

The Communicative Breakdown of Schizophrenia: Speech and Language  
Impairments through a Multidimensional Approach

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### **Abstract**

Schizophrenia is a mental disorder that spans across various domains. Susan McGurk, Elizabeth Twanley, David Sitzer, Gregory McHugo, and Kim Mueser conducted a meta-analysis of twenty-six peer-reviewed studies of 1,151 subjects to determine the impact of cognitive behavioral therapy on psychosocial functional tasks and cognitive remediation. It was determined that the presence of positive, negative, disorganized, and affective symptoms contribute to the condition and diagnosis of schizophrenia. During the last twenty years, the classification of schizophrenia transitioned from extensive alterations in mood, behaviors, and thoughts to the deterioration of cognitive functioning. According to the DSM-5, symptoms of schizophrenia affect a client's executive functioning, memory, social pragmatics, language, theory of mind and intellectual processes. Primary defects of schizophrenia include neurocognition and social cognition deficiencies. With a concentration on language, cognitive-social symptoms range from affective flattening, dysfluency, formal thought disorder, and memory recall. It could be argued that schizophrenic agolia, the poverty of speech, is a reflection of illogical, disorganized thinking. Within a multidisciplinary team composed of psychotherapists, psychiatrists, social workers, and speech-language pathologists, these professionals should adopt a multidimensional approach to treatment. Treatment would be more effective through a holistic method involving language, cognitive, and affective rehabilitation, as opposed to exclusively cognitive rehabilitation. A client with schizophrenia has the ability to develop their neurological and social cognitions to improve their overall prognosis and treatment

of this disorder with intensive, multidimensional therapy involving cognitive behavioral, medicinal, and speech and language remediation.

### **Evolution of the Diagnostic and Statistical Manual of Mental Disorders**

Professionals in the mental health and medical communities created the *American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders* to define and outline criteria for diagnosis and classification of mental disorders. This manual withstood the test of time and accreditation by clinicians, researchers, insurance companies, and patients. Revisions to this prestigious manual require decades of research, clinical studies, literature reviews, and validation. The first edition was published in 1951 and since then, five revisions have been published, the most recent released in 2013.

The first edition of the *Diagnostic and Statistical Manual of Mental Disorders* was published in 1952. This primitive edition featured 106 disorders known as personality "reactions" to psychological, social or biological factors (Adolf Meyer). These disorders were separated into two distinctions, disorders caused or associated with an impairment of brain tissue function or disorders with psychogenic origin or without a definite physical cause or structural change of the neural system.

Schizophrenia was initially categorized as a psychotic disorder under the realm of "Disorders of Psychogenic origin or without clearly defined physical cause of structural change in the brain." Schizophrenic reactions were "characterized by fundamental disturbances in reality relationships and concept formations, with

affective, behavioral, and intellectual disturbances in varying degrees and mixtures.” Furthermore, the DSM-1 describes the disharmony of reality, emotional and unpredictable disturbances of thought, regressive behavior, and an overall mental deterioration. Originally, the diagnosis of schizophrenia was incomplete, requiring further investigation. There was an assumed deterioration of mental processing, however, a specific cortical impairment could not be identified. Since schizophrenia was classified as a psychotic disorder, it was characterized by affective, behavioral, and intellectual disturbances that altered reality and caused bizarre behaviors, disturbances in thought, delusions, and hallucinations. The classification of an affective disorder associates schizophrenia with mood disturbances. This signifies the overall cause of alternations in thought and behaviors as a result of schizophrenia. Certain symptoms include affective mood and manic-depressive disturbances, bizarre and paranoid behaviors, hallucination and delusions.

In 1980, the third edition of the *Diagnostic and Statistical Manual of Mental Disorders* redefined the concept of schizophrenia. With further research and clinical services, the DSM-3 improved the reliability of diagnosing schizophrenia, differentiating schizophrenia from numerous psychotic disorders, such as Paranoid Disorder, Schizoaffective Disorder, Affective Disorder, Schizophreniform Disorder, Brief Reactive Psychosis, Atypical Psychosis and Schizotypal Personality Disorder. Prior to its publication, all fell within the label of Schizophrenia according to the DSM-1 diagnostic criteria (Spitzer, Andreasen, Endicott, 1978). The goal of the third edition of the DSM was to improve reliability, relate recent research to diagnoses, relate to treatment and prognosis, minimize the stigma of labeling and promote

clinical acceptability and collaboration with European colleagues. Within two decades, research revealed numerous subgroups within the diagnosis of schizophrenia and genetic, prognostic, and treatment variations.

The DSM-3 compromised two extreme classifications, affective disorder and schizophrenia reactions, into three categories, schizophrenia, affective disorder, and the presence of both the full affective syndrome and character symptoms of schizophrenia. This presented a third categorical diagnostic class and defines the development of the diagnosis of schizophrenia into a multidimensional psychotic disorder.

A second major significance of the DSM-3 was the addition of formal thought disorder within the diagnosis of schizophrenia. This disorder of thought was distinguished by the failure to adhere to syntax and semantics of language. It was noted that this breakdown of language was not associated with poor education, cultural differences, or low intelligence quotients. The language incoherence was defined as disturbances of speech or writing with presented obstacles of comprehension. Furthermore, the DSM-3 listed derailment, poverty of speech, illogicality and impairments in rate, content, or form, as symptoms of language and communication disturbances in schizophrenia.

The third significant change from the first edition of the *Diagnostic and Statistical Manual of Mental Disorders* and the third edition is the addition of affect. Affect is known as disturbances in affective expression. This is characterized as blunt behavior, expression flattening or inappropriateness. Existent symptoms could include a monotonous voice, lack of facial expression or emotional responses.

It is important to note, while these are presenting symptoms of schizophrenia, the DSM-3 found them to be insignificant with the diagnosis of schizophrenia due to their unreliability and presence in only extreme forms.

The publication of the DSM-3 outlines the current diagnosis characteristics of schizophrenia. The most recent *Diagnostic and Statistical Manual of Mental Disorders* was released in 2013. This edition expresses the schizophrenia spectrum, a continuum of varying severities, symptoms, and psychotic disorders. The defining abnormalities are within five domains; delusions, hallucinations, disorganized thinking or speech, disorganized motor behavior, and negative symptoms. "Based on leadership from the National Institute of Mental Health, the field began doing exactly this, looking carefully at schizophrenia phenomenology to find distinctions between symptomatic domains. The analysis of large clinical data sets showed the correlation of groups of related symptom types across clinical course, organized into "domains" of dysfunction, specifically cognition, psychosis, negative symptoms and affect" (Tamminga, 2008).

With a focus on disorganized thinking, speech, and language, the DSM-5 lists derailment, formal thought disorder, incomprehensible speech, receptive aphasia, and linguistic disorganization, word salad, confused or unintelligible speech, to be prevalent symptoms of schizophrenia. Negative symptoms, a lack or withdrawal of functioning, are also significant when discussing the language of individuals with schizophrenia. These symptoms include a decrease in emotional expression, seen as flat affect, loss of eye contact, and diminished prosody of speech. Negative symptoms also include avolition, a decrease in motivation of self-directed activities,

algebra, or a lack of interest in social interactions. Positive symptoms are defined as changes in behavior or thoughts, characterized by hallucinations or delusions.

The progression and development of the diagnosis of schizophrenia can be traced by the editions of the *Diagnostic and Statistical Manual of Mental Disorders*. In relation to schizophrenic speech, the 1980s, with the release of the DSM-3, became a breakthrough for the identification of language and communication impairments as a result of schizophrenia. Continuing through the years, to the release of the current DSM-5, semantics, syntax, and pragmatics are defining characteristics of an individual diagnosed with schizophrenia. Therefore, it can be hypothesized that an affective treatment plan for a client with schizophrenia would include physiological services in addition to speech therapy. Speech-language therapy addresses communication concerns within the scope of practice of speech sound production, voice, fluency, language comprehension and expression, and cognition. With a multidisciplinary approach in conjunction with psychologists, a client could develop their communication skills to promote psychotherapeutic treatment.

### **Communicative Symptoms of Schizophrenia**

As previously mentioned, the third edition of the *Diagnostic and Statistical Manual of Mental Disorders* was pivotal in addressing the linguistic impairments of schizophrenia. Throughout the years, research uncovered specific, recurring, and habitual symptoms present in extreme diagnoses. These linguistic impairments are seen in the semantics and pragmatics of language.

#### Semantics

Semantic knowledge is the knowledge of meaning. Semantics is a combination of fluency, executive functions, mental flexibility, and comprehension (Vogel, Chenery, Dart, Doan, Tan, Copland, 2009). In short and concise terms, semantics is the meaning of vocabulary. This incorporates the ability to understand concepts, label, categorize, and describe words, phrases, or sentences. With impairments to semantics, individuals may have difficulty with word finding, figurative language, and higher-level language. "Strong semantic language skills are crucial for developing an understanding of the world and an ability to express oneself clearly and meaningfully" (Paul, 2001).

According to Elsevier psychiatry research, "Specific attributes of a concept serve a dual purpose: (1) they provide a means of grouping concepts into categories; and (2) they distinguish among the various exemplars that constitute a given category," (Paulsen et al., 110). Furthermore, they explain semantics as distinguishing a chair from a table. Both are furniture and have a distinct purpose, even though they share similar characteristics. Patients with schizophrenia suffer from impaired semantic knowledge and cognitive maps. They have difficulty with recalling objects without priming and cues. Theorists believe semantic impairments are caused by their disorganized memory. Age of onset and the type of schizophrenia affects the severity of semantic defect. "...The disordered speech in schizophrenia is attributable to disorganization and degradation of the semantic system," (Goldberg et. all, 1998).

There is a direct relationship between brain deterioration and semantic difficulties. Brain deterioration present in schizophrenia can be caused by early



deterioration, genetics, and neurotransmitter dysfunction. In patients with schizophrenia, there is reduced activity and blood flow in the frontal lobe. The frontal lobe is responsible for short-term memory, executive cognitions, such as judgment, decision-making, and attention span. The prefrontal cortex, a portion of the frontal lobe, is severely affected in those with schizophrenia. This part of the brain is associated with higher order processing, expression, social behavior, and memory. The prefrontal cortex has the highest concentration of nerve fibers. However, patients with schizophrenia have a lack of gray matter, affecting the transmission of neural impulses.

Another influential difference is the superior temporal gyrus, located in the temporal lobe. The temporal lobe is notably smaller in those with schizophrenia. This is significantly important for speech therapy because the superior temporal gyrus contains the primary auditory cortex and Wernicke's area. Wernicke's area is responsible for processing speech for comprehension. The combination of a small superior temporal gyrus, prefrontal cortex and deteriorated frontal lobe affects the receptive and expressive semantics.

#### Pragmatics

Secondly, pragmatics is greatly affected in an individual diagnosed with schizophrenia. Pragmatic impairments could include lack of cohesion, difficulty understanding non-literal language, ironic speech, indirect hints, and conversational cues (Clegg, 82). The DSM-3 defined a major pragmatic impairment as sense of self, or the ability to feel emotions, individuality, or uniqueness. Through carryover, this is now known as the theory of mind. Theory of mind is the ability to understand

another person's emotions and thoughts (Brune, 2005). With understanding another person's thoughts, beliefs, or intentions, one is able to predict and explain behaviors. The capability to understand theory of mind is severely impacted in a person with schizophrenia. Understanding the emotions of another being is pivotal for nearly all social interactions. It is equally important to comprehend one's own emotions, one's sense of self. Understanding emotion can lead to the identification of reasoning for present and future actions. While theory of mind is generally a pragmatic element, it can be argued that without semantics, theory of mind is inconceivable. It is important to note, these symptoms of schizophrenia are constructed upon each other as scaffolding, for one does not exist independently.

“Pragmatic competence mediated by the right hemisphere, is an equally important and essential component of human communication,” (Boss, 1996). According to the American Speech Language Hearing Association, the right side of the brain is responsible for attention, memory, organization, reasoning, problem solving, and social communication, or pragmatics. Patients with schizophrenia suffer from the failure to segregate the right and left hemispheres of the brain. “The higher order language functions mediated by the right hemisphere are essential to an accurate understanding of someone's communicative intent, and the deficits displayed by patients with schizophrenia may make a significant contribution to their social interaction deficits,” (Mitchell, 2005). Therefore, without proper brain activity, a patient with schizophrenia may be unable to understand humor, sarcasm, emotions, and prosody, all significant elements of pragmatics that impair social communication.

Within the dominion of prosody is fluency. Fluency is a main impairment with schizophrenia. “Large effect sizes are present in both phonological and semantic fluency in individuals with schizophrenia compared to healthy, non clinical controls suggesting uniform difficulties in word generation at the diagnostic level,” (Elvevag et. Al., 2001). Phonemic fluency is a collaboration of words that contain the same phoneme. Semantic fluency is a group of words from a specific category. It is believed that phonemic fluency requires greater effort because retrieval relies on organization of semantic knowledge from object categories. Conversely, phonemic fluency is based on similar letters and sounds (Kreman, 2003).

The parts of the brain responsible for fluency are both the frontal lobe and temporal lobes. While both areas of the brain overlap with fluency, the frontal lobe is more responsible for phonemic fluency and the temporal lobe is more important for semantic fluency (Juhasz, 2012). With patients suffering from schizophrenia there is a clear disconnect of the temporal and frontal lobes.

Patients with schizophrenia have significant difficulties with semantics, pragmatics, and fluency. “Schizophrenia consists of relatively mild and variable difficulties at the microlinguistics level (involving phonology, morphology, and syntax), with more severe and pervasive deficits emerging at the macrolinguistic level (relating to pragmatics),” (Jablensky et. Al., 2011). ASHA clearly lists the roles and scope of practice for speech language pathologists. This includes speech sound production, fluency, language comprehension and expression, and cognition. A speech pathologist would be beneficial for an intervention involving a schizophrenic client to restore or reestablish semantics, pragmatics, and fluency.

### **Meta-Analysis of Remediation**

The psychosocial treatment of schizophrenia combines six interventions that provide the strongest and most effective outcomes. These interventions include individualized case management, vocational rehabilitation, family intervention, self-management training, cognitive-behavioral therapy, and mental health support (Mueser, Bond, 2000). Psychosocial intervention focuses on daily living skills.

Clients with schizophrenia will undergo psychosocial therapy to address communication, vocational, and self-care impairments. Cognitive behavior therapy, trains clients to live with their symptoms, focusing on their behaviors and cognitions. The ideology behind this therapeutic approach is to identify the client's perspective. From there, the therapist assists the client with developing alternative explanations for their symptoms, in turn reducing them (Morrison, 2009).

Treatment not only includes psychosocial intervention, but also the prescription of antipsychotic medication to treat psychotic symptoms, for example, hallucinations, discontinuity of reality.

Currently, this is the commonly accepted treatment plan for a client diagnosed with schizophrenia. Through meta-analysis, comparing and contrasting various studies to identify patterns of agreement and disagreement in treatment plans, a review can be synthesized to test the framework of a treatment plan.

Evidenced-based practice is the underlying fuel behind all areas of client-based directives. It is the combination of clinical expertise, relevant, peer-reviewed research, and client perspectives that frame clinical therapy from all domains.

Evidence-based practice creates the foundation of meta-analysis and systematic

reviews. Systematic reviews are the tools at which professionals use to treat their clients and make coherent, individualized decisions. Therefore, it is important to reference systematic reviews from different approaches to schizophrenia treatment in order to determine if speech language therapy would indeed benefit a client diagnosed with the psychotic disorder.

#### A Cognitive Approach

“A Meta-Analysis of Cognitive Remediation in Schizophrenia” by Susan R. McGurk, Elizabeth W. Twamley, David I. Sitzer, Gregory J. McHugo, and Kim T. Mueser is a study that evaluated, assessed the effects of cognitive remediation for improving cognitive and psychosocial abilities of a client diagnosed with schizophrenia. “Cognitive impairment is a core feature of schizophrenia, with converging evidence showing that it is strongly related to functioning in areas such as work, social relationships, and independent living “(McGurk et. Al., 2007). Therefore, a cognitive approach is an appropriate intervention for prominent cognitive functioning impairments. Cognitive treatments focus on nonverbal working memory changes, verbal learning, and visual learning. Cognitive therapy sessions are both active and structured, therapist and patient work towards session goals. These goals could focus on monitoring situational triggers that could promote delusions, hallucinations, mood changes, negative symptoms, or dysfunctional thoughts (Beck, Rector, 200). By treating a client’s cognitions, attention, memory, cognitive performance, the client is treated as a whole, starting at the root of the disorder with the goal of resetting their somewhat bizarre thoughts into meaningful cognitions. This individual treatment is unique to each client and effective based on

a collaborative effort. To restore rationale to cognitions and maintain control over symptoms is the key to this therapy approach.

According to the above meta-analysis, “the results indicate that cognitive remediation produced robust improvements in cognitive functioning across a variety of program and patient conditions.” One major benefit that was presented was the increase of self-esteem and self-efficacy from cognitive therapy. The positive learning experience, from this therapeutic approach, is shown to increase motivation, goal directed behaviors and decrease depression mood alterations. Overall, this improves the client’s mood. In regards to psychosocial functioning as a focus of the cognitive therapy, clients participated in more social interactions, had the ability to solve interpersonal predicaments, and vocational performance. The most effective strategy was drill and practice. This involved targeting memory and executive functioning by chunking information for recall and problem solving. These skills could be carried over to other environments and settings. To conclude, cognitive therapy was found an effective treatment to schizophrenia.

#### A Language Approach

The cognitive approach to schizophrenia treatment is used, predominately, in combination with the use of antipsychotic medicine. In addition to these two approaches, it would be beneficial to incorporate speech language therapy to treat the speech and language deficits of a client with schizophrenia. As explained above, schizophrenia has multiple pragmatic negative symptoms, thought disorders, and speech impairments. Speech language therapists are trained, educationally and clinically, to develop client’s intonation, pragmatics, sequencing, thought and word

organization. These professionals could use their specialty and training to rehabilitate the linguistic, communicative symptoms of schizophrenia.

This year, a study was conducted to determine if the speech disturbances of schizophrenia affect a client's quality of life. This study was the first evidence to show that impaired communication impacts both functioning and satisfaction of life. "The minimal and unspontaneous speech that reduces communicability may result in the slow subtle changes to daily routines, and loss of social relationships which are measured in objective quality of life" (Tan, Thomas, Rossell, 2014). Furthermore, it was discovered that communication was impaired through self-awareness and self-monitoring difficulties, insight, and verbal under productivity resulting in reduced social engagement and lack of volition. "This [study] suggests that reduction in spontaneous conversation has an independent and significant impact on functioning above mood and cognitive impairments that appears to align with established negative symptom impact on objective quality of life."

There is little research on the implication of speech therapy for a multidisciplinary approach to speech therapy. Most studies that have been conducted were case studies, focusing on the progression of one participant. In brief, the American Speech Language and Hearing Association published an article introducing a collaborative treatment approach to serving clients with mental illness. A 62-year old female was diagnosed with schizophrenia and underwent individual and group speech and language therapy. The focus was to develop her speech and language and generalize the session plan techniques into real life perspectives. After one year, the client participated in role playing during group

sessions, expressed her feelings verbally and improved her speech intelligibility. As a result of her speech therapy, her social interaction skills increased, as did her participation. Instead of remaining in her room, she kept her appointments, joked with other residences and increased her participation in group and social activities. Overall, it was said that her symptoms improved from severe to mild. This is just one, brief example of how speech intervention can improve the quality of life for a client with schizophrenia (Novak, Kapolnek, page 117, 2001).

In March of 2007, Judy Clegg and fellow researchers of the Academic Clinical Psychiatry of the University of Sheffield in the United Kingdom conducted a case study of a 53- year old adult male who suffered from schizophrenia. The focus of the study was to improve the client's verbal communication. This was conducted in two distinct phases. First, the client was to become desensitize to verbal communication. Second, the client was to develop his language productivity and awareness of social communication. The patient had significant disorders regarding his speech syntax, semantics processing, and pragmatics. PQ was referred for speech language therapy because of his poverty of speech, social anxiety, inability to produce spontaneous speech and withdrawal from social situations. The main aim of the study was to determine if speech and language therapy intervention could improve the client's verbal communication.

There were five distinct measures of the intervention. These included a written self-description, transcripts, S24, VASES, and CAS. S24 is an attitude scale towards communication. PQ scored a 15, which indicated he had a high level of social anxiety particularly communicating in groups, with new people, and talking



about himself and his feelings. The VASES assessment, Visual Analogue Self Esteem Scale is a measure of self-esteem for those with communication impairments. PQ scored a 21 out of 50 indicating that he had the presence of low self-esteem.

Transcripts were compiled to analyze the extent of PQ's poverty of speech. Before speech therapy, PQ had a mean length utterance of 3.4. The written self-description assessment provided an insight to how PQ perceived his communication skills and self-esteem. The impact of low self-esteem affects treatment outcomes, a clients quality of life, and understanding of self-concepts and wellbeing.

The first phase of the therapy focused around improving PQ's anxiety and awareness of his personal communication. Over 15 weeks, he was engaged in 45-minute sessions focusing on increasing his verbal situations and reducing his social anxiety. The completion of this phase was judged as no visible signs of anxiety by scoring a four on the CAS assessment. PQ also had to engage in one verbal situation and keep a written record. After the first phase, PQ gave factual information about himself in verbal sessions, earned a four on CAS, reduced his overt anxiety and his verbal situations increased. PQ no longer tapped his foot, wrung his hands, and remained seated.

The second phase of PQ's speech therapy focused on increasing his language productivity and awareness of his communication skills. The objectives were to increase his participation in less structured verbal situations, to use more descriptive language, and to develop more appropriate verbal skills. He met with the speech pathologist for 45-minutes for 10-weeks. This phase was completed when PQ showed no signs of anxiety, was involved in factual communication, described

his feelings and improved his pragmatics. The three pragmatic behaviors of focus were eye contact, to initiate and return greetings, and increase facial expressions by smiling. At the end of 10 weeks, PQ was able to engage in conversations about himself, books, articles, his progress, and life experiences. He was able to use emotional vocabulary, maintain eye contact, smile, participate in more spontaneous conversations also proving able to self-evaluate improvements.

Regarding the comparison pre and post speech language intervention, PQ increased his MLU from 3.4 to 8.5. His CAS score for anxiety decreased from 7 to 2 for speech therapy sessions, from a 9 to 4 in psychology sessions, and from 6 to 2 in family interactions. Initially PQ refused to complete a written self-description, after speech therapy he completed it using factual terms. His S24 score remained the same, meaning he continued to have a negative attitude towards therapy. The consistent S24 score indicated that PQ found it difficult to converse in group settings and communicate with new people. His VASES score increased from 21/50 to 34/50 signifying that his self-esteem increased. Despite his negativity towards communication, his self-esteem, productivity, and semantic content increased. His social anxiety decreased, allowing PQ to communicate with more confidence and awareness of his social interaction skills.

To conclude, PQ, a client with schizophrenia, benefited from speech language therapy. He continued to have a negative attitude towards communication; however, he increased his self-esteem and language productivity. He acknowledged his communication skills and was able to engage in spontaneous, verbal communication. PQ's became more interactive with his family and more confident in

social situations. He was able to communicate about himself and his personal experiences. This in turn prepared him to engage in sessions with a clinical psychologist. Previously, PQ refused to seek psychotherapy, now with this developed communication skills, he was confident and encouraged to seek psychological help. Thus, his mental state improved due to his psychiatric therapy, with assistance and development of his communication skills.

### **Conclusion**

Schizophrenia and speech language therapy are viewed as two distinct entities in related, but different fields. However, the diagnosis of schizophrenia has symptoms that directly relate to the field of communicative disorders.

Schizophrenia is treated through a multidisciplinary approach and this should include speech language pathologists. The objective of therapy is to improve the client's quality of life. The most basic method to improve life is through expression, whether verbal or another modality. The targeted goals of speech language therapy are to improve intelligibility, comprehension, and self-awareness. The addition of a communicative focus, concurrent with medicinal antipsychotic medicine and cognitive behavioral therapy, can rehabilitate a client's social and vocational life, as well as overall functionality. With more research, psychiatric disorders should be considered within the domain and management of a speech language pathologist due to their knowledge and clinical experience with communicative therapy.

Communication is the basis of cognitive behavior therapy and, in turn, codependent on functionality, comprehension, and self-expression.

## References

Beck, A. T., & Rector, N. A. (2000). Cognitive therapy of schizophrenia: A new therapy for the new millennium. *American Journal of Psychotherapy*, 54(3), 291-300. Retrieved from <http://search.proquest.com/docview/213135755?accountid=8204>

Boss, B. (1996). Pragmatics: right brain communication. *Axone*, 17(4), 81-85.

Brune, M., 2003. Theory of mind and role of IQ in chronic disorganized schizophrenia.

*Schizophrenia Research* 60, 57-64.

Diagnostic and statistical manual of mental disorders (1952). Washington, D.C.: American Psychiatric Association.

Diagnostic and statistical manual of mental disorders (3d ed.). (1980). Washington, D.C.: American Psychiatric Association.

Diagnostic and statistical manual of mental disorders: DSM-5. (5th ed.). (2013). Washington, D.C.: American Psychiatric Association.

Deyoung, N. (n.d.). History of the DSM. History of the DSM. Retrieved April 13, 2014, from <https://sites.google.com/site/psych54000/>

Elvevag, B., Fisher, J., Gurd, J., & Goldberg, T. (2001). A comparison of verbal fluency tasks in schizophrenic patients and normal controls.. *Schizophrenia Research*, 51(2), 119-126.

Jablensky, A.V. 2011, Diagnosis and revision of the classification systems in Schizophrenia Current Science and Clinical Practice, Wiley-Blackwell , U.K. Detail

Juhasz, Barbara J. "Evaluating Lexical Characteristics of Verbal Fluency Output in Schizophrenia." Wesleyan University. Department of Psychology, 30 Dec. 2012. Web. 14 Apr. 2013.

Kreman, W., Seidman, L. J., Faraone, S. V., & Tsuang, M. (2003). Is there disproportionate impairment in semantic or phonemic fluency in schizophrenia? *Journal of the International Neuropsychological Society : JINS*, 9(1), 79-88.

Kuperberg, G., & Caplan, D. (2003, March 17). Language Dysfunction in Schizophrenia. Language Dysfunction in Schizophrenia. Retrieved April 3, 2014, from <http://www.nmr.mgh.harvard.edu/kuperber>

McGurk, S. R., Twamley, E. W., Sitzer, D., McHugo, G. J., & Mueser, K. T. (2007). A Meta-Analysis of Cognitive Remediation in Schizophrenia. *The American Journal of Psychiatry*, *164*(12), 1791-1802.

Mitchell, R., & Crow, T. (2005). Right hemisphere language functions and schizophrenia: the forgotten hemisphere?. *Brain*, *128*(5), 963-978.

Morrison, A. A. (2009). Cognitive Behavior Therapy for People with Schizophrenia. *Psychiatry MMC*, *6*(12), 32-39. Retrieved February 18, 2014, from <http://www.ncbi.nlm.nih.gov/pmc/articles/P>

Mueser, K., & Bond, G. (2000). Psychosocial treatment approaches for schizophrenia. *Current Opinion in Psychiatry*, *13*, 27-35.

Novak, J., & Kapolnek, K. (2001). Speech-Language Pathologists Serving Clients with Mental Illness: A Collaborative Treatment Approach. *Contemporary Issues in Communication Science and Disorders*, *28*, 111-122.

Paul, R (2001). *Language Disorders from Infancy through Adolescence: Assessment and Intervention* 2nd Edition. St. Louis, Missouri: Mosby, Inc  
<http://cslstherapy.com/semantic-language/#sthash.cgbvDf1U.dpuf>

Paulsen, Jane S., Ramon Romero, Agnes Chan, Amy V. Davis, Robert K. Heaton, and Dilip V. Jeste. "Impairment of the Semantic Network in Schizophrenia." *University of California at San Diego Medical School*. Department of Psychiatry University of California, 17 Mar. 1996. Web. 14 Apr. 2013.

Spitzer, R. L., Andreasen, N. C., & Endicott, J. (1978). Schizophrenia and other psychotic disorders in DSM-III. *Schizophrenia Bulletin*, *4*(4), 489-511.

Tanninga, C. (2008). Domains of dysfunction in schizophrenia: implications for diagnosis. *World Psychiatry*, *7*(1), 34–35. Retrieved May 22, 2014, from <http://www.ncbi.nlm.nih.gov/pmc/articles/P>

Tan, E. J., Thomas, N., & Rossell, S. L. (2014). Speech disturbances and quality of life in schizophrenia: Differential impacts on functioning and life satisfaction. *Comprehensive Psychiatry*, *55*(3), 693-698. Retrieved March 1, 2014, from the Science Direct database.

Vogel, A. P., Chenery, H. J., Dart, C. M., Doan, B., Tan, M., & Copland, D. A. (2009). Verbal Fluency, Semantics, Context and Symptom Complexes in Schizophrenia. *Journal Of Psycholinguistic Research*, *38*(5), 459-473. doi:10.1007/s10936-009-9100-z

## Diagnostic Criteria of Schizophrenia

A. Two (or more) of the following, each present for a significant portion of time during a 1-month period (or less if successfully treated). At least one of these must be (1), (2), or (3):

- 1. Delusions
- 2. Hallucinations
- 3. Disorganized speech (e.g., frequent derailment or incoherence).
- 4. Grossly disorganized or catatonic behavior

B. Disturbance since onset in level of functioning in one or more major areas significantly below the level achieved prior to onset:

- Vocation
- Interpersonal relations
- Self-care

C. Continuous signs of disturbance for at least 6 months, including prodromal or residual periods of:

- Signs of negative symptoms
- Two or more symptoms in previous Criterion A (odd beliefs, unusual perceptual experiences)

D. Schizoaffective disorder and depressive or bipolar disorder with psychotic features either, have been present for a minority of the total duration or the active and residual periods of the illness:

- 1. No major depressive or manic episodes have occurred concurrently with active-phase symptoms or
- 2. Mood episodes have occurred during active-phase symptoms

E. The disturbance is not attributable to the physiological effects of a substance or another medical condition

F. If there is a history of autism spectrum disorder or a communication disorder of childhood onset

- Additional diagnosis of schizophrenia is made only if prominent delusions or hallucinations present of at least a month

Figure 1. Diagnostic Criterion adapted from the DSM-5

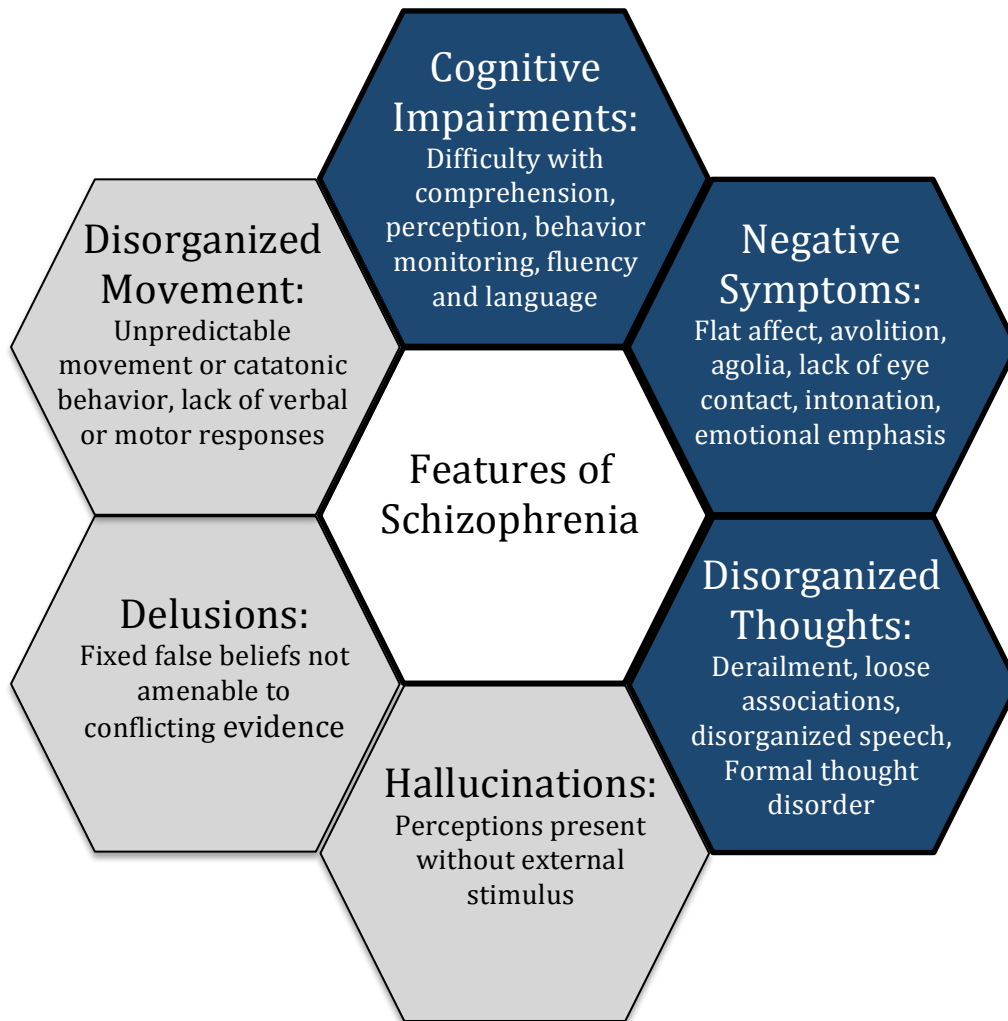


Figure 2. Schematic diagram of the diagnostic features of schizophrenia adapted form the DSM-5. Purple hexagons dictate symptoms relate to speech and language comprehension and communication.



Figure 3. Composition of communicative disorders in schizophrenia