Jurnal Sains Kesihatan Malaysia 23 (1) 2025: 55-68
DOI : http://dx.doi.org/10.17576/JSKM-2025-2301-05

# Metacognitionand Inner Speech In Individual With Psychosis: A Scoping Review

(Metakognisi dan Ucapan Batin dalam Individu Dengan Psikosis: Ulasan Skop)

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## Abstract

*Psychosis can be defined as individual's experience of hallucination or delusions or both. It is regarded as one of the most challenging psychological illnesses to handle within the clinical walls. As of now, three main lines of treatment interventions (i.e. pharmacological treatment, cognitive behavioural therapy, and social cognitive Training) were deemed as having mixed findings or having questionable efficacy. This led to researchers in trying to find other means of psychological constructs to be incorporated into therapeutic interventions for people with Psychosis. Two of the proposed constructs were Metacognition (i.e. thinking about thinking) and Inner Speech (i.e. the internal experience of auditory language without the need to use covert language). This scoping review attempts to provide an overview on the extent of research that has been done relating to these three concepts (i.e. Metacognition, Inner Speech and Psychosis). Furthermore, this scoping review also attempts to identify any gaps in the literature that could aid and inform the direction of future research within this area of interest. The scoping review was done according to five-stage framework introduced by Arksey and O'Malley (2005). Results showed there seemed to be several theories being proposed from both field of Metacognition and Inner Speech in trying to explain Psychosis. However, these theories were not only contradictory to one another but also only rely on philosophical and psychological theories as there were no further scientific research done in trying to back up its claim. Further discussion and implication were presented in this article.*

*Keywords: Metacognition; Inner Speech; Self-talk; Psychosis*

## Abstrak

*Psikosis adalah sejenis masalah kesihatan mental di mana seseorang individu akan mengalami gejala hallusinasi, delusi atau kedua-duanya sekali. Ianya dianggap sebagai salah satu masalah kesihatan mental yang paling mencabar untuk ditangani, Pada masa kini, terdapat tiga jenis intervensi utama, iaitu rawatan farmakologi, terapi kognitif tingkah laku serta latihan sosial kognitif dengan dapatan kajian yang bercampuran atau, keberkesanan tiga jenis intervensi ini masih lagi dipersoalkan. Ini mendorong, ahli penyelidik berusaha untuk mencari konstruk psikologi lain untuk disebatikan ke dalam intervensi untuk individu dengan Psikosis. Dua konstruk diusulkan ialah Metakognisi (iaitu memikir tentang pemikiran sendiri) dan Ucapan Batin (iaitu pengalaman dalaman suara audio tanpa perlu bahasa dalaman). Artikel ini bertujuan memberi gambaran sejauh mana kajian telah dijalankan berkenaan ketiga-tiga konsep Metakognisi, Ucapan Batin dan Psikosis. Ia juga mengenalpasti jurang dalam literatur supaya memberi arah penyelidikan masa datang yang berminat dalam bidang ini. Ulasan ini mengikut rangka kajian literatur lima peringkat Arksey dan O'Mallley (2005). Hasil kajian menunjukkan terdapat beberapa teori dikemukakan dari kedua-dua bidang Metakognisi dan Ucapan Batin untuk menjelaskan gejala Psikosis. Walau bagaimanapun teori-teori ini bertentangan antara satu sama lain dan kebanyakannya bergantung sahaja pada falsafah dan teori psikologi tanpa kajian saintifik untuk menyokong hujah. Perbincangan dan implikasi selanjutnya dibincangkan dalam artikel.*

*Kata kunci: Metakognisi; Ucapan Batin; Psikosis*

## INTRODUCTION

Difficulty in distinguishing reality and imagination is a hallmark of psychotic experiences. This usually relates to hearing voices, i.e. hallucination, which is perceived solely by the individuals themselves. Research suggests a link between psychotic symptoms with poorer inner speech and metacognitive abilities. Current literature attempts to understand how these factors intertwine with one another as it can potentially help to further understand how one's thoughts and insights influences mental health issues. This can subsequently help find new ways to aid individuals with psychosis and improve mental wellbeing of the general population.

### Psychosis

Psychosis refers to the delusions or hallucinations (or both) experienced by an individual (Arciniegas 2015). The Diagnostic Statistical Manual of Mental Disorder, 5th Edition (DSM-5) by American Psychiatric Association [APA] (2013) added Psychosis under several mental health disorder including "Schizophrenia", "Delusional disorder", "Schizophreniform disorder", and "Schizoaffective disorder". The prevalence rate of psychotic-related disorder was estimated to be around 4.6 per 1000 individuals (Moreno- Küstner et. al., 2018). Whilst, here in Malaysia, it was reported that there were more than 7000 individuals registered with Schizophrenia under the National Mental Health Registry Malaysia (Abdul Aziz et al. 2008)

Overall, the prognosis of psychotic related disorder is still considered poor with studies reported only around 15% of individuals with Schizophrenia managed to return to their pre-illness functioning (Tamminga 2018). Additionally, around two-thirds of individuals with psychotic symptoms would experience relapse, residual disability or be permanently incapacitated.

There are three main treatment interventions for Psychosis; Pharmacological treatment, social cognition training (e.g. social skills training) and cognitive behavioural therapy (Kuipers et al., 2014; APA, 2019). However, each of these treatment interventions came with its own limitations (refer to Cerveri et al. 2019; Hazell et al. 2016; Kurtz & Richardson 2012; Stafford et al. 2013; Remington et al. 2016). Thus, researchers have begun to explore other means of interventions or add other relevant skills and concepts to the current intervention. Two of these concepts are Metacognitive ability and Inner Speech.

### Metacognition (MC)

MC can be simply understood as "thinking about thinking" or "knowing about knowing". However, when it was coined by Flavel in 1979, he defined it as "one's knowledge concerning own cognitive processes or anything relating to them". The literature on MC has piqued the interest of researchers, particularly in trying to explain the presence of psychotic symptoms (Lysaker, Dimaggoio & Brune 2014).

### Inner Speech (IS)

IS, or sometimes called "inner voice", "self-talk" or "internal thoughts" are the experience of language within one's self without having to rely on overt and audible articulation (Alderson-Day & Fernyhough 2015). Just as Metacognition, researchers also attempted to link the concept of IS with psychotic symptoms.

However, despite the growing interests in trying to relate all these three concepts together, there are limited research available, and the outcomes of these studies were unclear in defining the relationship between these three key concepts. Hence, this scoping review articles aim to map out and examine the extent of research that has been done between Psychosis, MC and IS. Furthermore, this article would also like to summarise and disseminate current research findings as well as identify the research gap in relation to these three areas of literature (Arkseys & O'Malley's 2005).

## METHODS

The methodological approach utilised in this scoping review was based on the outline laid out by Arksey and O'Malley (2005) in their five-stage framework. The stages involved in this includes (1) identifying initial research questions; (2) identifying relevant studies; (3) study selection; (4) charting the data, and (5) collating, summarising and reporting the results gained the articles included in the final stage of the review. A summary of each of this step can be found on Table 1. These steps were outlined to ensure transparency and replicability of the literature review. This will in turn improves on the reliability of the study findings. It is also important to note that this scoping review was based on the Preferred Reporting of Items for Systematic Reviews and Meta-analyses, extension for Scoping Reviews (PRISMA-ScR). It was published in 2018 by Tricco et al. PRISMA-ScR is a checklist that contains 22 checklist items (20 essential and 2 optional items) to ensure the authors were able to amply synthesize evidence and assess the scope of literature regarding a specific topic.

Table 1 The summary for each of the stages involved within the scoping review framework by Arksey and O'Malley (2005)

| | |
|---|---|
| Stage 1 | *Identify the initial research questions* determine which aspects of the question are particularly important to facilitate the most appropriate search. |
| Stage 2 | *Identify the relevant studies* comprehensively answer the central research question(s) including any time, date, budget constraints and range of sources. |
| Stage 3 | *Study selection* adopts similar methods to systematic review from the outset adopts greater flexibility with inclusion and exclusion criteria, as familiarity with data progresses search terms may be redefined. |
| Stage 4 | *'Charting'* the data is representative of data extraction processes in a systematic review, but takes a broader approach. Uses a narrative descriptive-analytical framework method but does not attempt to 'weight' the methodological quality of evidence. |
| Stage 5 | *Collate, summarise and report* the results using a framework approach. |
| Stage 6 | *Optional consultation stage* with key stakeholders has potential to add value, additional references and valuable insights. |

Identifying initial research questions

This objective of this scoping review is to explore the current known link for both MC and IS in relation to psychotic symptoms. To ensure authors were able to gain a wide range of literature in covering these three areas, authors has identified formed several initial research questions to guide the literature search. The questions were as follows:

1. What is the MC and IS models that are involved in explaining psychotic symptoms?
2. How do the current MC and IS models explain the presence of psychotic symptoms in an individual?
3. What are the factors within MC and IS literature that contributes to psychotic symptoms?
4. What is the current evidence of MC and/or IS use that has been utilised within therapy when treating individuals with Psychosis?

Identifying relevant studies

One of the recommendations by Arksey and O'Malley (2005) was to use a wide range of keywords to allow for "broad coverage" of the available literature. Hence, to allow for this, authors have developed key concepts and search terms that is related to the core areas of interest within this scoping review. The key terms used for the scoping review can be seen on Table 2.

Table 2 The key terms utilised when searching for articles within the databases

| Key search terms | | | |
|---|---|---|---|
| Metacognition | Inner speech | Psychosis | Adult |
| Thinking about thinking | Self-talk | Schizophrenia | Adults |
| Knowing about knowing | Covert speech | Hallucination | |
| Awareness about awareness | Internal monologue | Delusion | |
| Cognition about cognition | Private speech | | |
| Boolean search combination | | | |
| (metacognition OR thinking AND about AND thinking OR knowing AND about AND knowing OR awareness AND about AND awareness OR cognition AND about AND cognition) AND (inner AND speech OR self AND talk OR covert AND speech OR internal AND monologue OR private AND speech) AND (psychosis OR schizophrenia OR hallucination OR delusion) AND (adult OR adults) | | | |

Additionally, authors have also came up with several inclusion and exclusion criteria to ensure the review would be done in a comprehensive and efficient manner. There were six criteria that was used to determine the eligibility of the article namely, "Time period",

"Language", "type of article", "study focus", "population and sample" and "literature focus". No specific contexts were assigned as part of the eligibility criteria. A full rundown of the inclusion and exclusion criteria can be seen on Table 3. Two main electronic databases were used in searching for the articles to be reviewed, "Ovid MEDLINE" and "SCOPUS". These databases were chosen due to its wide scope of coverage within medical and psychology literature.

Table 3 The inclusion and exclusion criteria used in this scoping review.

| Criterion | Inclusion | Exclusion |
|---|---|---|
| Time period | 1998 to 2019 | Articles published before these dates |
| Language | English or Malay | Non-English or non-Malay articles |
| Type of article | Research or review articles published in a peer review journal | Research or review articles that were not published in a peer review journal |
| Study focus | Individuals experiencing psychotic symptoms (Hallucination and/or delusions) | Sample participants that involves individuals that does not experience psychotic symptoms (Hallucination and/or delusions) |
| Population and sample | Adults with experiences of psychotic symptoms (clinical or non-clinical population) or having tendencies of experiencing psychotic symptoms | All other adults that has no experiences or tendencies of experiencing psychotic symptoms<br><br>Also, non-adult population (both clinical or non-clinical) which has or has no experience or tendencies of experiencing psychotic symptoms |
| Literature focus (Concept) | Articles that has majority of the theme discussing about MC and/or IS, in relation to Psychosis symptoms | Articles that made a passing or token reference to metacognition and/or inner speech in relation to Psychosis<br><br>Also included the articles that has no relation to any of the concepts that is of interest in this scoping review |
| Context of articles | Any context provided it satisfies to the criteria mentioned above | Not available |

Study selection

Initially, a total of 45 articles were discovered when using the key search terms (as shown in Table 2). After the removal of duplication, an updated total of 38 articles were identified. When further screening was done, particularly on the keywords, topic title and abstract used, six of the articles were excluded due to incompatibility. This incompatibility includes incompatible keywords or irrelevant topic title and abstract description. The full text versions of the remaining twenty articles were then collected and assessed for their eligibility to be included in the review. However, ultimately, a total of twelve of the articles were included in the final review as the eight articles excluded either does not meet any one or more of the inclusion criteria (as shown in Table 3). A flowchart of the study selection can be seen on Figure 1.

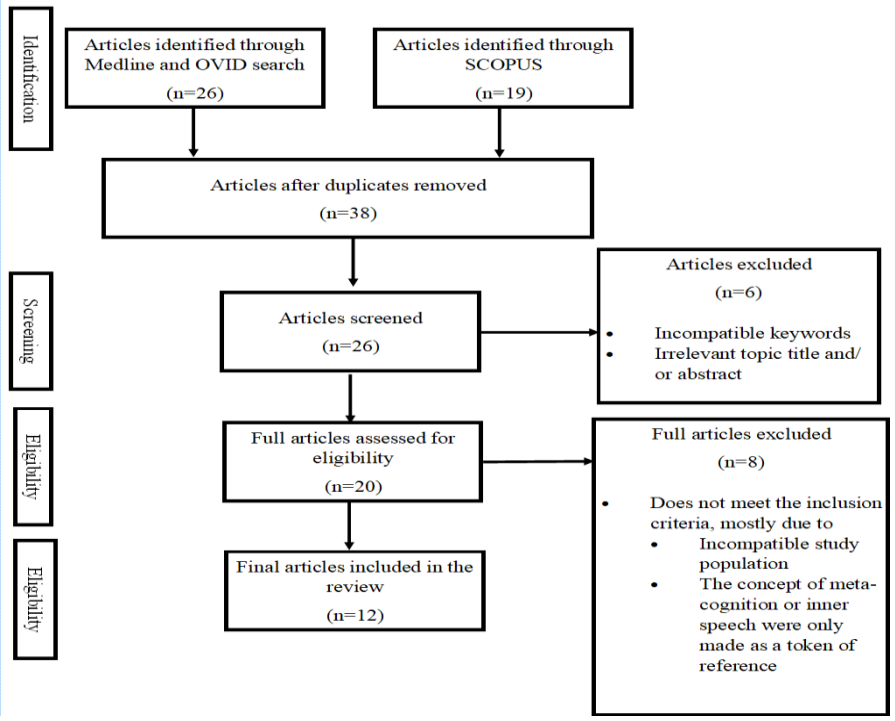


Figure 1 shows the PRISMA flow diagram for article selection Charting the data

After the articles were finalised, Arksey and O'Malley's (2005) framework recommend following up with the data charting. Authors have charted the remaining 12 articles into brief summaries which includes several key information. This includes the "Name of author(s)", "Year", "Country of study", "Study methodology", "Outcome measure" and "Study outcome". The table from the data charting can be found on Table 4.

Collating, summarising, and reporting of result

This is the final stage of Arksey and O'Malley's (2005) scoping framework. Here, researchers would summarise and report the literature search findings. The report for this stage can be found on the following section.

Table 4 outlines the charted data for the included studies

| Article No. | Article name; Author (Year), Country | Aims and objective of study | Study methodology | Outcome measures | Study outcome |
|---|---|---|---|---|---|
| 1 | Building bridges to observational perspectives: A grounded theory of therapy processes in psychosis; Dilks et al. (2008), UK | To explore the therapy process in Psychosis particularly on reflexivity and how it is used in therapy conversation. | Qualitative study design: Grounded theory | Interview response | Half of the patients reported the therapy conversation, specifically the scaffolding made by the therapist during their therapy sessions (i.e. to bridge the external and internal world), was being internalised as part of their daily inner dialog. This became one of the strategies in coping with the subsequent psychotic episodes. |
| 2 | How we know our own minds: The relationship between mindreading and metacognition; Carruthers (2009), USA | Outline, compare and evaluate between the four different accounts on Mindreading-metacognition relationship. | Narrative review | Past journal articles | Four major theories outlined:<br>Mindreading and metacognition as two separate entities.<br>Both mindreading and metacognition works under one mechanism with two modes of access (i.e. perception and introspection).<br>Both are skill based, metacognition develops first then mindreading.<br>Opposite of (iii), mindreading first then metacognition.<br>Episodes of hallucinations and delusions are not caused by either impairment or dissociation between metacognitive and/or mindreading ability. But instead it occurs due to impaired introspective process causing one to not interpret one's own action as not one's own action. |
| 3 | Cognitive processes in auditory hallucinations: attributional biases and metacognition; Baker & Morrison (1998), UK | Examine the attributional bias in individuals experiencing auditory hallucinations as well as to explore the role of metacognitive beliefs in relation to the hallucination episodes. | Correlational research study design | National Adult Reading Test (NART),<br><br>Hospital Anxiety and Depression Scale (HADS),<br><br>Metacognitions Questionnaire (MCQ),<br><br>Structured clinical interview,<br><br>Word association task | Patients with psychotic symptoms tend to employ misattribution bias (i.e. attributing self-generated word to an external source). They also scored lower overall on internality in the source monitoring task. They also scored higher across all subscales within MCQ except for cognitive-self-consciousness. Finally, study concluded that the general vulnerability factors for psychopathology are "Metacognitive efficiency" and "responsibility and superstitious beliefs". |

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| 4 | Inner speech: development, cognitive functions, phenomenology, and neurobiology; Alderson-Day & Fernyhough (2015), UK | This review examines prominent theoretical approaches to inner speech and methodological challenges in its study, before reviewing current evidence on inner speech in children and adults from both typical and atypical populations. | Narrative review | Past journal articles | Theories of inner speech<br>Vygotsky theory<br>Inner speech in working memory<br>Baddeley and Hitch multicomponent model.<br>Most prominent theory of auditory-visual hallucination (AVH) in relation to inner speech is the misattribution of inner speech to an external source.<br>There is also difference between clinical and non-clinical AVH whereby non-patients are associated with more typical neural organization of language processes than in clinical groups. One possibility is that, the distinction between clinical and non-clinical AVHs relates to differing roles of stress and cognitive challenge in triggering anomalous attributions of inner speech.<br>AVHs in deaf individuals implies misattribution of inner speech is less relevant but instead it may be due to misattribution of a communicative or articulatory code. Also, if the hearing impaired experienced AVH in relation to prior linguistic experience, then, this would imply that AVH is an internalized reflection of prior communicative experience, susceptible to individual differences in linguistic skills and developmental history. |
| 5 | Schizotypal tendencies are positively associated with self-talk frequency; Brinthaupt et al. (2019), USA | Explore the relationship between schizotypal tendencies and different Self- talk functions. | Correlational research study design | Schizotypal Personality Questionnaire,<br><br>Self-talk scale (STS) | Individual with higher schizotypal tendency tend to have higher frequency of self-talk. One explanation for this was, these individuals tend to have emotional and social difficulties which needed to be addressed. Hence, an increase in self-talk is needed for self-regulation. An excessive self-talk will predispose them to experiencing schizotypal and psychotic symptoms. |
| 6 | Shot through with voices: Dissociation mediates the relationship between varieties of inner speech and auditory hallucination proneness ; Alderson-Day et. al (2014), UK | To examine the relation between inner speech as well as self-esteem and dissociation (i.e. constructs related to development and experience for symptoms of psychosis). | Correlational research study design | Varieties of Inner Speech questionnaire (VISQ),<br><br>Rosenberg Self-esteem scale (RSES),<br><br>Launay-Slade Hallucination Scale-Revised (LSHS-R) | The construct “dissociation” mediates the relationship between inner speech quality (Particularly “other people” and “evaluative/ motivational” inner speech) and tendencies to experience AVH. Correlational analysis indicated a relationship between “Self-esteem”, “Evaluative/Motivational inner speech” quality and “Other people” in inner speech.<br>But no relationship was evident between “self-esteem” and “hallucination proneness”. Furthermore, “dialogic”, “evaluative” and the presence of “other voices” in inner speech positively correlated with proneness to AVH. This suggests, a greater tendency to experience other voices in everyday thinking may relate to dissociative tendency or could be a precursor of more developed dissociative states such as depersonalisation and identity confusion. |

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| 7 | The tangled roots of inner speech, voices and delusions; Rosen et. al (2018), UK | To explore the role of inner speech in the experience of auditory verbal hallucinations (AVHs) and delusions. | Correlational research study design | Varieties of Inner Speech questionnaire (VISQ),<br><br>Psychotic Symptom Rating Scales,<br><br>DAIMON scale | Individuals with psychosis have greater level of "Dialogical", "Other People" As Well As "Evaluative/Motivational" inner speech.<br>No evidence of differences in levels of "Condensed" inner speech between individual with psychosis and non-clinical sample.<br>Individuals with AVH were more likely to experience a labyrinth of tangled "dialogic", "other people", and "evaluative/ motivational" inner speech.<br>No specific type of inner speech could be accounted for presence and severity of delusions. |
| 8 | The varieties of inner speech: Links between quality of inner speech and psychopathological variables in a sample of young adults; McCarthy-Jones & Fernyhough (2011), UK | To develop and validate an assessment tool to measure inner speech (i.e. Varieties of inner speech, VISQ). | Psychometric assessment development | Varieties of Inner Speech questionnaire (VISQ),<br><br>Hospital Anxiety and Depression Scale (HADS),<br><br>Launay-Slade Hallucination Scale-Revised (LSHS-R) | None of the VISQ subscales predicted proneness to visual hallucinations/ disturbances. |
| 9 | The brain's conversation with itself: neural substrates of dialogic inner speech; Alderson-Day et al, (2015), UK | To compare the neural activation between different varieties of inner speech (i.e. dialogical and monological) as well as social cognitive ability (i.e. Theory of Mind). | Correlational research study design involving fMRI | fMRI imaging results | "Dialogical inner speech" was associated with a widespread bilateral network including left and right superior temporal gyri, praecuneus, posterior cingulate and left inferior and medial frontal gyri. Furthermore, this activation also overlaps with areas responsible for theory of mind, i.e. areas of right posterior temporal cortex, which also subsequently linked to mental state representation.<br>This further supports the idea of AVH occurring due to misattribution of inner speech, evident from common areas of activation between AVH episodes and "dialogical inner speech". |
| 10 | The varieties of inner speech questionnaire–revised (VISQ-R): replicating and refining links between inner speech and psychopathology ; Alderson-Day et al, (2018), UK | To revise and further validate psychometric assessment used to measure inner speech (i.e. VISQ). Also, to replicate previous findings on different varieties of inner speech relation to different psychopathological issues. | Correlational research study design | Varieties of Inner Speech Questionnaire (VISQ).<br><br>Revised Launay-Slade Hallucination scale (LSHS-R).<br><br>Hospital Anxiety and Depression scale (HADS).<br><br>Dissociative Experience Scale-Second Revision (DES-II).<br><br>Rosenberg Self-esteem scale (RSES). | Certain quality of inner speech were more strongly correlated with auditory hallucination than visual hallucination. The construct "dissociation" mediates this relationship.<br>Differences in the previous study, here, only "other people" inner speech has a strong correlation to proneness to auditory hallucination. There is evidence that patients with psychosis endorse the experience of "condensed" inner speech more than the control group, and this relates to increased levels of thought disorder. |

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| 11 | Toward a phenomenology of inner speaking.; Hurlburt et al (2013), USA | To outline the characteristics of inner speech and discuss its ramification on everyday inner experiences. | Qualitative study design: Phenomenological/ Descriptive Experience Sampling | Interview responses | There are some individual differences in how one experience inner speech: "frequency", "experience", "worded or un-worded", "doing vs happening", "voice characteristics", "meaningfulness" and "rate of inner speech".<br>They also noted some misconception of inner speech; particularly when inner speech were defined as inner hearing, unsymbolised thinking or sensory awareness |
| 12 | You can't spell schizophrenia without an 'I': how does the Early Intervention in psychosis approach relate to the concept of schizophrenia as an ipseity disturbance?; Akroyd (2013), UK | To outline the idea of ipseity disturbance (i.e. disturbance in sense of self) as the fundamental issue in psychosis. | Narrative review | Past journal articles | Schizophrenia is a product of ipseity disturbance. The idea of MC seems to be the closest to this. It is beneficial to work at this core issue when handling individuals with schizophrenia. |

## FINDINGS

Out of the 12 articles generated for this review, nine of the studies were conducted in the United Kingdom while the remaining three were conducted in the United States. Additionally, six of the studies were correlational study design, three were of narrative based review, two were qualitative based research and one article was psychometric assessment development. The following were some of the findings yielded from the analysis, organised in a way to correspond to the initial research questions posed during the beginning of this review.

Research question 1: What is the MC and IS models involved in explaining psychotic symptoms?

*Metacognition.* Based on Carruthers (2009) writings, there were four different theories on MC that was linked to the experience of psychotic symptoms: (1) Mindreading and MC as two different capacities, (2) Both Mindreading and MC works under one mechanism having two modes of access, (3) Both are skill based, Metacognition develops first then Mindreading (4) The opposite, Mindreading develops first then Metacognition.

1. Mindreading and MC as two different capacities (Nichols & Stitch 2003)

Mindreading and MC is seen as two different capacities with different core processes. For Mindreading, one will have to tap into their hypothetical reasoning aspect and subsequently construct an assumption of how another individual perceives the world. This assumption is later enriched by the individual's own inferential and planning mechanism. While, MC has two main mechanisms working under it. Firstly, to monitor and provide self-knowledge about own experiential state while the second mechanism are used to monitor and provide self-knowledge about one's propositional attitudes. These two mechanisms will work together to maintain MC ability and self-awareness of the individual.

2. Both Mindreading and MC works under one mechanism with two modes of access (Frith & Happé 1999; Happé 2003)

Mindreading and MC can be performed through two modular components that works symbiotically. This includes, "Other-knowledge" module and "Self-knowledge" module. These components will interact and send information with one another through the process of perception and introspection. These processes will then allow the individual to maintain their Mindreading and MC ability.

3. Both MC and Mindreading are skill based, MC develops first then Mindreading (Goldman 1993; 2006)

One must develop the ability to read own mental state (i.e. MC) before they can attribute their mental state onto another. This ability will later become enriched with the process of inference and simulation done by the individual. These processes would be largely affected by their personal experiences.

4. Mindreading first then MC (Carruthers 2006; Gazzaniga 1995; 2000; Gopnik 1993; Wegner 2017; Wilson 2002)

Just as in (3), various authors has proposed MC is merely the result of an individual turning their own Mindreading capacities upon themselves. Under this theoretical model and (3), it implies that there

are no differences between Mindreading and MC, instead it is two sides of the same coin.

Inner Speech. In Alderson-day & Fernyhough (2015) article, they described two different theories that accounted for development of Inner Speech and how it contributes to psychotic symptoms. These theories are (1) Vygotsky theory of private speech and (2) Inner Speech in working memory.

1. Vygotsky theory of private speech (1987)

Based on the developmental theorist, Vygotsky (1987), he believes that IS (or what he refers to as private speech) is an important outcome of a developmental process. He sees it as a transitional process when children start to internalise their intrapersonal thoughts.

Intrapersonal thoughts were initially used functionally and overtly with their "expert other" (e.g. caregiver). However, with the rise of Inner Speech, the child will then be able to self-regulate their behaviour and emotions without needing their "expert other". This can be regarded as a sign of developmental achievement and maturity.

2. Inner Speech in working memory (Baddeley & Hitch 1974)

This theory explains the role of Inner Speech within the working memory model. This IS model set its foundation heavily on the Baddeley and Hitch (1974) multicomponent model.

Under the Baddeley and Hitch (1974) multicomponent model, they proposed the working memory consisted of three different components namely, "central executive", "phonological loop" and "visuospatial sketchpad". however, later they added a fourth component which is known as the "episodic buffer". IS exists within the phonological loop which is "responsible for the representation of acoustic, verbal and phonological information".

However, some literatures have argued the experience or definition for Inner Speech under this model may be misconstrued as Inner Speech should not be considered simply as "inner hearing, unsymbolised thinking or sensory awareness" (Hurlburt et al. 2013)

Research question 2: How does Metacognition and/ or Inner Speech explain the experience relating to the psychotic symptoms?

*Metacognition.* As there are four different theories on MC processes as explained by Carruthers (2009): (1) Mindreading and MC as two different capacities, (2) Both Mindreading and MC works under one mechanism with two modes of access, (3) Both are skill based, MC develops first then Mindreading (4) The opposite, Mindreading develops first then MC. Each of them interprets the experience of psychotic episodes differently.

1. Mindreading and MC as two different capacities (Nichols & Stitch 2003)

Under this belief, psychotic symptoms occur when one can attribute their mental states to others (i.e. Mindreading intact) while their ability to assess self-capacity is damaged (i.e. MC impaired). While, on the other hand, having the opposite, i.e. Mindreading impaired and Metacognition intact, is a basis for autism spectrum disorder.

2. Both Mindreading and MC works under one mechanism with two modes of access (Frith & Happé 1999; Happé 2003)

Individuals with schizophrenia have one or more of the four-components, involved within the Mindreading-Metacognition process, compromised (i.e. "self-knowledge module", "other-knowledge module", "introspection", or "perception") which caused them to experience psychotic symptoms. Thus, it is possible for individuals with Psychosis to have combinations of impairments within these four components rather than just having impairment in one specific component of Mindreading-Metacognition process.

3. Both are skill based, MC develops first then Mindreading (Goldman 1993; 2006)

Similar to (2) above, this theory proposed that individuals with Psychosis has both Mindreading and Metacognition abilities impaired. However, unlike (2), it will not be possible for one to have Mindreading intact and Metacognition to be impaired as the latter is a pre-requisite for Mindreading.

4. Mindreading first then MC (Carruthers 2006; Gazzaniga 1995; 2000; Gopnik 1993; Wegner 2017; Wilson 2002)

Under this model, hallucinations and delusions are a product of confabulation when one failed to attribute mental states to themselves correctly as they manipulate perceptual and behavioural cues. Thus, this error leads to misleading input sent towards the self-interpretation process.

5. Other

However, some argued that psychotic episodes are not at all caused by impairments of Mindreading or Metacognition. Instead, other researchers (See Frith 2000a; 2000b) seemed to suggest this is due to the

impairment of other system within the introspective process of the individual, leading to "passivity" symptoms of schizophrenia (i.e. when the individual claimed their delusional episodes were inserted by an external force or being). One evidence for this was when a study showed individuals with passivity symptoms of Psychosis perform within the average range for Mindreading battery tasks (Carruthers 2009). However, some argued the sample size of participants within the study was small. Additionally, the study was believed to have other confounding factors and symptoms which may affect the overall task result. Not only that, Brüne et al. (2008) showed differences in neural activity within individuals with passivity symptoms of schizophrenia which further suggests they may exercise a different cognitive strategy entirely when completing the mindreading battery task.

*Inner Speech (Alderson-Day & Fernyhough 2015).* Unlike MC, most of the researchers within the literature of IS agreed that psychotic episodes are the result of misattribution of IS, Additionally, one may also be predisposed to hallucinations and/or delusions depending on the individual differences of IS experiences. The experiences may differ in terms of its "frequency", "experience", "worded or un-worded", "doing or happening", "voice characteristics", "meaningfulness" and "rate of inner speech" (Hurlburt et al. 2013). This idea was further supported in fMRI study scans which showed overlap in the brainwave activities between "dialogical IS" and "hallucinatory episodes" (Alderson-Day et al. 2015).

However, this claim is still dubious as studies with the hearing impaired showed, individuals with hearing impairment still experience "hearing" voices despite having the issue congenitally. This informs us one of two things; first, hallucination may not possibly arise due to misattribution of Inner Speech, but instead it may be due to misattribution of communicative and articulatory code. Secondly, this also implies the hallucination that one experience may be dependent on their prior linguistic experience (Alderson-Day & Fernyhough 2015).

Research question 3: What are the factors within MC and IS literature that contributes to psychotic symptoms?

*Metacognition.* Individuals with psychotic symptoms will have higher tendencies to employ attributional biases. This was evident when individuals with Psychosis tend to score lower throughout the subscales of metacognitive questionnaire (MCQ) and the factor "internality" within the word association task (Baker & Morrison 1998). Two of the highest predictive factors for auditory hallucination was "Metacognitive efficiency" and "responsibility and superstitious belief".

*Inner Speech.* Individuals with psychotic symptoms, either brief or long term, tend to employ higher frequency of self-talk (Brinthaupt et al. 2019). In regard to the variety of IS, there seemed to be a positive correlation between the tendency to experience auditory hallucination and specific varieties of IS, in particular, "dialogical", "other people" and "evaluative/ motivational" Inner Speech. While the mediator for this relationship was noted to be "dissociation" (Alderson-Day et al. 2014; Alderson-Day et al. 2018; Rosen et al. 2018). Based on this, it is possible that individuals with hallucinations tend to have these three properties of Inner Speech tangled up with one another during their psychotic episodes.

In some cases, "other people" Inner Speech tends to have the strongest correlation to proneness to auditory hallucination. While, some also endorsed the idea that patients with Psychosis experience "condensed" Inner Speech more than controls, and that it relates to increased levels of thought disorder whilst their non-clinical counterpart are not aware of this type of Inner Speech occurring until their condition becomes "awry".

However, when explored further, there were no predictive value yielded from any of the variety of Inner Speech in predicting the severity of hallucination. Furthermore, the result for the three varieties of Inner Speech in relation to proneness to hallucination was not clear cut as some studies was not able to replicate previous findings (McCarthy-Jones & Fernyhough 2011). Thus, based on all these findings, we can conclude that the findings were mixed at best.

Research question 4: What is the current evidence of Metacognition and/or Inner Speech use that has been related to therapy when treating individuals with Psychosis?

Not much finding was gained from the articles generated. Though, it was suggested that schizophrenia may be a result of ipseity disturbance (i.e. disturbance of the self) and one way to supplement this is by employing metacognitive therapy (Akroyd 2013).

Whilst within the IS literature, a phenomenological study managed to capture the idea of IS being used as a coping strategy when facing psychotic episode as clients reported that they utilised "dialogical" Inner Speech between them and their therapist to bridge the experience between their external and internal world during their psychotic episodes (Dilks et al, 2008).

## DISCUSSION

In this section, we will summarise and convey the findings for each research questions posed early on to provide what is currently known regarding the specific question and possibly to identify as well as highlight the gaps available within the literature.

Research question 1 and 2: "What are the Metacognition and Inner Speech models that is involved in explaining psychotic symptoms?" and "How do these models explain the experience relating to the psychotic symptoms?"

Currently there are several models, for both MC and IS, available that attempts to understand and explain the symptoms of Psychosis. Each with their own divisive take on explaining the symptoms for Psychosis. However, when synthesizing the data involved within this scoping review, it is important to note that the theories offered for both MC (i.e. theories mentioned by Carruthers [2009] regarding MC and Mindreading) and IS (E.g. Vygotsky) are still within the philosophical or theoretical level with little experimental based research to back their claim.

Perhaps, this may be due to difficulty in finding an objective way to measure MC or IS as these skills itself are highly subjective experiences. Nevertheless, it will still be good for future researchers to strive and attempt to find a way to measure the reliability of these theories as each of them brings something different to the table, which may just be what is needed for mental health practitioners to further their skills in managing patients with Psychosis.

Research question 3: What are the factors within Metacognition and Inner Speech literature that contributes to psychotic symptoms?

There seemed to be several research attempts in trying to explore the factors contributing to psychotic symptoms, particularly in the properties of IS as well as the MC activity which leads to it (See Baker & Morrison 1998; Brinthaupt et al. 2019). But the findings have been mixed and at times were not replicable. Furthermore, the studies also tend to lean more towards using a sample of undergraduate students by measuring their proneness to hallucination or delusion. This may pose some limitation in terms of its validity when applying to individuals who experiences psychotic symptoms first-hand as these individuals may gain or lose certain MC or IS abilities which the non-clinical populations may have not. Thus, it may be beneficial for future researchers to use more clinical populations and conduct replication studies to further confirm the MC and IS factors which may lead to psychotic symptoms.

Research question 4: What is the current evidence of Metacognition and/or Inner Speech use that has been related to therapy when treating individuals with Psychosis?

Based on the result gathered from the scoping review, there seemed to be extremely limited account in trying to gain the perspective of Metacognition and/or Inner Speech within the therapeutic walls. Perhaps this is one of the areas that may be beneficial for researchers to investigate as it may account for a more successful therapeutic outcome when handling Psychosis related disorder.

Implication For Research And Practice

As stated above, there were 12 articles in total for this review, with nine being conducted in the United Kingdom and 3 conducted in the United States. This shows absence of other countries, especially in Asian countries, in conducting this research. This may possibly be due to two main factors. Firstly, Asian culture has a different perception and understanding of psychosis. Certain culture would instead see it as a spiritual ailment (Sonethavilay 2011; Ho 2014; Good et al. 2019) which in turn may lead to viewing it as possessions or lack of faith.

Having these perceptions on psychosis subsequently led to increased stigma which hampers one's help-seeking behaviour. This ultimately led to underreporting and seen as having lesser occurrence. Additionally, this hinders research efforts as the issue as being "less important" compared to other issues with higher occurrence.

Secondly, despite the field of clinical psychology existed within Asian context dated back in eighth century (Haque 2004), the Western population had a longer foothold in comparison and initiated the movement of psychology as a field of experimental study in eighteenth century (Schwarz & Pfister 2016). This have given the western counterpart a first mover advantage which inevitably led to a more established institution, funding pools and research infrastructure to investigate more nuanced and subjective research such as inner speech and metacognition.

That being said, it is still undeniably useful for researchers from Eastern countries, such as Malaysia, to conduct research within this area as it may show some cultural differences which may have been overlooked so far. Not only that, it may also benefit in the realm of clinical practice as it may be useful to consider taking note of the

phenomenological account of the patient's MC and IS experiences during their psychotic episodes as this may potentially uncover new line of therapeutic interventions that may be effective when handling individuals with psychotic symptoms.

Limitation and Recommendation

Looking back at the processes and steps taken in this scoping review, it is evident that there were several limitations within this review itself. Firstly, the number of databases used in this scoping review was limited. Despite the recommended guideline put forward by University of South Australia (2019) to have a minimum of two databases included in the review process, it was evident that this limits the scope of articles covered in this area of interest. This was done due to authors having limited access to a more psychology-based journal database. Perhaps, adding more databases and including more relevant databases can be beneficial. One useful database combination might possibly be Embase, MEDLINE, Web of Science, and Google Scholar to increase adequacy and efficiency of search coverage (Bramer et al. 2017). Additionally, unpublished grey literatures (e.g. thesis, dissertations) can also be explored as it is possible that there might be several papers that are relevant to the research question being posed for this scoping review.

Secondly, this scoping review also did not involve any other professionals (e.g. neurologists, linguists or speech language therapists) in determining the inclusion or exclusion criteria as well as the suitability of the articles to be included in the study. Thus, by only limiting the team to psychologist may pose the risk of bias to this scoping review.

## CONCLUSION

To conclude, the scoping review has identified four different models of Metacognition and two different models of Inner Speech that contributes to the understanding of psychotic symptoms in their own unique way. Additionally, there were also several different factors of Inner Speech and Metacognition that may contribute to one's predisposition to hallucinations. Lastly, despite the limited evidence in the review, it is safe to say that IS and MC can possibly two of the main areas that can change the way we perceive and handle cases involving Psychosis related disorder moving forward.

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