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A Comparison of the Expressive Language Characteristics in Schizophrenia and Wernicke's
Aphasia

A thesis
presented to
The Department of Audiology and Speech-Language Pathology
East Tennessee State University

In partial fulfillment
of the requirements for the degree
Master of Science in Speech-Language Pathology

by
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May 2023

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ABSTRACT

A Comparison of the Expressive Language Characteristics in Schizophrenia and Wernicke's

Aphasia

by

Taylor Thomas

Mental illness and language disorders are rarely linked together as a way of making a comparison. In this study, a comprehensive scoping review was initiated to discuss the differential diagnostic characteristics of expressive language in Schizophrenia and Wernicke's Aphasia (WA). This study will examine the domains of language where there are overlaps between the characteristics of expressive language. Semantics, pragmatics, and discourse will be further examined while comparing what aspects of expressive language are key in each domain. Schizophrenia being classified as a mental illness and WA being classified as an acquired language disorder, there are fundamental properties of language that are synonymous; however, the terms used can be different. This study will discuss the process and reasoning behind a scoping review. The results of this scoping review will identify the gaps in the literature addressing similarities between the patterns of expressive language use in these two diagnoses.

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Chapter 1. Introduction

Language is identified as symbols, compiled together, used to convey a thought, need, interest, or message to another listener or listeners. Expressive language is conveyed verbally, gesturally, and with the use of body language. When there are deficits in language or a disorder involving language, communication may be hindered. An additional aspect of language and communication is comprehension; what is being understood while communicating.

Comprehension allows others to engage in conversation that is understood by persons and permits appropriate responses to one another. Without expression and comprehension, it is impossible to be able to have constructive conversations with one other.

Schizophrenia is classified as a mental health disorder and Wernicke's Aphasia (WA) is classified as an acquired language disorder. Clinicians working with both populations may observe similarities and overlap in the presentation of expressive language. By simply defining the two disorders and making surface level observations, there would appear to be very little similarities, if any, between the two disorders. However, when language is further studied and investigated, if both disorders appear to be similar, in terms of language, what are the similarities between schizophrenia and WA?

The Diagnostic and Statistical Manual of Mental Disorders Fifth Edition (DSM-V, 2013) classifies schizophrenia as a disorder where two or more of the following are present for a significant portion of the time during a one-month period: delusions, hallucinations, disorganized speech, and grossly disorganized or catatonic behavior. Delusions can be identified as false beliefs despite clear evidence that these beliefs are not true. Hallucinations can be identified as the vivid experience and utilization of all five senses despite nothing being there. Disorganized speech is identified as thoughts and speech combining in a nonsensical manner; alternating from

one topic to another. Catatonic behavior is a reaction, either little or none at all, to a person's environment; it can be unusual or unexpected. Hurley (2022) defines schizophrenia, utilizing the DSM-V criteria, as a chronic mental disorder characterized by disturbances in thought, perception, and behavior. Mayo Clinic (2020) defines schizophrenia as a serious mental disorder in which people interpret reality abnormally. This manifests as a spectrum of signs and symptoms, and may include some combination of hallucinations, delusions, and extreme disordered thinking and behavior that impairs daily functioning and can be disabling (Mayo Clinic 2020).

Language impairments in Schizophrenia can present as lexical selection based on patterns of rhyming, neologisms, unintelligible utterances, deficits in prosody, flat intonation, use of word approximation, difficulty in application of Grice's maxims (quality, quantity, relation, and manner), and with potential difficulty in comprehension (Colle et al., 2013). A theory of the etiology behind schizophrenia, according to Boxell and Marquis (2022) is, "Genes with environmental precipitants" (p. 457). Additionally, Boxell and Marquis (2022) state, "The expression of relevant genes based on environmental stimuli such as trauma may promote synaptogenesis and synaptic pruning in different parts of the brain" (p. 457). Crow (1989) suggested that the etiology of schizophrenia may be genetic, as the indicators of psychotic ideology are seen early and effect brain development with a lack of environmental components. It is certainly probable that the etiology of schizophrenia could stem from more than one factor.

Beeke et al. (2020) define aphasia as a deficit in communication due to damage in areas of the brain responsible for language and characterized by difficulty understanding and formulating language. According to the National Aphasia Association (NAA, 2022), aphasia is identified as an obtained communication disorder that diminishes a person's capacity to process

language; however, has no influence on intelligence. Aphasia impairs the ability to speak and understand others. Wernicke's Aphasia (WA) is a sub-category of aphasia, which is defined by Edwards (2005) (as cited in Beeke et al., 2020) as fluent speech that is inclined to demonstrate adequate sentence structure but may appear illogical due to word-finding deficits. WA is a neurological model of comprehension impairment, resulting in a deficit in semantic cognition (Robson et al., 2012).

Wernicke's area is the section of the brain responsible for language understanding; therefore, if Wernicke's area is damaged, comprehension of language is compromised (Ardila et al., 2016). Ardila and colleagues (2016) describe Wernicke's area as a large part of the language comprehension processes and understanding speech. The etiology of WA is damage to the brain; typically, the left side. The most common etiology of aphasia is a cerebrovascular accident (CVA) involving the left hemisphere (Fridriksson et al., 2018). Additional etiologies of WA are brain trauma (i.e., traumatic brain injury, non-traumatic acquired brain injury, or concussion), cerebral tumors, central nervous system infections, and degenerative brain disorders (e.g., Alzheimer's, Ataxia, Huntington's, Multiple System Atrophy, Parkinson's) (Binder, 2017). The NAA (2022) reports a person with WA can produce a great deal of words and typically speak using grammatically appropriate sentence structure; rate and prosody also remain intact. In contrast, what is said by the individual may not make sense pertaining to the topic (NAA, 2022). Additionally, what seems to be a deficit in topic maintenance, the statement made can comorbidly contain nonexistent or irrelevant words (NAA, 2022). The individual with WA will present with failure to recognize and understand communication breakdowns displayed by the listener.

Historical Perspective

Schizophrenia. In the late nineteenth and early twentieth century, physician Emil Kraepelin (1856-1926) studied mental illness (Dennert, 2021). The work of Kraepelin influenced modern psychiatry and the perception on mental illness (Bar & Ebert, 2010). Plumptre (2022) states Kraepelin was the first to systematically define schizophrenia, which at the time was known as *dementia praecox*; originally regarded as a condition used to symbolize early onset of dementia. Plumptre (2022) discusses the evolution of names for what we know now as schizophrenia: the French word ‘demence’ or loss of mind originated in the 1800s, shifting to *dementia praecox*, and what is now known as schizophrenia Kraepelin also made the distinction between manic-depression and *dementia praecox* (Bar & Ebert, 2010). Kraepelin classified *dementia praecox* as a progressive neurodegenerative disease and classified manic-depression as an episodic disorder, which would not cause permanent impaired brain function (Bar & Ebert, 2010).

Dennert (2021) reports that Kraepelin was one of the initial physicians to propose direct observation and description to gain scientific knowledge when studying mental illness. Kraepelin (1919) reported that people with schizophrenia commonly “lose both inclination and ability on their own initiative to keep their attention fixed for any length of time” (p. 94). Kraepelin stated, “The development of the disease is accomplished in about four-fifths of cases quite gradually; often an insidious change of the psychic personality precedes the appearance of distinct morbid phenomena by many years. In contrast, the remaining patients' disorder begins in the subacute form” (p. 94). According to Kraepelin (1919), the initial stages appear as, “Nervous troubles, complaints of lassitude, headaches, feeling of giddiness, fainting-fits, irritability, and sleep disorder” (p. 94). Pols (2011) states. “Kraepelin was eager to discover the environmental, social,

cultural, and ethnic factors which influenced the types, prevalence, and expression of mental illness” (para. 2).

Wernicke’s Aphasia. Carl Wernicke was a German psychiatrist and neurologist who identified what is now known as Wernicke’s area (Eggert, 1977). Wernicke provided an explanation of comprehension of language as cognitive function based on neural networks. As a psychiatrist and neurologist, Wernicke published a variety of neurological papers, and based off the literature, he was also a philosopher who cared about the health and the functioning of the brain. Pillman (2003) reports Wernicke’s network view of brain function foreshadowed today’s connectionist concepts.

Wernicke is also known for his research into aphasia and identifying the region where the cerebrum oversees receptive language in the temporal lobe (Eggert, 1977). Wernicke described a syndrome of fluent paraphasic speech and disturbances in writing with comprehension difficulty for speech and written language which later became known as Wernicke’s Aphasia (Geschwind, 1967). According to Wernicke (1874), the left temporal lobe is involved in the recognition of words. Wernicke’s discovery of WA came after he studied aphasia, and the effects aphasia has on language. Wernicke (1874) offered an outlook stating that the most basic psychic functions can be assigned designated areas of the cortex. Additionally, Wernicke (1874) states that “beyond the simplest functions, the union of various impressions into a concept, thinking, and consciousness, is an accomplishment of the fiber tracts which connect to various regions of the cortex to each other” (p. 4).

When comparing language in schizophrenia and language in individuals with Wernicke’s Aphasia (WA), there appears to be an unmistakable overlap between the two disorders. Typically, to determine the appropriate diagnosis of an individual, there is a series of steps

required: accumulate a case history, make an observation, gather applicable data, administer testing based off previous information gathered, and generate rule-outs between two or more equally plausible diagnoses. The challenge lies with determination of differential diagnosis if assessments yield the same results.

Summary

At this stage, a point of comparison in the etiologies of schizophrenia and WA is that there are similarities in the patterns of language use. Based off research, the genesis of schizophrenia may vary between developmental, congenital, and acquired. In contrast, WA is solely an acquired disorder. By separately researching the presentation of language in both disorders, there are relative expressive language qualities both disorders share. Due to the way language deficits are manifested in schizophrenia and WA, an overlap is presented in expressive language characteristics. When the diagnosis process occurs, how is one disorder ruled out from the other? This study will address the similar patterns shared by the two disorders, in terms of expressive language.

The key concepts of this study will be identifying the gaps in the literature describing these disorders and the linguistic presentation including the domains of language most affected. These topics were selected because the information provided are major aspects of learning about each disorder while providing the most information available on expressive language in each disorder. By making this comparison, it will provide greater detail into what comprises expressive language characteristics in both disorders.

A scoping review is completed when the topic or question being asked reveals gaps in the current literature and the question presented requires further inquiry (Munn et al., 2018). A scoping review was utilized for this study because there is little information on the differential

diagnostic characteristics in schizophrenia and WA. When completing a scoping review, each disorder had to be researched and investigated as a separate entity, as if the study was solely done on one disorder. This meant turning over every stone involving expressive language in schizophrenia and expressive language in WA. A scoping review will provide all the research and information utilized to formulate a comprehensive review and provide the ability to be able to make discernable questions for research.

Chapter 2. Literature Review

Domains of Language

In various disciplines, phonology, morphology, syntax, semantics, pragmatics, and discourse are known as the domains of language. According to the American Speech-Language-Hearing Association (ASHA, 2022), phonology can be defined as a study of speech sounds in language, along with the rules for merging and utilizing phonemes. Morphology is defined as regulations governing the least significant units of language and how the units are formed. Syntax can be defined as the regulations involving the way words are joined to form sentences in a language (ASHA, 2022). Although there is potential that individuals with schizophrenia or WA can experience deficits in phonology, morphology, and syntax, those domains do not pertain to the aspect of differentially diagnosing between schizophrenia and WA.

Most patterns of disordered language in schizophrenia and WA are found in semantics, pragmatics, and discourse. Semantics can be defined as word meaning and combinations of words in language. Pragmatics is defined as understanding social aspects of spoken language and conversational exchanges (ASHA, 2022). According to Tannen (n.d.) discourse can be defined as an analysis of language which goes “beyond the sentence;” studying the functionality and cohesiveness of the conversation as it flows together. Deficits in this area may manifest as derailment, tangentiality, incoherence, and poverty of speech (Hella et al., 2013). Through focusing on semantics, pragmatics, and discourse, overlaps and gaps in expressive language in these two diagnoses are revealed.

According to ASHA (What is speech? What is language? n.d.), expressive language can simply be defined as the ability to share or convey thoughts, ideas, and feelings. Thurman et al., (2022) defined expressive language as producing and combining sounds and words to interact

with others in the environment. Expressive language is verbal or nonverbal communication which provides the potentiality to express wants and needs (c.f., Vollmer, 2020). When referring to the chosen domains, the study addresses the meaning of what is being expressed when communicating (semantics), how expressive language is being interpreted and portrayed (pragmatics), and the overall coherence of expressive language (discourse). De Boer et al. (2020) define language patterns in schizophrenia as a quantifiable language disorder. These patients spoke less and used fewer complex sentences.

Semantics in Schizophrenia and Wernicke's Aphasia

Wang et al. (2011) states semantic deficits are the hallmarks of Schizophrenia. The patterns of language use in individuals with schizophrenia can be characterized by loose and aberrant associations, poverty of content, and neologisms. Aberrant associations can be defined as drifting away from the usual or typical connection of ideas or topics. Poverty of speech is also known as alogia. Wiginton (2022) identifies alogia or poverty of speech as a lack of conversation due to mental illness, brain injury, or dementia. Ragin et al. (1989) reports that poverty of speech is one of the prominent negative symptoms in those with schizophrenia. For those experiencing poverty of speech, it may appear as the person being quiet or shy; however, these individuals appear this way due to having difficulty with talking. Wiginton (2022) reports key factors that individuals with poverty of speech may present with: inappropriately long pauses between words, brief responses, answers only when asked, flat in tone of voice, and dull facial expressions.

Craik and Tulving (1975) report on the importance of semantic processing of information for successful recall. Two notable fields implemented in the relationship between schizophrenia and semantics associative processes in language and of selective attention (Baving et al., 2001).

Halpern et al. (1985) states that nouns followed by adjectives and adverbs the greatest portion of semantic (paradigmatic) word associations utilized in those with schizophrenia. Pronouns can be used by schizophrenic speakers as if there are referents but there are none (Goldfarb et al., 1994). Related to this, Hazlett et al. (2000) reports that extreme cognitive impairments, in those with schizophrenia, can be verbal learning and memory.

Morgan et al. (2006) discussed the utilization of semantic priming as a means for assessment of semantic deficits in schizophrenia. Semantic priming is facilitating the processing of a word when it is introduced by a related word (Hoedemaker and Gordon, 2017). Neely and Keefe (1989) reported,

Semantic priming model for lexical decisions, the probability that a word target is semantically related to its prime (relatedness proportion) has been confounded with the probability that a target is a nonword, given that it is unrelated to its prime (nonword ratio) (p. 1).

Neely and Keefe also discovered that lexical decisions influence prospective prime-generated expectancy and regulated by the relatedness proportion of semantic priming.

Thompson et al. (2015) stated WA has been associated with poor verbal comprehension and repetition, and fluent speech with jargon. Several authors (DeRenzi et al. 1972; Cohen et al. 1980; Gainotti et al. 1983; Ogar et al. 2011, as cited in Thompson et al., 2015) reported that people with WA can reveal deficits in non-verbal and verbal semantic tasks. Luria (1970) described semantic behaviors in those with WA as the inability to integrate relationships between concepts. In WA, semantic deficits can account for paraphasias, poor repetition, and poor naming abilities (Thompson et al., 2015). Those with WA have demonstrated interference effects and have negative affected by repetition through activation or related distractors (Thompson et

al., 2015). In WA, the individual can demonstrate a combination of assistance from reiteration and intrusion from uncontrollable competing concepts (Campanella and Shallice, 2011).

Those with WA are fluent in expressive language; however, the responses typically do not pertain to the conversation. Boyle (2004) discusses the deficit in the identification of semantics in a patient with WA. Presentation of concomitant semantic deficits are a characteristic of WA. Errors classified as indicators of WA can stem from insufficient activation of semantics throughout naming attempts (Dell et al., 1997 as cited in Thompson et al., 2015).

In WA, semantic and phonemic paraphasias may occur. A semantic paraphasia describes substitution of real and related word or term for another (e.g., *spoon* for *fork*). A phonemic paraphasia is noted as a non-desired sound or syllable substitution in a word (e.g., *choon* for *spoon*). When paraphasias occur, the individual's communicative intent will present as unclear, off topic, with a lack of understanding. Goldfarb and Halpern (1981) state semantic word associations manufactured by aphasic participants and typical participants were best performed with the use of adjectives and a lower performance level with nouns and verbs.

In schizophrenia and WA, individuals will occasionally use paraphasias when using expressive language. Neologisms are typically defined as new coinages, derived wording, phrasal words, collocations, and internationalism. For example, if the individual is seeking a novel to read, they might ask for a *novelian*. Verbal-semantic error is when the desired word and the response are similar visually and semantically, for example, if the individual wants a cookie but asks for a cracker. Both crackers and cookies are round, beige, food, and about the same size. Phonemic paraphasias contain subsystems: word-initial fragments, initial phonology, and noninitial phonology. Word-initial fragments is a response which the earliest portion of the desired word is stated. For example, if the target word is bandage, the individual will say, "band"

instead of bandage. Additionally, if the desired word is ‘tree,’ they might say ‘bree’ as a substitution. These semantic variations can be compiled by combining elements, specifically the compounding, blending, and asynchronization. Additionally, neologisms can be compiled by the pruning of element, specifically abbreviation, back information, and shortening.

Pragmatics in Schizophrenia and Wernicke’s Aphasia

Prutting & Kirchner (1987) define pragmatics as the use of language. Cordier et al. (2015) describes pragmatics as a complex linguistic skill such as how individuals explain, describe, assert, oneself, and listen to another person. In pragmatics there are variations in communicative contexts and interactants and the act of engaging, maintaining, and leaving interactions (Cordier et al., 2015). ASHA (Social Communication, n.d.) defines individuals with intact pragmatic ability as those who follow an unwritten rule of social communication. ASHA lists three major skills involved in social communication: using language for various reasons, changing language based off listener and situation, and following rules of conversation and storytelling. Pragmatic deficits are classified in two different categories: verbal communication and nonverbal communication.

Grice (1975) reports verbal communications, pragmatic deficits can present as speech acts (i.e., persuasion, questions, and requests), communicative intentions, speech acts (perlocutionary, illocutionary, and locutionary), prosody, and elements of discourse. Grice’s maxims, which are a set of rules utilizing cooperative communication such as, providing adequate information and honesty (Grice, 1975, as cited in Covington et al., 2005). For nonverbal communication, deficits can be present in body language, gesture, facial expression, eye contact, gaze, proxemics, deictic gestures, representational gestures, and challenging behavior as communication (ASHA Components of Social Communication, n.d.). An individual

can display perspective-taking issues, withdrawal from social situations, emergence in social situations at inappropriate times or inappropriate commentary, abrupt topic change, lack of appropriate body language, and any other verbal and non-verbal social nuances.

In schizophrenia, pragmatics is another diagnostic indicator of the disorder (Agostoni et al., 2021). Pragmatic insufficiencies the inability to comprehend non-literal utterances such as irony, metaphor, or indirect requests, which is vital step in grasping the speaker's aim in a specified context (Champagne-Lavau et al., 2006). Wrobel (1989) reports that those with pragmatic deficits, who have schizophrenia, experience a lack of adaptation to the various dimensions of speech and lacks skill in communication competence. Wrobel, (1989) identifies the meaning of communication competence:

To possess communication competence means to be able to select from the system inventory of communication behaviors, such forms of behavior which would be most correct from the point of view of the interlocutor (social competence), the communication situation (situational competence) and the purpose which we wish to achieve (pragmatic competence). (p. 118)

As cited in Kraepelin (1919), Bleuler (1911) reported that communicative impairments have been considered a foundational feature of schizophrenia. Evidence has revealed that individuals with schizophrenia demonstrate prevalent difficulties with communicative-pragmatic domain (Bosco et al., 2019). Those with schizophrenia display impairment in the ability to use and comprehend gestures and prosodic cues to express communication intentions (Bosco et al., 2019).

Holland (1982) reports that non-fluent adults (Broca's Aphasia) demonstrated more "normal" system of communication than fluent adults (Wernicke's Aphasia). In WA, pragmatic

abilities can present as abnormally high use of pronouns, which reflects challenges individuals with WA experience in finding content words (Wulfeck et al., 1989). WA subjects, with expressive language deficits, can demonstrate word-finding difficulties, paraphasias, and neologisms. Those with WA demonstrate challenges with pragmatic norms such as lexical expression which conveys impairment in encoding of information. Bates et al. (1983) reported that individuals with WA were pragmatically vulnerable in lexicalization and article use, with a tendency to produce substantial amounts of unclassifiable information.

McCullough et al. (2006) reported the vast majority of pragmatic errors in those with WA were in accuracy, pause time in turn-taking, the use of irrelevant words, and quantity of information. Acharya and Wroten (2022) state that those with WA are not aware of their deficits, which can manifest into frustration once there becomes a realization of communication breakdowns.

Prutting and Kirchner (1987) utilized the Pragmatic Protocol to reinforce depictions of deficits for individuals with Broca's or Wernicke's aphasia. The Pragmatic Protocol (Prutting & Kirchner, 1987), examines communication in observation of individuals engaged in spontaneous, unstructured conversation with a communication partner for fifteen minutes to form the outcomes of communication impairments in an individual's daily interactions. The Pragmatic Protocol is a good example of assessing pragmatic ability with an instrument, through which speech act usage, turn-taking ability, and lexical selection may be regarded as suitable or unsuitable. When the profile of the individual is developed, deficits can be identified related to the linguistic constraint characteristics of each aphasia subtype (McCullough et al., 2006). The Pragmatic Protocol is an attested measure, which has been commonly utilized to assess the pragmatic performance of aphasia in adults (McCullough et al., 2006).

Discourse in Schizophrenia and Wernicke's Aphasia

As cited in Adams (2017), Foucault (1969) suggests the features of discourse are a way to construct knowledge, which structures social relations through the collective understanding. Pallickal and Hema (2020, p. 2) reported that “a complex system of cognitive and linguistic process is required for the performance of discourse; any deficits at this system level can impair the use of language.” In certain instances, discourse deficits can be diagnosed as a thought disorder and/or disorganized speech. Hella et al. (2013), argues that thought disorder is the most salient component in individuals with a diagnosis of severe schizophrenia.

Discourse in schizophrenia can be divided into two categories: negative thought disorder and discourse coherence disturbance. Barch and Berenbaum (1997) defined negative thought disorder as reduced verbosity, reduced syntactic complexity, and increased pausing. Additionally, identifying discourse coherence disturbance as a tangential response, loss of goal, derailment, non-sequiturs, and distractable speech- considering deficits in maintaining a discourse plan.

Alonso-Sanchez et al. (2022) collected samples of patients encountering the first incident of schizophrenia, which has gone untreated. Descriptive discourse, which can be defined as involving numerous levels of cognitive processing to combine portions and qualities to produce a illustrative framework. Related to this, Rosenstein and colleagues (2015) noted that engaging in descriptive discourse tasks such as describing a picture scene, the patient with schizophrenia made unusual word choices.

This has further been described involving receptiveness and conveying less information, which can be referred to as a “weakening of goal” (Liddle et al., 2002) or “poverty of content” (Andreason & Grove, 1986). Discourse comprehension produces supplementary stipulations on

the regulated continuation of context-relevant information, which depends on prefrontal moderated cognitive control performance that are diminished in schizophrenia (Lesh et al., 2011).

Analysis of discourse will involve utterances with additional information and global coherence (Hazamy & Obermeyer, 2019). Global coherence is the demonstration of reliability and convergent validity which is a crucial macrolinguistic discourse ability which speakers use to produce discourse to deliver meaning with conservation to a topic (Leaman & Edmonds, 2021). These authors also discuss the measure of global coherence for conversation and the requirements due to noticeable contrast in cognitive and linguistic order made for productivity of contrasting types of discourse.

In WA, individuals are considered fluent speakers and talk excessively; however, these individuals typically lack insight- the inability to understand and perceive- topic coherence, clear content, and direction. These attributes can result in neologistic jargon (Pallickal & Hema. 2020), which can be associated with aphasia and is defined as a formulation of language including non-existent words or true neologisms not related to the conversation (Rohrer et al., 2009). Gleason et al. (1980) reported disorganized discourse and irrelevant information are the main difficulties, in discourse, presented by individuals with WA. Pallickal and Hema (2020) argued that discourse abilities in WA have not been discussed extensively in literature; however, individuals with WA demonstrate impaired coherence and connected or related linguistic units used to convey a message. Patterns of linguistic disruption are seen in individuals with WA, which can be further investigated by the analysis of discourse grammar (Pallickal & Hema, 2020).

Nicholas et al. (1985) conducted a study with participants with Alzheimer's (AD), Anomic Aphasia (AA), WA, and healthy controls. These researchers compared each

participant's discourse abilities utilizing a picture description task to test if there could be an identification process based on the discourse elicitation tasks. Pallickal and Hema (2020) state, "The discourse WA were characterized by neologisms, semantic and phonemic paraphasias, and excessive use of deictic terms, pronouns, repetitions, comments, and indefinite words" (p. 1142).

In schizophrenia and WA, both disorders present with a substantial impairment in topic coherence and clear content. As an example, discourse impairments with coherence and direction in both disorders present with tangentiality. When having a conversation with an individual with schizophrenia or WA, there can be many aspects of tangentiality, which can be identified as a disturbance in thought process which causes the individual to utilize excessive or irrelevant detail; may never reach the desired point of the current conversation (Balaram & Marwaha, 2018). Additionally, it could be used to classify behaviors in discourse in schizophrenia and WA. The term 'flight of ideas' means when a person is having a conversation, the topic changes are erratic and rapid, speech can be delivered rapidly, and thoughts and ideas can be intertwined. Flight of ideas, which impedes the individuals' ability to maintain a conversation or maintain the integrity of the conversation, is a common characteristic of individuals with schizophrenia; however, there are characteristics in WA as well.

Neurological Considerations

The neurological substrates that are similar in schizophrenia and WA include primarily damage to the temporal lobe and some damage can be found in the frontal lobe. Paquette and colleagues (2015) state, "Early left hemisphere specialization for expressive language suggests that language development hinges on structural and functional properties of the human brain with little reorganization occurring with development" (p. 1). Leonard and Chang (2014) report

speech sounds, words, and sentences show activity spreading from the posterior to anterior lobe. Due to the defining features and role of the temporal lobe, individuals with temporal lobe damage display a comprehensive impairment affecting language. Turetsky (1995) reports the right and left segment of the temporal lobe serve as varying aspects language, emotion, and memory. Individuals with schizophrenia, in the left temporal and right frontal areas, exhibit abnormal asymmetry, in the brain, with reduced brain volume.

The frontal lobe of the brain is vital for volitional movement, expressive language, and directing higher level executive functions (Acharya & Wroten, 2022; Karlsgodt et al., 2010). Damage to the frontal lobe can result in weakness and impaired execution of motor ability, expressive language, and other higher functioning processes: motivation, planning, social behavior, and language (Pirau & Lui, 2022). Impairments in cognitive control can mirror impairments in the responsibility of the dorsolateral prefrontal cortex (Chung & Barch, 2016). Edwards (2005) states that, “Damage to the pre-Rolandic areas of the cortex is associated with damage to the grammar or to the computational aspects of language, while mental lexicon, our vocabulary store, is spared” (p.1).

Chapter 3. Methodology

Purpose of Scoping Review

This project provides a scoping review that identifies the gaps in literature addressing differential diagnostic characteristics in schizophrenia and Wernicke's Aphasia. The research question is this: What are the comparisons of expressive language characteristics between schizophrenia and WA? Munn and colleagues (2018) described the process and purpose of constructing a systematic review versus constructing a scoping review. A systematic review is a broad identification process based on research which has been synthesized and conducted by a review group with specialized skills in identification and retrieval of international evidence that is relevant to a particular question or questions. Munn et al. (2018) additionally define the meaning and role behind a scoping review, noting that there are certain cases where, "Systematic reviews are unable to meet the necessary objectives or requirements of knowledge users (p. 1). Munn et al. (2018) states, "Methodologically robust and structured preliminary searching and scoping activity may be useful to inform the conduct of the systematic reviews" (p. 2). A scoping review is utilized when there is an examination of emerging literature, evidence still appears to be unclear, and more questions can be posed to the topic.

Some scoping reviews have been called scoping exercise or scoping studies (Colquhoun et al., 2014), which have appeared as a reasonable approach with contrasting indications for systematic review. The overall purpose of a scoping review is to identify and map out the available evidence (Colquhoun et al., 2014). When making the decision to complete a scoping review, part of the approach should be to determine exactly what questions are being asked and the purpose of the review. The objective of the scoping review is to produce a critical appraisal of, and synthesized results to the question posed, and to provide an overview of the evidence (Munn et al., 2018).

Currently, the fundamental question of this inquiry does not have a definitive answer; therefore, research requires the approach of a scoping review. The information compiled has been drawn from the existing bodies of literature on language in schizophrenia and WA. By gathering information on both disorders, further exploration can be done on the similarities between patterns of language expressed in both diagnoses.

Process of Selecting Peer-Reviewed Scientific Article

A fully developed comprehensive search was performed utilizing five major citation databases. PsychInfo, PubMed, ASHAWire, EBSCO, and Google Scholar were the primary databases used in the attempt to find specific and detailed information on each disorder as it pertained to language and more specifically, expressive language. PsychInfo was the most popular database used throughout the research process. All the databases provided an abundance of information on the desired information pertaining to schizophrenia. When searching for detailed descriptions on WA, PubMed, ASHAWire, and EBSCO were the most fruitful databases.

A common theme, when searching the body of research about schizophrenia and WA was the terminology used and the individual who researched the topic. Peer-reviewed academic journals were the primary source of information in the construction of this review. The initial search terms consisted of *Schizophrenia and Wernicke's Aphasia*. When searching for WA, there also needed to be a related search for fluent aphasia or receptive aphasia, as WA utilizes both names. A vital part of the scoping review process involved reading through articles focusing on *schizophrenia and expressive language* and reading through articles that focused on *WA and expressive language*. Although there is research and resources on both disorders, it was imperative to eliminate sources which did not focus on expressive language. Following the initial

process, the search was broadened to use combinations of key terms such as *Schizophrenia language*, *Schizophrenia pragmatics*, *Schizophrenia semantics*, *Schizophrenia discourse*. WA was researched in terms such as, *Wernicke's aphasia language*, *fluent aphasia language*, *Wernicke's aphasia pragmatics*, *fluent aphasia pragmatics*, and so forth through the domains.

The previous searches were prerequisites to searching more detailed searches, such as *Identification factors of Schizophrenia* and *Characteristics of Schizophrenia*. While searching the general aspects and concepts of schizophrenia was effortless, searching for comparable research related to WA was more challenging. Quite a bit of the research from WA came from journal articles discussing various aphasias with small snippets of information on WA. Most of the articles used comparisons between fluent aphasia (WA) and non-fluent aphasia (Broca's Aphasia; BA). The National Aphasia Association (NAA) (2022) defines BA as having difficulty with fluent speech, but comprehension is intact. Utilizing the different terminology (WA and fluent aphasia) provided more information. Searches on WA used were "Identifying WA/fluent aphasia" and "Characteristics of WA/fluent aphasia."

Following the generalized information on both disorders, more specific searches were targeted. Keeping focus on the purpose of this thesis, the next logical step was identifying the language domains most affected by both disorders. Semantics, pragmatics, and discourse were the three expressive language domains which are affected the most in both disorders. Prior to the identification of how these language domains manifest both disorders, the featured domains required defining briefly; the ASHA Wire provided brief, unambiguous definitions on the language domains.

Search terms to ascertain language domains within each disorder included *Semantics in Schizophrenia* or *Semantics in WA/Fluent aphasia*. Similar searches were utilized for pragmatics

and discourse as well. The primary purpose of identifying how deficits in the language domains present was to compare the two; the goal being to investigate the overlap in characteristics between both disorders in the three domains.

Although it appears that more research has been done involving the identification, characteristics, and effects of schizophrenia, there is far more research done in the etiology surrounding WA. Additional search terms, such as “etiology in WA” or “etiology in schizophrenia,” were targeted to establish how both disorders manifest and evolve.

Table 1

Key Terms Used for Search of Literature

Disorder	Search Terms
Schizophrenia	<ul style="list-style-type: none"> • What is Schizophrenia? • Schizophrenia + Characteristics • Expressive language in Schizophrenia • Schizophrenia + Semantics • Schizophrenia + Pragmatics • Schizophrenia + Discourse
Wernicke’s Aphasia	<ul style="list-style-type: none"> • What us WA? What is fluent aphasia? What is receptive aphasia. • WA/fluent/receptive aphasia + Characteristics • Expressive language in WA/fluent/receptive aphasia • WA + Semantics, Fluent Aphasia + Semantics, Receptive Aphasia + Semantics • WA + Pragmatics, Fluent Aphasia + Pragmatics, Receptive Aphasia + Pragmatics • WA + Discourse, Fluent Aphasia + Discourse, Receptive Aphasia + Discourse

Other Search Terms	<ul style="list-style-type: none"> • What is Semantics? • What is Pragmatics? • What is Discourse? • What is Expressive Language? • Domains of language • Wernicke + Aphasia • Carl Wernicke • Emil Kraepelin • Presentation of expressive language deficits
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Exclusion Criteria

The driving point of this review was to address the language overlap between both disorders which motivates the differential diagnostic characteristics in expressive language between schizophrenia and WA. Part of the exclusion process, when researching how expressive language is presented in both disorders, is how the disorders are presented in specific domains. When researching expressive language, phonology, morphology, and syntax were a part of the exclusion process. If there were areas in the literature which did not provide information on expressive language in semantics, pragmatics, and discourse, those areas of literature would not be considered viable data for this study.

In addition to eliminating literature not involving the targeted domains, there also was a focus put on receptive versus expressive language. Semantics, pragmatics, and discourse contain qualities of expressive and receptive language. Part of weeding through the various parts of literature was paying extreme attention to what the literature was conveying; deciphering if the literature's focal point was based on receptive language or expressive language in each disorder. If the literature concentrated on aspects of receptive language, this piece of literature would be excluded from the study. Furthermore, this study being a scoping review, it was imperative to utilize journals and articles from accredited databases. There is information out about both

disorders; however, not all information is accurate and lacks evidence to support specific statements.

Chapter 4. Results

This paper is composed as a scoping review due to the relative paucity of research in this area, and the abundance of unanswered questions. Scoping provides the researcher with the ability to look at the literature that has been published, while also providing the researcher with a clear indication of what information has not been discussed or when information appears to be scarce. Completion of this formal scoping review involved several steps, which have been modified based on Munn et al (2018):

- First, *identifying the types of evidence available in each field*. The type of evidence that has been researched and proven should be discussed when completing a scoping review. At this stage in the scoping review, the historical perspective of the topic should be mentioned and credited.
- Second, *examine how research is conducted on a certain topic or field*. What were the steps taken and the levels of evidence used to gather the current information?
- Third, *clarifying the key concepts/ definitions in literature*. This is a valuable step because the review is based off reporting others research and information gathered. Additionally, providing a clear understanding of past research.
- Fourth, *identify key characteristics or factors related to a concept*. In this case, this is related to patterns of expressive language deficits in schizophrenia and WA.
- Fifth, *identifying and analyzing knowledge gaps*. Are there gaps in the body of knowledge that have left questions unanswered?

Semantic Results

Identifying the types of evidence available and examining how research was conducted:

Neologisms can be formed by the reduction of element, namely abbreviation, back information, and shortening. Ragin et al. (1989) identifies poverty of speech as a prominent semantic deficit. Clinical and quantitative indices were utilized to determine the levels of poverty of speech. Thompson et al. (2015) discussed the deficits in semantics plays in WA; fluent speech with jargon. Additionally, Thompson et al. (2015) discuss the involvement of verbal and non-verbal-semantic tasks.

Clarifying key concepts and identifying and identifying key characteristics and concepts:

In semantics, research revealed that in schizophrenia and WA both disorders demonstrate various forms of neologisms and paraphasias. For both disorders, semantics can be present as one of the defining features of the disorder. When semantic deficits are displayed, it appears as if the individual is talking about a completely different topic not pertaining to the current conversation. For example, an individual wants to ask for an apple but instead asks for an orange. Though the substituted item was food and fruit, it was not the desired item. Remote paraphasia is when the desired object and the actual response provided are not of the same category but of similar semantic characteristics.

Identifying and analyzing knowledge gap: The apparent gap in semantic features is the absence of definitive diagnostic qualifiers to parse through commonalities in semantic presentation. Paraphasia and neologism are terms used in the language world; and neologism is a term used in the world of psychology. The meaning of a word, phrase or sentence can contain paraphasia or neologisms that provide new meaning to the desired meaning. It is important to realize that in WA, individuals rarely recognize or are aware of the use in substitution to

meaning. Additionally, neologisms can be formed by the reduction of element, namely abbreviation, back information, and shortening.

Pragmatic Results

Identifying the types of evidence available and examining how research was conducted: Covington et al. (2005) discussed thought disorder appearing to be a disruption in pragmatics; cohesion is impaired which can demonstrate expressive language abnormalities. In pragmatics, individuals with schizophrenia have a higher chance to make referents, non-verbally, when a verbal message could be used. Also, those with schizophrenia stay away from the use of indirect references due to the presumption that a typical listener would not understand the reference. Busch et al. (1988) found that adult with Broca's Aphasia are more coherent in communicating critical information than adults Wernicke's Aphasia. McCullough et al. (2006) states, "Based on current data, it seems that linguistic competence is an underlying factor influencing the relationship between pragmatic performance and functional communication" (p. 174). A treatment for aphasia that is typically addressed is pragmatics. Additionally, McCullough et al. (2006), suggests that impairments identified were connected to the linguistic constraint characteristics of each aphasia subtype. Gerson et al. (1977) (as cited by Pallickal & Hema, 2020) reported that in schizophrenia and WA one could discover the presence of indefinite responses and confusion resulting in misdiagnosis.

Clarifying key concepts and identifying key characteristics and concepts: According to Adams et al. (2005) approaches to pragmatics define the construct as, "...behavior that encompasses social, emotional, and communicative aspects of social language" (p.568). Pragmatics in schizophrenia can be presented in non-verbal and verbal language. In individuals with WA, content is impaired and demonstrated by the seemingly having two separate

conversations. In some instances, individuals with WA have demonstrated gestural coherence in the form of affirmational head nods, smiling, and other forms of body language; however, the conversation with the communication partner is incoherent speech. Commonly seen in schizophrenia and WA is the inability to follow a set of expressive language rules. Grice's Maxims provide a meaningful paradigm for pragmatic intent, as predictable patterns of breakdowns are manifested in both disorders.

Identifying and analyzing knowledge gap: Gaps in the literature related to pragmatic function are shown through an examination of Grice's Maxims. There is an overlap in commonalities with Grice's Maxims; however, there is an absence of differential qualifiers in determining what separates pragmatic features in schizophrenia and WA. Little et al. (2019) conducted a study determining the connection seen in abnormalities and extensive cognitive deficit in thought disorders by investigating language and cognition in both schizophrenia and aphasia. Little et al. (2019), conducted standardized test in a clinical population and a non-clinical population, and comparing the three populations (schizophrenia, WA, and control group). The study concluded that both the group with schizophrenia and the group with aphasia showed linguistic deficits.

Discourse Results

Identifying the types of evidence available and examining how research was conducted: In discourse in schizophrenia, Barch and Berenbaum (1997) found deficits in tangentiality, derailment, and non-sequiturs. Two separate stories were provided and answered multiple questions following each story. Alonso-Sanchez (2022) describes discourse as involving multiple levels of cognitive functioning. Evidence was measured by collecting speech samples of untreated, first episode participants with schizophrenia and healthy controls. Follow up language

samples were collected six months post first episode. Andreason and Grove (1986) discusses “poverty of content” (i.e., lack of information). Ninety-four “normal” volunteers and one-hundred psychiatric patients (twenty-five with schizoaffective disorder, twenty-five with schizophrenic disorder. Lesh et al. (2011) report stipulations of context-relevant information provided by those with schizophrenia due to prefrontal cognitive control. MacDonald et al. (2005) conducted an assessment study during event-related fMRI which yielded results indicating that schizophrenia participants had a particular impairment in context processing. The study from Lesh et al. (2011) composed a model outlining evidence from multiple modalities (e.g., structural and functional neuroimaging) and collecting samples from clinical high risk, genetic high risk, first episode and chronic participants.

In discourse in WA, Pallickal and Hema (2020) reports impaired topic coherence, clear content, and direction, which result in neologistic jargon. The study consisted of five participants with WA post CVA and five neurotypical bilingual participants (age-matched sample). A narrative discourse sample, utilizing a video recording, and transcribed using the International Phonetic Alphabet (IPA). Quantitative and qualitative discourse analysis methods were utilized to examine linguistic functions. Gleason et al. (1980) reported disorganized discourse and irrelevant information are some of the main challenges presented with individuals with WA. A picture story test was utilized to elicit narrative speech. This was administered to five patients with participants with Broca’s Aphasia, WA, and healthy controls. Nicholas et al. (1985) conducted a study with participants with Alzheimer’s Disease, Anomic Aphasia, Wernicke’s Aphasia, and healthy controls. In the study, a picture description task was administered. The purpose was to test if there could be an identification process made based on discourse elicitation

tasks. Nicholas et al. (1985) characterized expressive language with neologisms, phonemic and semantic paraphasias, the abundant use of deictic terms, and unspecified words.

Identifying key characteristics and concepts: Alonso-Sanchez (2022) states, “Language disorganization is a prominent feature in psychosis and is commonly observed initially as a disorder in generating interpersonal discourse” (para. 2). Tagments et al. (2013) reports the abundance of studies completed, which demonstrate language abnormalities in single word process; however, there are few studies completed which examine speech in schizophrenia at the discourse level; partially due to challenges in quantifying content of discourse. MacDonald et al. (2005) study of cognitive function (which included participants with schizophrenia, nonschizophrenia psychosis, and healthy) concluded that participants with only schizophrenia demonstrated to have prefrontal dysfunctions related to context processing; effects context relevance when communicating.

The study of discourse is a vital element of aphasia assessment because it can bring forth perception into salient communication abilities (Hazamy & Obermeyer, 2019). Although research has been done, “there is a lack of literature has been a lack of literature documenting qualitative and quantitative analysis of discourse in WA” (Pallickal & Hema, 2020, p. 8). In the study conducted by Pallickal and Hema (2020) it was determined that the WA group had the lowest mean scores and performed significantly lower on all measures of discourse structure. Examples of the structures used in the study were “discourse forethought” and “organizational planning.” The conclusion for participants with WA demonstrated that discourse was confusing logically and the general plan and theme of the topic. Additionally, the study’s results determined that WA participants qualitative score, in discourse analysis was significantly lower than neurotypical participants; however, the quantitative scores were similar between WA and

neurotypical participants; meaning both groups obtained similar parameters in number of clauses and number of words per clause. Similarly, Gleason et al. (1980) conducted a narrative picture story test. The results of the study determined that participants with WA did not differ from healthy controls in total output; however, the proportion of significant target lexemes was four times greater in participants with WA than healthy controls.

Clarifying key concepts and identifying and analyzing knowledge gap: Tangentiality or flight of ideas is a common characteristic of individuals with schizophrenia and WA, which impedes the individuals' ability to maintain a conversation or maintain the integrity of the conversation. In schizophrenia, tangentiality can be classified as a response pattern which increasingly deviates from the topic (Pauselli, 2018). Barch and Berenbaum (1997) reported a characteristic of discourse in schizophrenia is the negative thought disorder as reduced verbosity. In WA, individuals demonstrate abnormalities or impoverished vocabulary, word finding difficulties, circumlocutions, empty language, and impaired coherence (Chapman et al., 1998). WA can talk excessively; however, the content provided lacks insight.

The American Psychology Association (APA, n.d.) reports that circumlocution can be characterized as difficulty or inability to find the appropriate word or phrase to identify or explain a specific topic. Circumlocutions can be found in schizophrenia and WA. Circumlocutions can be manifested due to brain damage in the temporal lobe of the brain, which in certain cases be perceived as disorganized thought process or schizophrenia. Likewise, those with individuals will experience circumlocutions; empty content with incidence of vague words (Encyclopedia Britannica- Wernicke's Aphasia, n.d.). The gaps in discourse pertaining to expressive language manifest similarly to the gaps in semantics. The terminology used is

different; however, the premise is the same. Due to this, there is a gap in differentiating language characteristics when presentation of discourse is so similar.

Table 2

References Selected for Inclusion Describing Semantics, Pragmatics and Discourse in Schizophrenia and Wernicke's Aphasia

DISORDER	Semantics	Pragmatics	Discourse
<p style="text-align: center;">SCHIZOPHRENIA</p>	<ul style="list-style-type: none"> • Wang et al (2011): Meta-analysis- demonstrates processing deficits in schizophrenia. • Wiginton (2022): Commentary- identifying alogia/ poverty of speech in mental illness. • Ragin et al (1989): Meta-analysis- prominence of negative symptoms. Such as poverty of speech in schizophrenia. • Craik & Tulving (1975): Meta- Analysis- impact of semantics deficits in those with schizophrenia. • Baving et al. (2001): Meta Analysis- the use of semantic positive priming. • Halpern et al. (1985): Meta- Analysis- examined the use of semantic word association using auditory and visual modalities. 	<ul style="list-style-type: none"> • Agostoni et al (2021): Meta- Analysis- establishing the role of communicative- pragmatic abilities and function. • Grice’s Maxims (1975) as cited in Convington et al (2005): Systematic Review- surveying, in schizophrenia, the various domains or language and how though disorder appears. • Wrobel (1989, p. 118): Book- discusses the lack of pragmatic abilities in schizophrenia; inability to adapt to various forms of speech and lack communication competence. • As cited in Kraepelin (1919), Bleuler, (1911): Book- obscure associations caused by remote commonalities in ideas or sounds due to indirect associations. 	<ul style="list-style-type: none"> • Hella et al (2013): Meta- Analysis- examined the meanings of disorganized discourse with patients with though-disordered schizophrenia. • Barch & Berenbaum (1997): Meta- Analysis- testing the underlying language disturbances in schizophrenia and the effects of language manipulation on negative thought disorder and discourse coherence. • Alonso-Sanchez et al. (2022): Meta- Analysis- collect samples of descriptive discourse experiencing the first “episode.” • Rosenstein et al. (2015): Meta- Analysis- analyzed language use by

	<ul style="list-style-type: none"> •Goldfarb et al. (1994): Meta-Analysis- a technique used to measure convergent and divergent semantic behavior; comparing schizophrenia and various aphasias. • Hazlett et al. (2000): Meta-Analysis- reports verbal learning and memory deficits are the most severe cognitive deficits in schizophrenia. • Morgan et al. (2006): Meta- Analysis- the utilization of semantic priming in schizophrenia. 		<p>deriving set features; utilized an automated approach to modeling open-ended discourse which demonstrated enormous promise.</p> <ul style="list-style-type: none"> • Liddle et al. (2002): Meta-Analysis assessing interrater liability utilizing Thought and Language Index (TLI) to determine aberrations detectable in the speech of those with schizophrenia and healthy subjects. • Hazamy & Obermeyer (2019): Meta Analysis- examined fluent and non-fluent aphasia’s differences in utterance-level discourse measures. • Leaman & Edmonds (2021): Meta-Analysis- linguistic measures during unstructured conversation (global coherence).
	<ul style="list-style-type: none"> •Thompson et al. (2015): Meta-Analysis- poor repetition and fluent speech containing jargon. •Luria (1970): Book review- semantic behaviors presenting as the inability 	<ul style="list-style-type: none"> • Holland (1982): Meta-Analysis- analyzed communication patterns presented comparing BA to WA; BA demonstrated more “normal” patterns of communication than WA. 	<ul style="list-style-type: none"> • Pallickal & Hema (2020 p.2): Meta-Analysis- conducted a narrative discourse sample on individuals with WA and healthy subjects. • Rohrer et al (2009): Systematic Review-

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integrate relationships between concepts.

- Campanella and Shallice (2011): Meta-Analysis- studied the facilitation from repetition and interference due to overactivation of competing concepts.
- Goldfarb and Halpern (1981): Meta-Analysis- examined semantic word association. Those with aphasia produced more paradigmatic responses.

- Wulfeck et al (1989): Meta-Analysis- examines the phenomenon of language patterns; results indicated pragmatic deficits in WA in retrieving content words or closed-class grammatical elements.
- Bates et al (1983): Meta- Analysis- examine the ability for aphasic patients to shape utterances in terms of topicalization and focusing on information.
- McCullough et al (2006): Meta- Analysis- studied the linear regression defining pragmatic performance and functional communication.
- Acharya & Wroten (2022): Systematic Review- reported the lack of insight into deficits; including interactions with a communication partner (anosognosia)
- Prutting and Kirchner (1987): Meta- Analysis- developed the Pragmatic Protocol to assess aspects of language and conversational speech.

ideology of neologistic jargon in aphasia; defined as a production of language use of non-existent words or true neologisms.

- Gleason et al (1980): Meta- Analysis- utilizing a picture story to elicit narrative speech
- Nicholas et al (1985): Meta- Analysis- utilized empty speech during picture description task; naming deficits, as measured by confrontation naming tasks.

Chapter 5. Discussion

After taking a deep dive into the literature, research has demonstrated the overlap in expressive language features noted in schizophrenia and Wernicke's aphasia that are variously described as neologisms, paraphasias, Grice's Maxims, and tangentiality/flight of ideas. By analyzing the literature, there seems to be a vivid gap in what characteristics contribute to the comparison of expressive language characteristics in schizophrenia and WA. To make a valid determination of what the true gap in the expressive language deficits, scaffolding search terms from top to bottom was required. The most prominently disordered language features in schizophrenia and WA are throughout the domains of semantics, pragmatics, and discourse. In schizophrenia and WA expressive language Ray and Ram (2012) state, "A more recent formulation of the psychological disintegration is the idea that some experimental symptoms of schizophrenia can be explained by a failure to integrate the intention to act with the perceptual registration of the consequences of the action" (p. 327).

The compiled literature on expressive language in schizophrenia and WA contained indirect plausibility to the aspect of content versus intent. This means, the message from the speaker contains accurate or appropriate information and the message conveyed to the listener is intended or the intentions behind the message. Content can be defined as the amount of specified information and provide subject matter contained. Intent can be defined as the reasoning behind why the act is done; having the mind, attention, or will concentrated on something or some end or purpose. Content in schizophrenia and WA seem to be parallel to one another and both disorders display similar aspects of the content of communication. Intent or the intention to communicate within both disorders is a more perpendicular to each other.

When an individual has schizophrenia or WA, the function of conversation is impaired according to Grice's Maxims. Philosopher Paul Grice (1975) defined his Maxims as a pragmatic

conversational measure. Grice's maxims contain four subsystems: quality, quantity, relation, and manner. Measuring quality is providing truthful information with supported evidence to the conversation or to the conversational partner. It is important to know that quality of conversation does not mean the individual is intentionally being dishonest; however, this means the information they provide is not accurate. Measuring quantity in conversation is being as informative as possible, providing the appropriate amount of information necessary for the conversation to make sense; and not providing excess/unnecessary information. Deficits in quantity can be presented as the individual providing too much information or not enough information. Measuring relation or is providing relevant information pertinent to the conversation. Deficits in relation would present as an individual providing information that does not have anything to do with the current conversation or not staying on topic throughout the conversation. Lastly, measuring manners are clear, avoiding ambiguity and obscurity, brief, and orderly.

In Grice's Maxims, quality, quantity, relation, and manner are all forms of content of communication. Based on the literature, the quality can be a substantial impairment in schizophrenia and WA. Due to the impairments in both disorders, individuals with schizophrenia and WA may not be reliable historians or present appropriate contributions to the conversation. Quantity is demonstrated in separate ways between the two disorders; however, it is still affected. In schizophrenia, quantity can present as either providing too much information or a lack of information, also known as poverty of speech or alogia. In WA, quantity can be presented in the form of providing a lot of information. For both disorders, one of the hallmark features of Grice's Maxims is 'relation' or 'relevance.' In both disorders, it has been discussed how individuals are fluent in speech however, display either drifts in topic maintenance or

complete unawareness of the topic. Finally, there is the manner in which the message is presented. Manner specifically focuses on being unambiguous in relaying a message. In both disorders, the manner or ambiguity can be a factor that coincides with relation/relevance. The issue with content in both schizophrenia and WA is neither party is aware of the fact the message being relayed does not pertain to the conversation, does not make much sense, and has confused the conversational partner.

Think of intent as the urge or desire to communicate with a conversational partner. In schizophrenia, there specific desire to communicate or to not communicate with others. Schizophrenia falls on a spectrum and there are possibilities of co-morbidities. Therefore, there are individuals with schizophrenia who seek communication with others and there are others who have no intent to communicate (poverty of speech). With WA, individuals have the intent to communicate. Many individuals with WA seek out a communication partner. A similarity of intentions between the two disorders is anosognosia. Anosognosia simply means not being aware of one's deficits. As previously stated, some individuals with schizophrenia are eager to communicate while others are not. For the individuals with schizophrenia who have intentions to communicate and for most individuals with WA, a communication breakdown between speaker and listener is displayed. While the individual with either disorder is aware of the attempted message, the conversational partner will experience what is known as a communication breakdown.

Where is the gap? Characteristics of expressive language are similar in schizophrenia and WA and in the literature, these terms are described in the same way but given different labels, because the disciplines involved in treating the respective disorders have evolved separately. In language, Speech-Language Pathologists (SLP) engage in a series of testing, reviewing medical

charts and documents, viewing brain scans, observing, and collecting family history, to provide the appropriate diagnosis, in this case, Wernicke's Aphasia. For individuals with Schizophrenia, the diagnostic process involves observation and history, but is primarily a rule-out approach based on the DSM-V criteria. This is another example of a gap in diagnostic criteria.

Mental illness is not typically categorized with deficits of language and WA is not always categorized with psychological deficits. Neurology and psychiatry in Germany, during the late nineteenth century and early twentieth centuries, connected language disorders in both schizophrenia and aphasia (Geschwind, 1967). According to Breslau school, *schizophasia* was identified as a form of schizophrenia distinguished mainly by disorganized language (Goldfarb et al., 1994). Schizophasia was a label used to express the combination or comparison of language in schizophrenia and aphasia. Goldfarb et al. (1994) reports semantic conduct in schizophrenia can mirror aphasia; however, some researchers contemplate language in schizophrenia to be a subtype of aphasia. At the completion of the study, Goldfarb et al. (1994) concluded the subjects produced parallel responses. The given name provides a surface level description of what this disorder would be classified as; however, it does raise further questions. There are multiple variations of aphasia, and each form of aphasia produces various impairments. Which aphasia is schizophasia referring to? Could it be a new variant of aphasia? It would be beneficial for further examination in the possibility of schizophasia being a possible diagnosis.

What research has shown is both disorders display areas in language deficits and psychological deficits. When providing treatment to both disorders, an interdisciplinary approach must be taken. An interdisciplinary approach looks at the individual, with holistic lenses, assesses co-morbidities, and utilizes various healthcare professionals to provide the appropriate treatment for the individual. This would include comprehensive care, and interdisciplinary

approaches with psychologists and speech pathologists. Anything involving language deficits should always be addressed by a speech-language pathologist. A speech-language pathologist can contribute to the differential diagnosis process between schizophrenia and WA by utilizing the various assessments typically used to determine type and severity of aphasia. The aphasia assessments can be administered on both individuals with suspected aphasia and individuals with suspected schizophrenia.

A typical health professional team for a patient with schizophrenia consists of a psychologist, social worker, psychiatric nurse, and a case manager. A typical health professional team for a patient with WA consists of primary care physician, occupational therapist, physical therapist, speech-language pathologist, social worker, and psychologist. Because schizophrenia is classified as a mental disorder, the focus of treatment, from a language perspective, aids in verbal learning abilities, and decreases disorganized thoughts. Generally, in schizophrenia, language is not the primary diagnosis nor the primary concern; therefore, in the US the speech-language pathologist is rarely seen on the team for those with schizophrenia.

Limitations

This study did not come without its share of limitations. The overt limitations throughout the study were examining only three domains of language and accessing existing bodies of literature from older dates. Although semantics, pragmatics, and discourse were the domains of language, which provided the most literature motivating this study, there are additional domains of language which were not mentioned. Due to this, it was imperative to obtain literature focusing on the three targeted domains. Semantics, pragmatics, and discourse are the domains of language which are hallmarks in schizophrenia and WA; therefore, all literature had to be concentrated in those domains. The intent of this study was to compare the expressive language

characteristics of both disorders throughout the three domains. Phonology, morphology, and syntax were seen numerous times throughout the literature for both disorders; however, it was not pertaining to the diagnostic characteristics for expressive language in either disorder.

When researching and reading through the existing literature, it became evident that an abundant amount of the literature came from older dates. Granted there are research articles and journals which are not as old; however, the vast majority of the literature was found in the 1900s; at least over twenty-three years old. The research and sources provided were helpful in compiling the information needed to complete this study, it demonstrates the lack of research that has been done recently. Due to the lack of current information, it is difficult to know if the existing literature is truly up to date with current scientific findings. This can mean there are possibly new developments within these disorders, which need to be further investigated. In addition to not having the research and information on current developments, there was also evident time-period biases in the disorders. Many years ago, schizophrenia was looked at with a grave amount of judgement, misunderstandings, and assumptions. In contrast, there was very little research done on WA comparatively speaking. What this means is the older literature can have outdated ideologies based on the time-period in which the disorders were being studied.

Future Directions

Diagnostic investigation using participants is the future direction of this study. Due to this study being a scoping review, there were no subjects tested to provide a direct comparison between the two disorders. If subjects were tested from both populations of disorders, it would provide direct feedback in expressive language deficits. The process of recruiting test subjects is an additional hurdle to cross due to protocols put in place to uphold patient privacy. The Health Insurance Portability and Accountability Act (HIPAA) protects the patient's privacy, security,

and the breach notification rule. The Institutional Review Board (IRB) is a committee which provides oversight and ethical review involving any human subject. IRB requires a protocol, which must be approved prior to interacting with any potential subjects. It is difficult enough to identify subjects in one specific disorder.

Before testing, research participants must be recruited from both disorders. For example, it has been previously mentioned that schizophrenia falls on a spectrum. There are individuals who have schizophrenia and these individuals have gone unnoticed as a member of the disorder, which could be considered to be on the mild end of the schizophrenia spectrum. In contrast, there are those with severe or chronic schizophrenia; these individuals display obvious signs and symptoms of having schizophrenia. The notion of schizophrenia being on a spectrum means the disorder can manifest in a variety of different ways and the cause is undetermined.

Recruitment of participants who are currently diagnosed with schizophrenia or WA, would require consent from the individual or their families. For those with schizophrenia, there are various possibilities for living situations. These individuals can live with family, psychological institution, assisted living, or independently (depending on the severity). If an individual has WA, there is a possibility the individual could live with family or a skilled nursing facility; it is not common for this population to practice independent living. For potential test subjects living in any form of institution or nursing facility, additional processes and protocols are most likely put in place. For patients with schizophrenia and WA, there is the question of being cognitively competent enough to be able to consent. Consent requires metacognition and understanding of the expectations. If the patient is deemed unable to provide the proper consent to participate in the study, consent must be granted from the guardian or power of attorney.

It would be beneficial to take a more overt approach with interdisciplinary involvement. In the United States, speech-language pathologists working with mental illness is not a common practice. There are clear language impairments in schizophrenia and WA. Due to the language impairments, speech-language pathologists should be considered consistent team members for those with schizophrenia.

Due to the number of expressive language commonalities in Schizophrenia and Wernicke's Aphasia, language tests and samples should not only be administered to someone with potential WA but also potential Schizophrenia. Speech-language pathology is the discipline which tests for type of aphasia and severity; therefore, the speech-language pathologist should be a member of the patient's healthcare whether the final diagnosis is schizophrenia or WA.

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