HAL
open science

What do pause patterns in non- fluent aphasia tell us about monitoring speech ? A study of morph-syntactic complexity, accuracy and fluency in agrammatic sentence and connected discourse production

Halima Sahraoui, Julie Mauclair, Lorraine Baqué, Jean-Luc Nespoulous

To cite this version:

Halima Sahraoui, Julie Mauclair, Lorraine Baqué, Jean-Luc Nespoulous. What do pause patterns in non- fluent aphasia tell us about monitoring speech ? A study of morph-syntactic complexity, accuracy and fluency in agrammatic sentence and connected discourse production. 53rd Annual Meeting of Academy of Aphasia (2015), Oct 2015, Tucson, United States. pp.60-61. hal-01739988

HAL Id: hal-01739988

https://hal.science/hal-01739988

Submitted on 21 Mar 2018

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Open Archive TOULOUSE Archive Ouverte (OATAO)
OATAO is an open access repository that collects the work of Toulouse researchers and makes it freely available over the web where possible.

This is an author-deposited version published in : http://oatao.univ-toulouse.fr/
Eprints ID : 19180

The contribution was presented at 53rd Annual Meeting of Academy of Aphasia :
http://www2.academyofaphasia.org/2015-annual-meeting/
To link to this article URL :
https://www.frontiersin.org/10.3389/conf.fpsyg.2015.65.00060/event_abstract

To cite this version : Sahraoui, Halima and Mauclair, Julie and Baqué, Lorraine and Nespoulous, Jean-Luc *What do pause patterns in non- fluent aphasia tell us about monitoring speech ? A study of morph-syntactic complexity, accuracy and fluency in agrammatic sentence and connected discourse production.* (2015) In: 53rd Annual Meeting of Academy of Aphasia (2015), 18 October 2015 - 20 October 2015 (Tucson, United States).

Any correspondence concerning this service should be sent to the repository administrator: staff-oatao@listes-diff.inp-toulouse.fr

What do pause patterns in non-fluent aphasia tell us about monitoring speech? A study of morpho-syntactic complexity, accuracy and fluency in agrammatic sentence and connected discourse production

Sahraoui, Halima[1], Mauclair, Julie[2], Baqué, Lorraine[3] and Nespoulous, Jean-Luc[1]
sahraoui@univ-tlse2.fr mauclair@irit.fr lorraine.baque@uab.cat jlnespoulous@icloud.com

1. University of Toulouse, URI OCTOGONE-Lordat (EA 4156)
2. University of Paris Descartes, Institut de Recherche en Informatique deToulouse (IRIT)
3. Autonomous University of Barcelona

Keywords:
Non fluent aphasia, agrammatism, fluency, pause, adaptation, speech monitoring

Abstract:

Compared to normal speech, agrammatic utterances are "telegraphic" with frequent closed-class words omissions, simple clauses, short utterances and reduced morpho-syntactic complexity. Besides, its predominant symptom comprises fluency disturbances and great efforts needed to produce speech. Results from previous corpora analyses confirm that variability in agrammatic performance is a key feature for understanding impaired and strategic language use (Kolk & Heeschen, 1990 ; Kolk, 2006, Sahraoui & Nespoulous, 2012). Beyond the reduced on-line processing resource related to the underlying impairment, patients adjust the surface structure to be encoded according to contextual constraints. Moreover, across-task variability in fluency may also be determined by the use of various adaptation strategies, such as elliptical and corrective encoding strategies, related to the focus on form enabling better grammatical accuracy under certain conditions. In particular, corrective strategies are due to the preserved ability, in these patients, to detect errors and monitor their speech production (Postma, 2000 ; Oomen, Postma & Kolk, 2001). This suggests that agrammatic patients may over-use the monitoring device in producing language, at a pre-articulatory or post-articulatory stage and according to the type of task (Sahraoui, 2014).

In this study, we carefully look at temporal aspects of agrammatic speech production in order to understand how far does speech (non)fluency and dysfluency show a relation to the morpho-syntactic properties of sentence and connected discourse across various tasks. Indeed, describing and interpreting pause patterns may also contribute to account for non-fluent aphasia, as demonstrated in previous work dealing with fluent aphasia (Butterworth, 1979). To study pause patterns in non-fluent aphasia, we performed further speech data analyses involving agrammatic speakers (N=5) and control speakers (N=9) (Sahraoui & Nespoulous, 2012). In particular, silent and filled pauses were coded and automatically computed using speech processing methods (Mac Whinney, 2000 ; Boersma & Weenink, 2015). Analyses include speech and articulatory rate, pause durations and pause distribution in relation to the elliptical style, overt errors, dysfluencies and repair strategies (corrective adaptations). In connected discourse (spontaneous and autobiographical) with more elliptical style due to more frequent omissions of grammatical morphemes, the pattern of pauses is different from narrative and descriptive discourse, as well as in sentence production. The latter type of speech output is characterized by fewer grammatical omissions with longer and more frequent pauses, what is combined with greater morpho-syntactic accuracy and complexity (that is to say less elliptical style) and with more frequent corrective adaptations.

Arising from the way the speaker deals with the underlying impairment *in situ*, trade-offs are thus clearly made between fluency and morpho-syntactic accuracy and complexity. Even though language processing cannot perform in a safe way anymore, the agrammatic speakers rely on still operating executive functions related to pre- or post-articulatory speech monitoring in order to improve morpho-syntactic encoding.

Boersma, P. & Weenink, D. (2015). *Praat: Doing Phonetics by Computer* [Computer program: Version 5.4.08, retrieved 30 March 2015 from http://www.praat.org/].

Butterworth, B., (1979). Hesitation and the production of verbal paraphasias and neologisms in jargon aphasia. *Brain and Language, 8*, 133–161.

Kolk, H. (2006). How language adapts to the brain: An analysis of agrammatic aphasia. In Progovac, L., Paesani, K., Casielles, E. & Barton, E. (Eds.), *The syntax of nonsententials: Multidisciplinary perspectives* (229-58). Amsterdam: John Benjamins.

Kolk, H. H. J. & Heeschen, C. (1990). Adaptation and impairment symptoms in Broca's aphasia. *Aphasiology, 4*(3), 221-231.

MacWhinney, B. (2015 [2000]). *The CHILDES Project: Tools for Analyzing Talk*. 3 rd Edition. Mahwah, NJ: Lawrence Erlbaum Associates [on-line updated 2015 version: http://childes.talkbank.org/manuals/chat.pdf].

Oomen, C. E., Postma, A. & Kolk, H. H. J. (2001). Pre-articulary and post-articulary self-monitoring in Broca's Aphasia. *Cortex, 37,* 627-641.

Postma, A. (2000). Detection of errors during speech production. A review of speech monitoring models. *Cognition, 77*, 97-131.

Sahraoui, H. (2014). Trade-offs between fluency and grammatical complexity in language disorder: are agrammatic speakers "monitor over-users"? *International Workshop on Language Production*, Genève, 16-18 Jul 2014.

Sahraoui, H. & Nespoulous, J.-L. (2010). A corpus-based study of agrammatic aphasia: New evidence for the potential prominent part played by adaptive strategies in these patients' oral production. *Elsevier Procedia - Social and Behavioral Sciences, 48th Academy of Aphasia Proceedings,* 6, 115-116.

Sahraoui, H. & Nespoulous, J-L. (2012). Across-task variability in agrammatic performance. *Aphasiology, 26(*6), 785-810.