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A NOTE ON THE LANGUAGE COMPONENTS OF APHASIA

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Abstract. This study investigated the specific language deficits observed in persons with aphasia through a theoretical analysis of some of the classic and more recent literature in the field. The study used a systematic search and subsequent analysis of publications related to the topic retrieved from well-known electronic databases: PubMed, PsycINFO and Web of Science. The results suggest a nuanced interaction between language components and speech production in persons with aphasia. The theoretical analysis contributes to the understanding of aphasia by highlighting the sophisticated interplay between language processes and speech in individuals affected by this neurologically based communication disorder. It draws the attention of the speech and language pathologist to the need for evidence-based diagnostic and therapeutic interventions tailored to the language profiles of persons with aphasia.

Keywords: aphasia; linguistic components; language impairment; speech production

Introduction

An introduction to the study of aphasia

Aphasia is a language disorder caused by brain damage, covering a spectrum of language disorders that impair the understanding and production of spoken and written language. It is most commonly associated with damage to the left hemisphere of the brain, particularly in regions associated with language processing, such as Broca‘s area and Wernicke‘s area (Goodglass & Kaplan 1993). From a neurological perspective, pure aphasia is defined as an acquired language impairment resulting from focal brain lesions without concomitant cognitive, motor, or sensory deficits (Brown et al. 2023). This impairment covers all aspects of language, including **phonology**, **morphology**, **syntax**, **semantics** and **pragmatics**, and affects both receptive and expressive language functions. Impaired communication ability as a result of paralysis or impaired coordination of articulatory muscles, cognitive impairments, reduced vision or hearing often accompany aphasic syptoms

(Goodglass & Kaplan 1993; Brown et al. 2023). In particular, clarifying the language abilities of persons with aphasia facilitates the localization of lesion sites and points to possible brain pathology (Brown et al. 2023). In this context, Papathanasiou and Coppens (2011) defined aphasia as a selective language impairment acquired due to focal brain lesions in the language-dominant hemisphere. This disability has a significant impact on a person's communicative and social abilities, as well as on the quality of life of both the affected individual and their relatives and caregivers (World Health Organization 2001; Papathanasiou & Coppens 2011; Papathanasiou & Coppens 2022).

Aphasia manifests differently depending on the location and degree of brain damage, as well as individual variations in cognitive and language abilities. Common language deficits seen in persons with aphasia include impairments in differentiating speech sounds, word retrieval, sentence formulation, and understanding word meanings (Goodglass & Kaplan 1993). The prevalence of aphasia varies depending on factors such as age, etiology, and demographic characteristics of the population. It has been estimated that approximately one-third of first-time stroke survivors develop aphasia, with prevalence rates ranging from 23% to 35% (Flowers et al. 2013).

The impact of aphasia on communication extends beyond language impairment to affect social interactions, emotional well-being, and participation in daily activities (Hilary et al., 2009). In addition, aphasia can affect various aspects of daily life, including work, social relationships, and participation in leisure activities (Worrall et al. 2010). In addition, the inability to communicate effectively can result in lowered self-esteem, loss of independence, and impaired overall quality of life (Worrall et al. 2010).

A thorough understanding of the basic language components is paramount for the accurate diagnosis of, and effective treatment planning for, aphasia. Through comprehensive assessments covering different language domains, clinicians can tailor aphasia interventions to address different language impairments, thereby improving a person's communicative abilities (Beeson & Robey 2006). Furthermore, understanding the neural substrates underlying language processing serves as a cornerstone in the development of neurorehabilitation strategies aimed at promoting neuroplasticity and functional recovery in persons with aphasia (Fridriksson 2010).

Purpose of the study. The main aim of this study is to investigate the specific language components involved in the spoken language deficits of persons with aphasia. By examining these linguistic components, the authors attempt to elucidate the underlying mechanisms leading to impairments in speech production and how this contributes to the speech and language pathologist's ability to derive personalized therapeutic approaches for persons with aphasia.

Methods

Literature review. Through a careful review of the existing literature, an attempt is made to identify successful studies related to the linguistic components of speech

production in persons with aphasia. The aim is to synthesize and evaluate key research and theories that inform the professional community's understanding of language deficits in aphasia. By studying seminal works and contemporary research findings, the authors attempt to recognize the complex relationship between language impairment and speech ability in persons affected by aphasia.

Data collection. Data were extracted from known databases including PubMed, PsycINFO and Web of Science using a combination of key search terms such as "aphasia," "language deficits," "speech production," "phonological impairments," "lexical deficits," "syntactic deficits," "semantic impairments," "morphological deficits," and "pragmatic impairments." These keywords have been carefully selected to cover a wide range of literature that addresses different language components in aphasia. Through systematic searches of these scientific databases, the authors attempt to select an appropriate volume of useful information that covers the diverse language challenges faced by persons with aphasia.

Data analysis. The collected data were subjected to a theoretical analysis aimed at identifying patterns and trends in language deficits manifested in different aphasic profiles. Through the use of qualitative analytical and reflective techniques, commonalities and variations in the phonological, lexical, syntactic, semantic, morphological and pragmatic impairments observed in persons with aphasia are identified.

For the purposes of this study, the Lichtheim-Wernicke (1881, 1885) and Benson (1979) classifications of aphasia were used. They have played an influential role in clinical practice and in the scientific literature in the English-speaking world and in Western Europe. In our analysis, we use this classification framework to categorize the observed language deficits: Broca's aphasia, Wernicke's aphasia, Global aphasia, Transcortical motor aphasia, Transcortical sensory aphasia, Conduction aphasia, Anomic aphasia, Mixed transcortical aphasia (Benson & Ardila 1996).

Results and discussion

Phonological processing deficits characteristic of aphasia

Table 1. Phonological Characteristics of Different Types of Aphasia (Goodglass & Kaplan 1983; Milberg Blumstein, & Dworetzky 1988; Benson & Ardila 1996; Goodglass & Wingfield 1997; Hillis, Tuffiash, & Caramazza 2002; Dronkers et al. 2004; Swanberg et al. 2007; Crosson, Bohsali & Raymer 2018)

Type of Aphasia	Phonological Characteristics
Broca's Aphasia	Impaired articulation, phonemic paraphasias, reduced phonetic accuracy.

Wernicke's Aphasia	Semantic and phonemic paraphasias, neologisms, impaired access to phonological symbols and phonological-semantic linkages.
Conduction Aphasia	Phonemic paraphasias, challenges in maintaining correct serial order of speech sounds.
Transcortical Motor Aphasia	Phonological deficits are not characteristic
Transcortical Sensory Aphasia	Semantic paraphasias, neologisms. However, this deficit is not characteristic.
Global Aphasia	Severe phonemic paraphasias, disrupted speech repetition.
Anomic Aphasia	Random phonemic paraphasias, difficulties in word finding.
Mixed Transcortical Aphasia	Semantic paraphasias, as well as neologisms. However, this deficit is not characteristic.

Phonological processing is an integral part of language comprehension and production, involving the encoding and decoding of speech sounds. Disturbances in this process occur in different aphasias, which lead to different patterns of phonological deficit. Studies have investigated the neural basis of the deficit involving regions such as the left posterior superior temporal gyrus. Persons with aphasia often have difficulty distinguishing similar speech sounds and reproducing phonemes, which affects tasks such as auditory discrimination and repetition. These deficits are closely related to overall language performance in aphasia (Hillis et al. 2002; Dronkers et al. 2004).

Impairments in phonological processing are characteristic of Broca's aphasia, leading to challenges in accurately and fluently articulating speech sounds. The speech of persons with Broca's aphasia is typically characterized as halting and effortful. Speech sounds are misarticulated or otherwise distorted, with deficits in accessing and generating phonological symbols. Articulation difficulties and reduced phonetic accuracy are often accompanied by phonetic distortions and omissions, making speech telegraphed and difficult to understand. Furthermore, impairments in articulatory planning and execution contribute to the emergence of phonemic paraphasias and agrammatic speech patterns in persons with Broca's aphasia (Benson et al. 1996; Goodglass & Kaplan 1983).

In Wernicke's aphasia, phonological deficits are known to manifest as phonemic and semantic paraphasias, as well as neologisms reflecting impaired access to phonological symbols and impaired phonological-semantic connection. Persons with Wernicke's aphasia may exhibit fluent phonemic paraphasias, in which incorrect or nonsensical words substitute for the intended words, such as substituting the nonword "nable" for "table," indicative of difficulties in accurately reproducing speech sounds and phonological symbols (Benson et al. 1996).

Conduction aphasia primarily affects phoneme encoding and retrieval processes, resulting in phonemic paraphasias and difficulty maintaining the correct serial order of speech sounds during repetition tasks. These deficits are characterized by phonemic

paraphasias and articulatory difficulties, including phoneme substitutions or distortions, highlighting challenges in accurately articulating speech sounds (Milberg et al. 1988).

Global aphasia is characterized by phonological deficits leading to severe phonemic paraphasias and impaired repetition of speech sounds. Marked paraphasias, phonemic substitutions, and distortions indicate disturbances in phonological encoding and retrieval, reflecting deficits in articulatory planning and execution (Caplan 2003; Benson & Ardila 1996).

Transcortical motor aphasia is not characterized by phonemic deficits. It is characterized only by severely impaired language encoding with poor but semantically and grammatically correct speech (Crosson 2018; Benson & Ardila 1996). Unlike Wernicke‘s aphasia, transcortical sensory aphasia does not usually have phonemic deficits. Instead, the use of semantically incorrect words (i.e., verbal paraphasias and neologisms) is observed (Swanberg et al. 2007; Benson & Ardila 1996).

Anomic aphasia involves impaired access to lexical-semantic representations, resulting in deviations and occasional phonemic paraphasias (Laine & Martin 2006). While phonological processing remains largely intact, individuals may experience word-finding difficulties or occasional phonemic paraphasias, indicating mild impairments in phonological encoding and retrieval (Goodglass & Wingfield 1997).

In mixed transcortical aphasia, the disorder is entirely at the language level and is expressed in practically absent spontaneous oral and written speech. Speakers with this aphasia produce neologisms and semantic paraphasias in confrontational naming (Swanberg 2007; Benson & Ardila 1996).

Impairments in lexical retrieval in cases of aphasia

Table 2. Lexical Characteristics of Aphasia Types
(Nickels & Howard 1995; Benson & Ardila 1996; Goodglass & Wingfield 1997; Antonucci Beeson, & Rapcsak 2004; Swanberg et al. 2007; Fridriksson et al. 2018)

Aphasia Type	Lexical Characteristics
Broca’s Aphasia	Delayed lexical retrieval, circumlocution, difficulty finding words.
Wernicke’s Aphasia	Semantic paraphasias, difficulty accessing and retrieving words from the mental lexicon.
Conduction Aphasia	Difficulty accessing and retrieving words from the mental lexicon, phonological paraphasias.
Transcortical Motor Aphasia	Delayed accessing and retrieving words from the mental lexicon.
Transcortical Sensory Aphasia	Difficulty accessing and retrieving words from the mental lexicon, semantic paraphasias.

Global Aphasia	Severe anomia, reduced vocabulary, difficulty accessing and retrieving words from the mental lexicon.
Anomic Aphasia	Severe difficulty finding words, anomia.
Mixed Transcortical Aphasia	Difficulty finding words, anomia, semantic paraphasias.

Lexical processing, which is critical to word retrieval and comprehension, is likewise vital to language function. Aphasia often involves various lexical deficits affecting word recognition and retrieval (anomia). Studies of the neural mechanisms of this defect point to damage in areas such as the left inferior frontal gyrus, the angular gyrus, and the temporal lobe (Antonucci 2004; Fridriksson et al. 2007).

Lexical access can be compromised in Broca‘s aphasia, resulting in word-finding difficulties. Persons with Broca‘s aphasia exhibit delayed lexical retrieval and may resort to circumlocution or vague language to compensate for deficits in word retrieval. This can result in speech characterized by pauses and hesitations as the individual tries to find the right words (Benson 1996).

Lexical deficits in Wernicke‘s aphasia include difficulty accessing and retrieving words from the mental lexicon. Persons with Wernicke‘s aphasia may exhibit semantic paraphasias to the extent of jargon aphasia, in which semantically related words incorrectly substitute for necessary words. This suggests impairments in lexical retrieval and semantic processing (Benson 1996).

In conduction aphasia, lexical deficits often involve difficulties with phonological encoding and retrieval. Individuals may exhibit frequent word-finding pauses and phonological paraphasias during speech production (Benson 1996; Swanberg 2007). However, in global aphasia, lexical processing deficits affect word retrieval and recognition. Persons may experience severe anomia, difficulty naming objects and retrieving words from their mental lexicon (Benson 1996; Goodglass 1997).

Lexical deficits in transcortical motor aphasia include difficulty accessing and retrieving words from the mental lexicon, resulting in delays in their response. In confrontational naming, perseveration, fragmentation, or extravagant paraphasia may be observed (Benson 1996). In transcortical sensory aphasia, however, lexical processing deficits affect accessing and retrieving words from one‘s mental lexicon, resulting in anomia, or the inability to name objects. This impairment of lexical retrieval contributes to the fluent but empty speech characteristic of this type of aphasia. Individuals produce defective words or replace them with inappropriate words – verbal paraphasia (Benson 1996; Goodglass 1997).

A distinctive feature of anomic aphasia is a deficit in lexical processing, manifesting as severe word-finding difficulties (anomia). Individuals have difficulty or fail to retrieve specific words from their mental lexicon, resulting in circumlocutions or substitutions during conversation (Nickels & Howard 1994; Goodglass 1997).

Deficits in lexical processing are common in mixed transcortical aphasia, typically

resulting in severe word-finding difficulties and anomia. Sometimes persons with this type of aphasia produce neologisms or semantic paraphasia during confrontational naming (Benson 1996; Goodglass 1997).

Morphological deficits seen in aphasia

Table 3. Morphological Characteristics of Aphasia Types (Goodglass & Berko 1960; Caplan 1987; Feldman 1994; Berndt, Benson & Ardila,1996; Mitchum & Haendiges 1996; Goodglass & Wingfield 1997; Laine & Martin 2006; Faroqi-Shah & Thompson 2007)

Aphasia Type	Morphological Characteristics
Broca's Aphasia	Simplified sentence structures, reduced morphological complexity, limited use of verb inflections and grammatical markers.
Wernicke's Aphasia	Errors in word formation, production of neologisms, inappropriate morphological endings, reflecting disrupted access to lexical and grammatical knowledge.
Conduction Aphasia	Difficulty in accurate reproduction of morphological markers and inflections during oral repetition tasks. Challenges with word formation and grammatical structure.
Transcortical Motor Aphasia	Difficulties with grammatical morphology are not characteristic. Struggles with verb inflections, tense marking, and sentence structure.
Transcortical Sensory Aphasia	Difficulty in accurate production of morphological markers and inflections. Challenges with word formation and grammatical structure.
Global Aphasia	Widespread morphological deficits leading to impoverished morphological structures and limited use of grammatical markers across various word categories.
Anomic Aphasia	Minimal morphological deficits, with occasional errors in word formation or inflection, secondary to primary difficulty in word retrieval.
Mixed Transcortical Aphasia	Severe impairment of morphological markers and errors in word formation, reflecting disturbances in both production and perception of words.

Morphological processing is a fundamental aspect of language comprehension and production, involving the analysis and generation of the internal structure and grammatical features of words. In persons with preserved language abilities, morphological processing enables the recognition of word forms, inflections, and derivatives, facilitating effective communication. However, disruptions in this complex process can occur in different types of aphasia, resulting in different patterns of morphological deficits. Additionally, research has shown that persons with aphasia, particularly those with agrammatic aphasia, may exhibit specific defects with verb inflection errors. These errors can range from omissions

to inaccurate verb tense usage, influenced by semantic and morphological factors (Benson 1996; Faroqi-Shah 2007).

Persons with Broca's aphasia may demonstrate simplified sentence structures and reduced morphological complexity, such as limited use of verb inflections and grammatical markers (Berndt et al. 1997). Morphological deficits in Broca's aphasia can manifest as difficulties with inflectional morphology, such as verb conjugation and noun number. Goodglass and Berko (1960) observed agrammatic speech patterns in persons with Broca's aphasia characterized by simplified grammatical structures and omission of inflectional morphemes. For example, a person with Broca's aphasia might say "I walk dog" instead of "I walked the dogs."

Morphological deficits in Wernicke's aphasia can manifest as errors in word formation, including the production of neologisms and inappropriate morphological endings, reflecting impaired access to lexical and grammatical knowledge. Persons with Wernicke's aphasia exhibit ungrammatical speech patterns characterized by the omission or incorrect use of grammatical morphemes - paragrammatism (Benson 1996).

In conduction aphasia, morphological deficits may include difficulties in accurately reproducing morphological markers and inflections during oral repetition tasks (Feldman 1994; Benson 1996). Conversely, global aphasia results in difficulty understanding and producing morphemes. Individuals, after passing the mutism phase, experience difficulties with word formation, inflectional morphology, and grammatical agreement, resulting in telegraphic or agrammatic speech. Errors in morphology contribute to the impoverished and fragmented speech characteristic of global aphasia (Caplan 1987; Benson & Ardila 1996).

Morphological disorders in transcortical motor aphasia are not characteristic, but when present they can manifest as reduced morphological complexity and limited use of verb conjugations, difficulties with grammatical morphology. Speakers may experience difficulties with verb inflections, tense marking and sentence structure, omission of function words, and morphological markers (Feldman 1994; Benson & Ardila 1996).

In transcortical sensory aphasia, difficulties are primarily found in the recognition and correct use of word forms and structures, leading to challenges in both receptive and expressive language tasks. Persons with this type of aphasia may have difficulty with morphological processing, such as recognizing word roots, prefixes, and suffixes, which are essential for understanding the grammatical structure of words and constructing meaningful sentences. This difficulty in morphological analysis can lead to errors in word identification and sentence formation, contributing to the general language impairment seen in transcortical sensory aphasia (Caplan 1987; Benson 1996).

Morphological deficits in anomic aphasia are minimal because individuals usually maintain the ability to understand and produce morphemes and grammatical structures. Although they may show occasional errors in word formation or inflection, these impairments are secondary to a primary word retrieval difficulty (Goodglass & Wingfield 1997; Laine & Martin 2006).

Mixed transcortical aphasia combines the morphological deficits of motor and sensory transcortical aphasia. Individuals show difficulties in comprehension and production of morphemes to the extent of mutism. Errors in word formation or inflection may occur, but these are often secondary to the primary language impairment (Feldman 1994; Benson 1996).

Syntactic disorders characteristic of persons with aphasia

Table 4. Syntactic Characteristics of Aphasia Types (Goodglass & Berko 1960;Caramazza et al. 1981; Caplan 1987; Benson & Ardila 1996; Friedmann, & Grodzinsky 1997; Laine & Martin 2006)

Aphasia Type	Syntactic Characteristics
Broca's Aphasia	Telegraphic speech with simplified sentence structures, lacking functional words and grammatical markers. Difficulty in comprehension of complex syntactic structures.
Wernicke's Aphasia	Impaired understanding of sentence structure, leading to difficulty in comprehending complex syntactic structures and maintaining syntactic coherence. Production of grammatically incorrect sentences with syntactic distortions.
Conduction Aphasia	Difficulty in accurately repeating syntactically complex sentences
Transcortical Motor Aphasia	Reduced sentence lenght and simplified grammatical structure.
Transcortical Sensory Aphasia	Difficulty in understanding and producing syntactically complex sentences, leading to semantic paraphasia and syntactic simplification.
Global Aphasia	Difficulty in creating grammatically correct sentences and inability to understand complex syntactic structures.
Anomic Aphasia	Generally preserved syntactic processing with minor errors in sentence structure. Occasional word order errors or variable competency at comprehension of spoken language may occur.
Mixed Transcortical Aphasia	Impoverished or absent speech and impaired comprehension, reflecting disturbances in both syntactic planning and comprehension.

The syntactic component of language processing is relevant to both the comprehension and production of speech and involves the rules used in structuring phrases and sentences. Syntax disorders lead to problems forming grammatically correct sentences and conveying meaning through syntax. These deficits manifest as word order errors and fragmented speech. In some forms of aphasia, impairment in understanding complex syntactic structures is also evident (Caplan 1987; Caramazza 1981).

Syntactic deficits in Broca's aphasia often manifest as telegraphic speech (agrammatism) characterized by simplified sentence structures lacking function

words and grammatical markers (Friedmann & Grodzinsky 1997). Broca‘s aphasia is almost always impaired in the comprehension of more complex syntactic structures (Benson 1996).

In Wernicke‘s aphasia, impairments in syntax may include impaired sentence comprehension, resulting in difficulty understanding complex syntactic structures and maintaining syntactic coherence. In spontaneous speech in Wernicke‘s aphasia, function words and grammatical elements are abundant, but they are misused. This is the so-called paragrammatism. (Caramazza 1981; Benson 1996).

Syntactic deficits in conduction aphasia may include difficulties in accurately repeating syntactically complex sentences, indicating impairments in syntactic processing and phonological working memory (Caramazza 1981). Global aphasia, conversely, includes marked syntactic deficits that refer to difficulties in understanding and creating sentence structure. Speakers may show impaired sentence comprehension and produce grammatically incorrect sentences or struggle with complex syntactic constructions (Goodglass & Berko 1960; Benson 1996).

Syntactic impairments in transcortical motor aphasia include maximally shortened phrase length and simplified grammatical construction. True agrammatism, however, is not characteristic of this type of aphasia (Benson 1996). In transcortical sensory aphasia, difficulties in understanding and producing syntactically complex sentences are observed, resulting in paraphasic errors and syntactic simplification (Caramazza 1981; Benson 1996).

Syntactic processing is generally preserved in persons with anomic aphasia, with minor errors in sentence structure. Although some may show word order errors, syntactic deficits are not a prominent feature of this type of aphasia. Verbal comprehension is variable (Benson 1996; Laine 2006). In mixed transcortical aphasia, however, speakers have difficulty constructing and understanding sentences. Speech is poor or absent with echolalia present, and comprehension of received language messages is severely impaired (Caramazza 1981; Benson 1996).

Semantic disorders described in aphasia

Table 5. Semantic Characteristics of Aphasia Types (Benson & Ardila 1996; Goodglass & Wingfield 1997; Nickels 2002; Jefferies & Lambon Ralph 2006; Ardila 2010; Reilly & Martin 2018; Brown et al. 2023)

Aphasia Type	Semantic Characteristics
Broca’s Aphasia	Difficulty in word retrieval and reduced vocabulary leading to limited lexical access and decreased semantic diversity in speech production is not characteristic.
Wernicke’s Aphasia	Impaired understanding and use of meaningful language, characterized by neologisms, paraphasic errors, and verbal jargon.

Conduction Aphasia	Difficulty in precise repetition of semantically complex words and phrases, suggesting disturbances in integrating semantic information across different language modalities.
Transcortical Motor Aphasia	Difficulties in understanding and using meaningful language, including anomia and word-finding difficulties are not characteristic.
Transcortical Sensory Aphasia	Difficulty in understanding and integrating word meanings in discourse context, leading to semantic paraphasias and impaired comprehension of complex language structures.
Global Aphasia	Semantic deficits encompass difficulties in understanding word meanings, phrases, and sentences, with semantic paraphasias and challenges in distinguishing semantically related but contextually inappropriate words.
Anomic Aphasia	Mainly characterized by difficulties in word retrieval without fundamental impairments in understanding word meanings. Individuals may experience hesitations or pauses while searching for the correct word, but their understanding of semantic relationships remains relatively intact.
Mixed Transcortical Aphasia	Word-finding difficulties, producing neologisms and semantic paraphasias. Comprehension of linguistic messages is also profoundly disturbed.

Semantic processing is critical to language comprehension and expression, concerning understanding the meanings of words and their relationships. In aphasia, semantic deficits affect word comprehension and retrieval (Nickels 2002). They interfere with tasks such as naming objects and understanding word meanings (Lambon Ralph & Jefferies 2004).

Semantic deficits in Broca‘s aphasia may include difficulty understanding and using semantically related words. Semantic representations in this type of aphasia are relatively preserved compared to fluent aphasias (Benson 1996). Wernicke‘s aphasia, however, is characterized by impaired word comprehension and anomia, resulting in the production of neologisms and semantic paraphasic errors indicative of impaired semantics (Benson 1996; Jefferies & Lambon Ralph 2006).

The semantic deficit in conduction aphasia may be related to difficulties in accurately repeating semantically complex words and phrases, suggesting impairments in the integration of semantic information across language modalities (Ardila 2010). Conversely, global aphasia involves impairments in understanding the meaning of words, phrases and sentences. Speakers may have difficulty with comprehension tasks, exhibit semantic paraphasias, and experience difficulty discriminating between semantically related but contextually inappropriate words. Semantic impairments contribute to the limited comprehension and expression of meaningful language in persons with global aphasia (Benson 1996; APA Handbook 2023).

Semantic deficits in transcortical motor aphasia are not characteristic. Speakers with this type of aphasia have a problem with verbal initiative (Benson,

1996). However, in transcortical sensory aphasia, difficulties are encountered in understanding and integrating the meanings of words in the context of conversation, resulting in semantic paraphasias and impaired comprehension of complex language structures. This suggests discontinuities in accessing and integrating semantic knowledge during language processing (Benson 1996; Reilly et al. 2018).

Semantic deficits in anomic aphasia are characterized primarily by word-finding difficulties rather than a fundamental impairment in understanding word meanings. Individuals may exhibit hesitation or pauses while searching for the correct word, but their understanding of semantic relationships remains relatively intact (Goodglass & Wingfield 1997).

In mixed transcortical aphasia, the semantic deficit varies according to the extent of damage to language processing areas. Word-finding difficulties may be observed, producing neologisms and semantic paraphasias. Comprehension of linguistic messages is also profoundly impaired (Benson 1996).

Pragmatic deficits characteristic of aphasia

Table 6. Pragmatic Characteristics of Aphasia Types (Swanberg et al. 2007; Mancopes & Schultz 2008; Beeke 2012; Kennedy et al. 2018; Brown et al. 2023)

Aphasia Type	Pragmatic Characteristics
Broca's Aphasia	Individuals may struggle with turn-taking, topic maintenance, and understanding non-literal language such as metaphors and sarcasm, impacting communication effectiveness and social interaction. However, this deficit is not characteristic.
Wernicke's Aphasia	Tangential and inappropriate speech, disrupted conversation coherence, and inability to adjust language based on listener feedback, resulting in ineffective communication.
Conduction Aphasia	May produce paraphasic errors and have difficulty maintaining coherent discourse, leading to disjointed conversations and tangential responses. However, this deficit is not characteristic.
Transcortical Motor Aphasia	May have difficulty in initiating conversation, maintaining topics, and interpreting nonverbal communication signals.
Transcortical Sensory Aphasia	May struggle to initiate or maintain conversations, understand social cues, and convey information coherently. They may exhibit verbose or tangential speech and have trouble grasping non-literal language.
Global Aphasia	Pragmatic deficits include impairments in using language in social context and understanding others' communicative intentions. Individuals may struggle with initiating conversation, maintaining coherent discourse, and appropriately using nonverbal signals.

Anomic Aphasia	Difficulties in initiating and maintaining conversation topics, accurately interpreting conversation consequences, and appropriately adjusting language based on conversation context, leading to pragmatic errors and misinterpretations. Individuals may have hesitations or pauses while conversing and may struggle to maintain coherent discourse.
Mixed Transcortical Aphasia	Challenges include initiating and maintaining conversations, understanding social cues, and conveying information coherently. Issues with turn-taking, topic maintenance, and implied meanings are common.

Pragmatic deficits in aphasia relate to difficulties in using language correctly in social contexts, which affects the effectiveness of communication and social interaction. Persons with aphasia may exhibit impairments in the ability to participate in everyday conversation and social activities, maintain topics, and understand nonliteral language (APA textbook 2023).

Pragmatic deficits in Broca's aphasia are less common than in fluent aphasias and may include difficulty taking turns, maintaining topics, and conveying complex social meanings, leading to breakdowns in communication in a conversational setting. People with Broca's aphasia may have difficulty understanding non-literal language, such as metaphors and sarcasm, which affects communication effectiveness and social interaction (Beeke 2012; Kennedy 2018).

Wernicke's aphasia is characterized by tangential and inappropriate speech, impaired conversational coherence, and an inability to correct language based on feedback from the listener, resulting in ineffective communication. Speakers do not listen to their interlocutor and do not provide their communication partner the opportunity to speak. They often do not stop talking without interruption, often referred to as logorrhea. (Benson 1996; Chatzopoulos Deretzi, Rudolf & Proios 2020).

In conduction aphasia, there is difficulty in using language correctly in social interactions. Speech repetition is significantly impaired due to damage to the arcuate fasciculus, which disrupts conversational flow. Error monitoring is also compromised, leading to involuntary word substitutions (paraphasic errors) and hindering effective communication. Additionally, organizing thoughts and maintaining coherence is challenging, resulting in disjointed conversations and tangential responses (Benson 1996).

Pragmatic deficits in global aphasia arise from extensive damage to multiple language areas in the brain, resulting in severe impairments in the correct use of language in social contexts. They may show limited speech production, often characterized by disfluent and fragmented language. Additionally, their ability to understand and produce grammatically correct sentences can be significantly compromised. Overall, pragmatic deficits in global aphasia have a profound impact on social interactions and communication effectiveness (Benson 1994; Benson 1996; Dronkers 2009).

In transcortical motor aphasia, the ability to use language effectively in a social context is affected. Speakers may experience difficulties in taking up a conversation,

maintaining topics and interpreting non-verbal communication cues (Benson, 1996; Mancopes, 2008). Conversely, pragmatic deficits in transcortical sensory aphasia arise from damage to brain areas involved in language processing, particularly those responsible for integrating sensory information and social context. Persons with this condition may have difficulty using language appropriately in social interactions, starting and maintaining conversations, understanding social cues, and interpreting implied meanings. They may exhibit verbose and tangential speech, which disrupts the effective transmission of information and the maintenance of coherent conversation (Benson 1996; Swanberg 2007).

Mixed transcortical aphasia is characterized by difficulty using language correctly in social contexts. Persons with this condition may show incompetence in initiating and maintaining conversations, understanding social cues, and communicating information coherently. They may have difficulty taking turns, maintaining topic, and understanding implied meanings (Benson 1996; Swanberg 2007).

Integration of findings and final discussion

The study of language components in aphasia provides valuable insight into the different ways in which language impairment manifests itself after neurological damage. Phonological deficits involve challenges in processing speech sounds, morphological deficits lead to difficulties with word structure, and syntactic deficits are related to problems with sentence construction. Semantic deficits involve problems with word meaning and relationships, while pragmatic deficits affect the social use of language.

In different types of aphasia, these language deficits vary in severity and presentation. Broca‘s aphasia typically involves telegraphed speech and grammatical errors, while Wernicke‘s aphasia is characterized by fluent but nonsensical speech and semantic paraphasias. Conductive aphasia presents a challenge in repeating phonologically complex words and syntactically complex sentences.

Understanding these language components is critical to developing targeted interventions to improve communication and improve the quality of life of people with aphasia. By addressing specific deficits in phonology, morphology, syntax, semantics, and pragmatics, clinicians can tailor treatment approaches to meet the unique needs of each individual and facilitate better language rehabilitation outcomes.

Conclusion

In the presented brief survey of language components in aphasia, several key aspects are touched upon. Phonological, morphological, syntactic, semantic and pragmatic deficits represent the main areas in which language impairment due to neurological problems is manifested. Each of these areas has its own specific character and influence on the effectiveness of communication for the affected individuals.

Understanding the language components of aphasia is essential to improve science-based diagnosis, assessment, and speech and language rehabilitation. Knowing

the different aspects of language that may be affected in different types of aphasia allows for more targeted and effective therapeutic approaches. This is of particular importance as affected individuals need individualized interventions that are adapted to their specific needs and communication difficulties.

It is essential for future research to continue the development of science-based methods for the diagnosis and therapy of aphasia. Studying the relationship between different language components and other aspects of cognitive functions can contribute to a better understanding of the mechanisms of language disorders and discover new, modern, including technological tools to support recovery processes.

In conclusion, understanding the language components of aphasia is essential to improve diagnosis, treatment and support for affected individuals. The continued development of knowledge in this important area will continue to play an important role in improving the quality of life of persons with aphasia.

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