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Assessment of language functions
in a global world

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Globalised research & clinical practice

Scientific theories & therapies developed in one part of the world are used in other

=> Harmonisation of diagnostic criteria

AD, FTD, PPA, CBD, PCA...

=> Harmonisation of assessment

MMSE , DRS, WAB, ACE-R, ACE-III, ECAS etc

=> Multicentre therapeutic trials (-> E. Auff's lecture)

BUT

are tests, diagnosis, risk factors etc always the same?

Three problematic assumptions of globalised research

=> Assumption that other factors (genetic & environmental) are equal

=> Assumption that the same brain processes cause the same behavioural changes/functional impairment

=> Assumption that the same test results means the same across languages

The “default settings” of current research

Ethnicity: Caucasian

Culture = Anglo-saxon Culture
(= / = Western / European)

Language = English

"Default languages" of language research

Until 1945 most papers on language assessment on German & French, since 1945 on English

Pick exceptional in advocacy of language comparison

Observations on English form the basis of:

- Language assessment
- Treatment plans
- Theories of language

But to what extent?

Languages in aphasia research: current state

1265 papers since 2000 (*Beveridge & Bak, 2011, Aphasiology*)

English: 61.4%

German: 7%

Italian: 6.4%

Dutch: 4.7%

French: 3.8%

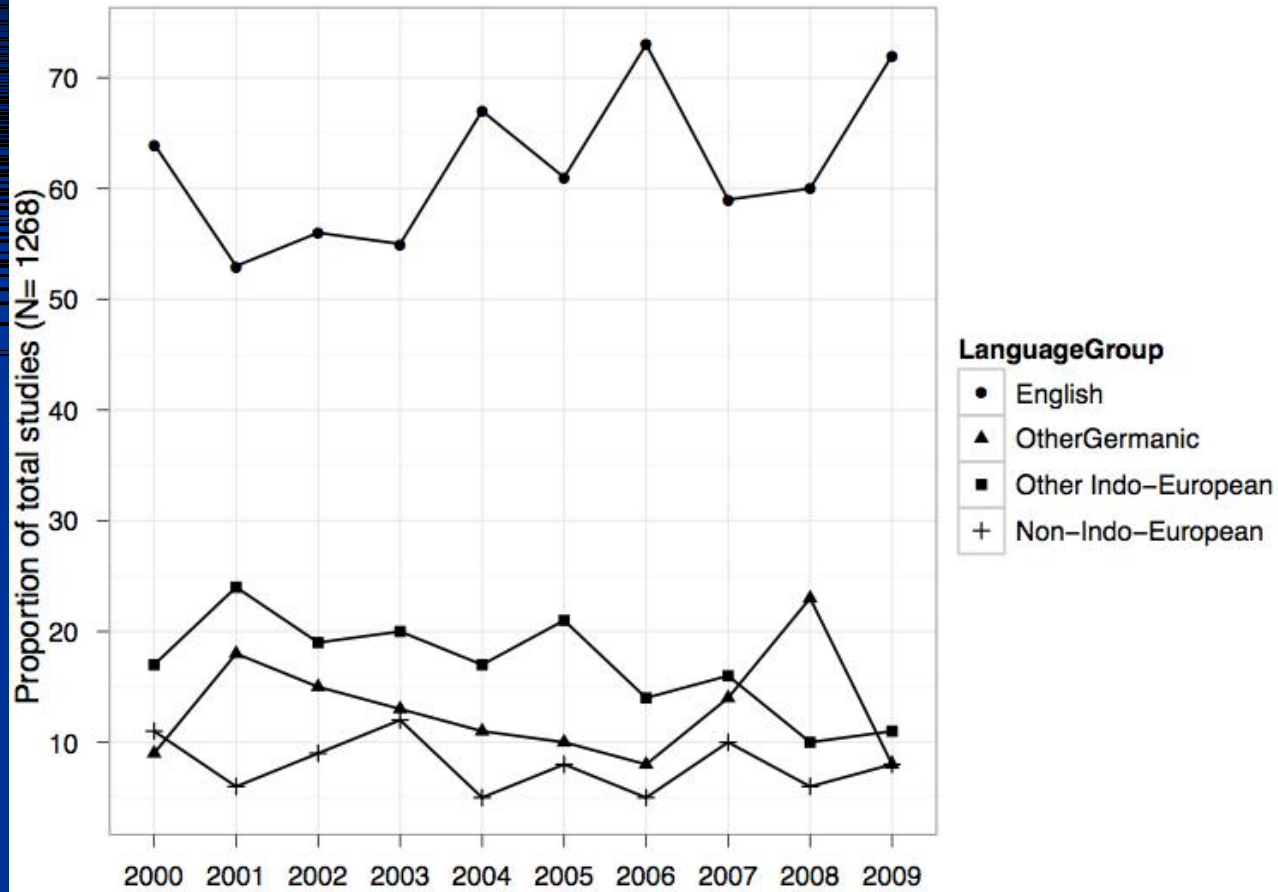
Spanish: 2.8%

Chinese: 2.5%

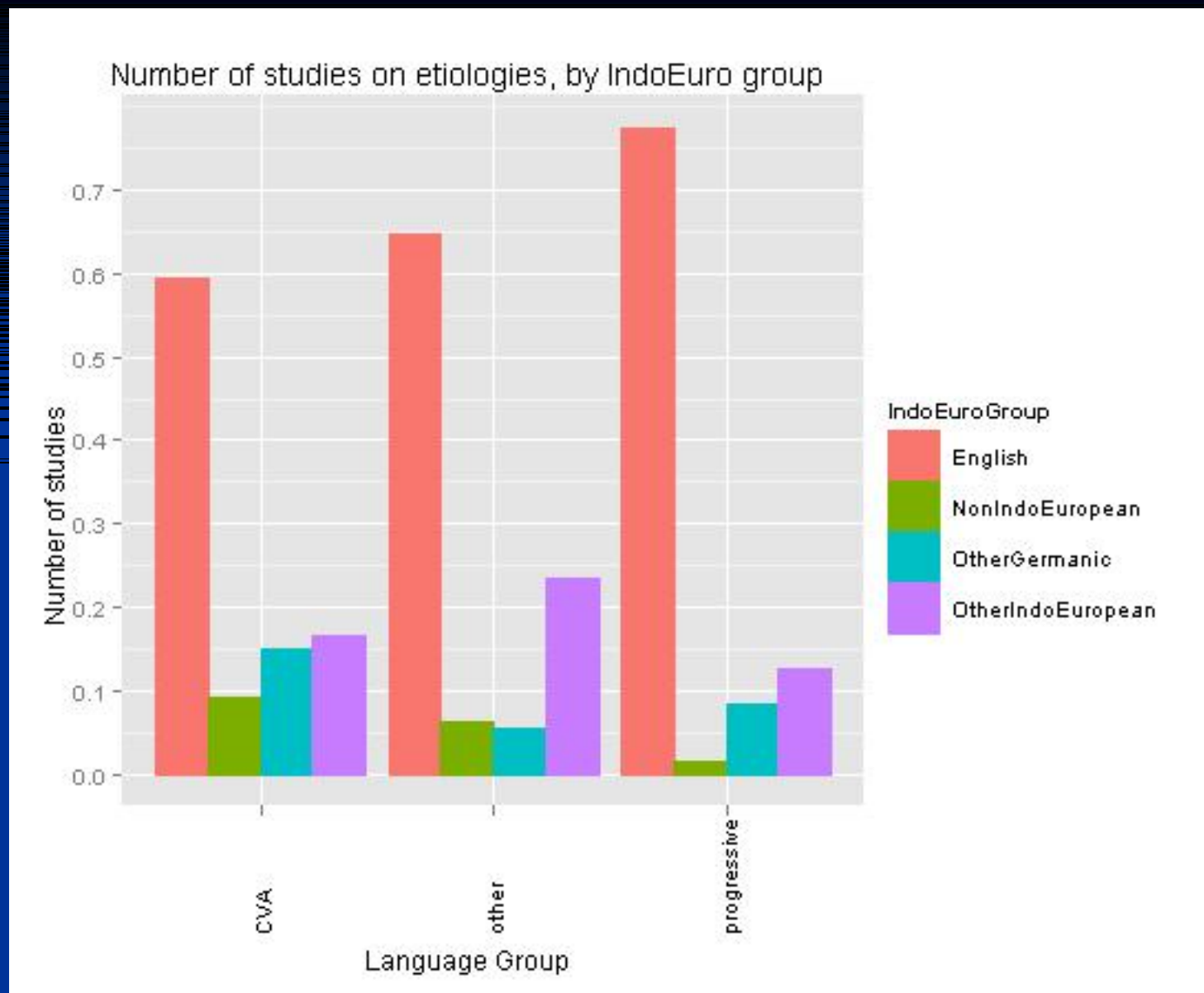
Greek: 1.7%

Hebrew: 1.3%

Japanese: 0.87%



Beveridge & Bak, 2011, Aphasiology



Beveridge & Bak, in preparation

Languages in aphasia research: impact & treatment

Number of citations:

30-50: (21 papers): 15 English, 3 Italian

> 50: (7 papers) 100% English

Papers on aphasia treatment:

85% on English

> 90% on English, German & Dutch

... but does it matter?

Can we study a single language and draw from it generally valid conclusions?

Or

Do specific features of language influence its neural representation and its pathology?

The goals of (language) assessment

Screening

The pathological diagnosis

The functional diagnosis

Longitudinal follow-up:

- Natural history

- Evaluation of therapeutic trials

The dangers of direct translations

Tests developed for a specific language might not be appropriate for another

Emphasises on potentially less relevant features

Missing important features of the target language

English might be a particularly inappropriate model for a large number of languages

How do languages differ from each other?

Languages (like all natural phenomena) do not fall into neat clusters

We can distinguish two types of relationship:

- Genetic (the origin of a language)

- Typological (current features of a language)

- Examples: grammatical gender, inflections

Language as...

Sounds

Words

Sentences

Propositions

Letters

Sounds (Phonology)

Apraxia of speech test: "pa - ta - ka"

Stahl et al, Brain (2011)

Melodic intonation therapy: an effect of melody & rhythm?
Syllabic versus stress-pattern languages

Crinion et al, Human Brain Mapping (2009)

Structural differences between Chinese & English speakers
Higher density in R anterior temporal lobe & L insula
Also in ethnically non-Chinese speakers of Chinese

Words

Morphology:

Polish: uczyć się, uczeń, nauczyciel, uczony, nauka...

English: to learn, pupil, teacher, scholar, science...

Grammatical gender:

Relative preservation

Relative impairment

Sentences

Passive, reflexive, dative constructions

Expressing time:

English: I **was** at home **yesterday**.

Chinese: **Zuotian** wo zaijia.

Hindi: Mai kal gharpar **tha**

Broca's aphasia: the traditional view (based on evidence from English & German)

Agrammatism & "telegraphic speech":

Omission of function words / "closed class words"

Use of uninflected verb forms

Over-reliance on word order

=> "putting together words without grammar"

=> evidence for a pure, selective damage to the
"universal grammar module"?

Broca's aphasia in morphologically complex languages (e.g. Slavonic languages, Greek, Semitic languages)

Produce **inflected** forms

No uninflected stems

No infinitives / nominatives

Produce **existing forms** but in an **incorrect context**:

No neologisms / incorrect morpheme combinations

e.g. incorrect person, number or tense

No omission of function words

Is there a "default writing system"?

The writing systems reflect more cultural, religious and political than linguistic relationships

Persian - Turkish

Hindi - Urdu

Large variation within script families, e.g. alphabetic scripts

English **is extremely atypical** for an alphabetic script in its extent of irregular reading (more comparable to Chinese or Japanese than Spanish or Dutch)

Beveridge & Bak (2012)
Brain & Behavioural Sciences

Alphabetic: 94%

Consonantal/Abjad: 1.9%

Semisyllabic/Abugida: 0.6%

Ideographic: 2.5%

Mixed: 0.9%

Bias in the assessment of written language

Traditionally strong emphasis on reading and writing of irregularly spelled words

=> less focus on regular spelling

MND: reports of spelling errors:

Italian

Japanese (kana)

=> Edinburgh Cognitive Assessment (ECAS):

Spelling the single most sensitive subtests for impairment

A strange condition...

Caused by linguistic deprivation in early childhood...

At least partly reversible if recognised

Causes cognitive deficits (e.g. executive functions)

May accelerate the occurrence of dementia by 4 years

=> Monolingualism

Bilingualism: opposing perspectives

In parts of the Western World seen as:

Rare

Painful, hard work at school

Dangerous (1920's: Welsh "destroys logical thinking")

In large parts of the World:

Part of everyday life

Languages acquired in natural setting

Common switching and diglossia

Patterns of bilingual aphasia

Parallel: 76%

Differential: 12%

Selective: 4%

Blended: 7%

Paradis 2004

Differential aphasia vs. differential recovery?

Generalisation of treatment effects from one language to another?

Patterns of differential bilingual aphasia

First language best preserved (*Ribot 1881*)

Last language best preserved (*Pittres 1895*)

Emotionally most relevant language best preserved
(*Minkowski 1928*)

Relevant language best preserved (*Goldstein 1948*)

Different type of aphasia in both languages:

Broca in English, Wernicke in Hebrew (*Albert & Obler 1975*)

Bilingualism & Dementia

Until 1980's overall negative view of bilingualism

1990's – positive effects of bilingualism on cognition
(first in children, then adults, then elderly)

2007, 2010 Bialystok, Freedman & Craik: Bilingualism
postponing the onset of dementia

2008 Kave: the number of languages correlated with
cognitive performance in healthy elderly

Bilingualism & Dementia cont'd

The majority of bilinguals have immigrant background:

Different ethnic background/genes

Different Lifestyle (diet, occupation, leisure activities etc)

Hyderabad Study (Alladi, Bak et al, Neurology, in press)

650 patients (half mono-, half bi- or multilingual)

Derived from autochthonous population

4-5 y delay for AD, FTD and vascular dementia

An even larger effect in illiterates (6 years)

Conclusions

Language assessment cannot be simply transferred from one language into another

=> tests have to be designed taking into account specific features of language and culture of respective patients

Bilingualism should be taken into account both in clinical work and research

WFN RG on Aphasia & Cognitive Disorders

wfn -> global networks -> research groups

Behavioural Neurology

Special issue; Bilingualism, Cross linguistic/cultural studies, 2015

The Observer,
8 Sept 2013

Thomas H Bak - Aphasia:

from concepts
to clinical applications,
Wiley-Blackwell, 2015

