

Valentina Cardella

**DELUSIONS AND HALLUCINATIONS:
THE ROLE OF METACOGNITION**

1. Introduction

As delusions and hallucinations express the detachment from reality characteristic of major mental disorders, they are the core features of psychosis. Since Kraepelin's works (1904) those symptoms was used to identify one of the most severe mental illness': schizophrenia. When entering the schizophrenic *Lebensform*, delusions and hallucinations assume peculiar traits: the former specifying in bizarre themes , the latter becoming *voices* which inhabit and violate the individual intimacy. In this paper, I'll try to show that the best way to investigate these symptoms is to highlight their shared mechanisms, focussing on metacognitive factors which form and maintain them. When examining these factors, the believes seem to be weaken in both cases, even if considering auditory hallucinations as pathologies of belief could seem counterintuitive. Voices don't seem to belong to the area of believes but to that of perception. Nonetheless, analizing the most recent literature on auditory hallucinations, one can notice that a growing space is given to top down processes (believes and expectations on own cognitive processes that would concur to feed and maintain the symptoms), rather than to bottom up processes (brain damages or neurological deficits that would cause psychotic symptoms, e.g. anomalous perceptual experiences).

2. Delusions

Delusion, according to the APA definition, is a false belief that is firmly sustained despite what almost everyone else believes and despite what constitutes incontrovertible and obvious proof or evidence to the contrary (APA 1994). Depending on the topic, delusions can be bizarre or non-bizarre: the first ones, characteristic of schizophrenia, are completely implausible, while the second ones have a possible content. For example, one of the most common delusions, that of persecution, is a non-bizarre one, since refers (even if in a peculiar way) to experiences that everyone can live in his life (feeling victimized by someone, persecuted by enemies or institutions and so on). On the contrary, delusion of control, whose content is the belief that our own actions are controlled by external forces, is a bizarre delusion; he who holds this delusion thinks to be a sort of puppet manipulated by someone else (“it isn’t me that acts this way, but someone else that moves my body”). Even more unusual to people that don’t have to do with schizophrenia are the delusions of thought withdrawal, broadcasting or insertion. A schizophrenic patient can believe the others think his own thoughts, or insert their thoughts in his mind, and he can describe his thoughts being broadcast to others or withdrawn by others. Kurt Schneider (1959) considered the delusions of thought withdrawal, insertion and broadcasting as the most important diagnostic indicators of schizophrenia, and for that reason he included them, together with hearing voices, in the first rank

symptoms. In other words, if a patient tells the psychiatrist that he sometimes hears voices or feels as though his thoughts are not his own, he is very likely a schizophrenic.

According to Maher (1992, 1999) delusions are rational responses to abnormal experiences. It means that there's nothing wrong on delusion itself, since it is nothing but an attempt to rationalize what the patient perceives as unusual. Therefore, the core factor of the genesis of delusions would be *bottom up*, since it consists for Maher in a neuropsychological deficit which in turn would cause an abnormal experience.

So, what are these abnormal experiences? Stone e Young (1997) focus on monothematic delusions, which are circumscribed to one topic, because, from a theoretical point of view, it would be easier to find the abnormality that leads to their genesis, abnormality that would be much harder to recognize in polythematic and florid delusions; the authors argue that monothematic delusions are based on atypical perceptual experiences occasioned by a wide set of neuropsychological anomalies.

One of the first delusions which has been analyzed that way is the Capgras syndrome, also known as the illusion of doubles, since he who suffers this delusion believe that a person or people close to him (the partner in most cases) have been replaced with duplicates. According to Maher (1999), this delusion is due to a deficit in the ability of recognize faces; more precisely, faces are recognized, but there is an impairment of the automatic emotional arousal response which is usually associated

with them. Therefore, patients recognize faces, but they don't feel the matching emotional responses, the feeling of familiarity, and so they face two opposite pieces of information: one saying for example "It is your wife", and the other, the emotional one, saying the opposite. The delusion makes the rationalization arise: "It seems my wife, but she's not"; for that reason Maher claims that the delusion would be nothing but the attempt to make sense of a peculiar experience. The same would go for the other kinds of delusion, also for the schizophrenic ones, like the delusion of control described above, whose deficit would consist in the alteration of the internal monitoring of actions, that would lead to perceive the actions as controlled by other agents.

According to Stone and Young, one can identify such neuropsychological anomalies in any other forms of monothematic delusion, and so the core factor for the genesis of delusion would be just some kind of anomalous perceptive experience. And Maher goes beyond claiming that the anomalous experience is the *only* factor causing the delusion, delusion which, apart from that, isn't different from normal believes:

Delusional beliefs, like normal beliefs, arise from an attempt to explain experience. The processes by which deluded persons reason from experience to belief are not significantly different from the processes by which non-deluded persons do. (Maher 1999, pp. 550-1).

This theory has been yet criticized on numerous fronts. First of all, no one has proved the existence of the deficits the authors talk about, and this clearly invalidates their view, because they seem to postulate *ad hoc* impairments which fit each kind of delusion. Moreover, one can notice that while some of these delusions (like the Capgras syndrome) are due to brain damages, and a neuropsychological anomaly is therefore supposable, for other kinds of delusion a similar origin must be ruled out, since for example a brain damage hasn't been proved yet in schizophrenia, and according to many authors every attempt to find this kind of damage in this mental disorder is bound to fail. Secondly, according to other authors the anomalous experiences would neither be necessary to form a delusion; Bell and coll. (2008) used an experiment to test the anomalous perceptual experiences in a control group, a group of subjects with delusions and a group of subjects with both delusions and hallucinations, and results showed that delusional patients didn't exhibit a significantly different level of anomalous experiences, compared with controls.

Other authors showed that the anomalous perceptual experiences, far from being necessary, would neither be sufficient to create a delusion. Davies and coll. (2001) proved that, in some cases, there are people who feel anomalous experiences without having a delusion. For example, patients with frontal lobes' damages fail to discriminate familiar faces, but they don't develop the Capgras syndrome, moreover, patients suffering from depersonalization disorder lack the sense of agency for their own actions, but they claim to feel *as if* someone is controlling their actions, and they

don't develop a delusion of control. For that reason, many researchers began to search for a second factor, which is not of the *bottom up* kind, but it refers to peculiar cognitive styles. These cognitive factors, rather than supposed (and never proved correct) anomalous experiences would form and maintain delusional beliefs.

And at this point, we have to face several hypotheses.

3. Metacognition and delusions

Garety and al., for example, started with a number of studies on deficits in probabilistic reasoning which are supposed to characterize people who suffer from persecutory delusion (Garety *et al.* 1991; Warman *et al.* 2007; Freeman 2008). More precisely, these subjects seem to be ready to believe something without having sufficient evidence, they show in other words a tendency to jump to conclusions. The *jumping to conclusions* bias would explain why paranoids usually jump from the experience (anomalous or not) to the delusional belief.

In line with these studies, many authors aim to explain persecutory delusions through referring to the “attributional styles” of subjects; paranoids seem to have, besides the jumping to conclusions bias, a further tendency to blame the others when things go wrong, and to take too much credit for success (Bentall 1994). Nonetheless, these hypotheses seem to be really controversial. If paranoids have actually the tendency to jump to conclusions, why, in front of opposite evidences, they don't jump immediately to the opposite belief? Moreover, following studies (Sharp *et al.*

1997, McKay *et al.* 2005) showed no association between persecutory delusions and the tendency to externalize the blame, and the same goes for the tendency, in paranoids, to take the credit for positive events. Finally, one can hardly apply this theory to the delusions of non-paranoids, like, for example, to the bizarre delusions of schizophrenics.

Actually, researchers must solve the mystery of the incorrigibility of delusion, rather than its first appearance; how can we explain, from a cognitive point of view, the fact that, once born, the delusional idea is so strongly maintained? Many authors refer to a generic deficit in the believes revision's mechanism (Bell *et al.* 2006b; Stone e Young 1997, Davies e Coltheart 2000, Davies *et al.* 2001), which has not been identified yet.

It is probably more useful to refer to metacognitive factors, in other words, to top down factors, which could have a feedback effect on psychotic symptoms. For example, Bentall (1990) and Morrison (2001) stressed how believes and expectations about the self and the external world can produce bias, that is systematic preferences guiding ambiguous experiences' interpretation (Stirling *et al.* 2007). More precisely, the role of some kind of metacognitions (thoughts about one's own cognitive processes) in the formation and the maintenance of neurotic and psychotic symptoms has been highlighted; the vulnerability towards mental disorder is due, according to these authors, to different mechanisms, e.g. heightened self-focused attention, threat monitoring, ruminative processing, activation of both dysfunctional beliefs and

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strategies that fail to modify maladaptive self-knowledge (Wells and Matthews 1994; Morrison e Wells 2003). Such a cognitive system makes the jump from experience to belief to delusion much easier: for example, if someone having believes like “I can trust no one, let alone the institutions”, receives a visit by an inspector checking the licence fee AE’s payment, for his meta cognitive bias he can focus on this event, make it particularly meaningful and salient, attach it with negative emotions and come to believe that the visit of the inspector is the proof of a governative conspiracy against him (Morrison 2001). Depending on the events the different subjects live, these jumps from experiences to beliefs to delusions can be extremely varied, as described here:

Examples [...] would include an individual interpreting intrusive thoughts as evidence of alien thought insertion; interpreting intrusive impulses as evidence of alien control over one’s body; [...]interpreting the mention of one’s first name on television as evidence that everyone is talking about you or that the media are communicating directly with you. (Morrison 2001, p. 260)

Theories like this, which stresses the role of metacognitive factors, seem to be more “parsimonious” than those previously mentioned, since they don’t need to postulate *ad hoc* mechanisms, like the *jumping to conclusions* or anomalies of the attributional style.

Once the delusional belief is born, it is firmly held through the same mechanisms: selective attention makes stimulus more salient than they actually are, and these

stimulus, especially when referring to the delusional theme, cause an arousal which feed it, and lessen the accessibility of possible counterexamples. In other words, once the delusion is generated, it maintains itself because an emotive hyper activation towards topics related to the delusion, which are actually neutral, encourages to the activation of heuristics, i.e. reasoning strategies which speed up the process of finding a solution, and that are intuitive, guided by habit, but not really accurate (Speechley, Ngan 2008).

In the last decades the idea that psychotic symptoms, however serious, place themselves on a *continuum*, is beginning to spread over; in this perspective, the boundary between sanity and madness doesn't lie in one jump, but in a series of small and continuous transitions. This *continuum* seems to apply to delusions (Verdoux, van Os 2002; Freeman 2010), insight (Shad 2006), hallucinations (Johns 2005), paranoia (Ellett *et al.* 2003, Freeman *et al.* 2005), and, as we'll see hereinafter, voices (Johns *et al.* 2002; Beck, Rector 2003). With regard to delusion, hypothesis like those described above are consistent with the *continuum* perspective, since the difference between delusional and normal beliefs doesn't rely on anomalous perceptual experiences, that would occur in one case and would not in the other, but rather on metacognitive factors that, taken individually, are not at all mysterious, but that, when combined together and fed on certain kinds of beliefs, lead to the development of a delusional system.

4. The auditory hallucinations

Just as the delusion takes typical topics and structure in schizophrenia, in the same way the hallucinations are distributed in a peculiar way inside the schizophrenic spectrum. Schneider (1959), which assigned auditory hallucinations a very important role in schizophrenia, identified three kinds of hallucinations as absolutely distinguishing: hearing comments about one's own behavior, hearing voices speaking of oneself in the third person, and hearing voices speaking one's thoughts (the so-called thought echo, that has a high diagnostic value for schizophrenia). In other words, voices, in all their forms, seem to rule the schizophrenic world.

The voices can be very different. They can be remarks, criticisms, orders, ruminations, worries, questions, they can be continuous one day, and disappear the next, they can be barely audible or at full volume. The voice can belong to a stranger, or to relatives, persecutors, lovers, gods, angels, devils, machines, radio, TV. At first sight, auditory hallucinations, just like delusions, or even more, seem to be something equivalent to mental disorder. To speak in a brutal way, if someone hears voices, it is *obvious* that he's mad. Nevertheless, some elements seem to suggest that this phenomenon is not limited to madness, but that in this case, just like the delusion's one, it is more proper to talk of a *continuum*. For example, there are people that hear voices without being psychotic (Beck, Rector 2003), like widows, which, in a survey of Rees, show an unusually high incidence of either visual or auditory hallucinations of the dead spouse, especially in the period immediately subsequent the loss (Rees,

1971). These voices don't seem to be qualitatively different from the psychotic ones. In line with this *continuum* hypothesis, voices, and hallucinations in general, appear more easily when subjects, both normal and psychotics, go through particularly stressful periods.

The onset situations of hallucinations are usually two, and opposite: they appear when subjects are alone, focusing on their own thoughts (the same situation as the delusion), but also when, on the contrary, there are many people. For this reason, one who experiences voices can adopt some strategies to reduce their onset, e.g. avoiding to be alone or to go to crowded places. Once closely related with delusions, hallucinations are maintained just in the same way: they establish themselves as real (it is hard indeed to doubt the existence of a voice shouting inside our mind) and they are judged as coming from the outside; moreover, the emotive responses they produce to the subject (which usually calms down if the voices are good, and gets anxious if they are evil) confirm their existence and their coming from the outside.

But what causes the auditory hallucinations according to the cognitive perspective? One of the major theories involves a deficit in the monitoring system. According to this hypothesis (also applied to delusions, as we noticed above), the voices would be self-generated, but not recognized, and so they are externalized. Shergill, Cameron e Brammer (2001) noticed for example that the activation patterns detected with fMRI during auditory hallucinations are very similar to those observed in normal subjects when they imagine that someone is speaking to them. This would mean that voices

are a sort of “internal speech” which, for some defect in the monitoring capacity, would be imputed to the external world. So, there would be a tendency to externalize the cause of self-generated actions.

But this theory of the *externalizing bias* has some weak points. It is not clear, for example, why a mistake in the monitoring capacity should cause only the bias to impute some internal events to external causes, and not the opposite tendency, to impute internal causes to external events. If there were this kind of deficit, in the differentiation between internal and external causes, the subjects should often be uncertain about the origin of the events, rather than regularly impute internal events to external causes, unless we assume, in addition to the monitoring deficit, also this tendency to externalize, and if so this theory will end up complicating without actually explaining anything.

More generally, the scientific consensus about the existence of a deficit which would make people judge as external voices actually self-generated, doesn't seem to stand the test of concrete. As highlighted by Stinson and coll. (2010), a bias in the self-monitoring capacity not only hasn't been proved yet, but in some cases doesn't seem to be connected with hallucinations (cfr. John *et al.* 2006, Versmissen *et al.* 2007). For this reason, in his survey Stinson can claim that the mechanisms underlying auditory hallucinations are still a black box (Stinson *et al.* 2010, p.179).

5. Metacognition and auditory hallucinations

Van Os and coll. made an interesting remark upon voices (van Os, Krabbendam 2002; Krabbendam *et al.* 2004). The authors pointed out that is the development of beliefs and delusions which are relative to hallucinations (e.g. giving them a special meaning, or believing that they come from an external source) to lead to psychosis, rather than the experience of hallucinations itself. It seems then that, even for hallucinations, psychosis is triggered by the beliefs, rather than by perceptual experiences.

Thus, many authors are beginning to highlight the role played by metacognitive factors, which are the same implicated in delusions. The vulnerability to hallucinations is ascribed to specific mechanisms, such as excess of self-focused attention, ruminative processing, dysfunctional self beliefs and hypervigilance to idiosyncratic threat cues (Ensum & Morrison 2004; Lobban *et al.* 2002; Morrison *et al.* 2000; Cangas *et al.* 2006). In other words, people who experience auditory hallucinations are more inclined to reflect and to judge their cognitive processes, and to have thoughts such as “I need to worry, in order to work well”, “It’s bad to have certain thoughts”, “This worrying will make me sick”, “I must control my thoughts” and so on (Morrison 2001). According to Larøi (Larøi *et al.* 2005), when intrusive thoughts (persistent and unwanted) are not admitted, a cognitive dissonance results, which the person tries to escape by externalising the intrusive thoughts. This would explain why these subjects don’t externalize all of their actions (as we would expect

if it were a deficit *in toto* in the self-monitoring capacity), but only some of their thoughts.

Once again, the beliefs referred to certain events lead to auditory hallucinations, rather than the events themselves. Thus, it will be the initial interpretation of an event, be it an intrusive thought or a real hallucination (which is an event more common than previously thought), to determine the reactions to the event itself.

[...] if someone interprets an auditory hallucination as the result of stress or sleep deprivation, he may reduce arousal or get some sleep but not give the hallucination any further thought. However, if the same person were to interpret it as being a sign of madness or indicative of their neighbour's attempts to harm them, they may engage in hypervigilance for similar experiences, attempt to suppress the experience, punish themselves for it or adopt safety behaviours to prevent the feared outcome, all of which may contribute to the maintenance of further hallucinations. (Morrison 2001, p. 264)

Through developing an hypervigilance for similar experiences, punishing oneself for them, considering them highly dangerous for being signs of madness, one will only make them more likely, and create a vicious circle which is impossible to escape from. Focusing on the voices in order to make them stop, these subjects will give special attention to them, making them more powerful and persistent. The subject's attitude towards his hallucinations is crucial since the very first episode, as described by this patient:

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On a Sunday morning at 10 o'clock, it suddenly was as if I received a totally unexpected enormous blow on my head. I was alone and there was a message—a message at which even the dogs would turn up their noses. I instantly panicked and couldn't prevent terrible events from happening. My first reaction was: What on earth is happening? The second was: I'm probably just imagining things. Then I thought: No, you're not imagining it; you have to take this seriously. (Beck, Rector 2003, p. 23)

In this example, it's the thought “you have to take this seriously” to trigger the “hallucinations – delusions – hallucinations” vicious circle.

Finally, also the emotions, such as anxiety and fear, play a crucial role in auditory hallucinations, since they attach greater importance to neutral stimuli, and they concur to maintain the belief on the reality of voices and their coming from an external source. Thus, the auditory hallucinations seem to be a phenomenon more complex than expected, because it arises from the linking of beliefs, expectations, emotions, hypervigilance, ruminations. Nevertheless, I think that, in this perspective, a leading role must be given to beliefs, for they contribute to interpret, trigger, confirm and maintain the voices.

6. Pathologies of belief

Hallucinations and delusions are closely related phenomena. They are connected not just because, in the majority of cases, the two symptoms confirm each other, e.g. the persecutory delusion can be supported by voices with negative content, which in turn are supported by the delusion itself, that consider them as belonging to the persecutor.

In my opinion, there is a deeper reason why we cannot deal with delusions and voices separately. They are both pathologies of belief. In the former case, the belief area seems to be obviously involved. It is a belief, be it plausible (in paranoia) or implausible (in schizophrenia), which is sustained beyond all evidence and that becomes the main focus of a person's life, who can't help but interpret everything basing on the delusion. In the latter, it is the way voices are judged, interpreted, and the related beliefs, rather than hallucinatory experience itself, to turn a phenomenon belonging to a continuum into a proper psychotic symptom.

Even if the mechanisms underlying these symptom are still unsolved, I think that the attempts of explanations which are more plausible are those involving common factors, and, more precisely, the role played by beliefs and *top-down* factors.

REFERENCES

- American Psychiatric Association (1994) *Diagnostic and Statistical Manual of Mental Disorders Fourth Edition*, Washington, DC, American Psychiatric Association.
- Beck A., Rector N. (2003) A cognitive model of Hallucinations, *Cognitive Therapy and Research*, Vol. 27, No. 1, pp. 19-52.
- Bell V., Halligan P.W., Ellis H. (2006) *A cognitive neuroscience of belief*, in Halligan P.W., Aylward M. (eds.) "The Power of Belief: Psychosocial influences on Illness, Disability and Medicine", Oxford, Oxford University Press.
- Bell V., Halligan P.W., Ellis H.D. (2008) Are anomalous perceptual experiences necessary for delusions?, *Journal of Nervous and Mental Disease*, 196 (1), pp. 3-8.
- Bentall R.P. (1990) The Illusion of Reality: A Review and Integration of Psychological Research on Hallucination, *Psychological Bulletin*, v.107(1), pp. 82-95.
- Bentall R.P. (1994). *Cognitive biases and abnormal beliefs: Towards a model of persecutory delusions*, in A. David & J. Cutting (Eds.), "The neuropsychology of schizophrenia" (pp. 337-360), Hove, UK: Lawrence Erlbaum Associates Ltd.
- Cangas A.J., Errasti J.M., Garcia-Montes J.M., Alvarez R., Ruiz R. (2006) Metacognitive factors and alterations of attention related to predisposition to hallucinations, *Personality and Individual Differences*, 40 pp. 487-496.
- Davies M., Coltheart M. (2000) Introduction: Pathologies of Belief, *Mind & Language*, Vol.15 n.1, Feb. 2000, pp. 1-46.
- Davies M., Coltheart M., Langdon R., Breen N. (2001) Monothematic delusions: Towards a two-factor account, in *On Understanding and Explaining Schizophrenia*, special issue of *Philosophy, Psychiatry and Psychology*, volume 8, numbers 2 and 3 (June/September, 2001), edited by Christoph Hoerl.
- Ellett L., Lopes B., Chadwick P. (2003) Paranoia in a nonclinical population of college students, *The Journal of nervous and mental disease*, Jul;191(7), pp. 425-30.
- Ensum I., Morrison A. P. (2004). The effects of focus of attention on attributional bias in patients experiencing auditory hallucinations, *Behaviour Research and Therapy*, 41, pp. 895-907.

Freeman D., Bebbington P.E., Rollinson R., Kuipers E., Ray K., Dunn G. (2005) Psychological investigation of the structure of paranoia in a non-clinical population, *The British Journal of Psychiatry*, 186, pp. 427-435.

Freeman D., Pugh K., Antley A., Slater M., Bebbington P., Gittins M., Dunn G., Kuipers E., Fowler D., Garety P. (2008) Virtual reality study of paranoid thinking in the general population, *The British Journal of Psychiatry*, April 1, 2008; 192(4), pp. 258-263.

Freeman D., Pugh K., Vorontsova N., Antley A., Slater M. (2010) Testing the Continuum of Delusional Beliefs. An Experimental Study Using Virtual Reality, *Journal Abnormal Psychology*, February; 119(1): pp. 83-92.

Garety P.A., Hemsley D.R., Wessely S. (1991) Reasoning in deluded schizophrenic and paranoid patients: biases in performance on a probabilistic inference task, *Journal of Nervous and Mental Disease*, 179, pp. 194-201.

Johns L.C., Nazroo J.Y., Bebbington P., Kuipers E. (2002) Occurrence of hallucinatory experiences in a community sample and ethnic variations, *The British Journal of Psychiatry*, 180, pp. 174 - 178.

Johns L.C. (2005) Hallucinations in the general population, *Current Psychiatry Report*, 7(3), pp. 162-7.

Johns L.C., Gregg L., Allen P., Vythelingum G.N., McGuire P.K. (2006) Verbal self-monitoring and auditory verbal hallucinations in psychosis: symptom or syndrome specific?, *Psychological Medicine*, 36, pp. 465-474.

Krabbendam L., Myin-Germeys I., Hanssen M., Bijl R.V., de Graaf R., Vollebergh W., Bak M., van Os J. (2004) Hallucinatory experiences and onset of psychotic disorder: evidence that the risk is mediated by delusion formation, *Acta Psychiatrica Scandinavica*, 110(4), pp. 264-72.

Kraepelin E. (1904) *Trattato di Psichiatria Generale*, trad.it. Vallardi, Milano, 1907.

Larøi F., Van der Linden M. (2005) Metacognitions in proneness towards hallucinations and delusions, *Behaviour Research and Therapy*, 43, pp. 1425-1441.

Lobban F., Haddock G., Kinderman P., Wells A. (2002). The role of metacognitive beliefs in auditory hallucinations, *Personality and Individual Differences*, 32, pp. 1351-1363.

Maher B.A. (1992) Delusions: Contemporary etiological hypotheses, *Psychiatric Annals*, 22, pp. 260-268.

Maher B.A. (1999) Anomalous experience in everyday life: Its significance for psychopathology, *Monist*, 82, pp. 547-570.

McKay R., Langdon R., Coltheart M. (2005) Paranoia, persecutory delusions and attributional biases, *Psychiatry Research*, 136, pp. 233-245.

Morrison A.P., Wells A., Nothard S. (2000). Cognitive factors in predisposition to auditory and visual hallucinations, *British Journal of Clinical Psychology*, 39, pp. 67-78.

Morrison A.P. (2001) The interpretation of illusions in psychosis: an integrative cognitive approach to hallucinations and delusions, *Behavioural and Cognitive Psychotherapy*, 2001, 29, pp. 257-276.

Morrison A.P., Wells A. (2003) A comparison of metacognitions in patients with hallucinations, delusions, panic disorder, and non-patient controls, *Behaviour Research and Therapy*, 41, pp. 251-256.

Shad M.U., Tamminga C.A., Cullum M., Haas G.L., Ke-shavan M.S. (2006) Insight and frontal cortical function in schizophrenia: a review, *Schizophrenic Research*, 86 (1-3), pp. 54-70.

Sharp H.M., Fear C.F., Healy D. (1997) Attributional style and delusions: an investigation based on delusional content, *European Psychiatry*, 12, pp. 1-7.

Schneider K. (1959) *Clinical Psychopathology*, New York: Grune and Stratton.

Shergill S.S., Cameron L.A., Brammer M.J. (2001) Modality specific neural correlates of auditory and somatic hallucinations, *Journal of Neurology, Neurosurgery and Psychiatry*, 71(5), pp. 688-690.

Speechley W.J., Ngan E.T.C. (2008) Dual-stream modulation failure: A novel hypothesis for the formation and maintenance of delusions in schizophrenia, *Medical Hypotheses*, 70, pp. 1210-1214.

Sterling J., Barkus E., Lewis S. (2007) Hallucination proneness, schizotypy and meta-cognition, *Behaviour Research and Therapy*, 45, pp. 1401-1408.

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Stinson K., Valmaggia L.R., Antley A., Slater M., Freeman D. (2010) Cognitive triggers of auditory hallucinations: An experimental investigation, *Journal of Behavior Therapy & Experimental Psychiatry*, 41, pp. 179-184.

Stone T., Young A.W. (1997) Delusions and brain injury: the philosophy and psychology of belief, *Mind and Language*, 12, pp. 327-364

van Os J., Krabbendam L. (2002) *Cognitive epidemiology as a tool to investigate psychological mechanisms of psychosis*. Paper presented at the annual meeting of the European Association for Behavioural and Cognitive Therapies, Maastricht, The Netherlands.

Verdoux H., van Os J. (2002) Psychotic symptoms in non-clinical populations and the continuum of psychosis, *Schizophrenia Research*, 54, Issue 1, pp. 59-65.

Versmissen D., Janssen I., Johns L., McGuire P., Drukker M., Campo J. (2007). Verbal self-monitoring in psychosis: a non-replication, *Psychological Medicine*, 7(4), pp. 569-576.

Warman D., Lysaker P.H, Martin J.M., Davis L., Haudenschild S.L. (2007) Jumping to conclusions and the continuum of delusional beliefs, *Behaviour research and therapy* n.45, pp. 1255-1269.