Literature review plan

Plan out your research with this helpful literature review plan, apply these strategies to your own work by filling out your answers to the questions below.

# Themes

What central themes have you identified in the field of research?

* Some evidence for inner speech theory to explain auditory verbal hallucinations (AVHs) in schizophrenia from cognitive and neuroimaging
* However, there are many limitations of the inner speech theory
* Other theories of auditory verbal hallucinations have their own pros and cons too

# Debates and disagreements

What are the main debates and disagreements in the research?

* The inner speech theory explains verbal hallucinations as arising from a failure to recognise one’s own inner speech as belonging to the self but the mechanism for misattribution to an external source is underspecified i.e. it doesn’t explain why / how you would then believe the voice to be that of a neighbour or friend etc.
* It also does not explain the second and third-person nature of voices, nor the fact they are often negative (negativity bias).

# Research chronology

Show how the research field has development over time.

* **Inner speech model (Frith & Done, 1989) -** their theory proposes that AVHs arise from a misattribution of one’s own inner voice, or “inner speech”, to an external source. Specifically, an internal monitoring system fails to recognise one’s own thoughts as emanating from the self and so they are interpreted as being ‘foreign’.
* Many **cognitive studies provide evidence** for deficits in self-monitoring in schizophrenia. When required to match a force they had just experienced, healthy controls overcompensated, consistently producing excessive force, in order to overcome the cancellation of the predicted sensory consequences (Shergill, Samson, Bays, Frith & Wolpert, 2005).
* Evidence for inner speech model from **neuroimaging studies**: Hallucinating patients show an abnormal pattern of activation in response to inner speech. In event-related potential (ERP) studies, the N100 component of the auditory ERP in response to unaltered feedback (recording) of the patient’s own voice was not dampened compared to the N100 response to an altered version of their own voice or another person’s voice, which correlated with hallucination severity as well as misattribution errors (Heinks-Maldonado et al, 2007). Schizophrenia patients also showed a failure of N1 suppression during talking relative to listening, compared to healthy controls (Ford et al, 2001), as well as a lack of neural synchrony preceding speech which inversely correlated with auditory hallucination severity (Mathalon & Ford, 2008).
* **Criticisms of inner speech theory** emerge: the model does not account for why the voice of a particular person, often known to the patient, is experienced (*Pacherie, Green & Bayne, 2006*).
* Other theories are proposed in response to limitations of inner speech theory, including the **memory inhibition deficits model**. This proposes a failure of past regularities, built from previous experience, in appropriately modulating current perception (**Hemsley, 1993**). This reduced influence of prior learning leads to 'unstructured sensory input', which results in the intrusion of unexpected material from long-term memory. It is postulated that aberrant perceptual experiences such as AVHs may also arise due to no ‘predictions’ being made in the face of this unstructured input.
* However, these theories are not without their own limitations either, leading to *Waters et al (2012)* proposing an integrated model of cognitive mechanisms in AVHs which suggests they arise from an interaction between bottom-up

aberrant auditory signals generated by hyperactivation in the auditory cortex and functionally related areas (triggered by internal factors such as emotions and/or environmental factors), and top-down mechanisms that shape the content of AVHs and which are caused by a range of cognitive deficits in processes such as intentional inhibition and signal detection.

* Bayesian inference modelling – takes more complete approach to this, and provides framework for perception under conditions of uncertainty. Corlett, Frith & Fletcher (2009) apply this framework to AVHs, suggesting they may arise from strong priors (cognitive predictions / expectations) and weak bottom-up signals from the environment, leading to the perception of non- existent sounds.

# Key researchers

Who are the key researchers in the field? What was their contribution?

* **Frith & Done –** came up with the inner speech theory
* **Waters et al –** suggested the idea that verbal hallucinations may arise from a mixture of top-down cognitive processes and bottom-up environmental influences
* **Corlett, Frith & Fletcher (2009)** – applied a theory of perception (Bayesian inference) to explaining delusions and hallucinations in schizophrenia

# Gaps in the research

What gaps or weakness are there in the research field?

* Bayesian inference is very theoretical and difficult to apply to AVHs as an all- encompassing explanation
* Some neurobiological studies suggest that actually weak priors (high prediction error) is mediated by dopamine dysfunction but it’s unclear how

aberrant dopaminergic activity in the ventral striatum would lead to the often negative valence of content in AVHs

* There are studies that support contradictory positions i.e. some that indicate AVHs are due to excessively strong priors (relative to bottom-up signals from the environment) and others that suggest they arise from strong bottom-up signals (relative to priors); these remain unaddressed.