

Neologisms are produced by the occurrence of several errors (additions, omissions, substitutions, transpositions) in the same target word. When embedded in fluent and well articulated speech, they are characteristic of neologistic jargon. Investigations of neologisms have led to different hypotheses about their nature. With reference to Patterson's (1986) model, two main hypotheses have been put forward, namely lexical vs postlexical deficits. In view of previous findings in patients with aphasia due to focal brain lesion, we endeavoured to investigate neologisms production in primary progressive aphasia (PPA).

PARTICIPANTS

Neologistic production was investigated in two patients affected by PPA. The first patient (ADC) is a 53-year-old male (education 8 yrs) with nonfluent (agrammatic) variant PPA. The second one (ER) is an 80-year-old female (education 5 yrs) with logopenic variant PPA. Following consensus criteria (Gorno-Tempini et al, 2011), the diagnosis was supported by history, clinical and neuropsychological data as well as by brain MRI/PET findings. Neuropsychological assessment was carried out by an extensive battery of tests tapping both verbal and non verbal functions. Patients were selected in view of their abundant neologistic production, emerging in spontaneous speech as well as in testing conditions.

METHODS

Neologistic production was specifically investigated by confrontation naming, reading aloud and repetition tasks, in which stimuli (n= 30, 124 and 124, respectively) were balanced for length, consonant clusters, frequency and imageability.

Incorrect responses were classified as no responses, phonemic paraphasias (1 phoneme discrepancy from target), semantic paraphasias and neologisms (≥2 phonemes discrepancy from target). Errors were qualitatively classified as additions, omissions, substitutions and transpositions. Quantitative response-to-target comparisons were performed by calculating the Phonological Overlap Index (POI, Bose et al, 2007) and a newly developed Phonological Correspondence Index (Indice di Corrispondenza Fonologica, ICF), which provides a more sensitive measure of transpositions. Neologisms were further classified as target-related or non target-related (bizarre). Length and cluster effects (linked to postlexical functional damage) as well as frequency and imageability (linked to lexical functional damage) were analyzed.

	ADC	ER
NAMING	+++ Non target-related	++ Non target-related
READING	+ Target-related	-
REPETITION	++ Non target-related	+ Target = non target-rel.
LENGTH EFF.	Reading and repetition (POI and ICF) #	-
FREQUENCY EFF.	Reading (POI and ICF and repetition (ICF) *	-
IMAGERY EFF.	-	-
CLUSTER COMPLEXITY EFF.	Repetition (POI) #	-
LENGTH RESP/TARGET	Naming and repetition *	- #

* Lexical deficit
 #Post-lexical deficit

RESULTS

In both patients naming was the most impaired and reading aloud the least impaired task, particularly in patient ER in whom reading was disproportionately spared. Her reading performance was peculiar in that she produced accent errors, which were the object of a separate study. Qualitative analysis of errors differed significantly between patients: substitutions were the most frequent errors in ADC, while ER's errors were mostly represented by additions. Due to the overall low number of transpositions, POI and ICF did not differ significantly. Length, frequency and cluster effects were significant in ADC. No effects turned out to be significant in ER.

Lexical deficit	Postlexical deficit
Naming < reading and repetition	Naming = reading = repetition
Frequency effect	Length effect
Imagery effect	Consonant cluster effect
Length response ≠ target	Length response = target

Phonological Overlap Index (POI) : $N \text{ shared} \times 2 / LT + LE$

Indice di Corrispondenza Fonologica (ICF): $N \text{ errors} / LT$

N shared = number of phonemes shared by target and error response regardless of position

LT = phonemic length of target

LE = phonemic length of error response

N errors = total number of errors including transpositions

ADC			
	Naming (n=30)	Reading (n=124)	Repetition (n=124)
Correct r.	13.3%	37.1%	29.0%
No response	0%	0%	2.4%
Phonemic p.	16.7%	12.9%	13.7%
Neologisms			
Non target rel.	46.6%	17.7%	31.5%
Target related	20.0%	32.3%	23.4%
Semantic p.	3.3%	0%	0%
Omissions	32.5%	23.5%	23.0%
Additions	8.8%	31.1%	36.2%
Substitutions	43.8%	30.3%	31.9%
Transpositions	15.0%	15.5%	8.9%

ER			
	Naming (n=30)	Reading (n=124)	Repetition (n=124)
Correct r.	36.7%	83.9%	40.3%
No response	13.3%	0%	0%
Phonemic p.	13.3%	6.5%	13.7%
Neologisms			
Non target rel.	20.0%	0%	22.6%
Target related	13.3%	2.4%	23.4%
Semantic p.	3.3%	0%	0%
Omissions	13.0%	7.1%	26.5%
Additions	51.9%	71.4%	31.1%
Substitutions	27.8%	21.4%	32.2%
Transpositions	7.4%	0%	5.8%

DISCUSSION

The analysis of neologistic responses confirms that different mechanisms are at play in different patients and that no single source of neologisms can be unequivocally identified. In analogy with jargonaphasia due to focal brain lesions, different profiles of lexical and/or postlexical deficits emerge also in PPA, suggesting differential pathological encroachment on language functional networks.

REFERENCES

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