Anomia rehabilitation viewed from a pragmatic-functional paradigm. A case study

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Abstract

The aim of this paper is to examine the effects of a therapeutic programme based on a pragmatic-functional paradigm. Elements of the therapeutic programme have been selected from the heuristic plan established in this paradigm by taking into consideration the particular profile of the individual case under study: a case of anomic aphasia. The phases of the therapeutic programme, administration criteria and the intensity of the therapy have been illustrated and reasoned for this particular case. Two tests have been selected to assess linguistic abilities, administered before and after the therapeutic intervention. One of them is the well-known BDAE (Boston Diagnostic Aphasia Examination) in its Spanish version (Goodglass & Kaplan, 1998), which enables a conventional, standardised assessment of linguistic skills to be carried out. The other is the *MetAphAs* (Metalanguage in Aphasia Assessment) test (Hernández-Sacristán, Rosell-Clari, Serra-Alegre & Quiles-Climent, 2012; Rosell-Clari & Hernández-Sacristán, 2014), which has been designed to assess natural metalinguistic abilities as representative of the metacognitive dimension of verbal behaviour. After treatment, the patient made progress in all language areas, although retaining mild anomia. The diagnosis changed from motor-mixed aphasia to anomic aphasia according BDAE after 8 months of treatment. The patient also demonstrated meaningful advances in performing different kinds of metalinguistic tasks as measured with the *MetAphAs* test. The patient's own reports and reports from family members confirm recovery of a practically autonomous way of life after treatment.

Key words: Anomia rehabilitation; Aphasia rehabilitation; Conversation-based techniques; Metacognitive abilities; Pragmatic-functional paradigm.

Rehabilitación de la anomia desde una perspectiva pragmática-funcional: un estudio de caso

Resumen

El objetivo de este trabajo es examinar los efectos de una programa terapéutico basado en un paradigma pragmático-funcional. Los elementos del programa terapéutico han sido seleccionados dentro del plan heurístico establecido en este paradigma tomando en consideración el perfil característico del sujeto sometido a estudio: un caso de afasia anómica. Las fases del programa terapéutico, los criterios de administración y la intensidad de la terapia se ilustran y justifican para este caso particular. Se han seleccionado dos tests para evaluar las habilidades lingüísticas, que se han

administrado antes y después de la intervención terapéutica. Uno de ellos es el bien conocido BDAE (Test Boston para el diagnóstico de la afasia) en su versión española (Goodglass & Kaplan, 1998), que permite realizar una evaluación convencional y estandarizada de habilidades lingüísticas. El otro es el test *MetAphAs* (Evaluación del metalenguaje en la afasia) (Hernández-Sacristán, Rosell-Clari, Serra-Alegre & Quiles-Climent, 2012; Rosell-Clari & Hernández-Sacristán, 2014), que ha sido diseñado para evaluar habilidades metalingüísticas naturales representativas de la dimensión metacognitiva de la conducta verbal. Después del tratamiento, la paciente hizo progresos en todas las áreas del lenguaje, aunque con persistencia de una ligera anomia. Después de 8 meses de tratamiento, el diagnóstico se modificó desde una afasia motora mixta a una afasia anómica de acuerdo con los criterios del BDAE. La paciente mostró también avances significativos en la realización de diferentes tipos de tareas metalingüísticas medidas a partir del tests *MetAphAs*. Los autoinformes de la paciente y los informes de familiares confirman la recuperación de un modo de vida prácticamente autónomo después del tratamiento.
Palabras clave: Habilidades metacognitivas; Paradigma pragmático-funcional; Rehabilitación de la afasia; Rehabilitación de la anomia; Técnicas basadas en la conversación.

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Introduction

Aphasia is defined as an acquired language disorder caused by a brain injury which can affect one or more aspects of communication. The aetiology can be highly variable including, but not limited to, diseases such as stroke, brain trauma, brain tumours, anoxic or toxic encephalopathies, and other neurological diseases. Brain injuries causing aphasia generally produce other disturbances (cognitive, motor, social and personal), leading us to consider aphasia as a general cognitive-communicative disorder.

Speech therapists are involved in the assessment, diagnosis and treatment of aphasia in all stages of recovery, and work closely with the person with aphasia and their caregivers. There is no universal treatment that can be applied and shown to be effective for every person with aphasia. Kelly, Brady & Enderby (2010) reviewed the effects of speech and language therapy (SLT) in a sample of 1,840 patients with aphasia taking into account studies carried out during a period of 30 years. Although the results of this review suggest the effectiveness of SLT for people with aphasia, however, there was insufficient evidence to draw conclusions regarding the efficacy of one therapeutic approach over another. Given that there is no conclusive evidence on the efficacy of alternative therapeutic approaches, the rehabilitation has normally

been based on the symptoms, with the aim of improving the specific deficits observed. Let us now pay particular attention to anomia and its treatment.

Anomia is one of the most common symptoms experienced by patients with aphasia. It is the difficulty of retrieving words or reproducing the sounds that they are composed of. Anomia is shown in both oral and written uses of language, as well in programmed tasks such as denomination or description of images, or in the use of colloquial speech. Oral manifestations of anomia are the focus of interest in this paper. Anomia can be extremely disabling and it can hinder speech production in a persistent way (Mather & Raymer, 2004). This difficulty in retrieving words has different degrees of severity, ranging from mild or moderate difficulty in producing the desired words in a conversation to an inability to produce words under any conditions. The severity of anomia depends on the type of aphasia and the severity of brain injury (Fridriksson, Holland, Beeson & Morrow, 2005). Anomia is sometimes associated with dysarthria, apraxia or agnosia transforming it into a very heterogeneous disorder (Cuetos et al., 2010). This heterogeneity can also be due to individual differences (Kiran & Johnson, 2008), which is challenging for the development of experimental designs.

Although there is evidence that non-specifically-oriented speech therapy benefits patients with anomia (Le Dorze & Pitts, 1995), the therapeutic techniques most frequently used to treat a patient suffering from naming difficulties are phonemic and semantic facilitation. Phonological techniques attempt to help the patient access the target word by giving phonological cues. When the patient cannot name a certain image (Mather & Raymer, 2004), the therapist provides a number of signals that can aid in the recovery of the target word, such as the initial phoneme or the initial syllable, the corresponding written word or words that rhyme with it. Some authors demonstrate the effectiveness of phonological facilitation in the rehabilitation of anomia, by observing that after therapy all subjects have experienced an increase in the number of correct answers and need less phonemic aid. Moreover, the phonological technique can have a generalizing effect in that in some cases positive results have been reported in the recovery of words not specifically treated and these results are maintained over time (León-Carrión & Viñals, 1999; Leonard, Rochon & Laird, 2008; Miceli, Amitrano, Capasso & Caramazza, 1996).

Other authors have focused on investigating semantic facilitation (Semantically Based Naming Treatment) (Boyle & Coehlo, 1995; Boyle, 2004; Kiran, 2007; Lowell, Beeson & Holland, 1995). The therapist provides semantic features, which facilitate the access to the conceptual representation of an object, as a way of recovering the corresponding name. Semantic facilitation can be based on working with conceptual similarities or differences, by linking the word with its corresponding drawing, by providing synonyms and antonyms, by using word definitions and semantic categorization of words, and by posing specific semantic questions (i.e.: What is this? Is it a fruit? How is it eaten? What is it like?). Research shows that therapies that improve lexical access by means of semantic features can also improve the ability of naming images (Ansaldo, Marcotte, Vitali & Delgado, 2006; Kiran, 2007).

Some studies combine phonological and semantic facilitation techniques. However, disparate results are obtained with this method: some patients benefit from treatment when employing both techniques, while others improve only when using one of them (Crofts, Nickels, Makin, Taylor & Moses, 2004; Le Dorze & Pitts, 1995; Macoir, Routhier, Simard & Picard, 2012; Raymer, Thompson, Jacobs & Le Grand, 1993).

Other methods used in the rehabilitation of anomia are: the use of the communicative context (McKelvey, Hux, Dietz & Beukelman, 2010; Raymer & Koehn, 2006), the employment of relearning techniques (Salazar et al., 2012), the repetition of words, the use of written language as a support and the facilitation of word retrieval by means of gestures (Raymer et al., 2012). These techniques show that the use of external aids (pictures, gestures, oral or written words, syllables and phonemes), are useful for improving the denomination tasks performed by patients with aphasia, especially if the images and stimuli are individually adapted (McKelvey, Hux, Dietz & Beukelman, 2010). A clear example of this procedure is found in the Personalized Cueing Method (Freed, Celery & Marshall, 2004; Marsall & Freed, 2006). This method is based on mnemonic devices often used by people without brain damage to recall information such as the access code to a bank account or a computer password. A joint effort between the patient and the therapist to create a mnemonic device will help in the denomination of a word. The aim is to develop associative links between the target

word (i.e. coffee) and another word (i.e. Colombia) or phrase (i.e. "I felt very well in Colombia"), photographs or drawings on past experiences (i.e. photos of Colombia; a drawing of a cup of coffee), other associated experiences (i.e. the smell of coffee) and gestures depicting the use of the object in question (i.e. a gesture depicting stirring or drinking the coffee). After the mnemonic device has been created, the patient is trained to remember the target word repeatedly linking the word with this device. The active participation of the patient in the treatment process will help maintain long-term effects (Marsall & Freed, 2006).

Defining a pragmatic-functional paradigm in anomia therapy

Not all perceived objects of our environment deserve denomination, but only those with which we interact frequently and which are therefore relevant to us. The name of an object is created as a support reinforcing or consolidating established connections with our world. The inability to retrieve a name therefore means a partial loss of our capacity to interact with the world, including cooperation with other individuals. This can be considered as the pragmatic dimension of naming. Within this pragmatic dimension naming is therefore a particular manifestation of the way a human individual (with his/her social image and somatic and cognitive involvement) interacts with the world and cooperates with other individuals.

Once a name is at our disposal, it can be used as a basis permitting new connections with other names. In fact, the meaning of a name or of a word in general, can be identified as the web of relationships in which it is involved. As a consequence the mental search for the lost word usually means the exploration of the hypothetical web of relationships in which this word is entangled. It is in fact commonly assumed that the rehabilitation of a particular element of language involves the use of other linguistic elements belonging to its web of connections, e.g.: circumlocutions, as proposed by Francis, Clark & Humphreys (2002). When trying to recover a lost name, providing cues directly referring to that name can sometimes be a frustrating strategy. In some cases, according to Francis, Clark & Humphreys' proposal, stimulating free discursive activity around the object (the name of which has been lost by the impaired speaker), provides a more efficient pathway for recovery. Let us consider this web of

relationships as the functional dimension of naming. A particular act of naming is not an isolated operation, but must be understood in its relationships, firstly, with other acts of naming, but then also with other linguistic abilities, including phonological and syntactic ones. In fact, development of lexical capacities in children cannot be considered independently of the development of phonological and syntactic capacities. This interdependence between linguistic components persists in adult language, and sustains the idea that "language rehabilitates language", that is, the well-known fact that we use language itself as a tool in language restoration.

The pragmatic and functional dimensions of naming are in fact the two sides of the general relational nature of a linguistic system, which manifests itself externally by linking language with the referred world and the language user (pragmatic dimension) and internally linking linguistic units with each other (functional dimension). These two dimensions blend together in the natural contexts of linguistic use. This makes conversation or linguistic tasks based on conversational interaction a suitable instrument for rehabilitation purposes. In this manner pragmatic and functional dimensions of language are exploited in a combined way, therefore enhancing their constitutive and conforming effects on linguistic structures and units (Carter, Connor & Dromerick, 2010; Johnson et al., 2014; Kagan, Black, Duchan, Simmons-Mackie & Square, 2001; Simmons-Mackie, Raymer, Armstrong, Holland & Cherney, 2010; Wilkinson & Wielaert, 2012).

The common practice of conversation particularly stimulates the strategic use of language requiring an interrelationship between language practice and executive functions. Conversation involves a multidimensional cognitive domain surrounding language production and comprehension. Inhibition, attention, working memory, behavioural planning, emotional control are executive functions dialectically interrelated with linguistic activity, which can be particularly observed in conversational practice (Frankel & Penn, 2007; Frankel, Penn & Ormond-Brown, 2007; Penn, Frankel, Watermeyer & Russell, 2010). Following from this, language therapy cannot be (and should not be) disassociated from intervention in the metacognitive domain of executive functioning, a specific aspect of the pragmatic dimension of language. It is crucial for the effective implementation of metacognitive tasks in the

therapy to develop "reflexivity", i.e. the ability of the language user to introduce a mental distance from his/her own linguistic behaviour, and therefore to assign language the status of a differentiated object of perception (Hernández-Sacristán, Rosell-Clari, Serra-Alegre & Quiles-Climent; 2012; Rosell-Clari & Hernández-Sacristán, 2014).

Conversation-based therapies also assign an especially meaningful role to the patient in other ways. The use of language in conversation affects speakers in all their cognitive, personal and somatic dimensions. In natural conversational settings we can include emotional markers associated with language production and comprehension, and non-verbal semiotic means such as phonic and kinesic gesturing accompanying verbal activity. Non-verbal semiotic means, such as gesturing, have also been proposed as complementary instruments in aphasia rehabilitation (Rose, 2006).

Moreover, the inter-subjective nature of language is particularly manifested in conversation. Our linguistic contributions are conditioned by the inferences we usually make about the previous knowledge of our conversational partners, their expectations, or their mental states. In this way, conversational practice always requires theory-of-mind activity. Many therapeutic programmes enhance the role played by key conversational partners (Holland, 1991; Kagan, 1998) and, in a more general sense, the communicative activity of carers in interaction with aphasic individuals.

Transference of rehabilitation achievements to the everyday communicative practice can be considered the ultimate goal of language therapy. Our therapeutic aim is to re-establish, as much as possible, linguistic and communicative capacities linked to premorbid social interactions of the patient, by guaranteeing at least a basic capacity for communicative interaction in everyday life. In our view, only therapies that enhance the general relational components of language to which we are referring here are appropriately designed for effectively transferring the rehabilitation achievements to the common communicative situations of the patients. The relevance of the intensity of the therapeutic work has precisely to do with a coordinated and reinforced activation of the relational components of language.

The perspectives discussed herein and the factors commonly referred to as essential to the efficacy of a language therapy programme can be considered together as defining a pragmatic-functional paradigm. These factors have been individually assessed as therapy tools, but nothing precludes the option of working with them in a cooperative way. All of them enhance relational components of language involved as critical factors in language therapy, but they reinforce their effects when, together, they are put into play in language therapy sessions.

The pragmatic-functional paradigm, so defined, can only provide a general heuristic plan for aphasia rehabilitation, which must be specified in rehabilitation programmes. Obviously, each patient requires individually tailored rehabilitation exercises, adapted to their particular communicative needs, interests and motivations, taking into account their preserved cognitive abilities. The rehabilitation programme provides the context in which patients can make their own decisions regarding what, how and when to communicate. Indeed, the patient takes an active role in determining treatment, which can be modified according to the skills and abilities put into play by the patient when performing the rehabilitation tasks. Exercises are adapted with regard to the degree of difficulty, type of task involved and the specific objective to be achieved, which should always be congruent with the patient's needs and expectations. The therapy process involves the patient in natural communicative situations or situations evoking a natural use of language. Therapy procedures focus on description and analysis of the situation (context), on feelings, intentions and thoughts of the participants in this situation (personal component), and on what these participants are probably saying, how they are saying it, including gesturing and intonation, what their intentions may be, what kind of mistakes they could make and how they would cope with linguistic and communicative impairments.

Aims

The objective of this paper is to describe and assess the effects of a therapeutic programme based on the pragmatic-functional paradigm outlined above. Factors and phases integrating this therapeutic programme have been selected from the heuristic plan provided by the pragmatic-functional paradigm after considering the particular

situation of the individual case under study, a case of anomic aphasia. The individual profile includes not only remaining linguistic and communicative abilities, but also the subject's educational and socio-cultural background. By assuming a case study methodology, the goal of this study is to illustrate a therapeutic procedure and the positive evolution of the patient's linguistic performance as shown in our data. Our focus of interest will be a therapeutic work oriented towards the recovery of lexical items. As previously stated, exploring the web of relationships of a word represents a natural procedure that normal speakers put into play so that they can access that word when circumstantially lost. As we will demonstrate, a systematic implementation of this procedure can be considered relevant for therapeutic aims in a particular case of anomic aphasia.

Method

Case description

The case presented here, CPA, is a woman who was 69 when she suffered a stroke. CPA is a bilingual Spanish-Valencian speaker (with predominant use of Spanish) living in Alzira (Valencia). She lives with her husband (aged 71) and son (aged 27), and has a middle socioeconomic status. She has tertiary level studies and was a secondary school teacher. She had led a normal social life, which was seriously affected after the stroke. CPA was admitted to the Emergency Department of the Ribera Hospital (Alzira, Spain) on May 25, 2013, after suffering hemiparesis of the upper and lower right limbs and speech problems. Brain CAT Scan (25/05/13): Slight decrease in the density of the caudate nucleus, anterior limb of the internal capsule and the anterior part of the lenticular nucleus, left side, corresponding to acute ischemic stroke, with no other findings of interest. Arterial Doppler of the supra-aortic trunks: A low level of punctiform calcified plaques in the carotid artery and bifurcation (left predominance). CAT angiogram of supra-aortic trunks (28/05/13): Area of ischemic stroke in the left striatum nucleus. DIAGNOSIS: Ischemic stroke of the left middle cerebral artery.

Two instruments have been selected for the assessment of linguistic abilities of CPA before (September 2013) and after (May 2014) the administration of the therapeutic program. One of them is the well-known BDAE *(Boston Diagnostic Aphasia*

Examination, Goodglass & Kaplan, 1983) in its Spanish version (Goodglass & Kaplan, 1998), permitting a conventional and standardized assessment of linguistic skills. The other is the *MetAphAs* (*Metalanguage in Aphasia Assessment*) test (Hernández-Sacristán, et al., 2012; Rosell-Clari et al., 2014), a test developed for the assessment of natural metalinguistic abilities in people with aphasia. Natural metalinguistic abilities are understood in this test as representative of a metacognitive dimension of verbal behaviour. The test contains 42 items organized in six sections focussing on the following aspects:

Section I: Inner, inhibited and deferred speech

Section II: Control of concurrent semiotic procedures

Section III: Paraphrastic abilities and associated phenomena

Section IV: Reported speech and associated phenomena

Section V: Monitoring abilities and contextualisation cues

Section VI: Displaced use of language and Theory of Mind (TOM) phenomena

The *MetAphAs* test has been specifically designed for evaluating cognitive dimensions of the pragmatic-functional paradigm, as has been previously presented. Therefore, *MetAphAs* test should presumably be sensitive to a therapeutic programme inspired in this paradigm. In fact, it is expected that *MetAphAs* test should be more sensitive to this therapeutic programme than BDAE, a less specific test with regard to the metacognitive dimension of language.

In September 2013, and according to the BDAE test (Spanish version, 1988), CPA showed motor-mixed aphasia, with abundant anomias and paraphasias, within the context of clear limitations in conversational fluency. She demonstrated good comprehension of simple orders and terms referring to particular objects in naming tasks. Difficulties increased with the comprehension of more abstract words, sentences with a more complex syntactic structure and discourses with higher informative content. In reading and writing similar errors were observed. According to the *MetAphAs* test CPA profile was as follows:

In Section I she demonstrated mild difficulties in performing monological activity, in using verbalisation as a support for non-verbal everyday activities, and in the deferred use of language (both in deferred answer and deferred description). These difficulties of CPA were to some extent due to an impaired lexical access and to limitations in verbal memory and executive function.

In Section II CPA demonstrated some difficulties in the use of discourse markers and gesturing concurrent with verbal activity.

In Section III we found minor difficulties with the definition of terms, and moderate difficulties in naming tasks, with some anomias, paraphasias, circumlocutions and other active attempts at lexical searching.

In Section IV CPA demonstrated minor or moderate difficulties in her capacity for using reported speech.

In Section V we found minor difficulties when using sense stress for emphasis, in the ability to contextualise language use, to perform hetero-corrections and to assess another's words.

In the Section VI we found minor difficulties in the ability to describe situations not present, when recalling remote past events, when anticipating future events, and with emotion reading. CPA also demonstrated moderate difficulties in expressing sarcasm. She was partially aware of her own linguistic mistakes.

The patient CPA started the rehabilitation programme in September 2013. A treatment focussing on the skills under consideration was performed during a period of 8 months (until May, 2014), with 3 one and a half hour sessions per week. The frequency and duration of therapeutic sessions were adjusted to the patient's conditions trying in any case to maximize the effects of treatment intensity. The rehabilitation sessions were always performed on a one-to-one basis: dealing individually with the patient.

Aphasia rehabilitation programme within the pragmatic-functional paradigm: a version adapted to this particular case

All treatment units are conceived for a development in three phases: START, MAIN ACTIVITY and FINAL ACTIVITY. START introduces the activity, a role-playing task and /or

a dialogue referring to an everyday communicative situation. The MAIN ACTIVITY phase, with different possible scenarios, includes specific verbal (and non-verbal) tasks the therapist proposes for putting into play metalinguistic and cognitive abilities involved in the communicative situation under consideration. Active and dialogical response from the patient is crucial. The FINAL ACTIVITY phase is conceived for summarizing and reinforcing previous advances, and for planning homework, if necessary. It is essentially aimed at generalization and the transfer of learning to similar situations. The final activity can be conceived in different ways depending on the patient profile and the specific therapeutic objectives.

The initial rehabilitation objectives with CPA, after a first exploration of her linguistic and communicative abilities, can be summarized as follows:

1. - To improve her inner speech activity and to stimulate her awareness of language by establishing a psychological distance from it (General Objective).

2. - To improve the use of language for directing, referring to or commenting on verbal and non-verbal activities.

3. - To improve the use of gesturing as both a complement of language and an independent communicative tool.

4. - To improve the use of linguistic intonation (imperative, exclamation, emphasis or interrogation), of emotional intonation (demonstrating emotions such as happiness, sadness, anger, fear…) and abilities for imitating the voice or speech of another person.

5. - To improve the deferred use of language, by suggesting or creating a time span for reflection on what to say before answering or for the elaboration of a complex answer.

6. - To reduce lexical difficulties of the patient by practising lexical search techniques. These may include a gesture-object association (pantomime), a semantically oriented search involving questions such as "What is it (the object)?", "What is it used for?", a phonologically oriented search involving questions such as "How do you spell it (the name)?", "What letter or syllable does it start with?", searching on associated personal experiences with the object by means of key questions such as "Remember where, when, how, how much do you used it", and

conversation techniques which require the patient to complete the information, as for example by using suspended syntactic constructions or questions about the name of an object.

7. - To improve the use of indirect language.

8. - To improve the ability to speak about objects not immediately present, and about past or future events.

9. - To improve the ability to communicate and understand emotions. To improve the capacity for empathy (that is to say, putting oneself in another's place) (ToM).

10. - To improve the comprehension and production of figurative (non-literal) language, sarcasm and irony.

All these proposed objectives are interrelated, although our attention focus on objective 6 aimed at reducing the lexical difficulties of CPA, very significant for this individual, in order to exemplify our treatment procedure. In fact, the selection of this particular objective doesn't mean involvement of only one communicative activity, but our proposal puts into play a variety of communicative situations and the associated verbal and non-verbal cognitive abilities. Although some tasks are normally used in other rehabilitation programmes, the originality of our proposal is based on the way these tasks are used to fulfil specific objectives in natural communicative situations.

Table 1. Examples of exercises Start Phase

Example 1: Shopping 1. START ACTIVITY	
Task objective	**Metalinguistic abilities**
- Thinking about habits and routine when shopping. - Attention to what is said and the way it's said. - Establishing psychological distance with their own language. -Improving auditory feedback and self-correction. - Improving lexical access.	- Inner speech activity about previous experiences when shopping. - Deferred use of language. - Monitoring the own linguistic production. - Describing a situation not present.
START ACTIVITY: The patient is asked to think, before answering, about her habits when shopping, about her involvement in this task: whether with the family or not, the frequency, and types of shops visited. Give time for thinking about an answer. Spontaneous responses are accepted (and appreciated). Speech therapist works by taking into account the response of the patient. **CONVERSATION BASED TECHNIQUES.** - *Therapist (T):* Do you go shopping? - *Patient (P) response:* I usually go shopping. We do the main in 'Carrefour' and then I go to the other.	

- *T:* What do you mean by saying 'I go to the other'? But do you shop by yourself? *The therapist poses a question and each time waits for the reply of the patient.*
- P: The main shop I do with my son (*semantic paraphasia:* 'son' * 'husband').
- T: Do you do your main shopping with your son?
- P: No, not with my son, with my husband.
- T: How often?
- P: We go once a week. Through the week I go by myself… to buy meat, and to the butcher's …
- T: Do you go on your own to the butcher's and to …. (pause).
- P: …not to the butcher's (*mistake awareness*), to the … (*correction not achieved, anomia*), … for apples (*circumlocution*).
- T: What do you call the shop where we buy apples? The apples are…?
- P: The apples are fruit, … it's a fruit shop.

In the START phase and for all kind of tasks, before requiring a response, the patient is asked to reflect on the task to be performed, on the communicative activity involved, and on her previous experiences in similar situations. Afterwards we work with the patient on her initial responses by focussing on both form and content of the language used. This permits the patient to establish a psychological distance from her own language transforming it into an object of attention and reflection, which normally results in an improvement of all linguistic processes.

Table 2. Examples of exercises Main Activity Phase

Example 2: Shopping 2. MAIN ACTIVITY	
Task objective	**Metalinguistic abilities**
- Improving lexical access. - Improving traces of lexical memory for the most common fruits. - Remembering terms naming particular objects. - Training patient for different kinds of (mental) search. - Increasing the functional use of communicative gestures. - Increasing the functional use of discourse markers. - Increasing the functional use of circumlocutions. - Breaking the blockade of lexical access by using gestures and self-elicited semantic or phonological cues. - Increasing verbalizations concurrent with (supporting) everyday activities.	-Gesturing concurrent with verbal behaviour. -Use of discourse markers. -Defining terms naming particular objects. -Describing past events. -Describing an object not present. -Circumlocutions. -Verbalizations concurrent with (supporting) everyday activities.
MAIN ACTIVITY. NAMING FRUIT. CONVERSATION BASED TECHNIQUES. - T: Imagine you want to buy some fruit. What kind? - P: I usually buy oranges… (*lexical access blocked*), oranges and … (*turn maintenance and mental searching process*). - T: Only oranges? Surely not? - P: Yes, but I can't get the word. - T: I know you know the names of lots of other fruits. I want you to search your memory and imagine buying some fruit. Can you think what types of fruit there are in a fruit shop? Think about one of them, please. Can you tell me what it's like? - P: It's more or less this size (*she describes it with hand gestures*) and it's red. - T: Very good. How do you eat it? Can you show me? Please, try to mimic the actions and explain	

what you are doing as well.
- P: *The patient goes through a mime showing the preparation of strawberries and says*: "First you wash, then you take off the green, you put sssshhh (*the sound of squirting cream*) and then you eat them.
- T: What does it taste like?
- P: They're very good.
- T: Now let's try to put these things together. Repeat. Let's see. It's a fruit that…, can you follow?
- P: Let's see. It's a green fruit (*semantic paraphasia, anticipation*), no, red (*self-correction*), and we take off the green and they're very good (*the whole phrase is a circumlocution*).
- T: Very good, and it's called …
- P: 0 *She doesn't respond (anomia). If there is no answer, phonological prompts can be given, for example the first syllable.*
- T: It's called straw…(*strawberry*).
- P: STRAWBERRY

In the MAIN ACTIVITY phase we work with more specific situations and cognitive abilities. We work on the patient's abilities to denominate things by involving the patient's previous experience, or imagination. Semantic, phonological and motor skills are used to instruct CPA for directing and developing her own searching processes. We direct the cognitive activity of the patient so that she focuses on her own linguistic production with the aim of attaining self-improvement in lexical access and other potential areas. In the example we can observe how therapist and patient interact to overcome difficulties of lexical access when performing a naming task, either without the support of visual stimuli or with it. This procedure can be applied to any anomic situation with the objective of training the patient to make her own lexical searches, to produce circumlocutions or to seek the help of the interlocutor. In this vein, many other exercises can be proposed for working on lexical difficulties within the MAIN ACTIVITY component of the session.

Table 3. Examples of exercises Final Activity Phase

Example 3: Shopping 3. FINAL ACTIVITY	
Task objective	**Metalinguistic abilities**
–Reflecting on previous work along therapeutic sessions. –Generalization and transfer of learning to similar situations. –Remembering notions and practicing previously used techniques. –Using imagination and previous experience of the patient. –Improving the functional use of communicative gestures. –Improving the functional use of circumlocutions and definitions. –Improving the use of indirect language / irony. –Identifying and expressing emotions.	–Gesturing concurrent with verbal behaviour. –Deferred use of language. –Defining terms naming particular objects. –Describing past events. –Describing an object not present. –Definitions and circumlocutions. –Intonation and phonic gesturing. -Indirect (non-literal) language. -Describing own and other people's feelings and emotions.

FINAL ACTIVITY. CONVERSATION BASED TECHNIQUES.

- T: Today we started by talking about your shopping habits. I suggested that you take a little time before answering. Perhaps in this way communication can be improved. Do you find this method helpful?
- P: Only when I have to talk about complicated things.
- T: Can you give me an example?
- P: When I have to talk about a film.
- T: Very good. Do you think you can also use this strategy in other situations?
- P: Yes, I think so.
- T: We talked about the different fruits you normally buy. Do you remember some of them?
- P: Yes. Oranges, apples, pears, cherries … (*mental block*), that's the problem.
- T: Have you forgotten? What can we do?
- P: Yes. We can imagine a fruit shop and describe what we see.
- T: Very good. Please think about a particular fruit. Tell me what it's like. Show me how you prepare it for eating.
- P: It is big and round, green outside and red inside (*circumlocution*). You can eat it like this (*he imitates cutting it in half, taking a slice and eating it*).
- T: Very good, and it's called …
- P: I can't.
- T: It's called ME…
- P: MELON.
- T: Very good. We can use this technique as an aid to bring back to mind the word you are looking for. Afterwards we focused on identifying and expressing feelings and emotions, by using as well subtleties such a sarcasm or irony. Do you think you can remember what you were going to say to your husband about the expensive fruit?
- P: Yes. I paid a lot, because they are the best.
- T: We also used some irony. Do you remember how you said in an ironic way that the fruit was expensive?
- P: How cheap!
- T: Very good. We also spelled out some words. Can you spell the word 'cherries'?
- P: CHE-RRIES.
- T: Very good. You can use all these techniques at home. I'll give you some homework. Is that alright?
- P: Yes, that'll be good.

As each session of rehabilitation can have different MAIN ACTIVITIES, so it can also have different FINAL ACTIVITIES, depending on the objective we have in mind. In each FINAL ACTIVITY we review what has been learned and worked on during the session, including both procedural and declarative knowledge. In the FINAL ACTIVITY we propose examples taken from everyday life and exercises for practising at home, as seen during the session. This will help the patient in the processes of transference and generalization of learning.

In our case, we suggest to the patient to make, together with her husband, a list of things they want to buy in the fruit shop. When the patient finds difficulty in retrieving lexical units and after using the techniques covered during the rehabilitation session, she could ask her partner "what do you call this fruit which is… (+ circumlocution)?" or "do you remember this fruit that … (+ experiences of the

patient)?" Additional homework for the patient might include constructing sentences with fruits; describing her local fruit shop; comparing her local fruit shop with the fruit section in a big supermarket; relating how to prepare a fruit salad; talking about the fruits grown in her area; trying to remember a recipe for a fruit cake; classifying different fruits according to the flavour, colour, shape, where they come from, etc.

Results

After treatment, CPA made progress in all areas, although retaining mild anomia. In fact, the diagnosis changed from motor-mixed aphasia to anomic aphasia according BDAE after 8 months of treatment. We observed an increase in her functional use of circumlocutions and in her requests for collaboration from the interlocutor. We observed as well an improvement of comprehension, including the ability to understand abstract concepts and complex grammatical structures. The improvement covered both oral and written language. Moreover, CPA demonstrated meaningful advances in performing different kinds of metalinguistic or metacognitive tasks applied to verbal behavior as measured with the *MetAphAs* test. We observed particularly advancement in the ability to understand and use non-verbal communicative procedures concurrent with the verbal means, such as intonation, rhythm, and gesturing. This circumstance can be interpreted as a general improvement of the patient's capacity to functionally exploit experience about her own linguistic behaviour. The active role of the patient within the speech therapy programme seems to be a crucial factor required in achieving therapeutic goals. This active role of the patient can explain particularly the transference of the therapeutic work to everyday communicative practice. Patient's self-reports and reports of family members confirm, in fact, the CPA's recovery of a practical autonomous way of life after treatment. To summarize, the evolution of CPA was very positive when observed from both BDAE and *MetAphAs* test. In both cases, test-retest differences are statistically meaningful ($z = -2.615$, $p = .009$; $z = -3.357$, $p = .001$; respectively).

CPA demonstrated general naming difficulties, affecting different semantic categories and notional domains. This was one of the most relevant characteristics of CPA's profile when treatment was initiated. Therefore, we compared the results of

CPA's answers with the items of BDAE test specifically exploring naming abilities and paraphasias. The test-retest comparison, although not statistically meaningful, revealed an improvement in denomination tasks and a decrease in the number of paraphasias ($z = -1.826$, $p = .068$; $z = -1.069$, $p = .285$; respectively). Some improvements in other sections of BDAE were also observed (conversation and expository speech, auditory comprehension and writing tasks), but test-retest differences were not statistically meaningful.

Table 4. Subtest BDAE Denomination - Paraphasias & *MetAphAs* Sections. Descriptive statistics

BDAE Denomination & *MetAphAs* Sections		Average	Standard Deviation	Min.	Max.
Denomination	2013	23.75	19.15	6	50
	2014	32.25	26.55	15	74
Paraphasias	2013	3.50	3.69	1	9
	2014	0.75	.95	0	2
Section I	2013	3.00	.632	2	4
	2014	3.50	.548	3	4
Section II	2013	3.60	.632	3	4
	2014	3.80	.447	3	4
Section III	2013	2.60	.548	2	3
	2014	3.40	.548	3	4
Section IV	2013	3.00	.816	2	4
	2014	3.75	.500	3	4
Section V	2013	3.50	.527	3	4
	2014	4.00	.000	4	4
Section VI	2013	3.40	.699	2	4
	2014	3.80	.422	3	4

Results obtained by CPA in September 2013 and May 2014 for each of the *MetAphAs* sections were also compared. We observed better average results after treatment, confirming a general improvement in all metalinguistic abilities. However, results are statistically meaningful only for Sections III, V and VI of the *MetAphAs* test ($z = -2.000$, $p = .046$; $z = -2.236$, $p = .025$; $z = -2.000$, $p = .046$; respectively). These sections contain the items specifically worked on by using therapeutic techniques based on the pragmatic-functional paradigm. The *MetAphAs* test is therefore shown to be more sensitive than the BDAE to the improvements attained in both metalinguistic abilities, as previously defined, and specific naming tasks. This difference of sensitivity

can be attributed to the fact that, in contrast with BDAE, items of *MetAphAs* try to 'ecologically' assess language by demanding natural-like or conversational-like activities, including concurrent semiotic means such as gesturing, and cognitive factors surrounding verbal behaviour, such as theory of mind processes and different kinds of monitoring activities.

As derived from a case study, the results of this paper are obviously limited. Our interest was to describe "real therapeutic work" adapted to a patient. The particular tasks involved in therapy are usually locally controlled and therefore difficult to be pre-programmed. Although we cannot be conclusive regarding the benefits of a particular therapeutic programme for a specific patient, the procedures and results of different case studies, when clearly described, are open to meta-analyses. Meta-analyses permit to introduce different comparability criteria, and solve the well-known difficulties (both practical and ethical) for evaluating a therapeutic programme under strict experimental conditions, which require pre-programming activities that cannot be altered along the therapeutic process, depriving controls of therapy, selecting patients with comparable situations, etc.

Conclusions

For a particular patient, there are many variables involved in the recovery of linguistic and communicative abilities, when considering cognitive, social, physical and functional dimensions. Some of these variables refer to the nature of the impairment (size, type and location of the neurological injury responsible for the linguistic and communicative difficulties shown by the patient, type and degree of the aphasic symptoms, etc.), others point to the personal involvement of the patient (emotional and motivational aspects, personality, engagement in the therapeutic process), whereas some other variables refer to the social context of the patient (educational and economic level, social integration, collaboration and support of friends and family) and others, finally, refer to the therapeutic procedures used (post-stroke period before initiation of therapy, number and duration of weekly sessions, type of treatment employed: specific vs. holistic, involvement of key interlocutors, involvement of everyday situations within and after the rehabilitation sessions, etc.).

Assuming the multifactorial and idiosyncratic nature of the recovery process in aphasia, and particularly the difficulty in isolating the effect of spontaneous recovery, the therapeutic work performed on CPA has been associated with an improvement in the results obtained by this patient in BDAE and *MetAphAs*. The results of *MetAphAs* demonstrate a particular sensitivity in terms of functional communication advances. As mentioned, *MetAphAs* has been specifically designed for evaluating different dimensions of the pragmatic-functional paradigm and, particularly, the cognitive factors included in the more comprehensive domains of this paradigm. Our data confirm its sensitivity to the therapeutic work to a greater extent than BDAE, a less specific test regarding the pragmatic and metacognitive dimension of language.

Speech therapy techniques assuming a pragmatic-functional perspective demonstrate usefulness for the recovery of metalinguistic skills and communicative abilities in natural contexts of linguistic use. By natural context of linguistic use, such as natural conversational practice, we mean the context where verbal behaviour merges with executive functioning in a dynamic bidirectional interaction. Selecting linguistic tasks representative of this kind of interaction, as proposed by *MetAphAs* for assessment, can also be useful for therapeutic goals, as the data presented in this case study suggest. Results obtained with CPA cannot be properly extrapolated to other patients, but we are convinced that positive results can be obtained by adjusting the methodology presented here to the characteristics and needs of individual cases.

As previously stated, the pragmatic-functional paradigm must be considered as an open heuristic working plan, being its component factors cognitively interrelated and not sequentially ordered. A specific therapeutic programme based on this paradigm requires a particular selection and sequence of tasks adapted to the patient under treatment. To carry this out, a creative and dialogically-founded implication of the language therapist is required. This creative and therefore personal implication of the language therapist in specifying the therapeutic programme contributes to the therapy achievements yet probably not to a lesser degree than the active role of the patient does. Thinking of a language therapist as an individual who mechanically applies a preconceived and unchangeable instrument helps perhaps to make

treatment data more comparable, but severely limits the therapeutic achievements for individual cases.

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