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Textual structure and aphasia

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ABSTRACT: *Background*: The bibliography on language and brain damage investigates how speakers suffering from brain damage, both those with aphasic damage and those damaged in the right cerebral hemisphere, construct their texts, paying special attention to the narrative outlines. *Aims and Methods*: Using a collection of recordings of speakers with aphasic damage from the group PerLa (Perception, Language and Aphasia), we analyse how these speakers formulate texts and develop texts on a more general level. We analyse how they adapt the core parts of a text, but also how appropriate the different elements of the text are in terms of cognitive relevance, by using the notions of prototypicality and the syntactic iconicity; we believe that both concepts are highly relevant for the explanation of some characteristics traditionally associated with agrammatism, such as occurs for example with the choice of grammatical subjects or the loss of information. *Conclusions*: Aphasic narrative text show evidence of the handling of narrative superstructures and of the presence of the three informative levels (descriptive, agentive and evaluative); cohesion and coherence errors manifest the interdependence between grammar and pragmatics, and can be explained with cognitive linguistic theories.

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1. Narrative and aphasia

Research on narrative and aphasia, unlike the case with other textual structures such as argument, provides an extensive bibliography, particularly since the 1980s (Brownell 1988; Coelho, Liles & Duffy 1991, 1995; Liles, Coelho, Duffy & Zalagens 1989; McDonald 1993; Mentis & Prutting 1987; Glosser & Deser 1991; Hartley & Jensen,1991).

In the specific field of textual pragmatics, Brownell (1988) states that while texts produced by left hemisphere damage (LHD) show problems IN speech acts, those of speakers with right hemisphere damage (RHD) show problems AMONG speech acts; linguistically it could be said, then, that aphasia shows problems with cohesion, while RH damage produces more problems with coherence. From this perspective, it is interesting to look at the work done by Hartley & Jensen (1991) on coreferential chains in aphasia; however, their results are variable because of the differences in subject's severity (the study involved few speakers). Other studies on coherence (Tucker and Hanlon 1998; Coelho 2002) show that speakers with aphasia present more incomplete episodes, less reliance on inference and a greater presence of irrelevant elements than subjects in the control group.

More recently, Christiansen (1999) deals with experimental tests on constructing narratives and attempts to establish differences between the two usual types of aphasia; she points out that speakers with Wernicke's aphasia have problems with coherence, especially in severe cases (whose semantic problems sometimes make assessment difficult), with a high rate of introduction of irrelevant information, whilst speakers with Broca's aphasia produce similar amounts of essential and peripheral concepts to non-aphasic speakers. This work does not take into account narrative categories as such (it talks about thematic macrostructures and propositional analysis, but does not address textual structure) and concludes by stating the obvious link between pragmatic deficit

and grammatical deficit: *"It's not clear whether irrelevant propositions produced by Wernicke's aphasics represent a particular disturbance in discurse coherence or is secundary to an overall semantic impairment affecting language production at the level of words and sentences*". (1999: 4).

Penn (2007) does address the specific features of cohesion and coherence, stating that, compared to the control group, aphasic speakers construct shorter, less propositional, syntactically simpler narratives, with more omissions and unfinished speech acts and with more problems related to set word order. In terms of text coherence, Penn uses Labov's structural model, with a scale of five narrative categories: Temporal Organisation, Relevance, Character Development, Descriptive Information and End; with this structural model he found that aphasics include fewer of all these categories in their texts than speakers in the control group. Other features highlighted by Penn are the frequent resource to direct style (part of Goodwin's "enactment", together with intensifiers, 2000) and to repetitions.

2. *The data: the University of Valencia PerLA corpus*

Our data belongs to the PerLA corpus (Perception, Language and Aphasia, www.uv.es/perla), produced in the University of Valencia since 2000 and the transcription of which has been published in part (Gallardo-Paúls and Sanmartín 2005; Gallardo-Paúls and Moreno 2005; Hernández, Serra and Veyrat 2008; Gallardo-Paúls 2009a; Rodríguez Muñoz 2010). Data analysis is based on distinguishing three pragmatic levels:

1. Enunciative level: speech acts (locative, propositional and ilocutive), repair acts, non verbal acts and inferences.

2. Interactive level: turn taking, types of intervention, thematic management, predictability, turn-taking agility and rate of conversational participation.

3. Textual level:

    a. Cohesion: reformulating the concepts of agrammatism and paragrammatism using the concept of Syntactic Infradetermination (Hernández 2006); formal speech markers (Intersubjectivity and Theory of Mind, Gallardo-Paúls 2009b).

    b. Coherence: textual superstructures.

Our objective is to take an in-depth look at the study of textual superstructures in aphasia, paying attention to the strictly textual aspect of pragmatics, according to the model applied in our analysis of the narrative and argumentative superstructures of ADHD in the PerLA corpus (Gallardo-Paúls 2007).

The particular data used in this study are:

1. Consulting room recordings: descriptions of the "Cookie Theft" picture card, especially suitable for developing descriptive frameworks (although it is a specific, not sequential, anecdotal narrative).

2. Conversational recordings in ecological contexts: selected narrative fragments.

3. Textual pragmatics

Textual pragmatics is the pragmatic level directly linked to the message, to the speech act; as we know, a distinction should be made between cohesion, in which coreferential chains and connectivity are analysed, and coherence, which deals with the textual outlines that give sense and communicative value to each speech act.

Our study takes into account the classic concepts of superstructure and narrative organisation. For Van Dijk (1989: 53): "*a superstructure can be intuitively characterised as the 'overall shape' of a discourse, which defines the overall order of the discourse and the relations (hierarchical) of its respective fragments. [...] Story categories include, for example: introduction, evaluation and moral*".

As is well known, Labov (1972) puts forward a narrative text organisation with fixed categories:

- Abstract: a summary of the story.
- Orientation: identifies time, location, characters (usually in imperfect indicative).
- Evaluations: the story's sense and interest.
- Narrative speech acts: the only essential element. Generally in indefinite and with a basic structure: subject + predicate + complement + adjuncts.
- Outcome.
- Ending.

Similar proposals are found in Thorndyke (1977), for instance, who takes the story grammar approach, that is, with rules for correct formation by using a suitable combination of the following categories:

- Setting: characters + location + time
- Theme: event + goal
- Plot: episodes 1..n
- Resolution.

At a later stage, in the field of narrative analysis of conversational texts, Polanyi (1985) goes beyond the diagrammatic model of isolated categories and formation rules to put

forward a three dimensional story construction, which, instead of specific categories, involves three superimposed informative levels:

- NARRATIVE or EVENT STRUCTURE is organised following temporal patterns: time moves forward as events happen. The western approach tends to prefer this structure in both its stories and in studies on them: introduction, body, ending.
- DESCRIPTIVE STRUCTURE which focuses all the information on the situation and the actors in the story, referring to the underlying argument: characters, locations and times.
- EVALUATIVE STRUCTURE tells readers which aspects the narrator considers fundamental, and why. It uses several mechanisms that can be woven into the story itself or that frame it.

Our analysis uses this view, paying attention to informative levels and to their specification in identifiable categories.

3.1. Descriptive level

For aphasics with mild or medium aphasia, Ulatowska and Sadowska (1992) address the possible effects of agrammatism (Broca) and paragrammatism (Wernicke) on textual structure, and suggest that they are affected by a lack of the following features, related to **cohesion** mechanisms:

- Temporality (sequencing):
    - Aphasic speakers generally tend to use less connectors, and time connectors are limited to now, next, when, as.
    - Aphasic speakers make more mistakes in consecutio temporum and in verbal flexion (TAM system).

- Coreferential chains
    - Motor aphasics have more problems with nominal chains, and sensory aphasics with pronominal repetitions.
    - Referential problems also affect coherence, to the extent that characters do not easily change roles and this causes problems with changing narrative perspective.

Constructing narratives, whether oral or written, has to rely of necessity on the descriptive categories that contextualise the plot: characters, locations and times. Because of this, we think the description of the "Cookie Theft" picture card from the Boston Naming Test was ideal for studying this level. Using a total of 28 oral texts, consisting of 9 descriptions of the "Cookie Theft" picture card, and 19 spontaneous oral narratives, the basic categories present in the texts were assigned:

- P (characters)
- DP (character descriptions)
- L (locations)
- T (times)

Firstly, we analysed the thoroughness of the description depending on whether subjects mentioned one, two or three scenes (sub-scenes of the children, the woman, or the cat who leaves the scene), although we cannot draw conclusions from this data as it is sometimes the interviewer who guides the subject in the description. Secondly, we have taken into account the appearance of descriptive categories in the text (by deleting meta-discursive fragments, redundant utterances and draft events). This analysis of the descriptive aspect enables us to draw the following conclusions:

- The first finding refers to the scarcity of temporal (4.6%) and locative (16.5%) information, compared to the predominance of information relating to the

characters and their description, which makes up 45.1% of all the narrative categories.

- There is evident use of proforms owing to lack of lexical access (a total of 53 uses were recorded, 71.6% of which were used by fluent aphasics).
- The most severe cases show an absence of the necessary (relevant) information, making understanding difficult (in 46% of texts, by both fluent and non-fluent).

3.2. Agentive level

This informative level corresponds to the known categories of narrative events, episodes, complications and resolutions. In our previous analyses on ADHD we used the concept of "narrative density", depending on the number of episodes and events contained in each narrative. In speakers with aphasia it was found that narrative density is directly conditioned by the existence of a strictly grammatical deficit, as the link between the category "event" and some grammatical categories is clear; it is likely, then, that a speaker with problems in using verbs will also have problems in constructing events (Behrns, Ahlsén & Wengelin 2009).

To account for these conditioning factors between textual pragmatics and grammatical deficit, we consider it is appropriate to employ the theoretical premises of syntactic iconicity. Haiman (1980) suggests the iconicity of grammatical structures (form) in respect of reality (meaning); Enkvist (1981:101-102) applies theories of iconicity to the production of narrative and concludes that they resort to unmarked syntactic structures when they reflect logical, real, temporality. Givón (1990: 968) also points out that if the structure is not arbitrary but fulfils a function, then that same structure can also be a reflection of this function (linear order principle).

To summarise, it can be seen that the cognitive theory of iconicity enables us to reason that certain morphosyntactic categories can be prototypically associated with certain

narrative categories, and they therefore provide a cognitive view from which to describe textual pragmatic deficit. We can also complete this point of view with the semantic distinction between constitutive and relational units: "*Independently of the grammatical category they belong to, words, by their meaning, are constituted in two classes of units with different behaviour: some words, when they appear in discourse, are made as knots where bundles of relations converge; others, however, typify sets of relations that have to be supported by certain knots. […] I have called the former constitutive units (CU) and the latter relational units (RU)*". (López García 1977: 68).

- Descriptive level:
  - Nominal syntagmas, conjunctions.
  - Semantically constitutive units.
- Agentive level:
  - Verbs, adverbs.
  - Semantically relational units.

The real expression of this category is made more difficult by problems with lexical access and morphological selection (only 31% of clearly identified narrative categories are Events). Analysis of specific data enables us to see how, in fact, anomia makes textual construction difficult (e.g. 1) in the same way as perserverations (e.g. 2, perseveration of the noun "muelle" - "spring").

- Example 1, speaker with conduction aphasia (MAN/ age 61/ female/ ACV July 2006/ Recorded April 2008):

0010	I.	está /// un platito – un plátano / ((con pa – con patas)) / una – una chica - una chica / un // aquí (SEÑALA LA LÁMINA EN LA PARTE DONDE ESTÁ LA MUJER SECANDO EL PLATO Y SE SALE EL AGUA) // no me acuerdo
0011	E.	dónde ocurre todo↑ / en qué parte de la casa↑
0012	I.	qué llave // mm // en la quee / en la primer que mee / ((espera)) / ahí (SEÑALA LA

LÁMINA) / en una aquí otra / aquí no (porque) como no sé no ((sé↓)) / y otra / otra ((no me)) aquí / (xxx xxx)

0010 I. it's /// a little plate – a banana / ((with – with feet)) / a – a girl - a girl / a // here (POINTING TO THE PLACE ON THE CARD WHERE THE WOMAN IS DRYING THE PLATE AND THE WATER IS OVERFLOWING) // I can't remember
0011 E. where everything happened↑ / in what part of the house↑
0012 I. what key // mm // in the one that / in the first one I / ((wait)) / there (POINTING TO THE CARD) / in one here another / here no (because) as I don't know I don't ((know↓)) / and another / another ((I don't)) here / (xxx xxx)

- Example 2, speaker with transcortical sensory aphasia caused by left sylvian ischemic ictus by left carotid thrombosis (FCJ/ male / age 57/ ACV May 2002/ Recorded April 2007):

130 I: pero espérese no es que sólo na(da) más que uno (LEVANTA LA MANO CON EL DEDO ÍNDICE EXTENDIDO^{R})/ un fresador nada más/ y era era era/ era fresador/ era era fresador/ era era c-todos los muelles/ todo todo todo todo todos los fresadores/ todos (xxx)
131 M: no eras no eras tornero↑
132 I: síi// es fresador/ he sido ca-caf§
133 M: §toor §
134 I: §tornero/ tornero/ todo/ todos los muelles gracias a Dios yo gané/ a todos los chavales y a todos los→/ los tenía veinte chavales por aquí y yo ((gracias a Dios)) [me lo sabía yo todo]
135 M: [º(les enseñaba a los chiquillos)º]
136 I: =y lo veía todo// y los muelles [de mi casa]
137 E1: [¿enseñabas/] enseñabas el oficio?
138 M: [a los chavalitos a los chavalitos de ahí y a los jefes/ los hijos de los jefes/ estaban (xxx)]
139 I: [sí sí (xxx xxx)] yo no llegué a hacer el muelle de mi casa/ y cuando yo escribía (hace el gesto de escribir con la mano) los muelles de mi casa (⇒M)

130 I: but wait he's not only no(thing) more than one (RAISING THE HAND WITH THE INDEX FINGER POINTED^{R})/ a grinder nothing more/ and he was was was/ was a grinder/ he was was a grinder/ was was w-all the springs/ all all all all the grinders/ all (xxx)
131 M: weren't you weren't you a lathe operator↑
132 I: yes// he's a grinder/ I was a ca-caf§
133 M: §la §
134 I: §lathe operator/ lathe operator/ all/ all the springs thank God I won/ all the kids and all the→/ I had them twenty kids here and I ((thank God)) [I knew it all]
135 M: [º(I taught the children)º]
136 I: =and I saw it all// and the springs [in my house]
137 E1: [¿did you teach/] did you teach the trade?
138 M: [the lads the lads there and the bosses/ the boss's children/ were there (xxx)]

139 I: [yes yes (xxx xxx)] I didn't get to do the spring in my house/ and when I wrote (making the gesture of writing with the hand) the springs in my house (⇒M)

It can generally be assumed that the selective deficits for nominal or verbal categories are present in descriptive and agentive categories, a situation for which speakers frequently compensate by resorting to activating inferences, making the listener deduce the link between two nominal syntagmas (see example 3), and by over-using the direct style in narratives (see example 4, where it is easy to spot the expressive scarcity and use of the direct style as an iconic footprint):

- Example 3 Speaker with motor aphasia by ACV in left carotid (ENR, male, age 65/ ACV in 2006/ Recorded November 2008).

0004 I. este / los chiquitos // no↓ // este / el chi – el chiquito y el - y la - y la niña / galletas /// el mamá – la mamá está e /// vozando // yy /// y esta mujer // este yy (7.0) y la mujer s(e) – se // no me acu(erdo) / co – cómo se dice↑ (3.0) la mujer // a – agua / se – se ag(ua) / se a // agua (3.0) y ya no sé

0004 I. this / the little boys // no↓ // this / the bo – the boy and the - and the - and the girl / cookies /// the mummy – the mummy is e /// speaking // andand /// and this woman // this andand (7.0) and the woman s(e) – is // I don't remem(ber) / how – how to say↑ (3.0) the woman // wa – water / is – wa(ter) / is w // water (3.0) and I don't know

- Example 4. Speaker with motor aphasia by ACV (MCP/ Female/ age 27/ ACV in May 2003/ Recorded July 2004):

0042 E: ¿en qué trabajas?
0043 I: bingo
0044 M: ¿en cuál?/ díselo en cuál
0045 I: *(Torre fiel)*
0046 M: en Torrefiel (xxx)
0047 E: ¿y qué hacías? (muestra la palma de la mano)
0048 I: vender
0049 M: (xxx)
0050 I: cartones (EXTIENDE EL BRAZO)§
0051 M: § y cantar
0052 E: nunca he jugado al bingo↑/// ¿cómo se juega?
0053 I: (BRAZO⇑, RISAS) seten ta y cua tro/ ¡BINGO! (risa)
0054 E: pero los cartones que tú repartes///¿ahí qué hay?/ ¿qué se hace con eso?

0055 M: con números→ lo tienes que rellenar y el primero que lo rellena gana
0056 I: (SEÑALA A E) ¿cuántos quieres?/ ¡cinco! (ILTR DE REPARTO)

0042 E: what's your job?
0043 I: bingo
0044 M: which one?/ say which one
0045 I: *(Torre fiel)*
0046 M: in Torrefiel (xxx)
0047 E: and what did you do? (SHOWS PALM OF HAND)
0048 I: sell
0049 M: (xxx)
0050 I: cards (stretching arm out)§
0051 M: § and sing
0052 E: I've never played bingo↑/// how do you play?
0053 I: (ARM⇑, LAUGHTER) seven ty fo ur/ BINGO! (laughter)
0054 E: but the cards you hand out///what's on them?/ what do you do with them?
0055 M: with numbers→ you have to fill it up and the first one to fill it up wins
0056 I: (POINTS TO E) how many do you want?/ five! (GESTURE OF HANDING OUT)

It can be seen, then, that the subjects introduce categories belonging to the three informative levels mentioned above for their narrative, although their textual progression comes up against the limitations caused by strictly grammatical deficit. This is why, when an evaluation mechanism such as PREP (Pragmatic Rapid Assessment Protocol, Gallardo-Paúls 2008) is used, speakers with aphasia are shown to be more affected in the grammatical base categories than in strictly pragmatic ones. An analysis of the PerLA corpus with this test clearly shows that, although subjects with ADHD or Williams Syndrome show a greater deficit in specific pragmatic categories (scores of 53 and 47 per 100) compared to greater preservation of the grammatical base pragmatics (scores of 71.4 and 73.8 per 100), in the case of aphasia the opposite is observed: in a sample of 19 recordings from the corpus, specific pragmatic skills returned a score of 69.5 (per 100) and grammatical base pragmatic skills dropped to 31.4 (per 100). It is this grammatical difficulty that basically explains the deficit of aphasic speakers in their textual production, but not in their mastery of superstructures.

3.3. Evaluative level

In their 1999 study, Ulatowska, Bond, Johnson & Branch showed a picture story with a moral and asked the aphasic speaker: "Can you apply the lesson to life or to people?". They concluded that aphasic speakers showed specific, non-general, lexical use, which suggested difficulty in expressing moral judgement. In another study, in 2006, Ulatowska, Olness, Keebler & Tillery asked aphasics their views on their ACV, but they confused the evaluative level of the story (speaker-listener) with the evaluative level of the plot (characters).

Our analysis of evaluative structure in the PerLA corpus narratives shows that it is developed both at plot level (evaluation) and at story level (moral); the use of facial expressions and laughter is particularly apparent as an evaluative value and activator of evaluative inferences in the listener. The same activating intention can be attributed to emphatic gestuality: especially emblems and illustrators.

4. Conclusions

The analysis of narrative structures in the PerLA corpus of aphasia enable us to draw the following conclusions:

- There is evidence of the handling of narrative superstructures, with no narrative simplifying mechanisms, or errors in stringing categories together (as in ADHD for instance).
- There is evidence of the presence of the three informative levels: descriptive, agentive and evaluative.
- Informative progression is frequently hindered by errors of lexical access and syntactic infra-determination (agrammatisms and paragrammatisms): cohesion deficit often triggers errors in coherence, especially due to morphologically

selective anomias, that is, speakers with more severe problems with normal elements than in verbal elements, or vice versa.

- The interdependence between grammar and pragmatics is obvious, especially in the extent to which textual pragmatic categories are directly linked to grammar.
- Over-use of inferential meaning, particularly conversational implications (resorting to direct style).
- As mentioned earlier, the key aspect for explaining textual pragmatic deficit in aphasia is the interdependence between grammatical use and pragmatic use, and by extension, between linguistic use and underlying cognitive mechanisms. We consider that the recourse to theories of cognitive linguistics, and the theory of prototypes or iconicity, point to a plausible method of analysis for aphasiology.

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