

MEASURING SENTENCE PRODUCTION IN PRIMARY PROGRESSIVE APHASIA

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Introduction and objective

- ✓ The three clinical presentations of primary progressive aphasia (PPA) reflect heterogeneous neuropathological substrates that are difficult to be recognized *in vivo*.
- ✓ The presence of agrammatism in the clinical profile has a high association with tauopathy. However, grammatical competence is still difficult to be assessed in the clinical setting, mainly when patients have affected speech production.
- ✓ In this study, we proposed a sentence anagram test (SAT). This test measures sentence production over patient speech disturbances.
- ✓ **Our aim was to assess the ability of SAT in differentiating nonfluent (nfvPPA) and logopenic (lvPPA) variants of PPA which are difficult to be distinguished based on speech production albeit associated with different underneath pathology.**

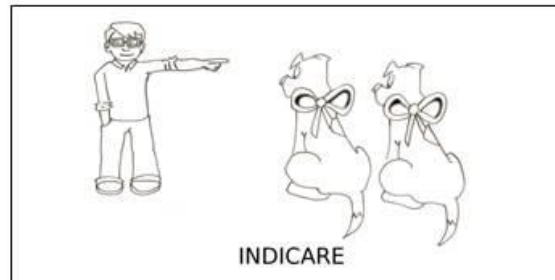
Subjects

	nfvPPA	lvPPA	p
N	13	9	
Age	71.1 ± 5.3	73.2 ± 7.2	0.45
Gender, females	8 (62%)	5 (56%)	1.00
Disease duration	2.5 ± 1.3	3.8 ± 1.4	0.04*
Education	10.3 ± 5.7	14.4 ± 2.7	0.06
MMSE	23.7 ± 3.9	25 ± 3.3	0.42
Naming	44.3 ± 3.3	40.9 ± 6.1	0.15
Single word comprehension	48.0 ± 0.0	47.9 ± 0.4	0.30
Object Knowledge	49.1 ± 3.4	49.8 ± 2.1	0.64
Repetition	129.5 ± 28.9	128.1 ± 10.1	0.90
Syntactic comprehension, visual	37.7 ± 7.2	41.4 ± 3.7	0.23
Syntactic comprehension, auditory	49.7 ± 10.0	53.3 ± 8.0	0.44

Values denotes means ± standard deviations (or frequencies). P values refer to t-test models or Fisher's exact test. Abbreviations: lv=logopenic variant; MMSE=Mini Mental State Examination; nfv=non-fluent variant; PPA=primary progressive aphasia.

Sentence Anagram Test in PPA

Sentence Anagram Test



Sentences

Canonical

**Simple
Active**

cani i indica ragazzo il

Il ragazzo indica i cani

**Complex
Active**

hanno fiocco i il indica
ragazzo il che cani

Il ragazzo indica i cani che hanno il fiocco

Non-Canonical

Passive

i dal cani indicati
ragazzo sono

I cani sono indicati dal ragazzo

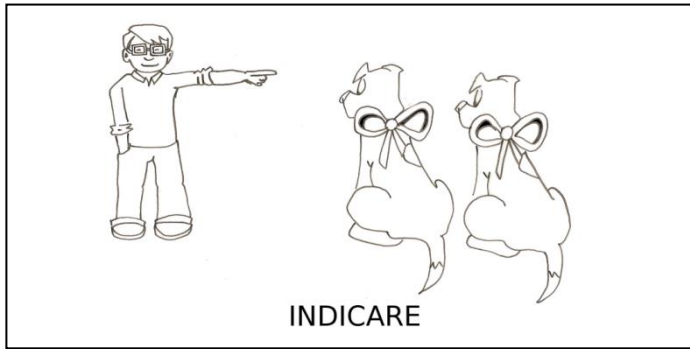
**Object-
extracted
question**

animali indica ragazzo
quali ? il

Quali animali indica il ragazzo?

Sentence Anagram Test in PPA

Results: nfvPPA vs lvPPA



Simple Active

cani i indica ragazzo il

Il ragazzo indica i cani

p

Score	0.05
Time	0.87

Complex Active

hanno fiocco i il indica
ragazzo il che cani

Il ragazzo indica i cani che hanno il fiocco

Score	0.001
Time	0.26

Passive

i dal cani indicati
ragazzo sono

I cani sono indicati dal ragazzo

Score	0.001
Time	0.99

Object-extracted question

animali indica ragazzo
quali ? il

Quali animali indica il ragazzo?

Score	0.002
Time	0.95

Total

	p	AUC
Score	<0.001	0.91
Time	0.55	

Canonical

	p	AUC
Score	0.001	0.86
Time	0.32	

Non-Canonical

	p	AUC
Score	<0.001	0.93
Time	0.97	

Conclusions

- ✓ The adaptation of NAT for the Italian language is powerful for distinguishing nfvPPA and lvPPA in vivo.
- ✓ Although some lvPPA had longer disease duration, the SAT was still able to detect the differences in the two variants.
- ✓ Non canonical sentences are the most powerful for classifying the two patient groups.
- ✓ Future studies in larger samples should confirm the performance of these measures for a correct classification at the single subject level.