., Larkin, 1979; Romme *et al.*, 1992). For example, voices that were initially heard as coming from outside via the ears may eventually be perceived as being located within the hearer's own head or body. Furthermore, these changes may occur according to the hearer's mental and emotional state (e.g., when a person is stressed or upset, their voices may be loud and they may experience them as coming from outside). Also, patients sometimes observe that the voices are at one time 'telling jokes,' whereas at another point in time they 'become mean.' It is therefore plausible that these variations in the phenomenology reflect important changes in the patient's emotional state.

## Dimensions and categories

For the purposes of fulfilling criteria in diagnostic categories, hallucinations have often been assessed as being 'present' or 'absent' in clinical practice (Sims, 2002). Over the last two decades, the application of a psychometric approach to measuring psychosis-like experience in the general population has reconceptualized perceptual distortions as occurring on a continuum without the population, and to differing degrees with each individual (Tien, 1991; Ohayon, 2000; Johns & van Os, 2001). Measures that have been taken from the traditional approach tend to be designed specifically for clinical settings, involve structured interviews, and require the assessor to make a judgement whether hallucinations are present of absent before rating their characteristics.

Along these lines, the mental health research institute unusual perception schedule (MUPS; Carter *et al.*, 1995) and the psychotic symptom rating scales (PSYRATS; Haddock *et al.*, 1999). Auditory hallucinations scale are semi-structured interviews that require an *a priori* clinical judgment as to whether the patient is hallucinating or not before they can be used. The MUPS is probably the most complete scale in terms of its ability to take into account the greatest number of phenomenological characteristics, although the PSYRATS is considerably shorter and better suited for repeated clinical monitoring. The specific aspects of the experience that they assess will be discussed in the section on auditory hallucinations.

Although not specifically designed as assessments solely for hallucinations, it is worth briefly mentioning how hallucinations are assessed in two of the most widely used assessment strategies for schizophrenic and psychotic patients: the positive and negative syndrome scale (PANSS; Kay *et al.*, 1987) and the scale for the assessment of positive symptoms (SAPS; Andreasen, 1984) both of which allow quasi-dimensional ratings from structured clinical interviews. In the PANSS, there is only one hallucinations dimension, in which hallucinations are assessed along a 7-point severity scale (absent, minimal, slight, average, moderately severe, severe, and extreme). However, different hallucination modalities are not assessed, and neither are hallucination characteristics (e.g., frequency, control, triggers, emotional aspects, localization, and physical qualities). In the SAPS, auditory (general, voices commenting, voices conversing), somatic or tactile, olfactory, and visual hallucinations are assessed individually along a 6-point severity scale (none, questionable, mild, moderate, marked, severe). However, here too, hallucination characteristics (e.g., frequency, control, triggers, emotional aspects, localization, and physical qualities) are not assessed.

Measures that focus on a dimensional approach to hallucinations are typically designed as self-report questionnaires that ask about both non-clinical sensory distortions (e.g., vivid daydreams and changes in sensory intensity) as well as frank hallucinatory experiences (e.g., hearing voices in the absence of any environmental source). These encompass both the traditional psychiatric definitions of a hallucination proper, and an illusion, or a distortion in genuine sensory experience. Although designed to cover both the non-clinical spectrum they are widely used in clinical settings and are typically validated on both healthy participants and psychotic inpatients samples. One of the most

widely studied is the Launay-Slade hallucinations scale (LSHS; Launay & Slade, 1981), a self-report questionnaire for measuring hallucinatory experiences in both the clinical and nonclinical populations. Although the LSHS may be used in a clinical context, its particular strength is its usefulness in research contexts, especially in studies including both clinical and nonclinical subjects. Originally a 12-item scale designed to assess hallucinatory experiences in a prison population, a number of changes have since been made to the LSHS, including changing the negative response items to positive ones and substituting the true-and-false format with a 5-point scale (Bentall & Slade, 1985); incorporating additional items measuring predisposition to visual hallucinations, predisposition to auditory hallucinations, vividness of imagery, and daydreaming (Morrison *et al.*, 2002); and adding items assessing other subtypes of hallucinations, including visual, olfactory, haptic, gustatory, hypnagogic, and hypnopompic hallucinations (Larøi *et al.*, 2004; Larøi & Van der Linden, 2005). The internal structure of the LSHS has been examined on numerous occasions (Levitan *et al.*, 1996; Morrison *et al.*, 2000; Aleman *et al.*, 2001; Waters *et al.*, 2003; Larøi *et al.*, 2004; Larøi & Van der Linden, 2005; Serper *et al.*, 2005; Paulik *et al.*, 2006). Larøi and Van der Linden (2005) performed principal-components analysis on a revised version of the LSHS and found evidence of five factors that were characterized as representing items related to (a) sleep-related hallucinatory items, (b) vivid daydreams, (c) intrusive or vivid thoughts, (d) auditory hallucinations, and (e) visual hallucinations.

Notably, the LSHS focuses on a conception of hallucinations and sensory distortion drawn from clinical psychiatry, where visual and auditory distortions are given specific importance. The Cardiff anomalous perceptions scale (CAPS; Bell *et al.*, 2006) is a 32-item scale designed to include distortions of proprioception, time perception, somatosensory, sensory flooding, and changes in intensity as well as frank hallucinations in the five main sensory modalities. It also includes additional ratings for distress, intrusiveness and frequency, and attempts to account for differences in insight. Despite being in an interview format, the structured interview for assessing perceptual anomalies (SIAPA) does provide fully dimensional ratings although only measures changes in sensory intensity, lack of perceptual focus, and feelings of perceptual 'flooding' (Bunney *et al.*, 1999).

## Insight

One important aspect in the experience of hallucinations is the extent to which the person considers them to be true or veridical perceptions, captured somewhat clumsily by the clinical concept of insight. The traditional 3-point psychiatric concept of insight (does the patient realize the experience is abnormal? Attribute it to a mental illness? Accept treatment?) is focused on the clinical needs of a diagnostic system (David, 1990), whereas the question of to what extent someone believes a perception to be an accurate reflection of the world is complex and multi-faceted. As Sackheim (1998, p. 9) noted 'since virtually all waking perceptual experiences are veridical, a long personal history of validated perception would dictate accepting hallucinations as veridical.' Many psychometric scales rely on variations of the question 'Do you ever experience things that aren't really there or

seem strange?' and rely on the fact that a patient will know which perceptions are genuine and which are not, something which is clearly problematic. Instead, Bell *et al.* (2006) approached the problem from three angles, using questions that attempt to assess the likelihood of hallucinations regardless of the patient's understand of their experience. These include asking about whether a perceptual experience is not shared by others (e.g., 'Do you ever see things that other people cannot?'), whether the experience seems strange or unusual (e.g., 'Do you ever think that everyday things look abnormal to you?') and whether the perception arises form an unexplained source (e.g., 'Do you ever hear noises or sounds when there is nothing about to explain them?'). It is also clear that insight may fluctuate for some patients (Berrios & Brook, 1984) and that there can be a difference between 'spontaneous' and 'assisted' insight. Although not well researched, clinical experience suggests that hallucinatory perceptions accepted as veridical by a patient can be subsequently accepted as illusory after discussion with another person (assisted insight) or derived from the behaviour of others as they fail to react to something that seems to occur in shared space (spontaneous insight).

## Auditory hallucinations

Perhaps the most striking form of hallucinations are auditory verbal hallucinations (AVHs) that classically take the form of one or more 'voices' that talk to or about the patient. While the most clinically important, owing to their intrusive nature and association with psychosis, they are not the only form of auditory hallucinations that may take the form of noises, sounds, or quite often, music.

However, auditory verbal hallucinations (AVHs) are a common symptom of schizophrenia and florid psychotic conditions and hence have been a particular focus of assessment research. Audible thoughts and imperative voices, for example, have been almost univocally considered of important clinical value since Kraepelin and Bleuler and are explicitly indicated as symptoms of primary diagnostic importance (so called First-Rank Symptoms, FRS) by Kurt Schneider. Such primacy is still maintained in DSM-IV-TR, where FRS are recoded as bizarre delusions and hallucinations consisting of 'of hearing one voice participating in a running commentary of the patient's actions or of hearing two or more voices conversing with each other'.

Despite having been given such diagnostic weight, AVHs can be difficult to fully assess in the clinical context. First, they are not fully captured by operational criteria as the experience of 'hearing voices' varies greatly between individuals and may involve numerous disturbances of agency, autonomy, and the 'stream of consciousness'. Second, they are associated with profound transformations of self-awareness that may be difficult to describe, which can lead to feelings of estrangement from common human experience and communication (Straus, 1966; Stanghellini, 2004; Dalle Luche, 2006; Cermolacce, 2007). Finally, most patients note how even the most common description of AVH as 'voices' is a rather poor metaphor, which does not fully capture their experiential richness.

As can be seen from the quotes below, one common difficulty is that AVHs are not clearly distinguished from other environmental sounds or from other aspects of the 'stream of consciousness'.

> At these times my ear took some part in hearing the voices. This was not so before when I responded to the voices without any auditory sensation. Now even though I distinguished them readily from real voices, I could say I actually heard them resounding in my room. And then I kept seeing everything in a confusion of terrible unreality: each object cut off, under a cold and blinding light. (Sechehaye, 1951)
>
> The voices and so on were not that important. I think that the enduring and pervasive feeling of being unreal is the disease itself. When I realized this condition of looking at myself as in a movie was permanent, I understood it would eventually destroy the core of my life. (Møller & Husby, 2000)

Needless to say, it is easy to impose our own ideas about what the experience of 'hearing voices' might be like, typically focusing on the vocal, perceptual-like features of AVHs, but we would be in danger of missing many of the equally as significant aspects of the total change in experience brought about by the psychotic experience.

## The emergence of auditory verbal hallucinations

Detailed phenomenological analyses of hallucinations reveal that a broad metamorphosis of psychotic consciousness precedes the appearance of florid hallucinations. Specifically, transitional sequences from more subtle, not-yet psychotic disturbances of subjectivity have been empirically identified and documented (Klosterkötter, 1988, 1992). In particular, disturbances of the stream of consciousness, such as thought pressure, thought interference, thought block, obsessive-like perseveration, and failure to discriminate between thought and perception, seem to precede the emergence of AVHs (Klosterkötter, 1988, 1992). As the prodromal state progresses, there can be an increasing gap between the sense of self and the flow of consciousness: inner speech becomes more and more objectified, spatially localized and externally perceived even before well-established auditory hallucinations emerge (Sass & Parnas, 2003). Qualitative changes in the immediacy and familiarity of the thought stream can be some of the first manifestations of a later psychotic episode.

Notably, both contemporary psychiatry and the cognitive neurosciences almost exclusively investigate hallucinations in their frank form, neglecting the changes in consciousness and experience that lead to these psychopathological end-points. This has some clear implications with respect to both research and clinical practice. Needless to say, an exclusive focus on florid symptoms, such as overt AVHs, does not allow an in-depth examination of etiological mechanisms (e.g., like investigating heart attacks in order to understand hypertension) and is not always informative for the purpose of early diagnosis and timely preventative intervention.

However, several phenomenologically inspired scales have been developed, which attempt to capture some of these processes. These include the Bonn scale for the assessment of basic symptoms (Gross *et al.*, 1987), the schizophrenia proneness instrument (Schultze-Lutter *et al.*, 2007), and the examination of anomalous self-experience

(Parnas *et al.*, 2005), all which address subtle and 'not-yet-psychotic' changes in subjective experience. The Bonn scale for the assessment of basic symptoms (BSABS) is a semi structured interview, originally published in German (Gross *et al.*, 1987) but currently available in an English translation (Gross *et al.*, 2008), which addresses subtle, subjectively experienced disturbances termed 'basic symptoms' in the domains of perception, cognition, language, motor function, will, initiative and level of energy, and stress tolerance. These disturbances are closely linked to the hypothetical core vulnerability of schizophrenia and are presumed to be the first experiential correlate of the underlying neurobiological disorder. The scale consists of five subsets of the basic symptoms: (a) dynamic deficits, (b) cognitive disturbances, (c) coenesthetic experiences, (d) central vegetative disturbances, and (e) self-protective behaviour/coping. Each basic symptom is rated as present or absent and for some of them inhering disturbances of cognition, speech, and perception reveal a highly predictive value for the subsequent development of schizophrenia. The schizophrenia proneness instrument (SPI-A) was developed by Schultze-Lutter *et al.* (2007, in press) with a specific focus on early detection of prodromal patients. It is based on a selection of BSABS items yielded through cluster and facet analyses, performed on data from the Cologne early recognition study (Klosterkötter *et al.*, 2001). The SPI-A consists of six subscales: (a) affective-dynamic disturbances, (b) cognitive-attentional impediments, (c) cognitive disturbances, (d) disturbances in experiencing the self and surroundings, (e) body perception disturbances, and (f) perception disturbances. The examination of anomalous self-experience (EASE) is a symptom checklist to assist the semi-structured exploration of disorders of subjectivity developed by Parnas and colleagues (Parnas, 1999; Parnas & Handest, 2003; Parnas *et al.*, 2005). The EASE addresses phenomena are regarded as important phenomenological aspects in the pre-onset phase and as core features of schizophrenia spectrum disorders. The interview consists of five subscales: (a) cognition and stream of consciousness, (b) disorders of self-awareness and presence, (c) bodily experience, (d) transitivism/demarcation, and (e) existential reorientation/solipsism.

## Perceptual properties of auditory verbal hallucinations

While there are clearly changes in meaning and subjective experience of the mind itself that accompany the experience of AVHs, it is most common for assessments to focus on the perceptual properties of the voices. These can include factors such as how many voices are present, whether the voice appears to originate from inside or outside the head, whether they are male or female, seem loud or soft, clear or indistinct, or coherent or nonsensical (Wykes, 2004). Other typical targets for assessment might be the frequency and durations of voices and their intrusiveness.

The MUPS (Carter *et al.*, 1995) is a semi-structured interview for auditory hallucinations and has items assessing various aspects of hallucinations, such as physical characteristics (e.g., frequency, when during the day, localization, volume, clarity), personal characteristics (e.g., sex of the voice; number of voices; known voice or not; whether in first, second, or third person), relations and emotion (e.g., relation with the voice,

emotional state during the experience, associated emotions), form and contents (e.g., linguistic complexity, repeated contents, commands), cognitive processes (e.g., delusional activity, language or accent), perception of the experience (e.g., imaginary vs. real, hallucinations in other modalities), and psychosocial aspects (e.g., triggers, strategies used, role of medication).

Although less detailed compared to the MUPS, the PSYRATS (Haddock *et al.*, 1999) consists of 11 items assessing dimensions (based on a 5-point scale) of frequency, duration, location, loudness, beliefs concerning the origin of voices (varying from the belief that they are solely internally generated to solely from external causes), amount of negative content of voices, degree of negative content, amount of distress, intensity of distress, disruption of life caused by voices, and controllability of voices. Finally, the number of voices (over the past week) and the form of the voices (first person, second person, third person; single words, or phrases without pronouns) are assessed. The scales have been found to have excellent inter-rater reliability (Haddock *et al.*, 1999).

Similar hallucination characteristics are included in the Auditory Vocal Hallucination Rating Scale (AVHRS; Jenner *et al.*, 2002), however, also included in this instrument are an item on hypnagogic and hypnopompic voices, the degree to which voices interfere with thinking, and a question verifying whether voices are talking one by one or simultaneously. Results from Bartels-Velthuis *et al.* (submitted) revealed that the AVHRS has good internal consistency and inter-rater reliability.

## Emotional and social aspects of auditory verbal hallucinations

The impact of auditory hallucinations is usually one of the most clinically significant aspects of the experience and is affected by the person's attributions for the experience, their perception of control over the voices, their emotional state, culture, prior social experience, and ability to resist commands or requests. Indeed, AVHs in schizophrenia can be part of a wide array of 'passivity experiences', characterized by a disturbance of the sense of agency and autonomy. Rather than the perceptual qualities of the hallucinated voice, it is the clients' understanding and beliefs about the experience, which typically drives distress and disability and is typically the target of psychological treatment.

Emotional factors may play a significant role in the experience of AVHs. This is particularly the case for psychiatric hallucinations and somewhat less so for neurological and pharmacological hallucinations. Three aspects can be distinguished: emotional antecedents, emotional content, and emotional consequences. Certain affective states have been associated with the onset of psychotic symptoms. For instance, a stage of heightened awareness and emotionality combined with a sense of anxiety and impasse has consistently been described as preceding psychosis. AVHs have often a negative, maladaptive quality. Indeed, voices may insult and criticize the patient, tell the patient to do something unacceptable (e.g., to commit suicide or to harm someone), or threaten the patient. However, AVHs are not exclusively perceived as negative by patients—some AVHs may not have a particular emotional content (i.e., are more or less neutral) and some

patients may even state that their voices serve an adaptive function (help feel privileged or protected, they relieve boredom, provide an outlet for hostility, help raise self-esteem, provide comfort, etc.). Finally, for a large majority of patients, their AVHs elicit negative emotional responses such as fear, distress, anxiety, and depression.

The MUPS provides a relatively sophisticated assessment of affective aspects of AVHs. In particular, the tone of the voice (e.g., as harsh, angry, gentle, bossy, menacing, loving, etc.) is assessed, in addition to whether the tone has changed over time. Similarly, content of voices (e.g., as persecutory, abusive, obscene, derogatory, guiding, affirming, inspiring, threatening, etc.), and if the content has changed over time, is evaluated. Finally, feelings associated with AVHs (e.g. feeling terrified, irritated, sad, helpless, angry, anxious, comforted, assured, depressed, excited, frightened, confused, inspired, happy, intruded upon, etc.) is also assessed. Another instrument, the positive and useful voices inventory (PUVI; Jenner *et al.*, 2008), provides an assessment of positive (e.g., 'Want to protect me', 'Make me confident') and useful (e.g., 'Give me advice, 'Help me to make decisions') AVHs and emotional attribution.

Using the MUPS, Copolov *et al.* (2004) examined the affective impact of AVHs in detail in a group of 199 patients (the majority with schizophrenia and affective psychosis). Patients' responses to auditory hallucinations were combined into two (uncorrelated) indexes: one assessing total affective impact (i.e., the strength of affective response) and the other, assessing the affective direction (i.e., the degree of positivity or negativity). The authors argued that this suggests that (at least) two dimensions are required to characterize subjects' positive and negative experiences of and responses to auditory hallucinations. That is, even subjects who assess the tone, content, and feeling of their auditory hallucinations as extremely negative may also rate part of their experience in positive terms. Also, in this study, various differential associations (too many to detail here) were found based on this more sophisticated dimensional assessment of affective impact. For instance, it was found that frequent, long, and loud auditory hallucinations were more often perceived as negative. The auditory hallucinations of patients with grandiose delusions were found to be more pleasant than those of patients without such delusions. Also, auditory hallucinations addressing the patient in the second person were found to be significantly more unpleasant than those that did not address the patient in the second person.

Another striking and persuasive feature of AVHs can be the omnipotence and seeming omnipresence of the voices. They have been described as 'atmospheric, they behave like the elements—the wind, the rain, the fire—and yet they speak, deride, and threaten.' (Straus, 1966, p. 287). Hearing voices can seem like being 'at the centre of a *network of disembodied voices*' (Stanghellini, 2004, p. 161), which undoubtedly plays a part in a perception of their power over the individual, as noted by Chadwick and Birchwood (1994):

> without exception, voices were seen as omnipotent…For many patients this […] was supported by an experience of control […] and by the patient having no influence over the voice. Also, all voices were seen as omniscient, again emphasizing their superhuman quality.

These aspects of the experience can have a profound impact on the voice hearer but can be neglected in many assessments that focus on perceptual qualities.

In light of this, the beliefs about voices questionnaire (BAVQ; Chadwick & Birchwood, 1995) does not elicit detailed and wide-ranging information concerning phenomenological characteristics of hallucinations—its unique contribution is that it provides the clinician and researcher with related and crucial information concerning how subjects react in the face of hallucinatory experiences. The BAVQ is a 30-item self-report instrument that measures how people perceive and respond to their verbal auditory hallucinations. It includes five subscales: (a) Malevolence (e.g., 'My voice is evil'), (b) benevolence (e.g., 'My voice wants to help me'), (c) omnipotence (e.g., 'My voice is very powerful'), (d) resistance (e.g., 'When I hear my voice, I usually think of preventing it from talking'), and (e) engagement (e.g., 'When I hear my voice, I usually seek its advice'). Among these five subscales, three relate to beliefs about voices (malevolence, benevolence, and omnipotence) and two measure emotional and behavioural reactions to the voices (Resistance and Engagement). All responses are rated by checking 'yes' or 'no.' Individuals who hear more than one voice are asked to complete the questionnaire for their predominant voice. The BAVQ shows acceptable levels of reliability, validity, and stability on test-retest over 1 week (Chadwick & Birchwood, 1995). A revised version of the BAVQ has also been developed (the revised beliefs about voices questionnaire; BAVQ-R; Chadwick *et al.*, 2000) to address two weaknesses in the original BAVQ: Participants answered 'yes' or 'no' to each of the items, and there was only one item concerning omnipotence. The revised version contains 35 items (which includes 5 new items pertaining to omnipotence), and responses are rated on a 4-point scale (disagree, unsure, agree slightly, and agree strongly). Results from Chadwick *et al.* (2000) revealed that the BAVQ-R was more reliable and sensitive to individual differences than the BAVQ and that the BAVQ-R reliably measures omnipotence.

Another pertinent scale to mention that assesses other aspects related to hallucinations, namely, how individuals cope with these experiences, is the Maastricht assessment of coping strategies (MACS; Bak *et al.*, 2001). The MACS is a semi-structured interview that asks patients about the presence of a list of 24 symptoms related to psychosis. Both auditory hallucinations and nonverbal hallucinatory experiences (visual, olfactory, gustatory, or tactile hallucinations) are included in this list. If a symptom is present, subjects are asked whether it has been present in the last week or month and to indicate (on a 7-point scale) the degree of distress associated with the symptom (varying from no distress to very distressing). In terms of coping strategies, patients are asked to name all the strategies used to alleviate the distress caused by the symptom. These coping strategies are categorized by the interviewer on the basis of a list of 14 different coping strategies. Factor analysis has identified five coping domains: active problem solving (distraction, problem solving, help seeking), passive illness behaviour (prescribed medication, non-prescribed substances, physical change), active problem avoiding (shifted attention, socialization, task performance, indulgence), passive problem avoiding (isolation, nonspecific activities, suppression), and symptomatic behaviour. Results from Bak *et al.* (2001) indicate that the MACS

has good inter-rater and test-retest reliability. Also see Farhall (this volume) for a guide to how to assess coping strategies in individuals experiencing hallucinations.

Culture has a certain influence on hallucination prevalence and expression (cf. Aleman & Larøi, 2008). Al-Issa (1995) suggests that contrasting (metaphysical) attitudes between cultures, such as between Western and non-Western cultures, varying, for example, in the degree to which a given experience is considered real or imaginary, could explain these cultural variations. There is, for example, evidence of cultural variation in the frequency of different kinds of hallucinations between cultures—where auditory hallucinations are more frequently reported by patients in the West compared to visual hallucinations being more frequently reported in African and Asian countries. Studies reveal that it is common for people to see, hear, or feel the presence of the deceased person during bereavement, and that there are cultural differences in terms of the rates of hallucinatory experiences in the context of bereavement (Grimby, 1993, 1998; Yamamoto *et al.*, 1969). Kent and Wahass (1996) observe that a religious and superstitious content was more likely to be reported by patients from Saudi Arabia, whereas instruction and running commentary were more commonly reported by patients from the UK. Also, Wahass & Kent (1997a) found that patients from the United Kingdom were more likely to use biological and psychological approaches to explain the apparition of their hallucinations, whereas patients from Saudi Arabia were more likely to evoke religious and superstitious causes. Finally, patients in Saudi Arabia tend to use coping strategies for their hallucinations that are associated with their religion, whereas patients in the United Kingdom are more likely to use distraction or physiologically based approaches (Wahass & Kent, 1997b).

Evidence of cultural variations has clinical implications. Simply put, the clinician, in addition to providing a detailed account of the hallucinations, must also take into account a person's cultural background when assessing and treating hallucinations. Thus, the treatment strategies that clinicians propose should attempt to take into account the etiological beliefs of their patients. As Bentall (2003) pointed out, failure to appreciate the cultural context may prevent clinicians from responding appropriately to the distress experienced by their patients. On the other hand, where hallucinatory experiences are culturally accepted reactions to various life events (and therefore might be quite common), the clinician may consider not intervening at all. Thus, awareness of people's attitudes toward hallucinations may help the clinician distinguish between pathological and culturally sanctioned hallucinations (Al-Issa, 1995).

Some assessment tools have been developed for use (but not exclusively) in the context of specific types of auditory hallucinations, such as command hallucinations. The voice compliance scale (Beck-Sander *et al.*, 1997) is an observer-rated scale to measure the frequency of command hallucinations and the level of compliance or resistance with each identified command. The voice power differential scale (Birchwood *et al.*, 2000) measures the perceived relative power differential between voice and voice hearer with regard to the components of power, including strength, confidence, respect, ability to inflict harm, superiority, and knowledge. There are seven items, and each is rated on a 5-point scale and yields a total power score.

## Musical hallucinations

Musical hallucinations most typically present in older people and females and are most associated with hearing loss, psychiatric disorder, focal brain lesions, epilepsy, and intoxication, although, unlike auditory verbal hallucinations, are not most commonly associated with psychotic mental illness (Evers & Ellger, 2004). Indeed, for an estimated 40% of patients, they present as the only symptom (Berrios, 1991). The music can be varied and can include both singing and instrumental arrangements, popular tunes, religious music, traditional music, and even unfamiliar and unknown melodies. Although musical hallucinations are often considered benign, it is worth noting that in their analysis of 73 cases, Evers and Ellger (2004) reported that 41% of patients found the experience frightening, although it is not clear how much this is to do with the perceptual qualities of the music or the fact that the experiences sparks distressing concerns about 'going mad'. As with Charles Bonnet syndrome, it is likely that these experiences are under-reported for this reason.

# Visual hallucinations

Visual perceptual distortions can occur in a wide range of pathological and non-pathological conditions with phenomena ranging from flashes of light, alterations in sensory acuity and stability of objects in the visual field, to fully formed complex scenes of a fantastical nature.

Curiously, impairments to the earliest stage of the visual system, the retina, can lead to some of the most spectacular hallucinations. The following description is from a case of Charles Bonnet syndrome owing to macular degeneration (Jacob *et al.*, 2004):

> Neighbours brought an 87-year-old white widower—who lived alone in a flat—to the medical assessment unit of a district general hospital. They were concerned that he was becoming demented. Apparently, he had reported seeing people and animals in his house—including bears and Highland cattle. He verified these statements and said he had been seeing them for the previous six weeks. He had also often seen swarms of flies and blue fish darting across the room. He knew that these visions were not real and they didn't bother him much, but he thought he might be losing his mind. The visions lasted for minutes to hours, and the cattle used to stare at him while quietly munching away at the grass. The visions tended to occur more in the evenings before he switched on the lights.

These hallucinations tend to appear in the area of visual field loss have a number of typical features (Plummer *et al.*, 2006): they are exacerbated by dim lighting, drowsiness, and isolation and are typically experienced with good insight with the patient feeling as if they are an 'onlooker' rather than an active participant. Despite their high prevalence in older adults, clinicians should be aware that patients may be reluctant to report the experiences for fear of appearing 'mad', even though they are rarely associated with psychiatric illness (Teunisse *et al.*, 1995).

Various forms of 'hallucinosis' are also commonly reported in the neurological literature. Hallucinosis refers to complex auditory or visual hallucinations with preserved insight (sometimes called 'pseudo hallucinations' for this reason), without delusion or

concurrent disturbances to consciousness, although, in practice, the term is used somewhat vaguely and can be used to refer generally to hallucinations as a consequence of organic brain disease. Most commonly discussed in the literature are alcoholic hallucinosis, triggered by acute alcohol withdrawal and more likely to involve auditory hallucinations and paranoid ideation (Glass, 1989), and peduncular hallucinosis, triggered by lesions in the midbrain and pons and having a significant overlap with Charles Bonnet syndrome (Mocellin *et al.*, 2006).

Geometric patterns, grids and lines, often described as 'form constants' (Kluver, 1966) are another form of hallucinatory experience in which the subject typically retains good insight. These are associated with migraine, occipital lobe epilepsy, certain hallucinogenic drugs, and the visual flicker in the 8–13 Hz range (Panayiotopoulos, 1999; Ter Meulen *et al.*, 2009) and are thought to arise from unstable activity and desynchronized communication in the early visual system (Ffytche, 2008).

Visual hallucinations that seem to have particular reference to the person experiencing them are more likely to occur in psychoses such as schizophrenia or bipolar disorder or in the context of psychoses after gross neuropathology and are less likely to be perceived as unreal and may form part of a larger delusional system (Cutting, 1987).

Sadly, there are few scales that attempt to specifically tackle visual hallucinations, although they are covered as part of more comprehensive assessments (e.g., in the LHSH, Larøi & Van der Linden, 2005; and CAPS, Bell *et al.*, 2006). One that does target the area, however, is the Institute of Psychiatry Visual Hallucinations Interview (Santhouse *et al.*, 2000) that was developed from a previous unstructured survey (Ffytche & Howard, 1999). Participants are questioned about various phenomenological categories of pathological visual experience, such as temporal aspects (e.g., duration of individual hallucinations, length of time subjects have been hallucinating, frequency), emotional content (pleasant, unpleasant, neutral), localization (e.g., in front of the subject, out of the corner of the eye, in their blind area), detail and physical characteristics (e.g., more detail than real objects, whole scenes or individual objects or figures, can you see through them, flashes, lines, colours, zigzags, regular or irregular patterns, face without a body, words, letters, musical notes, numbers), and triggers (e.g., if they appear when the participant's eyes are closed, if they disappear when the participant blinks or move his or her head). In addition, there are exclusion questions (e.g., visions associated with sound or talking, dizziness, or strange smells; occurrence only in bed or on waking from sleep; history of psychiatric and/or neurological disorders; frightening visions of small animals, snakes, maggots).

More recently, Mosimann *et al.* (2008) developed the north-east visual hallucinations interview (NEVHI), a semi-structured interview for identifying and assessing visual hallucinations in older people with eye disease and/or cognitive impairment. Section 1 includes screening questions for visual hallucinations and a detailed assessment of the phenomenology, section 2 assesses the temporal aspects of hallucinations (i.e., when they first started, and duration and frequency of hallucinations), section 3 evaluates emotions, cognitions, and behaviours associated with recurrent visual hallucinations. Results from

Mosimann *et al.* (2008) revealed that the NEVHI possesses good psychometric properties including good face and content validities, internal consistency, and inter-rater reliability.

## Hallucinations in other modalities

### Somatic hallucinations

Although much less commonly discussed, somatic hallucinations are a remarkably diverse form of perceptual distortion that appear in numerous conditions. Although auditory verbal hallucinations are considered to be one of the main symptoms of schizophrenia, the experience of 'influences playing on the body' are also listed among Schneider's (1959), the 'first rank symptoms' that are given particular diagnostic weight. In schizophrenia, they are usually linked to thematically related delusional beliefs and may include specific tactile sensations, for example, touches, stab sensations, sexual feelings, or alterations to body image or proprioception, such as the stretching or distortion of the body) (e.g., Lewandowski *et al.*, 2009). Additionally, hallucinations may occur as sensations seeming to arise in internal bodily organs, including internal movements, changes to how a part of the body 'feels' (such as the perception that a hand has 'turned to jelly'), and internal spatial distortions. These are not well studied but have been historically described as 'cenesthetic hallucinations' (Jenkins & Röhricht, 2007). 'Phantom' sensations are where patients have sensations from amputated body parts and are a normal consequence of surgery. Although typically described as a 'phantom limb', the experience can follow after removing almost any body parts including the eyes, teeth, tongue, breasts, rectum, or bladder and occur in 50% to 78% of post-amputation patients (Schley *et al.*, 2008). The sensation of 'bugs' crawling over or just under the skin is commonly associated with stimulant drugs that affect the dopamine system, such as cocaine, amphetamine, and L-DOPA treatment in Parkinson's disease and in its delusional form may present as delusional parasitosis where the patient believes they are infested with a parasite (Koo & Lee, 2001).

### Olfactory and gustatory hallucinations

Hallucinations of touch and taste are among the most common reported perceptual distortions in the general population (Tien, 1991; Ohayon, 2000) but receive far less clinical attention. However, they can present in multiple conditions and in their non-delusional form are most linked to epileptic aura or simple-partial seizures (Elliot *et al.*, 2009) and in their delusional form can be associated with schizophrenia or 'olfactory reference syndrome' where the patient believes they emit an offensive odour despite evidence to the contrary (Bizamcer *et al.*, 2008).

### Time and space

Changes in time perception are particularly common in patients with neurodegenerative disorders that affect the basal ganglia such as Parkinson's and Huntingdon's disease (Wild-Wall *et al.*, 2008). Specific alterations to the perception of relative size of the body

or external world without other visual disturbances is usually associated with 'Alice in Wonderland' syndrome, micro- or macrosomatognosia, which is relatively more common in children and usually linked to migraine or epilepsy (Todd, 1955; Evans & Rolak, 2004).

## Conclusion

Despite their seemingly simple definition, hallucinations constitute a challenging target for clinical assessment. Hallucinatory experiences, usually classified according to their sensory qualities, also entail complex cognitive and emotional aspects that need to be addressed not only for research and diagnostic purposes, but also for and adequate identification of treatment needs that will guide the therapeutic approach. Such assessment needs to be context-dependent and informed by a preliminary recognition of the layers of personal, social, and cultural influences that might affect the patient's modes of experiencing and, hence, communicating his or her own subjective experience.

Notably, besides their phenomenological heterogeneity, hallucinations are dynamic and can change in time. In this respect, assessment instruments offer a valuable support for longitudinal monitoring. Moreover, addressing the very moment of their emergence constitutes a useful entry point for a more person-tailored evaluation and a deeper understanding of their existential and psychological impact. The assessment instruments discussed in this chapter are meant to constitute strategic tools to enrich and supplement the clinical investigation of hallucinations, specifically providing reproducible quantitative frameworks. Their use provides both the patient and the clinician with a shared medium to rephrase experiences. Besides the obvious implications in terms of informational gathering and consolidation of the therapeutic alliance, this can be an important part of overcoming stigma and difficulties with the verbalization of the experiences often associated with hallucinations. This is clearly an important step towards tailored treatment and can support both an understanding of the exacerbating or maintaining factors (e.g., intense emotional valences in auditory verbal hallucinations) and the strengthening of basic coping strategies.

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