

## Abstract/Proposal #20428

---

### Automatic Detection of Linguistic Indicators As a Means of Early Prediction of Alzheimer's and of Related Dementias: A Cross Linguistics Analysis

---

Vassiliki Rentoumi, PhD<sup>1</sup>, George Paliouras, PhD<sup>2</sup>, Dimitra Arfani<sup>3</sup>, Katerina Fragkopoulou<sup>3</sup>, Spyridoula Varlokosta, PhD<sup>3</sup> and **Peter Garrard, MA, MBChB, PhD, FRCP<sup>4</sup>**, (1)NCSR 'Demokritos', Athens, Greece, (2)NCSR Demokritos, ATHENS, Greece, (3)National and Kapodistrian University of Athens (UoA), ATHENS, Greece, (4)St George's, University of London, London, United Kingdom

#### Abstract Text:

**Background:** Alzheimer's Disease (AD) and other types of dementia are associated with changes in spoken language, but the impact of these changes on different languages has not been extensively examined or compared. In this direction [iASiS](#) intends to pave the way towards personalized medicine for AD patients integrating and analyzing data from various sources and languages. In the present study which is performed within the context of [iASiS](#) we analysed samples obtained from native speakers of Greek and English who were at mild and moderate stages of probable Alzheimer's disease.

**Methods:** We evaluated differences in spoken language between AD patients and normal controls using novel quantitative methods. We searched for the most important sources of variation between the groups in the two languages. Most importantly, we tried to identify AD-induced language characteristics that are either cross-linguistic or language-specific. We adopted a computational approach for the comparison of morpho-syntactic complexity and lexical variety in digitised transcripts of speech produced by AD patients at various stages and by age-matched cognitively normal controls (NC). We used text classification approaches to assign the samples to one of the two groups. The classifiers were tested using various features: morpho-syntactic, lexical as well as complex statistical characteristics. **Results:** Preliminary findings indicate that syntactic and lexical complexity can be markers of linguistic change in both languages. The method succeeded in finding linguistic characteristics which differentiated AD patients from NC in mild stages in both languages.

**Conclusions:** The cross-linguistic comparison can contribute to a deeper understanding of language deficits in Alzheimer's disease, potentially leading to the development of a cross-linguistic diagnostic tool.

#### Topic Selection:

[Posters Tues] Diagnosis and Prognosis: Neuropsychology

#### Slot:

P3-10: Tuesday, July 24, 2018: 9:30 AM-4:15 PM

#### Final Paper##:

P3-474

**Title:**

Automatic Detection of Linguistic Indicators As a Means of Early Prediction of Alzheimer's and of Related Dementias: A Cross Linguistics Analysis

**Submitter's E-mail Address:**

pgarrard@sgul.ac.uk

**Electronic Signature:**

V RENTOUMI

**Dual Submission Rules:**

I acknowledge that I cannot also submit this abstract for oral presentation consideration at the Alzheimer's Imaging Consortium (AIC).

**Preferred Presentation Format:**

Poster Presentation Only

**Was this research funded by an Alzheimer's Association grant?**

No

**Abstract Submission Affirmations:**

I agree to the Abstract Submission Affirmations.

**Do you plan to upload figures or tables to supplement your abstract text?**

No

**Theme:**

Diagnosis and Prognosis

**Topic:**

Neuropsychology

**Sub Topic:**

Multicultural issues in assessment of dementia

**Learning Objectives:**

- Define the challenges associated with comparing clinical status and cognitive performance across languages and cultures.

**Keywords:**

ISTAART Professional Interest Area: Diversity and Disparities, language and neuropsychology

**Fellowship:**

No.

First Author

---

Vassiliki Rentoumi, PhD

**Email:** vassiliki.rentoumi@gmail.com

NCSR 'Demokritos'

Athens 15310

Greece

**Any relevant financial relationships?** NoSigned on 01/15/2018 by *V RENTOUMI*Second Author

---

George Paliouras, PhD

**Email:** paliourg@jit.demokritos.gr

NCSR Demokritos

ATHENS

Greece

Third Author

---

Dimitra Arfani

**Email:** dimiarfan@yahoo.gr

National and Kapodistrian University of Athens (UoA)  
ATHENS  
Greece

---

#### Fourth Author

---

Katerina Fragkopoulou  
**Email:** katfil18@windowslive.com

National and Kapodistrian University of Athens (UoA)  
ATHENS  
Greece

---

#### Fifth Author

---

Spyridoula Varlokosta, PhD  
**Email:** svarlokosta@phil.uoa.gr

National and Kapodistrian University of Athens (UoA)  
ATHENS  
Greece

---

#### Sixth Presenting Author

---

##### ***Presenting Author***

---

Peter Garrard, MA, MBChB, PhD, FRCP  
**Email:** pgarrard@sgul.ac.uk

St George's, University of London

London  
United Kingdom

**Any relevant financial relationships?** No  
Signed on 03/28/2018 by *Peter Garrard*