

The pragmatic rehabilitation approach for broca aphasic case based on the P.A.C.E. method (Promoting Aphasia Communication Effectiveness)

إعادة تأهيل براغماتي لحالة حبسة بروكا اعتمادا على طريقة LA PACE

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Abstract:

. The current study aims to identify the effectiveness of pragmatic therapy using the P.A.C.E. approach (Promoting Aphasic's Communicative Effectiveness). in improving verbal and non-verbal communication in a patient with Broca's aphasia. This was achieved by employing a case study methodology and applying the MTA 92 battery, an adapted version of the MT86 protocol (Montreal Toulouse) for the Algerian environment by Nasira Zallal in 1992, to assess language production. Additionally, the gesture tests were used to evaluate non-verbal communication. The study also utilized a pragmatic therapeutic program based on the PACE approach (Promoting Aphasic's Communicative Effectiveness) by Dominique Benichou. The research sample consisted of a case suffering from Broca's aphasia following an ischemic stroke. The results, after applying the therapeutic protocol for 10 sessions, showed qualitative and quantitative improvements in both verbal and non-verbal communication for the patient.

Keywords: broca aphasic, pragmatic, PACE approach

ملخص:

تهدف الدراسة الحالية الى التعرف على فعالية العلاج البراغماتي بالاعتماد على طريقة LA PACE في تحسين التواصل اللفظي وغير اللفظي عند المصاب بحبسة بروكا بالاعتماد على منهج دراسة الحالة وبتطبيق بطارية MTA 92 وهي النسخة المكيفة من بطارية MT86 protocol Montreal thoulouse المكيف على البيئة الجزائرية من طرف نصيرة زلال سنة 1992 لتقييم الانتاج اللغو ؛ بالإضافة الى اختبار الوضعيات tests des gestes لتقييم التواصل غير اللفظي كما تم الاعتماد على برنامج علاجي براغماتي يعتمد على طريقة LA PACE ل Dominique Benichou حيث احتوت عينة البحث على حالة تعاني من حبسة بروكا بعد الإصابة AVC ischémique hemorragique حيث بينت النتائج بعد تطبيق البروتوكول العلاجي ل 10 حصص على تحسن نوعي وكمي في التواصل اللفظي وغير اللفظي للحالة

الكلمات المفتاحية: حبسة بروكا ؛ البراغماتية؛ طريقة LA PACE

Introduction :

Aphasia is the clinical consequence of a disorganization of human language due to a circumscribed brain lesion. It represents a significant psychological and socio-familial tragedy, severely impairing the patient's communication with others, leading to isolation, withdrawal, frustration, and depression. However, significant and encouraging advancements have occurred in recent years in theoretical and clinical understanding of symptoms, brain lesion imaging and recovery, evaluation, and rehabilitation. While language is impaired in aphasia, communication, though essential, is also weakened. Even though individuals with aphasia retain a communicative competence superior to their linguistic abilities, communication requires significant effort for them.

Speech therapy aims to rehabilitate the patient's language, but above all, to restore their means of communication so they can continue expressing themselves. Through our readings, we became particularly interested in the communicative aspect of speech rehabilitation, specifically its non-verbal aspect. We focused on rehabilitations aimed at communication, particularly the Promoting Aphasic's Communicative Effectiveness (P.A.C.E.) approach. More and more speech therapists are interested in this approach, but they do not always have the necessary material to conduct rehabilitation sessions.

Aphasia is an acquired neurolinguistic disorder due to a brain lesion in language areas. "Aphasia is characterized by the appearance, in a subject who has acquired normal language, of disorders affecting the expression and comprehension of language, both written and spoken, provided that these disorders are not the consequence of either global dementia or deficits in the reception (vision, hearing) or emission (phonation) of verbal messages." (Galtier-Boissière, 1970) , referring to the International Classification of Functioning, Disability and Health (ICF), "aphasic symptoms are language and verbal skill impairments that result in limitations in communication activities." (Pradat-Dielh P., 2006) It is essential to differentiate between a primary communication disorder that exists outside of any linguistic impairment and a secondary communication disorder, which is the consequence of linguistic impairments: the communication alterations of an aphasic person stem from a secondary communication disorder. In this sense, a study has shown that "verbal communication disturbances are indeed a consequence of psycholinguistic symptoms, with pragmatic skills generally less affected." (Sollaud, 1993).

Therefore, the objective of this study is to present and make known a pragmatic rehabilitation material, which will be usable for numerous patients and practical to use. Thus, this study will seek to recognize the importance of the

PACE method in the rehabilitation of pragmatics in verbal and non-verbal communication in individuals with aphasia.

1. Broca aphasia definition :

This condition is named after its discoverer, the physician Pierre Paul Broca. It is commonly referred to as Broca's aphasia, also known as expressive aphasia or motor aphasia. It results from brain damage in the frontal region of the cerebral cortex (Broca's area). Symptoms of this aphasia include difficulty producing fluent speech and linguistic disorder known as agrammatism, characterized by shortened expressions lacking functional words such as prepositions, conjunctions, and articles. It may be accompanied by apraxia of speech, which is the loss of the ability to coordinate and sequence sounds to form words. Repetition of speech may also be limited.

Broca's aphasia, also known as expressive aphasia or motor aphasia, is characterized by a reduction in language with difficulties in expressing words, facilitated to some extent through broad oral outlines, and disturbances in writing during comprehension. This condition is also referred to as motor aphasia and expressive aphasia. These names are closely associated with the characteristics exhibited by the patient, who typically suffers from paralysis or weakness in the right half of the body, including the speech organs, especially the tongue, greatly limiting their ability to produce speech. This, in turn, restricts their verbal expression significantly. This type of aphasia results from damage to the third convolution of the frontal lobe in the left hemisphere of the brain. It is named after the scientist Paul Broca, who discovered area 44 in the brain. The inability to coordinate the speech process and difficulty in speaking characterize this condition. However, comprehension remains largely intact, and the person's ability to repeat speech is relatively limited. There are errors in phonological system and fluency, slow speech and writing, and difficulty in imitating sounds due to speech problems.

2 .Pragmatic approach :

Pragmatics comes from the Greek word "pragma" meaning "action". The term was first used by the renowned philosopher Charles Morris and is a branch of linguistics that studies the external structure of language. It is the ability to use language and employ it appropriately in social situations, in addition to utilizing non-verbal aspects such as gestures and facial expressions. Pragmatics focuses on language in discourse context, studying its specific features to confirm its communicative nature, and its function in using language in discourse and the distinctive features that establish its communicative direction within the language structure.

3 . Pragmatic Approach in Aphasia Rehabilitation:

Pragmatic (or ecological) and psychosocial approaches are experiencing significant development. The objective here is no longer to directly reduce aphasic symptoms but to break the isolation of the aphasic individual, help them communicate better with others, and regain their place in the family and society (approach focused on activity limitations and participation restrictions).

The Promoting Aphasia Communication Effectiveness (PACE) approach, developed by Davis and Wilcox, was the first validated technique in this approach. It involves encouraging the patient to communicate through all means: speech, drawing, gestures, onomatopoeia, etc., to exchange information with the therapist about photographs hidden from the patient's view. Role reversal allows the patient to take turns being an information giver and receiver. Depending on the context and stage of evolution, speech therapists also use techniques such as role-playing (shopkeeper and customer), real-life situations, group work, and group conversations.

The introduction of Conversation Analysis (CA) techniques represented a significant therapeutic innovation. CA, conducted on communication corpora recorded on video at the patients' homes, aims to assess the impact of aphasia on natural interactions between the aphasic individual and their usual interlocutors, and how these partners collaborate to ensure the success of the conversation. CA analyzes factors such as the number and duration of speaking turns, management of topics, and types of repairs, i.e., the corrections or additions that each partner makes to clarify the exchange and facilitate understanding (De Partz, 2001). Speech therapists use this information in rehabilitation to help relatives understand the difficulties encountered by the aphasic individual, assist them in better participating in successful conversations, and then train them to spontaneously apply these guidelines. A post-therapeutic CA allows for the evaluation of the effect of these partner-focused interventions and any resulting modifications in the aphasic individual's communication behaviors. It has been shown that this technique significantly improves pragmatic communication effectiveness, even when the linguistic performance of the aphasic individual remains unchanged. Thus, the care derived from CA focuses more on the surroundings than on the aphasic individual themselves and typically aligns with the environmental adaptation perspective of social disadvantage reduction, complementing direct interventions on the primary deficiencies of the aphasic individual.

Deficiencies and incapacities resulting from aphasia may necessitate the use of compensatory techniques to quickly restore communication with the individual's surroundings. In this regard, Communication Binders, customized according to each patient's specific needs and now available on CD-ROM, have proven to be superior to previous functional compensatory tools, which never

experienced significant growth (Charton-Gonzalez et al., 2003). The Communication Binder also serves as a valuable support for pragmatic rehabilitation sessions. Additionally, it's worth mentioning the adaptation to aphasia by Pulver Muller and colleagues of forced-use rehabilitation techniques, where patients engage in short, intensive sessions practicing language acts in which they experience the most difficulty, fitting well within the theoretical framework of pragmatic rehabilitations.

4.The P.A.C.E:

The therapy P.A.C.E. (Promoting Aphasic's Communicative Effectiveness) was developed in the United States by Albyn Davis and Jeanne Wilcox. The procedure's description was published in 1981. P.A.C.E. constitutes a pragmatic approach to communication rehabilitation. It falls under communicative rehabilitation as it aims to replicate interaction situations between the patient and therapist as closely as possible to a natural conversation. The objective of P.A.C.E. is to promote the preserved communicative abilities in aphasic patients and to prioritize the transfer of rehabilitation gains to their daily lives.

Although Davis and Wilcox did not specifically prescribe it for a particular type of aphasia, according to numerous authors (Pradat-Diehl, Mazevet, Marchal, Durand, Tessier, 1997), it is more suitable for non-fluent and global aphasia. However, P.A.C.E. can also be employed to manage jargon in fluent aphasia.

P.A.C.E. does not solely focus on verbal or non-verbal rehabilitation since oral language, when possible, is favored. However, it allows for the solicitation of all communication channels. The patient can thus utilize both verbal and non-verbal means, aiming to maintain effectiveness in daily communication.

Davis and Wilcox (1981) argued that the parameters of natural exchange (gestures, postures, facial expressions, emotional content, tone, volume, intonation, voice rhythm) were not sufficiently utilized in traditional rehabilitation situations. Therefore, P.A.C.E. adheres to four principles that consider the characteristics of a natural conversation:

- 1.1. The exchanged information must be novel.
- 1.2. The method demands equal participation from both the patient and the therapist.
- 1.3. The choice of communication channels is free.
- 1.4. Feedback must remain functional.

The enrichment and development of P.A.C.E. were undertaken by the Brussels team, resulting in P.A.C.E. materials comprising images, photographs, or drawings. Initially proposed by Davis and Wilcox, the P.A.C.E. rehabilitation situation involves unique cards, with the therapist and patient taking turns

describing the content of a card (unknown to each other). When the interlocutor can form a precise representation, the describer can stop.

This rehabilitation situation, which aimed to introduce an ecological notion within speech therapy, was further developed and enriched by the Seron team in 1984. Thanks to the work of (Clerebaut et al,1984) from Xavier Seron's team, P.A.C.E. rehabilitation could take on a more therapeutic, singular, and refined aspect, characterizing it in Europe today. The Belgian team drew inspiration from Davis and Wilcox's approach while addressing various criticisms, offering additional communication situations that adhere to the four parameters of "natural conversation."

- A dictation situation: Both patient and therapist produce a drawing to explain to each other, allowing the latter to reproduce the drawing as faithfully as possible.

- Two situations with unique cards: One situation follows Davis and Wilcox's initial plan (unique cards in "explanation"). Another introduces a new instruction: using unique cards for "guessing." In other words, the interlocutor must guess the content of the card as precisely as possible by asking questions to the card holder.

- Two situations with double cards: Both patient and speech therapist have identical sets of cards (six to ten) hidden behind a wooden partition. In the "explanation" situation, the describer stops when the other finds the same image in their set. In the "guessing" situation, the interlocutor must try to find it by asking questions about the content of the image.

The Belgian team also proposes a three-step P.A.C.E. rehabilitation scheme:

- An initial observation phase during which the speech therapist introduces P.A.C.E. and its principles to the patient. They also assess the patient's preserved communicative abilities.

- A second modeling phase where the speech therapist serves as a model for the patient, encouraging them to utilize communication channels they neglect or, conversely, those they handle effectively to optimize their informativeness. However, a subsequent study demonstrated that the task, material, and severity of aphasia are more determining factors than the verbal modeling of the therapist itself (Glindemann, Willmes, Huber, and Springer, 1991).

- A third phase of actual rehabilitation where the patient chooses how to communicate.

Finally, Clerebaut et al. propose an evaluation grid for P.A.C.E. rehabilitation, which allows for the observation of potential improvement in the patient's communicative competence. Davis and Wilcox had developed a comprehensive evaluation in five points: from one point for a message not transmitted despite the efforts of the patient and therapist to five points for a message transmitted on the first try. Clerebaut et al.'s grid aims to be more thorough. It lists the patient's

expression and comprehension abilities, providing information on the communication channels used and their effectiveness, the number of feedbacks required indicating the patient's informativeness, etc. (Bénichou, 2015, p. 17).

4.Field study :

The current study relied on a single case study approach represented in the following steps and procedures.

4-1 Case Presentation:

Mr. L.K., 86 years old, a university graduate, suffered from an ischemic stroke in December 2016, resulting a right hemiplegia. He was under care until January 2018, presenting with non-fluent aphasia. The MTA92 test revealed a lack of words, dysarthria, and disorders in written comprehension.

To achieve the objectives of our study, we opted for the P.A.C.E. (Promoting Aphasic's Communicative Effectiveness) material by Dominique Benichou to rehabilitate pragmatics in aphasic individuals. After an initial evaluation of verbal communication using the MTA 92 and the ecological subtest to evaluate non-verbal communication, we administered five series of photos over 10 sessions. After reassessment, the results were as follows:

4-2 Initial evaluation :

The ecological subtest of gestures for pragmatic evaluation yielded the following results:

Table 01: "Results of applying the écologique test to évaluer pragmatism "

Ecological test items	Verbal production	Written production	Gesture production
Approaching sign	None	[lalalalala]	Négative finger gesture
Greeting sign	None	None	He repete the same sign
Hand advanced	None	None	None
Reflection	None	None	None
Amazement expression	None	None	None
ingnorance expression	None	[lalalalala]	Index finger gesture from right to left
Pain expression	None	None	None
Disagreement sign	None	None	None
disapproval sign	None	[mamama]	Index finger gesture from right to left

acquiescence sign	None	None	None
Eating expression	Draw a plate	None	None

4-3 The Administration of P.A.C.E.:

After the initial assessment of the pragmatic skills of the case through the application of the ecological test, intervention was provided using the PACE approach for a duration of 10 sessions, with two sessions per week, each session lasting 15 minutes. A set of pictures of Promoting Aphasic's Communicative Effectiveness; from Dominique Binichou's collection was chosen, which belongs to the series of professions, household tools, and rooms in the house.

Table 02: " procedures for applying the therapeutic approach PACE

Séance	Photos series	Images	Communication canal used by therapist	The Correct answers	The wrong answers	Communication canal used by patient
1	professions	1/2/3/4	verbal communication + gestures and facial expressions	0	4	gestures and facial expressions
2	Professions	1/2/3/4	verbal communication + gestures and facial expressions	1	3	Paraverbale communication + gestures and facial expressions
3	Professions	5/6/7/8	verbal communication + drawing and writing	0	4	Paraverbale communication + gestures and facial expressions
4	Professions	5/6/7/8	verbal communication + drawing and writing	2	2	verbal communication
5	Ustensils	1/2/3/4/5/6/7	verbal communication + drawing and facial expressions	2	2	verbal communication
6	Ustensils	1/2/3/4/5/6/7	verbal communication + drawing and writing	2	2	Paraverbale communication+ gestures and facial expressions

7	Ustensils	1/2/ 3/4/ 5/6	verbal communication + drawing and facial expressions	3	1	Communication verbale
8	House parts	1/2/ 3/4/ 5/6	verbal communication + drawing	2	2	Gesture and drawing
9	House parts	1/2/ 3/4/ 5/6	verbal communication + drawing	2	4	Paraverbale communication + gestures and facial expressions
10	House parts	1/2/ 3/4/ 5/6	verbal communication + drawing	3	3	Paraverbale communication + gestures and facial expressions

"After assessment following intervention based on the P.A.C.E method Promoting Aphasic's Communicative Effectiveness, the following results were observed: A clear improvement was noted in verbal expression (consonant repetition) with a percentage of (20%); and in written comprehension with a percentage of (40%) according to the MTA test. Results of the ecological subtest:

4.4 Reassessment of pragmatic in case study

Re-evaluating pragmatic skill in case study by re-applying the environmental test and the same items and image approved in the initial evaluation .

Table 03: "Results of re-applying the écologique test to évaluer pragmatism "

Ecological test items	Verbal production	Written	Ecological test items
Approaching sign	[aaaaaaa]	[lalalala]	He responds negatively with his index
Greeting sign	[iiiiiiiiiiii]	None	He repeat the gesture
Hand advanced	[iiiiiiiiiiii]	None	He gives his hand
réflexion	Mmmmmm	None	None
Amazement expression	Aucune	None	None

ingnorance expression	[mamama]	None	He responds with the finger movement
Pain expression	[aaaaaaaaa]	None	None
	None	None	He responds with the finger movement
Disagreement sign	Ma	None	He responds with the finger movement e
	None	None	None
disapproval sign	None	Dedrawing a plate	None

The gestural subtests indicate a significant improvement in verbal communication (syllable expression) and non-verbal communication (understanding the majority of gestures expressed through facial expressions).

5.Discussion:

According to the results obtained after an orthophonic therapeutic intervention based on the PACE method, a significant improvement in both verbal and non-verbal communication is observed in aphasic individual. This is evidenced by the use of new communication channels such as drawing, facial expressions, writing, and gestures, which were absent before therapy, aiming to make themselves understood by their surroundings. Furthermore, there is noticeable enhancement in consonant repetition, pronunciation, and written comprehension. To promote the use of this method, which has been forgotten and overlooked by our practitioners, a comprehensive language assessment is crucial, addressing the question of how the patient utilizes their language. A complete speech rehabilitation should also be implemented to correct the pragmatic language subsystem.

Pragmatics is the branch of linguistics that studies the communication situation. According to Newhoff (Wirotius, Brauge, 2004), pragmatics refers to the set of rules governing language usage in its context. "pragmatic facts are strictly dependent on context (...) change the context and you will change the interpretation." Therefore, the pragmatist studies discourse, its internal structure, and the communicative effectiveness of the individuals involved. To communicate effectively, an individual relies on their communicative competence, constrained by four principles (Botelle and Bouchet, 1993):

1. Verbal adaptation: The individual must adapt their speech (vocabulary, grammatical form, etc.) according to their interlocutor, the interaction situation, and the objective of the interaction.
2. Use of speech acts: The individual must be able to grasp both direct and indirect speech acts. For example, a request to open the window can be made directly ("open the window") or indirectly ("it's hot in here!").
3. Grice's cooperation rules: According to Grice (1975, cited by Bonneau, Botelle, Bouchet, 1993), two interlocutors must respect the principle of cooperation to ensure the success of their verbal exchange. This principle encompasses four specific and complementary maxims:
 - Maxim of relevance: An utterance must be appropriate to the context.
 - Maxim of sincerity: The speaker must be truthful and authentic.
 - Maxim of quantity: The speaker should provide as much information as necessary but not more.
 - Maxim of manner: The discourse should be clear and easy to follow.
4. Use of non-verbal semiotic elements: The individual uses verbal messages as well as certain non-verbal elements such as proximity (proxemics) to the interlocutor, intonation, rhythm, facial expressions, and gestures, which add meaning to the message content and enhance communication effectiveness (Newhoff, 1997, cited by Mallet-Guy, Wirotius, Brauge, 2004; Fex and Mansson, 1998).

And finally we can say that The pragmatic skills involved in the act of communication are partially preserved in individuals with aphasia, as it is accepted that individuals with aphasia communicate better than they speak (Holland, 1980, cited by Campan, Darrigrand, Mazaux, 2001). In aphasia, communication impairments predominate over writing letters, reading documents, conversing on abstract topics, and using the telephone . Through this study, the importance and role of pragmatic therapy in improving non-verbal communication in individuals with Broca's aphasia become evident. This is achieved through the "LA PACE" technique, which compensates for the lost communicative function and aims to reach a utilitarian purpose that enhances the remaining communicative abilities of the patient by employing what they acquire from rehabilitation in their daily lives.

These approaches take into consideration communication in the patient's daily life situations. However, therapeutic strategies used in this context respect methodological principles for goal setting, defining treatment stages, and measuring effectiveness. Previously revealed alternative strategies for treating severe speech loss (such as sign languages, visual communication [VAT], alternative drawing-based communication, communication notebooks,

functional communication programs like PACE, computerized artificial limbs) are also part of the practical stream. Functional strategies (working on scenarios, family member strategies, and group therapy) are more specific in addressing communication capabilities and interactions

Conclusion:

. Aphasia is the clinical consequence of a disruption in human language due to a circumscribed brain lesion. It represents a severe psychological and sociofamilial drama, which seriously impairs the patient's communication with others, leading to isolation, withdrawal, frustration, and depression. However, significant and encouraging advances have occurred in recent years in the theoretical and clinical understanding of symptoms, brain lesion imaging and recovery, assessment, and rehabilitation. While language is hindered when aphasia occurs, communication, although essential, also appears weakened. Even though individuals with aphasia retain superior communicative competence compared to their linguistic skills communicating requires significant effort for aphasic patients. Speech therapy aims to rehabilitate the patient's language, but above all, it aims to provide them with means of communication so they can continue to express themselves. Through our readings, we became particularly interested in the communicative aspect of speech therapy, especially its non-verbal aspect. Therefore, we focused on communicative rehabilitation interventions, particularly the P.A.C.E. approach (Promoting Aphasic's Communicative Effectiveness). More and more speech therapists are interested in this approach, but they do not always have the necessary material to conduct rehabilitation sessions. The objective of this communication is to present and make known a rehabilitation method that will be usable for many patients and practical to use by presenting two case studies of aphasic patients who underwent a 10-session therapy using the P.A.C.E. method .

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