EasyChair Preprint

№ 6498

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August 31, 2021

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Introduction

Spontaneous speech analysis (SpSA) is commonly used in clinical practice for people with aphasia, as it allows clinicians to detect deficits which may otherwise be missed and provides a baseline for further assessment. However, SpSA methods often lack clinical applicability given their time-consuming nature. Moreover, there is currently no standardised method for SpSA available for use in Spanish. This presentation seeks to address these gaps by introducing the ALEA (*Análisis del Lenguaje Espontáneo en Adultos*), a novel comprehensive method for SpSA in Spanish.

Methods

The ALEA is made up of 9 indices targeting sentence (MLU, approximation, finiteness, grammaticality & subordination) and word level phenomena (paraphasias and neologisms, nº of nouns, verbs & incorrect verbs). These have been adapted from other SpSA methods, mainly the *Quantitative Production Analysis* (QPA; Saffran et al., 1989), the *Analyse voor Spontane Taal bij Afasie* (ASTA; Boxum et al., 2013), to ensure reliability for use with a range of Spanish-speaking adult healthy and clinical populations, including those with mild aphasia. Semi-spontaneous speech samples were recorded and transcribed following the ALEA guidelines: https://lenguajespontaneo.cl/

Results

The results of 119 Spanish-speaking healthy volunteers are presented here providing a norm-referenced sample (Table 1). Non-parametric tests showed significant differences on

a number of indices as a result of demographic variables such as age, educational attainment and gender, however multiple regression analyses suggested that these variables had low explanatory power. Cut-off points for preliminary clinical use were calculated at the 5th and 95th percentile. Clinical data from post-stroke aphasia (n=15), dementia (n=15), tumors (n=12) and vascular malformations (n=5) confirms the potential of the ALEA as a clinical screening tool.

Conclusions

The ALEA is a reliable tool for use with Spanish-speaking adult populations. The main strength of the ALEA is its controlled length and easiness of administration which favors its implementation in the clinical practice. The number of indices is kept to a minimum to provide a first screening of the speech output of different groups of adults, although additional research is needed to validate the specificity and sensitivity of this method in the above-mentioned clinical populations.

References

Boxum, E., Van der Scheer, F. & Zwaga, M. (2013). *Analyse voor Spontane Taal bij Afasie (ASTA)*. Standaard in samenwerking met de Vereniging voor Klinische Linguïstiek. 4th version. Retrieved from: http://www.klinischelinguistiek.nl.

Saffran, E. M., Berndt, R. S. & Schwartz, M. F. (1989). The quantitative analysis of agrammatic production: Procedure and data. *Brain and Language, 37,* 440-479.

Acknowledgments

The authors would like to thank the participants in this study for generously volunteering their time. Caitlin Holme thanks the Departamento de Fonoaudiología at Pontificia Universidad Católica de Chile for hosting and Dr. Laura Bos for arranging the internship which allowed her to contribute to this project. Carolina Méndez-Orellana acknowledges the support of FONDECYT (Nº11150429) to develop this study. Silvia Martínez-Ferreiro also acknowledges support of the AADI project (FEDER - Europe & Région Occitanie, FSE 2014-2020 N°2019-A03105-52.). Finally, the authors thank the international network Collaboration of Aphasia Trialists (CATs) for their support.

Table 1. Cut-off points in percentiles for ALEA measurements (n = 119)

ALEA Index	Mean	SD	Min	Max	P5	P95
MLU	10.49	1.75	6.52	15	7.87	13.64
Approximation	0.08	0.04	0.02	0.18	0.03	0.15
Finiteness	27.56	4.86	19	43	21	37
Grammaticality	0.93	0.07	0.68	1	0.78	1
Subordination	0.32	0.11	0.1	0.6	0.18	0.52
Paraphasias & Neologisms	0.08	0.27	0	1	0	1
Nouns	50.55	8.08	33	74	38	63
Verbs	59.17	7.56	41	80	47	71
Incorrect Verbs	0.98	0.13	0	1	0.97	1