



Contrastive Pragmatics
Cross-Disciplinary Journal

Investigating the Effectiveness of Multisensory Stimulation Therapy for Dealing with Communication Difficulties and Social Withdrawal in People with Transcortical Aphasia

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The study aims to delve deeply into the communication challenges faced by individuals with specific language disorders caused by brain damage, such as Transcortical Aphasia. These disorders not only serve as an obstacle to these individuals' social and personal adjustment but also lead to further complications like social isolation due to mispronunciation and feelings of embarrassment. This research posits that the challenges these individuals face are not only their own but extend to those around them who wish to communicate effectively with them.

Employing a hybrid methodology that integrates both qualitative and quantitative analyses, the research scrutinizes the effectiveness of Multisensory Stimulation therapy as a learning method for individuals with language disorders. The study is framed as classroom action research, designed to evaluate the real-world implications of implementing such a therapy in a learning environment. The overarching conclusion of the study suggests that Multisensory Stimulation therapy has a considerable positive impact on improving language abilities and social interactions for people with Transcortical Aphasia. However, the research also underscores the need for further refinement in the implementation strategies, tactics, and learning models based on Multisensory Stimulation therapy. It calls for the adaptation and coordination of these learning methodologies to adhere to principles of effectiveness and efficiency rigorously. By doing so, the study aims to contribute to a more nuanced understanding of language disorders and offer tangible solutions for improving the quality of life for affected individuals and their social circles.

Keywords: *Multisensory Stimulation, Therapy, Communication, Social, Isolation, Efficacy*

I. Introduction

Communication serves as the bedrock of human interaction, a vital necessity in the tapestry of human experience. It is not merely an optional part of our lives but an integral one that enables us to express ourselves, understand others, and participate fully in society. Ideal communication relies

on a seamless interplay among articulators, auditors, and the acoustic media through which sound travels. When any of these elements are compromised—be it the mental processes governing speech or the physical apparatus enabling it—communication can become challenging, frustrating, and at times, virtually impossible (Indriati, 2011, p. 22).

This predicament is especially poignant for individuals suffering from specific language disorders triggered by neurological impairments. These people are no different from the general population in terms of their inherent desire to communicate and be understood. They face not only their internal struggles with language but also the secondary consequences of these impairments, such as social isolation and emotional difficulties.

These specific language disorders can manifest as various types of speech abnormalities, from mispronunciations to more severe language deficits, which inevitably affect the individual's personal and social life. These obstacles extend beyond the individual to their social circles, as the inability to communicate effectively often leads to feelings of embarrassment and social withdrawal. Over time, this can culminate in the individual becoming increasingly isolated, reticent to engage in conversations, reluctant to ask questions, or even participate in simple social interactions.

It's a problem that extends far beyond mere inconvenience, complicating the lives of those who suffer from it and demanding an effective treatment approach. One of the strategies that has shown promise in addressing these complex issues is Multisensory Stimulation Therapy. This therapy is a specialized approach designed to harness the less commonly understood but crucial sensory systems: the tactile (touch), vestibular (balance), and proprioceptive (body position) systems. While these sensory systems may not be as well-known as sight or hearing, they play a critical role in how individuals interpret and respond to their surroundings (Siregar, 2016, p. 33).

Multisensory Stimulation Therapy has the potential to offer a new avenue for tackling the intricate problems of speech and communication disorders, particularly among those with conditions like transcortical aphasia. By targeting these often-overlooked sensory systems, the therapy aims to create a more comprehensive treatment that could offer hope for improved communication and, by extension, a better quality of life for these individuals and those who interact with them.

This research project aims to delve into the effectiveness of a specialized learning approach centered around Multisensory Stimulation Therapy for patients diagnosed with Transcortical Aphasia. Specifically, the study evaluates the outcomes generated by applying this innovative therapy to improve the language skills of children who are impacted by this neurological disorder. These children, who serve as the primary subjects of this research, often struggle with substantial deficits in their language capabilities, resulting in pronounced difficulties in everyday communication. The barriers they face are not just limited to their immediate families but extend to interactions with

broader society, particularly with those who are not versed in alternative modes of communication such as sign language.

One of the most glaring issues faced by these children is a distinct lack in articulatory proficiency, especially when it comes to the formation of consonants. This often manifests as soft or unclear articulation, which considerably hampers their ability to pronounce words correctly. As a result, not only is their speech compromised, but the overall intelligibility of what they are trying to convey becomes a significant barrier to effective communication.

The study employs a multi-faceted approach to evaluate how Multisensory Stimulation Therapy impacts these language skill deficits. It explores the ways in which the therapy employs tactile, vestibular, and proprioceptive sensory systems to enrich the children's interpretative and responsive interactions with their environment. By focusing on these oft-neglected sensory pathways, the research hopes to unveil how Multisensory Stimulation Therapy can offer a more comprehensive treatment strategy, specifically aimed at improving both the language skills and overall quality of life for children suffering from Transcortical Aphasia.

In summary, this research seeks to provide an in-depth analysis and subsequent evaluation of the effectiveness of Multisensory Stimulation Therapy as a viable learning method for children struggling with severe language deficits due to Transcortical Aphasia. The ultimate goal is to shed light on how this innovative approach can better equip these children to overcome the significant challenges they face in communication and social interaction.

New research is worth undertaking if it touches on at least one of these two traits: urgency and interest (Siregar et al., 2021, p. 51). Indonesian linguists' research in specific language disorder neurolinguistics is limited, especially in education and learning. This field is very strategic and requires a linguist's role in making tests to diagnose particular language disorder sufferers from the point of view of the language. By researching and analyzing grammatically, it is hoped to develop a rule in treating people with Transcortical Aphasia.

This research endeavor is focused on delivering a comprehensive, objective assessment of the consequences of utilizing a pedagogical approach grounded in Multisensory Stimulation Therapy for treating individuals afflicted with Transcortical Aphasia. The motivation for this research direction is of particular importance given that Multisensory Stimulation Therapy represents a novel therapeutic intervention, distinct in its strategic, tactical, and instructional components when compared to more traditional forms of treatment.

By employing a robust evaluation framework, the study aims to offer an impartial and systematic appraisal of the effectiveness of implementing Multisensory Stimulation Therapy techniques. Specifically, it seeks to determine whether the therapeutic adjustments and modifications

embedded in this innovative approach result in a statistically and clinically significant improvement in the language and communication skills of individuals diagnosed with Transcortical Aphasia.

The broader aspiration emanating from this research is to contribute not just a critical evaluation of a new treatment modality but to pave the way for more effective, evidence-based therapies in the future. If the Multisensory approach proves to be effective, this study could be a cornerstone in the advancement of the therapeutic landscape for language disorders precipitated by neural damage.

Ultimately, the study is committed to enhancing the quality of life for people affected by specific language disorders stemming from neurological impairment, as well as improving the communicative interactions between these individuals and their social networks. By doing so, it addresses a critical gap in our understanding and management of such disorders, aiming for more than just clinical improvement but also striving for an elevation in the social and emotional well-being of these individuals and those with whom they interact.

II. Literature Reviews

The human brain is the central hub that significantly influences an individual's linguistic capabilities. Any form of disruption or damage to this crucial organ will invariably lead to impairments in the ability to communicate effectively. As delineated by Johan in his 2018 publication, there are generally four specific types of neurological disorders that can adversely affect different regions of the brain and consequently impede language functions. These are aphasia, agnosia, apraxia, and dysarthria.

The underlying factors that contribute to language disorders can differ markedly from one individual to another. As articulated by Ahmadi in his 2015 research, these causative elements are broadly categorized into two key domains. The first domain encompasses medical factors, such as neurological injuries or genetic predispositions that directly affect the brain's capacity for language processing. The second category involves social and environmental variables, such as lack of exposure to language-rich environments or social settings that may contribute to language delay or impairment.

The brain is not only essential for cognitive and emotional functions but is also exceedingly susceptible to damage. According to Satyanegara's 2013 study, brain injuries often occur due to vascular anomalies, leading to a variety of consequences for bodily functions. For instance, a person might experience right-sided paralysis due to the impairment of muscle control in specific body areas. Such dysfunction results in muscular imbalances, which can then extend to affecting visual perception, memory, and even the digestive system.

Moreover, neurologic deficits may arise when there's a reduction in the blood supply to the brain, resulting in decreased levels of oxygen. Initially, this does not result in the death of brain tissue, but it does disturb the normal functioning of the neural circuitry. However, if the depletion of blood flow persists for an extended period, it can ultimately lead to the irreversible death of neural tissue. Additionally, in conditions like hemorrhagic stroke, the buildup of extra blood in the cranial cavity increases intracranial pressure, further complicating the situation.

In summary, the brain's role in language and overall body function is irreplaceable and highly susceptible to various types of disturbances, be they medical or environmental. Such vulnerabilities underline the importance of early diagnosis and intervention to minimize the negative outcomes on language development and bodily functions.

High pressure in the dome can be fatal. Some of the causes that attack the brain include:

A. stroke

Stroke is usually defined as a disease that makes a person paralyzed. A stroke is an attack on the brain. This condition happens due to a lack of oxygen, and anyone can have a stroke. Usually, many adults have a stroke. However, this can also happen to young people. A stroke is a sudden damage to nerve function due to not smooth blood circulation to the brain. This condition occurs when a blood vessel in the brain becomes blocked or bursts. The brain must get enough oxygen. Otherwise, it will inhibit, and the brain will be deprived of oxygen which causes nerve cell death (Pinzon, 2010, p. 1).

B. Head bump

For someone who accidentally gets into an accident, the part that is most prone to injury is the head. Although the skull protects the brain and the outside of the skull, skin, and hair cover it, possible damages to the head and brain can occur; the injury can be minor or fatal afterward. After a minor injury, there will be marked loss of neurological function and no structural damage. According to Batticaca (2008: 98), when a person has a severe head injury, the brain is bruised, and the affected area bleeds. A seriously injured person is unconscious, has a weak pulse, shortness of breath, pale skin, and blood pressure and temperature below normal.

C. Infection

Infections that can cause a person to experience a specific language disorder are bacterial meningitis caused by infection of the meninges. According to Ginsberg (2005, p. 122), there are three organisms in the epidemic: *Neisseria meningitidis*. The second is *Haemophilus influenzae*, which

often affects children and even adults, and the third is *Streptococcus pneumoniae*, which occurs in the elderly and is associated with alcohol. This infection spreads to the meninges from adjacent structures (ears) or the lungs via the bloodstream.

Brain degeneration occurs due to losing one or more brain components, such as metabolic, toxic, and hereditary diseases. A form of brain atrophy, i.e., generalized brain atrophy, occurs with aging or Alzheimer's disease, viral infections, and poisoning.

D. Tumor

Brain tumor grades are divided into grades one to four. This classification is based on the nature of the tumor, such as the speed of spread. Brain tumors that are benign and non-malignant are ranked one and two, then tumors that can become cancer are ranked third and fourth. According to Satyanegara (2013, p. 263), the first type of tumor is a glioma in the connective tissue between nerve cells and spinal nerve fibers. Second, meningiomas, these tumors are in the membrane that protects the brain and spinal cord. Third, hemangioma, a tumor located in the blood vessels of the brain, this tumor can cause partial paralysis and convulsions, which is very susceptible to aphasia. *Fourth acoustic neuroma* is a tumor located on the auditory nerve that helps control the balance of a person's body. Fifth is the pituitary adenoma, a small gland located in the brain's lower area. This tumor is benign but affects the effects of hormones throughout the body.

Specific language disorder caused by brain damages is a case of damage to the various lobes of the brain that isolates several neural pathways and structures associated with language. The function of this area is preserved, which explains the identity of this specific language disorder symptom.

Specific language disorders that arise due to brain damage manifest a broad spectrum of symptoms, and the range of these symptoms can vary considerably depending on the type of disorder—whether it is sensory, motor, or a mixed form. One defining characteristic common across these different classifications of specific language disorders induced by brain damage is the preservation of the ability to echo or repeat words or phrases that are spoken by others. This distinguishing feature sets these types of language disorders apart from other more well-known variants, such as Broca's aphasia, which primarily affects motor language functions, or Wernicke's aphasia, which impacts sensory language functions. There are also conductive and global or total types of language disorders. Apart from this hallmark ability to repeat verbal cues, the general symptoms associated with specific language disorders caused by brain damage bear resemblance to those observed in other types of language disorders.

On the therapeutic front, Multisensory Stimulation Therapy (MST) is an innovative approach that focuses on enhancing three critical but often underappreciated sensory systems: the tactile (touch), vestibular (balance and spatial orientation), and proprioceptive (sense of body position) systems. According to Siregar's 2016 research, MST serves as a powerful stimulator of these specific senses, aiming to rehabilitate various chemical systems and biological functions within the human body. Although these sensory systems may not be as widely recognized as sight, hearing, or taste, they play an integral role in how children, or individuals more generally, interpret and interact with their environmental surroundings. MST leverages the potential of these sensory channels to provide a more holistic and effective treatment option, enhancing not only language abilities but also the overall quality of life for those grappling with language disorders.

III. Research Method

To achieve research objectives effectively and efficiently, a researcher must carefully select the most suitable methodology, as emphasized by Siregar in 2021. This particular study employs a hybrid approach that seamlessly integrates both qualitative and quantitative research methods. Specifically, the research falls under the umbrella of "classroom action research," a form of investigative inquiry aimed at improving classroom learning practices. This concept is supported by multiple scholars; for instance, Kunandar asserts that the goal of classroom action research is to enhance the quality of educational acquisition within the classroom setting. Similarly, Luthfi Diah AW describes classroom action research as a pedagogical action research carried out in a classroom context, with the primary aim of improving academic achievement and quality.

Further elaborating on the nature of classroom action research, Herawati Susilo et al. define it as a controlled, cyclic, and introspective process led by teachers or aspiring teachers to better their teaching methodology, approach, effectiveness, and overall learning environment. In this study, data collection and analysis are undertaken meticulously through the recording of objective documentation, subsequently subjected to comprehensive analysis tailored to the specific research needs. This technique aligns with the research design propounded by Kemmis and McTaggart, which follows a cyclical model comprising four key phases: Planning, Execution, Observation, and Reflection.

In the context of this study, five patients were carefully observed, recorded, and evaluated as primary subjects or objects of research. The selection process for these participants was conducted randomly and in compliance with the desires of the patients themselves, their families, and the caregiving institutions involved. Additionally, the research adhered to mandatory ethical protocols pertaining to human subjects.

As a critical part of the study's methodology, a learning outcomes test was utilized as the primary measurement tool. This test was custom-designed by the researcher, who considered various reference aspects from preliminary studies. Created to assess the competencies of the research subjects both before and after the implementation of the action plan, the test comprises 20 questions related to the actions undertaken. This rigorous approach ensures that the study not only meets its objectives but also contributes meaningful, actionable insights to the field.

The assessment is based on the achievement indicators in the scoring system as follows:

1. Score 5: if the object can respond to the test clearly and corrects the sound.
2. Score 4: if students can respond to the test through repetition and clear sound.
3. Score 3: if students can respond to the test by subtracting or adding letters and clear sounds.
4. Score 2: if students can answer the test in doubt, their voice is unclear.
5. Score 1 if the student cannot answer the question and his voice is unclear.

IV. Results and Discussions

In this research endeavor, a stratified classification system was implemented to categorize the conditions exhibited by the subjects of the study. While each subject within a given stratum received a similar therapeutic approach grounded in Multisensory Stimulation therapy techniques and strategies, certain procedural steps were occasionally modified—either added or omitted—to enhance the overall efficacy and efficiency of the research.

While it is commonly understood that humans have five primary senses—sight, hearing, touch, taste, and smell—this study emphasizes the critical importance of two additional senses, namely the vestibular sense related to balance and proprioception associated with movement and spatial orientation.

The first sense scrutinized in the study is the tactile sense, a complex system of receptors that allows humans to perceive various forms of touch-based stimuli, such as pressure, temperature, and pain. This intricate network of tactile receptors is spread throughout the body, from the tips of the hairs down to the toes. Disruptions in the tactile sense can lead to perceptual inaccuracies in interpreting touch-based information. These disturbances manifest in three principal ways: hypersensitivity, hyposensitivity, and seeking behaviors. For instance, a child with tactile hypersensitivity might exhibit an aversion to being touched, avoid specific textures in foods, or refuse to wear certain materials, all of which could interfere with their overall developmental progress. Conversely, tactile hyposensitivity poses dangerous risks, such as a child touching a hot surface without sensing the heat, potentially leading to severe burns.

Next, the study focuses on the vestibular sense, an intricate system located within the inner ear that governs balance, spatial orientation, and movement coordination. Disturbances in this sense can be categorized as either hypersensitivity or hyposensitivity. Individuals experiencing hypersensitivity may exhibit an irrational fear of basic movements—such as swinging or being carried—and may avoid elevators or escalators due to their heightened sense of imbalance. Those with hyposensitivity might not perceive the sensation of falling and therefore may not engage in protective behaviors like bracing for impact, potentially resulting in injury.

Lastly, the study delves into the proprioceptive sense, a system crucial for body awareness and spatial orientation. This sense informs an individual about the position of their limbs in space, their own position within their environment, and the force required for particular movements. Effective proprioception is essential for accomplishing intricate motor tasks such as writing, eating, or buttoning a shirt. A disruption in this sensory system might make it challenging for a person to gauge the appropriate muscle force necessary for holding a pencil, for instance. Whether the grip is too tight or too loose, the affected individual may struggle to differentiate between the two.

By exploring these various sensory disturbances, this study aims to understand their implications better and investigate how Multisensory Stimulation therapy can serve as a viable treatment option.

The steps that are observed and used as a reference for data collection are limited to the following stages:

A. Observing

- a. Using the sense of sight to read lips, see writing through picture cards and the teacher's report, and the child can say words from the word/picture cards shown by the teacher.
- b. Optimizing the sense of hearing to hear while optimizing the sense of sight in observing lip movements, then the child says the words he hears from the teacher while seeing the teacher's lips move.
- c. Optimizing the sense of hearing to hear the words spoken by the teacher without reading lips, and the child can say the words he hears without seeing the teacher's lips move.
- d. Say the word according to the teacher's example, and the child can repeat the word exemplified by the teacher.
- e. Optimizing the sense of touch to feel the vibration of the speech organ due to sound, for example, the cheek, neck, and chest area, then the child says the word according to the teacher's example model while feeling the cheek, neck, and chest.

- f. Optimizing tactile to search for words with their fingers, then the child can say the word after tracing the word with their fingers.

B. Asking

- a. Motivate sufferers by asking about learning materials.
- b. Encourage sufferers to respond to answers to their questions.

C. Reasoning

- a. Directs the patient to analyze the words spoken by the interlocutor.
- b. Directs the patient to analyze the articulation of the interlocutor when pronouncing words.

D. Try

- a. Guiding students to carry out exercises according to the existing work stages and reminding students to record the results of the experiment.
- b. Guiding students to focus on practical activities.

This study also collects and evaluates data formulated into the classification of student speech, the research object. The formulation is carried out qualitatively.

A. News Sentence

"Auk jalan, duduk sebelah pohon itu, alah."

"I was walking and sitting near a tree."

The sentence is a news sentence. There is a mission to inform the researcher that the object of the study walked to a tree next to a house and then sat there. As a reference, Kridalaksana (2008, p. 103) explains that news sentences contain news intonation and generally contain the meaning of 'state or give something,' and news sentences end with a period.

The findings of this study are also similar to the results of Dardjowidjojo's (2008, p. 158) study, namely the language of children with specific language disorder is not perfect because specific language disorder is a speech disease in the form of not being able to speak well because of a brain disorder.

B. Interrogative sentence

"Apa ini pulak pulak"?

"What is this"?

The sentence is identified as an interrogative sentence. Because "What is this" uses a question word that indicates a question about the noun, namely "what." An *interrogative sentence* is a sentence that contains a question. This theory is supported by the opinion of Manaf (2009, p. 92), who calls interrogative sentences with interrogative terms, namely sentences that contain the basic meaning of questions.

According to the researcher's assumption, the context of this sentence occurs when the object of research is confused in identifying an object given to him. The thing given to the object is a pain relief patch. It was later discovered that the research object had never seen or used a pain reliever patch before.

C. Imperative sentence

"Hoi sana, ngan ko, sana ngan."

"Huh there, don't you, go there."

This sentence is a command sentence because the sentence produced by the research object contains the above elements. It is a command sentence; the research object orders his younger brother to go in a particular direction.

Command sentences are also called orders, namely sentences containing an order's meaning. This opinion is like the opinion of Manaf (2009: 99), who calls command sentences imperative sentences, namely sentences with the command's primary purpose.

D. Single Sentence

"Capek aku"

"I am tired. "

The sentence is a single sentence because there is only one independent clause. This follows the opinion of Kridalaksana (2008:106), which states that a single sentence consists of one independent clause.

The context of this sentence is when the researcher asks the resource person or the object of research regarding his willingness to continue the research session. The penalty is a verbal response from the thing of research.

Sentence patterns generated by the speakers or research objects can generally say sentences with the S-P, P-S, P-K marks. Research data related to sentence patterns found can be seen in the following description.

A. S-P Pola Pattern

The researchers found sentences with the S-P pattern in sentences produced by people with aphasia, such as "Aku duduk."

The filler element of the subject is a noun. In contrast, the predicate filler element is a verb. The meaning of the sentence uttered by the child in the example above is to inform that he is tired.

B. P-S Pola Pattern

The researchers also found sentences with P-S patterns in sentences produced by people with aphasia, such as "Capek aku."

C. P-K Pola Pattern

The researchers also found sentences with P-K patterns in sentences produced by people with aphasia, such as "Sana ngan."

Observations made by researchers during the learning activities that took place showed essential things as follows:

- a. Objects 2 and 5 looked very enthusiastic about participating in the therapy process. Objects follow the entire learning sequence even though the two subjects fight over the same paper. Subject 2 often took the identification card belonging to subject 5, so the two subjects often joked and made a fuss during the lesson. These two objects often appear impatient and compete to start first when asked to pronounce consonant variables and stick cards before being given instructions by the therapist.
- b. During the learning process, object one was initially confused about following the therapist's instructions, so he was often late when sticking cards and got the last queue when he practiced pronouncing the consonants in words listed on the cards. Object 1 was still confused when following the learning series at the first and second stage meetings. Meanwhile, the objects were enthusiastic about playing puzzles and asking questions at the third and sixth meetings.
- c. Object 5 is the most easily directed in learning. Object 5 also often helps the teacher when other things have difficulty following instructions and improving pronunciation. Object 5 is very enthusiastic about participating in education. Object 5 was able to follow instructions and speak words and string questions, although some errors still occurred. Object 5 also on its initiative to practice pronunciation during the grace period.
- d. All objects experience saturation after meeting the 3rd stage. The enthusiasm for following the new therapy process emerged after revisions and material variations were carried out in the following steps. Modifications and interpretations made in principle only change the figure or place presented in the learning material. At the same time, the classification and orientation of the material were not changed or corrected at all.

- e. All objects are seen to identify the therapist's sincerity and patience. In many cases, therapists who claim to be physically or mentally exhausted do not seem to respond positively to all objects. Although the way of speaking and gestures has been tried to be changed to be more gentle and pleasant, things still react negatively to the interactions made by the therapists.

V. Conclusion

Drawing from the findings and data analysis of the research project, the conclusion articulates a noteworthy positive impact stemming from the utilization of learning methods centered around Multisensory Stimulation therapy. One of the key factors influencing both the treatment process and its ultimate outcomes is the level of enthusiasm exhibited by the student participants. This enthusiasm, however, can be tempered by a potential saturation point in the therapeutic process, making it crucial to continually engage students in a meaningful way.

In this context, the role of the teacher or therapist is absolutely pivotal. Their ability to inject innovation and conceptual depth into the therapy sessions largely dictates the quality and efficacy of the treatment. The teacher's skill in adapting the curriculum and therapeutic exercises according to the students' needs can either uplift or diminish the benefits derived from the Multisensory Stimulation therapy.

Furthermore, the research emphasizes the critical importance of precise calibration in the timing, frequency, and intensity of the therapy sessions. This meticulous adjustment not only optimizes the engagement and participation of the students but also significantly influences the overall effectiveness of the therapeutic intervention.

Given these findings, this study strongly advocates for prioritizing learning methods that rely on Multisensory Stimulation therapy as a frontline strategy in the rehabilitative treatment for individuals diagnosed with Transcortical Aphasia. Nevertheless, the study also stresses the ongoing need for refinement and development in the associated strategies, tactics, and educational models that underpin this type of therapy. There is an imperative to continually adapt and innovate these frameworks in line with the principles of effectiveness and efficiency to ensure that the therapeutic intervention is as impactful as possible.

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