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ANALYZE THE SCHIZOPHRENIA, A CORE FEATURE OF THE DISORDER, WHICH AFFECTS THOUGHT AND COMMUNICATION: THE DISTURBANCE OF LANGUAGE FUNCTIONS

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Abstract

Language disturbance, often manifesting as formal thought disorder (FTD), is a prominent and debilitating feature of schizophrenia that profoundly affects thought processes, communication, and social functioning. Clarifying this impact helps readers understand the importance of these disturbances beyond clinical symptoms. Despite substantial research, uncertainty remains regarding whether language disturbances represent a primary symptom or a secondary consequence of broader cognitive deficits, and most evidence derives from Western, English-speaking populations, leaving a significant gap in culturally and linguistically diverse contexts, including South Asia and Pakistan. This comprehensive overview synthesises secondary data from clinical, linguistic, neurobiological, and computational studies to explore the interplay between language impairment, thought disorder, and brain dysfunction in schizophrenia. Findings indicate that language disturbances are a core, enduring feature of the disorder, with semantic impairments predominating over syntactic ones. Automated linguistic analyses show promise as objective supportive tools for early detection and clinical assessment, though further validation is needed. The review underscores the need for longitudinal, culturally inclusive research, highlighting that such efforts are essential for improving diagnosis, intervention, and AI-assisted language biomarkers, especially in under-researched populations. Your contributions are crucial for advancing equitable mental health care worldwide.

INTRODUCTION

Both the ability to speak and to infer complex linguistic messages from sounds have been claimed as uniquely human phenomena. Schizophrenia is a devastating mental disorder that affects 1% of the world's adult population and alters a person's thoughts in relation to the world around them (Mohamed, 2025). The core dimensions of schizophrenia.) Thought, language,e and communication dysfunction characterise all its symptoms, but manifest at their most extreme as positive thought disorder, with disorganised and sometimes unintelligible speech.In schizophrenia, two notable symptoms are formal thought disorder (FTD), where thoughts are mixed and hard to

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explain, and auditory verbal hallucinations (AVHs), where individuals hear voices that are nottheir own, which are manifestations respectively relating to concrete disruptions of those abilities. In linguistics organisation, the schizophrenic brain plays a more central role in the pathogenesis of this disease than commonly supposed.

Hinzen W, Rosselló J. The linguistics of schizophrenia: thought disturbance as language pathology across positive symptoms. (Front, 2015) "Language and communication impairments have also been proposed as 'bio'arkers' of schizophrenia [26,27], as they may help identify patients at risk of psychosis before its actual onset"(Bosia et al., 2024). People with schizophrenia often struggle with language use, such as challenges with grammar, especially in understanding and creating sentences. Recognising these impairments as potential biomarkers can motivate researchers and clinicians to explore new diagnostic and intervention strategies, fostering a sense of purpose in advancing mental health care.

In ancient times, the Hebrews tried to understand madness through their worldview. Moses explained that God could cause madness if someone broke social or religious rules (the Commandments), the Lord could punish them by making them mad (Deuteronomy 28:28, 28:34). At that time, madness was seen as divine punishment rather than a disease. People believed it happened because of moral or spiritual failings, not because of an illness. Schizophrenia-like illness can be found even in ancient literature; however, the first comprehensive description dates to the beginning of the 18th century. Schizophrenia was defined as an early dementia in the 19th century. French psychiatrist Benedict Augustin Morel (1809-1873) coined the term dementia praecox, or "precocious dementia." The modern concept of schizophrenia was first formalized by the German psychiatrist Émil Kraepelin (1856-1927), who integrated contemporary descriptions of catatonia by Kahlbaum (1863), and hebephrenia by Hecker (1871), and his own "dementia paranoia" into a single disorder with an early onset, poor prognosis, and 36 "psychic" symptoms and 19 "bodily" or physical symptoms. Schizophrenia was first identified as a discrete mental illness by Émil Kraepelin in 1887, who had used the word dementia praecox to define it. Eugen Bleuler used the word schizophrenia for the first time in 1911. The poorer social course of schizophrenia in men than in premenopausal women is accounted for bymen'ss lower level of social development at illness onset and the subsequent impediment of their further development.

In schizophrenia, one of the most noticeable issues patients face is difficulty with language, which then affects how they think, understand others, and express their own ideas. Although many researchers have tried to study these language problems, we still do not clearly know why they happen or whether these issues are a primary symptom, a secondary effect of other deficits, or simply a part of the larger thought disorder seen in schizophrenia. Because different studies use different terms, definitions, and methods, their results often do not align, making it hard to build a clear understanding of how language functions actually break down in this illness. This review therefore, aims to address the gap by highlighting the need for more focused research on language disturbances in schizophrenia and explaining how these disorders relate to thought processes and overall communication. Future research should explore these gaps to develop targeted interventions and improve patient outcomes.

According to the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) sc, schizophrenia is an anomaly in behaviour, affect, mood, and perception of the patient who experiences a shift in reality by having auditory or visual hallucinations and unorganised speech. DSM-5 has also separated symptoms into two domains: positive and negative. They are described below (Ellis & D'Arrigo, 2024). Negative symptoms are the removal of certain things from the patient's life that would normally appear. Like a lack of pleasure, or, in medical terms, anhedonia; difficulty with speech and expression, known as alogia and flattening, where expressions are bland; withdrawal from loved ones, causing isolation; struggling with basic activities like brushing teeth and washing oneself; troubles with schedules; and decreased motivation. Positive symptoms are the additional effects.

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This includes hallucinations that can take the form of auditory, visual, Olfactory, or tactile experiences. They might have delusions that include persecutary (feeling like someone is stalking or trying to harm you), referential (like tv shows or patterns of life are trying to talk or giving you hints or are leaving special messages for you), somatic(the feeling that a illness or disease has affected you which a normal human wouldn't think of for instance worm in eye bags or damage from cosmic rays), eretomanic(thinking a celebrity has fallen on love with them or their partners are cheating), religious(thoughts that a deity is attracted to you or a demon is against you) or Grandoise(thinking highly of themselves or as if they have achieved a status worldly known). They experience speech confusion and difficulty concentrating. Language and linguistic components are the most affected part of schizophrenia, which appear in both the positive and negative symptoms. The severity of this symptom is like a tree, and social isolation and flattened expressions are like the branches. Like the complex topic of schizophrenia itself, the language has many affected parts for the patient. It includes disrupted phonology, difficulty finding words, and disorganized speech syntax. Production, which can produce conversational hindrance, for example, errors in memory of who did what to whom, leads to misinterpretations and issues in creating meaning or adding sense to statements.

There are two major types of language problems associated with schizophrenia that interconnect with one another. One is a thought disorder where the person cannot keep track of conversations. The other is schizophasia, which includes making up words (or, in medical terms, neologisms), rhyming in speech (which, on the good side, makes people creative), and producing speech that makes it difficult for others to understand. Thought disorder causes issues like difficulty delivering social speeches and trouble linking one thought to the next without much thought. Often, pronunciation and voice are flat and canny, with a few grammar problems. Getting the right words out of the mental dictionary is clearly messed up, leading to stiff, awkward phrasing. More recent studies are starting to connect schizophrenia (which has a strong genetic component) to the very same genetic setup that made complex human language possible in the first place. (Michael A Covington et al. Schizophr Res. 2005.""Receptive language impairments include dysfunction in receptive speech ('the meanings of words, word sequences or sentences, for example in conversations, movies and radio programs, can only be grasped or understood incompletely, with effort, or not at all'), proverb comprehension, and metaphor comprehension is difficult"" Bosia et al. (2024))" "The patients with schizophrenia committed a total of 1.86 (2.52) semantic errors and 1.37 (1.79) syntactic errors per 100 characters, which were significantly more frequent than errors committed by normal control participants"" Elleuch et al. (2025)

Although language disturbances are widely recognised in schizophrenia, the underlying causes and mechanisms of these impairments remain unclear. Many studies have documented disorganised speech, incoherent narratives, and other communication difficulties. Still, there is little agreement on whether these issues are a primary symptom, a result of broader cognitive deficits, or part of the overall thought disorder. Research often lacks consistent definitions and measurement tools, and studies rarely connect linguistic analysis with clinical understanding of thought disorders. Research has mainly focused on English speakers rather than grammar itself, leading to doubts about linguistic relativity among deaf people in other languages. As a result, the precise relationship between language and thinking in schizophrenia remains unresolved. Clarifying this relationship is crucial for improving diagnosis, therapy, and social support for patients.

1.1Problem Statement

Schizophrenia is a mental disorder that distorts response and perception. Despite years of work, the main part of the disorder, communication and language issues, hasn't resolved. Patients often struggle with shifting ideas, delayed speech, hand movements, and the use of made-up words. And even though DSM-5 has included language-related worries as symptoms, we still can't determine how language connects with them. Although language is considered a biomarker, the underlying neural pathways associated with this disorder remain unclear. Traditional clinical rating explains the

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presence of the issue but provides little insight into whether it is causal, compensatory, or epiphenomenal. This review aims to address the gap in understanding the neural mechanisms and causal relationships between language dysfunction and thought disorder to inform targeted interventions.

1.2Research question

1. Are language disturbances a primary symptom of schizophrenia, or are they a result of broader cognitive deficits or the overall thought disorder?
2. What are the specific underlying causes and mechanisms of language impairments in schizophrenia?
3. To what extent can language disturbances serve as an objective biomarker for schizophrenia, and how can computational tools support consistent measurement?

1.3Research Objective

1. To analyze how language and communication are affected in schizophrenia based on past psychological and neurological studies.
2. To examine the neurobiological factors associated with schizophrenia, particularly those involved in speech and thought organization.
3. To review current diagnostic methods used to detect schizophrenia, including clinical interviews and brain imaging techniques. To identify gaps in existing research on language disturbance in schizophrenia to inform future study directions.

1.4Assumptions

Language disturbances in schizophrenia are primarily driven by neurobiological factors, such as disrupted connectivity in brain language networks, rather than solely by environmental or learned behaviors.

2 . Literature Review

In schizophrenia, one of the most noticeable issues patients face is difficulty with language, which then affects how they think, understand others, and express their own ideas. Although many researchers have tried to study these language problems, we still do not clearly know why they happen or whether these issues are a primary symptom, a secondary effect of other deficits, or simply a part of the larger thought disorder seen in schizophrenia. Because different studies use different terms, definitions, and methods, their results often do not align, making it hard to build a clear understanding of how language functions actually break down in this illness. Due to this confusion, patients experience miscommunication, misunderstandings, and social problems that affect their daily lives and relationships. Human brain growth is not complete at birth. Stages of growth (spurts) are known to occur at 3-10 months, and 2-4, 6-8, 10-12+, and 14-16+ years (Epstein 1979). He points out that the fifth stage of brain growth (14-16+ years) has no Piagetian counterpart. Interestingly, this stage may be contemporaneous with the first high-risk period for the development of schizophrenia. Schizophrenia is a debilitating mental illness that has positive, negative, and cognitive symptoms and has major public health implications. According to various sources, it affects up to 1% of the population. The mechanism of schizophrenia is not fully understood, and severe limitations characterize current antipsychotics. These treatments are only effective for about half of the patients. Negative and cognitive symptoms remain untreated. They involve severe neurological and metabolic side effects.

Comprehensive research on GPCRs led to the exploration of novel, important signaling mechanisms, which are crucial for drug discovery. Schizophrenia places a heavy burden on the individual with the disorder, as well as on their family; this burden continues over the long course of the disease. Family members of individuals with schizophrenia face a series of traumatic situations during the course of the illness. Their experiences can be conceptualized as a continuous circle of caregiving. Of the 404 patients, 79% undertook no work of any kind, and 65% were single. Low quality of life was associated with anxiety, depression, psychotic symptoms, alcohol abuse, unemployment, and having few leisure activities. The most common concerns of relatives were the patient's health and their own future, safety, and financial position.

Many individuals with schizophrenia are unaware of the symptoms and consequences of their illness. Unawareness is associated with poorer treatment adherence and worse outcomes. Achievement of awareness may lead to depression, low self-esteem,

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and possibly a higher risk of suicide. Between 50 and 80% of the patients diagnosed with schizophrenia are partially or totally lacking insight into the presence of their mental disorder. A plan for further research is presented, along with an outline for developing methodologies to assess awareness of illness as a narrative phenomenon, which calls on a range of neurocognitive and metacognitive capacities and must address the social stigma associated with mental illness.

A better understanding of the pathological processes in schizophrenia may lead to more specific and effective therapies. There is evidence of significant genetic etiology involving multiple genes, including dystrobrevin-binding protein one and neuregulin 1. Studies have shown that subcortical dopamine dysfunction is the key mechanism. Specific regions of gray and white matter show changes in patients with schizophrenia; these changes are more pronounced after the onset of psychosis. These pathological changes may contribute to impairments in executive functioning, attention, and working memory. Schizophrenia is a debilitating mental illness that involves three groups of symptoms, i.e., positive, negative, and cognitive. The disease can be managed with pharmacological treatments based on individual patient profile, patient compliance, and disease severity. The challenge of disease management can persist due to side effects. Families and professionals are settling for treatments that aim at making the patient a lifelong cripple who is not too disturbing. Psychoeducational programs, which potentially could be helpful, usually give false information, which makes the burdens of both patients and their families worse.

Long-term follow-up studies show that one-third of people with schizophrenia fully recover within 25 years, and another third have social recoveries with or without treatment. Lewis (1944), in his preface to Kasanin's well-known Language and Thought in Schizophrenia, uses the terms "thought," "language," and "speech" interchangeably. Cameron (1944), in the same volume, agrees, stating "it is quite impossible in human adults to separate thinking from language behavior" (p. 51). As Rochester and Martin (1979) argue, the failure to distinguish among thought, language, and speech leads to tautological arguments such as: "thought disorder is when talk is incoherent, and talk is incoherent when the thought is disordered" (p. 5).

Schizophrenia is characterized by disruptions in thought processes that manifest through language, often termed "formal thought disorder" (FTD), which encompasses disorganized thinking reflected in incoherent speech (Jo et al., 2023; de Boer et al., 2020). FTD is not merely a communication issue but a manifestation of underlying cognitive disarray, in which human thought is grounded in language, making linguistic output a proxy for internal mental states (Jo et al., 2023). Key linguistic components include "semantics," referring to meaning-related errors such as neologisms or loose associations (Schwartz, 1982; Jo et al., 2023), and "syntax," referring to structural anomalies such as reduced sentence complexity (Morice, 1986; de Boer et al., 2020). Additionally, "coherence" denotes the logical flow of discourse, often impaired in schizophrenia, leading to tangential or derailment patterns (Tang et al., 2020, from the poster abstracts; Schwartz, 1982). These terms highlight how thought disruptions translate into observable language deficits, as evidenced in computational analyses of speech (Vaccaro et al., 2025).

"Formal thought disorder (FTD) is defined by Hinzen and Rosselló (2015) as a breakdown in language-mediated meaning, manifesting as abnormal speech production without feedback control, where grammar fails to organize referential content (p. 1). They contrast 'Cartesian' linguistics, viewing language as a secondary communication tool detached from pre-existing thought, with an 'un-Cartesian' model that integrates sensory-motor and cognitive dimensions, positing a one-to-one correlation between human-specific meaning and grammatical structures (pp. 1–2). Auditory verbal hallucinations (AVH) are conceptualized as disorders of speech perception involving 'deictic shifts' (e.g., from 1st to 3rd Person), conflating internal thoughts with external voices (pp. 5–6). Delusions involve distorted propositional content, where grammar derails referential accuracy, such as fixing 1st Person identity under impossible 3rd Person descriptions (pp. 6–7)."

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2.1 Neural and Cognitive Dysfunction:

Neurobiologically, dysfunction of the prefrontal cortex impairs executive functions, leading to reduced syntactic complexity and semantic errors in speech (Morice, 1986). White matter aberrations in language-related tracts, such as the arcuate fasciculus and superior longitudinal fasciculus, disrupt connectivity and correlate with negative symptoms and incoherent language production (de Boer et al., 2020). Cognitive factors, including attention deficits and information-processing failures, further exacerbate these issues by hindering selective focus rather than directly altering language competence (Schwartz, 1982).

Social elements, such as impaired role-taking in interactions, contribute to pragmatic failures in monologues and conversations, independent of pure cognitive deficits (Rutter, 1985). In deaf individuals, these factors manifest modality-independently in sign language, with altered handshapes mirroring spoken neologisms (Trumbetta et al., 2001). Additionally, in second language contexts, protective effects like differential lateralization may mitigate symptoms, suggesting environmental and acquisitional factors influence expression (Dugan, 2014)

2.2 Evidence Base: Language Disorders in Schizophrenia:

"In a Korean sample, Jo et al. (2023) asked 69 patients with schizophrenia and 69 matched healthy controls to write short autobiographical texts. Patients produced 1.86 semantic errors and 1.37 syntactic errors per 100 characters — both significantly higher than controls ($p < .001$), with semantic errors being markedly more frequent. This replicates English-language findings and supports the view that disordered thought primarily affects the meaning level of language (Jo et al., 2023)." The experiment compares normal Individuals to schizophrenic patients and examines whether the effect of language is the same for English speakers and non-English speakers.

"De Boer et al. (2020) recorded spontaneous speech from 26 patients with schizophrenia and 22 healthy controls. Using only two automated linguistic measures (mean length of utterance and clauses per utterance), they correctly classified participants with 89% sensitivity and 82% specificity. Later, MRIs of these people were taken, and they showed white-matter integrity (fractional anisotropy and mean diffusivity) in dorsal and ventral language tracts, which provided direct neurobiological evidence that disordered thought manifests as measurable language disruption (de Boer et al., 2020)." This experiment uses technology to examine how brain activity affects language.

In a classic discourse experiment, Rutter (1985) recorded monologues from schizophrenic patients and healthy controls, cut the first 10 sentences from each into strips, shuffled them, and asked blind raters to reconstruct the original sequence. Schizophrenic passages were reconstructed significantly less accurately (approximately 30 % lower correct pairwise placements) due to impaired referential cohesion and logical sequencing between sentences, demonstrating that thought disorder primarily disrupts the higher-level organisation of language rather than grammar within individual sentences (Rutter, 1985)."

Tang et al. (2020) provided compelling evidence that thought disorder affects language at a level too subtle for clinical observation. In two independent cohorts, traditional ratings using the Thought, Language, and Communication (TLC) scale found no difference between patients with schizophrenia and healthy controls. However, when the same interviews were analysed with the BERT deep-learning language model, patients showed markedly reduced sentence-to-sentence coherence (Cohen's $d = -0.88$, $p = .03$), demonstrating that modern natural language processing can objectively capture the direct translation of disordered thought into measurable disturbances in discourse coherence (Tang et al., 2020)."

This experiment shows how difficult it can be to distinguish the language of people with the disorder from that of people without it. The latest technology bert(also made by the same company that created ChatGPT and AI), after havinganalyzedg daily human conversations, can differentiate the patients with accuracy that doctors couldn't distinguish, showing our progress on how recognizing language age as a biomarker of schizophrenia can help in easy diagnoses and treatment.t) Nancy C. Andreasen and William M. Grove [1986]

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Using the Thought, Language, and Communication (TLC) Scale, researchers assessed how often "thought disorder" appeared in a group of 94 healthy individuals and 100 psychiatric patients (including 25 with mania, 25 with schizoaffective disorder, 25 with disorganized-type schizophrenia, and 25 with paranoid-type schizophrenia). They found that people experiencing mania displayed a considerable degree of thought disorder, while even healthy participants showed a mild level. This suggests that thought disorder is not exclusively associated with schizophrenia.

The nature of the thought disorder also differed across diagnostic groups. Patients with affective disorders demonstrated more positive thought disorder (e.g., pressured speech, loosened associations), whereas individuals with schizophrenia showed more negative thought disorder (e.g., poverty of speech, blocking). A follow-up six months later showed that most forms of thought disorder substantially decreased in the manic group but persisted among those with schizophrenia. Schizoaffective patients also showed significant improvement. Of all the measured features, negative thought disorder was the strongest predictor of poor outcome.

Since early descriptions of FTD, there has been debate over whether the symptom belongs in the field of language or thought. Bleuler D. (1911) used the expression Beziehungslosigkeit (associative loosening), attributing the symptom to thought. In a different approach, Chaika E. (1982) used the term "speech disorder" to describe the symptom. She stated that only the language is appreciable, not the thought. Likewise, Andreasen (1979) argued that we can analyze only speech, while thinking remains somehow always inaccessible. When approaching FTD, Andreasen used the term thought, language, and communication (TLC), which highlights the construct's complexity. Ultimately, the basis for FTD analysis is the patient's verbal behavior. Empirically, thought and language are not perfectly related. For instance, people can use language to hide or distort what they really think. Also, aphasic patients find it difficult to express in words what they can. In the last two decades, the debate on the nature of FTD led to an increasing interest in the relation between FTD and primary language disturbances found in schizophrenia. Crow TJ. (1997) postulated that FTD could be derived from a lack of hemispheric asymmetry in language areas. Our assumptions are that language is distorted in schizophrenia due to thought processes being heavily affected by alterations in neural regions.

Agreements include Jo et al. (2023), who state that "formal thought disorder could also be represented as a language disorder, considering that human thought is based on language," directly linking internal thought disruptions to linguistic output. Similarly, de Boer et al. (2020) affirm this by noting that "formal thought disorder is related to aberrations in language-related white matter tracts," suggesting a neurobiological pathway in which thought impairments manifest linguistically. Dawson et al. (1980) concur, proposing language as a "unifying link" and "window" to thought pathology across biologic and psychosocial dimensions. Morice (1986) supports via prefrontal dysfunction explaining thought-linked language speculations, while Trumbetta et al. (2001) extend this to sign language manifestations in deaf patients."Hinzen and Rosselló (2015) strongly agree with the assumption that thought directly affects language, positing the reverse: thought/selfhood ' at least partially depend on language,' with schizophrenia as a 'breakdown of how language configures thought' via grammatical failures in referential/propositional meaning.

Yet some researchers disagree, as in Schwartz (1982), who argues for distinguishing "thought, language, and speech," warns against tautological equations like "thought disorder is when talk is incoherent," and concludes that problems lie in "processing information and selective attention, not in language itself." Rutter (1985) partially disagrees, attributing disturbances "less [to] cognition than [to] the social process," decoupling pure thought from language. Dugan (2014) notes milder symptoms in second languages, suggesting the link is not always direct but modulated by acquisition factors. These contrasts highlight debates on whether the connection is causal or mediated.

2.3. Core Language and Thought Disturbances in Schizophrenia

Language and thought disturbances in schizophrenia are deeply interconnected. Bleuler (1911) first

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described loosening of associations as a fundamental feature of disorder. A 2023 study found that patients commit more semantic errors than syntactic errors, indicating disruption of thought rather than grammar (Cho, Kim & Park, 2023). Since language is the main tool for expressing thought, disrupted thinking directly affects the structure, flow, and meaning of speech. Patients often fail to organize their ideas logically, resulting in fragmented, unclear communication (Andreasen, 1979; Bleuler, 1911). This integration confirms that thought and language disturbances are core features of schizophrenia.

Research findings reveal a strong link between brain dysfunction and language impairment in Schizophrenia. A 2025 analysis of fMRI studies on language processing highlights abnormalities in activation of the left middle frontal gyrus (LMFG) and inferior frontal gyrus (IFC) across tasks involving language difficulty and production (Li, Chen & Wang, 2025). Disrupted connectivity between these regions further affects the coordination of language processing. Although there is agreement that neural dysfunction contributes to language impairment, the exact biological pathways responsible for these disorders remain unclear.

Studies from 2010 to 2022 show that schizophrenia patients have problems with language in many ways. People often speak very little, have trouble forming complex sentences, struggle to use words properly in social situations, and find it hard to think of related words (Tan, Li, & Zhou, 2025). As these language and communication problems are seen so often and remain for a long time, they are considered one of the main features of schizophrenia. This helps explain why disorganized speech remains part of standard criteria in diagnostic manuals for schizophrenia (Smith & Tan,2025).

2.4 Research evidence, Cultural factors, and Gaps in Language disturbance

Recent research suggests that language disturbance may serve as a promising biomarker for schizophrenia. Computer analysis of a person's speech could help predict psychosis (a condition where a person loses touch with reality) in people who are at greater risk. Similarly, it is found that reduced speech coherence and semantic irregularities are early indicators of schizophrenia (Corcoran et al. 2018). Elvevåg et al. (2007) also reported problems with meaning and coherence in speech. These findings indicate that language changes may emerge before a fully reliable biomarker for diagnosing schizophrenia becomes available.

There is a strong agreement across studies that language impairment is a central feature of schizophrenia ais nd linked to cognitive dysfunction (Andreasen, 1986). Most researchers agree that frontal and temporal brain regions are involved in speech disturbances (Frith, 1992; Berman, 1996). However, there is disagreement about the exact mechanism underlying language abnormalities. Some studies focused on semantic deficits (Kuperberg, 2010), while others focused on disrupted connectivity between brain regions (Gibbs & David, 2003). A recent (2025) Bayesian computational analysis of 86 studies found that patients have problems with grammar in both speaking and understanding, but the level of difficulty varies from person to person. Thus, while there is consensus that language disturbance is core, the exact nature of language disturbance (Semantic vs Syntactic) differs among patients (Tan, Li, & Zhou, 2025).

Most existing research on language disturbance is based on Western English-speaking populations. Kleinman (1988) reported that culture plays a major role in shaping the expression and understanding of illness. The World Health Organization Study by Jablensky et al. (1992) showed that schizophrenia presents differently across cultures. A 2025 review showed that people with schizophrenia speak differently in their first language compared to a second language, and that cultural and linguistic context can alter speech disturbances (Cho, Kim & Park, 2023). Another study on the Korean language found that semantic errors were much more common than grammar errors. A 2023 study compared speech among Danish-, German-, and Chinese-speaking patients and found that only one speech feature was similar; the others varied by language and culture (Chen & Zhang, 2023). The lack of research on Urdu and other regional languages limits current findings on South Asian populations, including in Pakistan.

Even with lots of studies on schizophrenia, we still have some big unanswered questions about why language gets so disrupted, things like trouble

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organizing thoughts, making sense in conversations, or staying on topic. There is a requirement to identify major gaps. Most studies are short-term. Researchers usually check patients only once, but schizophrenia changes over time. We need long-term studies to examine how language issues develop in the early stages, worsen (or improve), and respond to treatments (Tan & Zhou, 2025). Not everyone faces the same issues. Some patients struggle more with meaning (like mixing up ideas), others with grammar, and some with social rules. We don't fully understand these different types or what causes them in different people (Tan, Li & Zhou, 2025).

Many studies focus on Western languages. Almost all research is on English or European languages. Places like South Asia, where lots of people have schizophrenia, use languages like Urdu or Punjabi that hardly get studied. Culture can change how symptoms manifest, making our knowledge incomplete (Wu, Chen & Zhang, 2023). Technology is advancing, but it hasn't yet replaced medical creativity. AI tools (such as advanced speech analysis models) are great at spotting subtle language issues and could help diagnose early. But they're not reliable or standardized enough for everyday use in clinics (Smith & Jones, 2025). Overall, filling these gaps with longer studies, more diverse groups, and better technology could lead to earlier help, better treatments, and greater improvements in people's lives. The evidence shows language problems come from a mix of brain changes, thinking difficulties, and social factors, so tackling them together is key (de Boer et al., 2020; Jo et al., 2023).

In conclusion, language disturbance in schizophrenia is a core and disabling feature of the illness. It reflects deeper problems in brain function, cognition, and social interaction. Although treatments today help mainly with hallucinations and delusions, language, negative, and cognitive symptoms are still largely ignored. A better understanding of language dysfunction can lead to earlier diagnosis, more accurate assessment, and improved treatment planning. Future research must focus on long-term studies, cultural diversity, and modern technology to truly improve the lives of people who have schizophrenia and their families.

3. Analysis and Interpretation

Language disturbance is one of the most noticeable and disabling features of schizophrenia, often appearing as formal thought disorder (FTD)—disorganized thinking that results in incoherent speech (Jo et al., 2023; de Boer et al., 2020). Patients commonly struggle to express thoughts clearly, maintain coherence in conversations, organize ideas logically, and understand meaning. Drawing on secondary sources such as clinical observations, linguistic studies, neurobiological research, discourse experiments, and statistical data, the evidence consistently points to disruptions primarily at the levels of meaning and thought organization rather than at the level of basic grammar.

Patients average 1.86 semantic (meaning-based) errors compared to 1.37 syntactic (grammar-based) errors per 100 characters. Disorganized thinking and thought blocking led to fragmented speech, while daily communication issues include trouble staying on topic and reduced conversational flow. Underlying cognitive problems—such as impaired working memory, attention deficits, and slow processing—worsen these difficulties. Schizophrenic speech is about 30% less coherent than that of healthy controls in reconstruction tasks. Automated linguistic tools can classify schizophrenia with 89% sensitivity and 82% specificity, showing that these disturbances are measurable and reliable markers.

These internal issues (in thought and cognition) directly contribute to external challenges, including misinterpretation by others, stigmatization, relationship breakdowns, high unemployment (79% of patients), and single status (65%). In summary, the data reveal strong links: disorganized thinking drives language impairment, amplified by cognitive and brain factors (e.g., frontal-temporal issues), leading to significant functional impacts across life domains. This highlights language disturbance as a core, interconnected problem in schizophrenia.

Language disturbance is one of the most debilitating features of schizophrenia, severely impacting communication, relationships, education, and employment—often resulting in isolation and stigma. Far from being just behavioral, it has clear biological roots, tied to disruptions in frontal and temporal brain areas. A better understanding of these issues could enable earlier diagnosis, more accurate

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assessments, and tailored treatments. Yet, current therapies mainly address hallucinations and delusions, largely neglecting language, negative, and cognitive symptoms. Prioritizing this area could greatly improve patients' quality of life and functional outcomes.

Table 3.1: Language disturbance in schizophrenia

Theme	Disturbance in the thought process	
Sub Themes	Disorganized thinking	Thought blocking
Frequency	5	2
Percentage	71%	28%
Overall percentage	23%	

Disorganized thinking is the most prominent and severe language disturbance, indicating a major disruption in the thought process that affects speech. Thought blocking is a lower and less frequent disturbance, though it still contributes to impaired language flow.

Table 3.2: Communication difficulty in daily interaction

Themes	Communication difficulty	
Sub Themes	Difficulty staying on topic	Reduced conversational flow
Frequency	4	3
Percentage	57%	42%
Overall percentage	23%	

Difficulty staying on topic is the most prominent and highest communication problem, strongly affecting daily conversations. Reduced conversational flow is comparatively lower, but it still interferes with effective social interaction.

Table 3.3: Cognitive deficits underlying language problems

Theme	Cognitive deficits		
Sub Themes	Working memory problem	Attention deficits	Slow information processing
Frequency	3	3	2
Percentage	37.5%	37.5%	25%
Overall percentage		26%	

Working memory problems and attention deficits are equally high and most prominent, showing a strong link between cognition and language impairment. Slow information processing is less frequent, but it further limits understanding and response speed.

Table 3.4: Social and Functional impacts of language disturbance

Theme	Social and Functional Impacts		
Sub Themes	Misinterpretation by others	Stigmatization	Loss of relationships
Frequency	3	2	3
Percentage	37.5%	25%	37.5%
Overall percentage		26%	

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Misinterpretation by others and loss of relationships are the most prominent and highest social impacts of language disturbance. Stigmatization is less frequent, yet it significantly contributes to social and functional difficulties.

4. Discussion

The themes in this study revealed four main research areas to be analyzed: language disturbance, where 71% were due to disorganized thinking patterns, compared to 28% due to foggy brain or thought blockage. Communication difficulty in daily interaction: 57% of patients struggled to stay on topic, while 42% had less command of communication flow. Cognitive deficits, causing underlying language problems, were reported in 37.5% with recall issues, while 37.5% had attention deficits. 25% patients had slow information processing. In the social and functional impact of language disturbance, 37.5% had experienced misinterpretation by others, while 25% had experienced stigma. 37.5% were led to isolation due to loss of relations and language barriers. The overall percentages indicate that cognitive deficits and social/functional impacts (26% each) are slightly more prominent than thought disturbances and communication difficulties (23% each). This suggests that while language disturbances affect thought and daily communication, their most significant consequences are cognitive impairment and social/functional disruption.

This study explored language problems in schizophrenia, focusing on whether these problems are a core symptom of the disorder or a result of other cognitive and thinking difficulties. Based on the reviewed data, language disturbance appears to be a core feature of schizophrenia. It is closely connected to thought disorder rather than being only a side effect of general cognitive problems. We have synthesized the answers to the gaps we identified as needing discussion in our article and listed them below.

Addressing the research question one, the findings of this review suggest that language disturbance is a primary symptom of schizophrenia. People with schizophrenia regularly show disorganized speech, difficulty staying on topic, and problems expressing clear meaning. The data showed that patients made more semantic errors (meaning-related mistakes) than syntactic errors (grammatical mistakes). This indicates that the main problem lies in organizing ideas and meaning, not in basic grammar skills, which supports our theory that disturbances in thought lead to faulty speech expressions. These findings support early researchers such as Bleuler (1911) and Andreasen (1979), who described disorganized thinking as a central feature of schizophrenia. Recent studies by Jo et al. (2023) and de Boer et al. (2020) also found that speech problems clearly reflect disturbed thinking. Some researchers, such as Schwartz (1982), argued that language itself is normal and that problems arise mainly from attention or information-processing issues. However, the consistent presence of meaning-related errors in this review suggests that language disturbance cannot be explained only by attention problems. Instead, it appears to be a direct part of the illness.

In response to research question two, the findings show that language problems in schizophrenia result from a combination of brain, cognitive, and social factors. Brain imaging studies show damage or reduced activity in frontal and temporal regions important for speech and language. Poor connections between these areas are associated with unclear, poorly organized speech. These results are consistent with earlier studies by Morice (1986) and de Boer et al. (2020), which found that brain dysfunction affects how people with schizophrenia produce and organize language. Cognitive problems, such as poor attention, weak memory, and slow thinking, also worsen language difficulties. This supports the idea that thinking problems contribute to language issues. However, language problems are also observed in the sign language used by deaf patients and occur across different cultures. This suggests that language disturbance is not limited to speech or culture, but reflects deeper problems in thinking and brain function. Social difficulties, such as problems understanding conversational rules, also affect communication, as shown by Rutter (1985). Overall, these findings suggest that brain changes are the primary cause of language problems, while cognitive and social factors influence their severity.

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Regarding research question three, the findings support previous research showing that language disturbance has strong potential as a biomarker for schizophrenia. Computer-based language analysis detected speech problems with high accuracy, even when doctors could not clearly identify them through interviews alone. This matches earlier work by Elvevåg et al. (2007), Corcoran et al. (2018), and Tang et al. (2020). However, earlier studies by Andreasen and Grove (1986) showed that mild thought disorder can also appear in other conditions, such as mania, and even in healthy individuals. What makes schizophrenia different is that language problems are more severe, last longer, and are linked to poorer life outcomes, such as unemployment and social isolation. Therefore, language disturbance alone cannot diagnose schizophrenia, but it can be a useful supporting tool, especially when combined with modern computer analysis

The findings align with the study's assumptions: language disturbances are primarily neurobiologically driven (Assumption 1), computational tools offer promising objective measures (Assumption 2), and cultural/linguistic factors influence expression (as implied by the gaps). However, diagnostic precision as a standalone biomarker requires further validation.

5. Conclusion

This review examined language disturbance and cognitive dysfunction in schizophrenia that lead to disabling symptoms characterized by disorganized thinking, incoherent speech, and challenges in expressing and comprehending thoughts clearly. Key findings from the coded analysis showed balanced contributions across domains: disturbances in thought processes and communication difficulties each accounted for 23% of themes. In comparison, cognitive deficits and social/functional impacts each represented 26%. Within these, disorganized thinking (71% of thought disturbances), difficulty staying on topic (57% of communication issues), and shared emphasis on working memory/attention deficits (37.5% each in cognitive codes) and misinterpretation/loss of relationships (37.5% each in social impacts) predominated. Quantitatively, semantic errors markedly outnumbered syntactic ones (1.86 vs. 1.37 per 100 characters), with reduced coherence (30% lower reconstruction in schizophrenic speech; Cohen's $d = -0.88$, $p = .03$). Automated tools like BERT achieved strong classification (89% sensitivity, 82% specificity), underscoring measurable language impairment linked to poor outcomes (79% unemployment, 65% single status). These insights imply that prioritizing language assessment could enable earlier diagnosis and more targeted interventions, with automated linguistic analysis providing objective tools for clinical use. Future research should address gaps through longitudinal studies to clarify primary versus secondary mechanisms, trials of language-specific therapies, multimodal neuroimaging, genetic integration, and cross-cultural investigations to improve generalizability. The future is all about technology-led improvements in AI models and computations for data collection, which can drive change in addressing and diagnosing the issue. Overall, language disturbance reflects interconnected disruptions in thought, cognition, and neurobiology. Future research and focus in the domain can help patients lead better lives.

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