Development of the Standardised Mini Linguistic State Examination (MLSE) to Classify and Monitor Primary Progressive Aphasia

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Introduction

- Language loss is common in dementia and is an isolated feature of primary progressive aphasia (PPA); available assessments are time-consuming and not readily comparable across languages.
- Current criteria identify three main variants of PPA based on complex clinical criteria and/or imaging[1]. Improved clinical tools to screen, diagnose, and monitor PPA are essential.
- In this study, we develop English and Italian versions of a brief (<20 mins) language assessment tool that includes the major domains affected by the different PPA syndromes.

Background: Clinical features of the 3 main variants of Primary Progressive Aphasia

Semantic Dementia (SD)		Progressive non-fluent aphasia (PNFA)		Logopenic aphasia (LPA)	
Impaired	*Spared*	*Impaired*	*Spared*	*Impaired*	*Spared*
Object naming, single-word comprehension and object knowledge.	Repetition, grammar and motor speech production.	Agrammatism, effortful/halting speech, apraxia of speech, impaired comprehension of syntactically complex sentences.	Single-word comprehension and object knowledge.	Impaired single-word retrieval and sentence repetition, phonological errors.	Single-word comprehension, object knowledge, grammar and motor speech production.

Study outline

Recruitment

Phase 1: pre-norming and pilot data

180 controls (age: 45-75 years) for English and Italian[1] versions.

Phase 2: Principal study

40 controls (age:45-75) and 90 patients with a diagnosis of:

60 patients with PPA
- SD [*n*= 25]
- PNFA [*n*= 25]
- LPA [*n*= 10]

30 patients with movement disorders
- PSP
- CBS

Procedure

Participants will complete the MLSE test, subtests of the Boston Diagnostic Aphasia Examination (BDAE), Addenbrooke's Cognitive Examination (ACE-III) and a 3T MRI scan. All patients will undergo a follow-up assessment at 1 year.

The MLSE

Components of the MLSE are selected by the relevant domains, and based on the recommendation of current diagnostic guidelines[2]:

Confrontation naming: *for assessing anomia, semantic/phonemic errors.* Featuring 9 items (non-living and living); all with low values of familiarity/spoken frequency to be sensitive to mild deficits [Fig. 1].

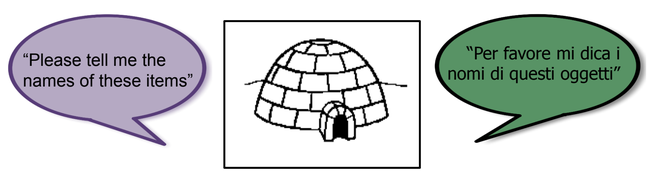

Figure 1, Confrontation naming example

Single-word comprehension (repeat and point): *for assessing semantic knowledge*. One target and 5 distractors from the same semantic category [Fig. 2].

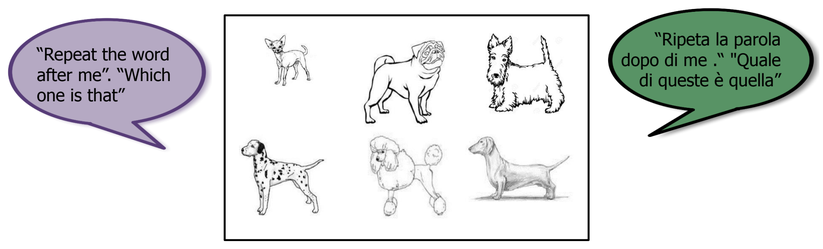

Figure 2, Single-word comprehension example

Semantic association: *for assessing semantic knowledge.* [Fig. 3]

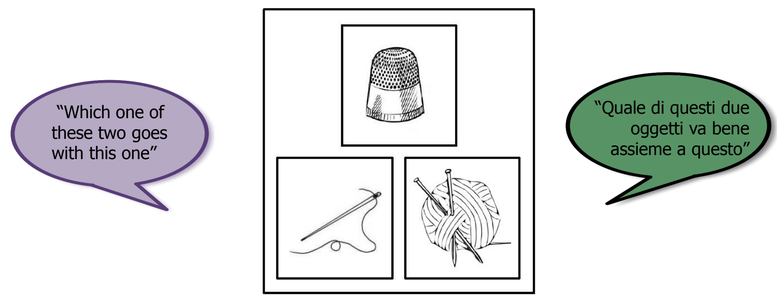

Figure 3, Semantic association example

Sentence comprehension: *for assessing the effects of sentence length and grammatical complexity.* Tasks including matching orally presented sentences to pictures, and answering questions about orally presented sentences. Sentences vary in grammatical complexity, length, and predictability [Fig. 4].

Repetition: includes single words of varying syllabic length, repeated production of a polysyllabic word, polysyllabic nonsense words, and sentences assessing difficulties with phonology, articulation, and working memory [Fig. 5].

Picture description: *for connected speech analysis, including assessment of narrative structure, vocabulary, grammar, phonology, and fluency* [Fig. 6].

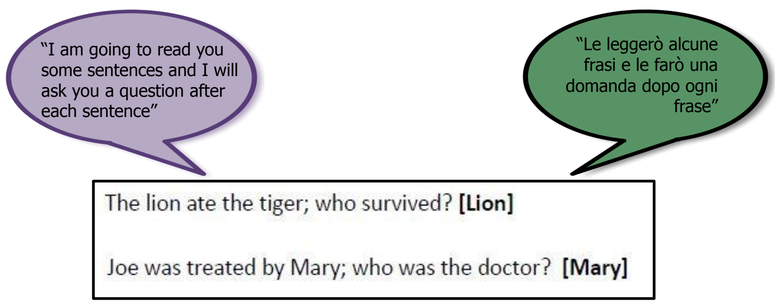

Figure 4, Sentence comprehension example

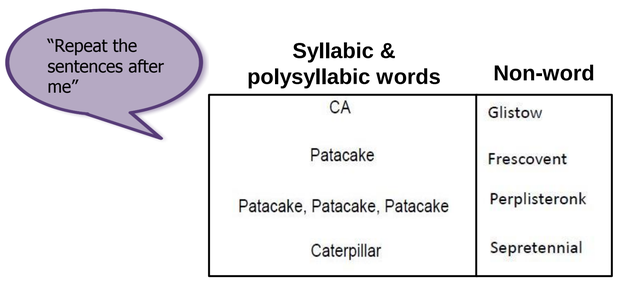

Figure 5, Repetition example

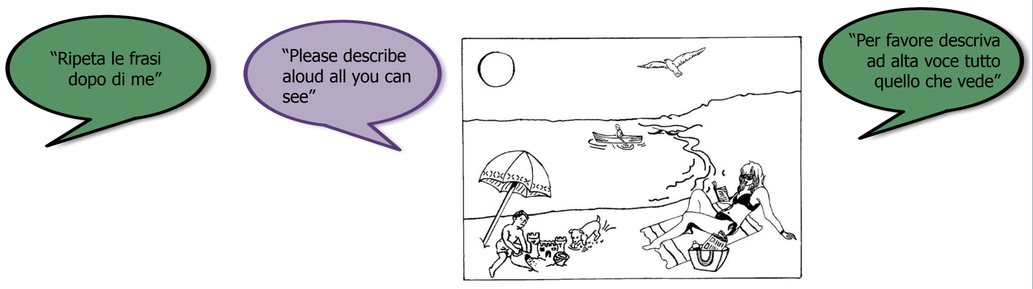

Figure 6, Picture description example

Reading (words and non-words): like repetition, reading aloud can indicate problems with phonology and articulation, but is also sensitive to impaired lexical-semantic word knowledge as indicated in English language by regularisation errors such as "SEW" pronounced as "sue". This task features regular and irregular words. There is no spelling irregularity in Italian (i.e. orthography is 'transparent'); typical and atypical stress assignment is therefore used instead [Fig. 7].

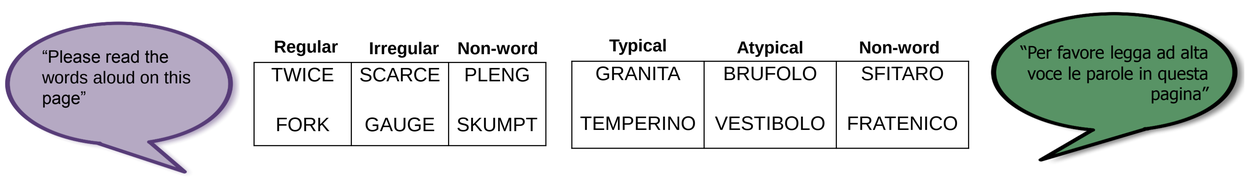

Figure 7, Reading (words and non-words) example

Writing: *for assessing modifications (e.g. allography, micrography) and errors (e.g. orthographic, semantic, grammatical/syntactic).* Instructed to write how to brush your teeth in sentences [Fig. 8].

Figure 8, Writing example

Contact

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