

- Summary: 0, 1 - intercept at $x=0$ - baseline category
- sum to 0 coding: -0.5, 0.5 intercept is at $x=0$ - mean
- preprocessing: scaling
- fixed and random effects

has countable few levels has many possible levels

Analyses by subjects (f_1) and by items (f_2)

Random intercepts and slopes

- random intercept for subjects - RT varies per subject
- random intercept for items - RT per item
- random slope for age or item - effect of subject; all may be different on some items

non-normal data \rightarrow Box-Cox procedure

Ethics & Data Management in Research

10.04.2020

• human participants, local law, ethical code & management of data
Aspects: proportionality, privacy, protection of personal data, physical and mental integrity of people, equality and non-discrimination, protection of environment and human health

passive consent - opt out, active - opt in

Data management

personal identifiable data - not necessarily ID

Bilingualism and executive functions

ability vs function

- Classified by: age, ability, balance, development, context, motivation
- 1 Language processing 3 Cognitive effects
 - 2 Language & code switching 4 Neural representations

Theories of language representation

- Unitary language system - shared lexicon and grammar
Pros: early LA: fluid system, fluid code-switching, interference
Cons: clear differentiation of language, neuroimaging
- Dual systems: completely separate representations
Pros: speed in tasks between L₁ and L₂, distinct regions in brain, language switching is a controlled process
Cons: language interference when both systems are used simultaneously, flexibility of switching?
- Distributed Conceptual Representation: concepts stored separately
Pros: mapping shared meaning onto a language-specific representation in translation, meaning is independent
Cons: language-specific structures may influence cognitive processing; what cognitive control mechanisms are involved in switching

Cognitive aspects

inhibition, switching, updating - executive control
eye-tracking and fMRI → both languages are activated, only one is not inhibited. Weave lines between non-dominant L and concept storage
code switching + code mixing

fMRI, PET, EEG, ERP → different areas, different brainwaves

Aphasia: can be balanced or not, recovery: parallel / distributed, sequential recovery or concurrent rehabilitation

Errors: interference, code-switching & mixing, phonological (phoneme substitution, enclitic), morphosyntactic (case, gender, number, aspect marker), syntactic (word order, agreement, phrase structure), semantic (wrong choice), pragmatic (misinterpretation of politeness forms, discourse markers)

Effect on executive functions

inhibition, updating, shifting

CANTAB measures

Grammar

human beings VS everyone else

prototyping & priming

physical + neural phenomena + cognitive + social

Generative grammar VS use-based grammar

Lexical-grammatical distinctions

- paradigmatic: open vs closed class
- semantic: grammatical or functional, lexical or contentful
- syntagmatic: obligatory, non-obligatory
- complex distinction in terms of sets of features
phonologically & semantically reduced and vice versa

use-based theory

grammar & lexicon being attention to the most important part

lexical - potentially discourse primary

grammatical discourse secondary

↓
shifts attention

Lexical: can be focused, addressed, modified, stand alone, elaborated
& grammatical attract less attention in processing

* in production more errors, longer RT

* agrammatic speech - grammatical underproduced

Audience design: extra costs for speakers but helps listeners' attention

Clinical Linguistics

11.04.2021

- MCI amnestic
- single Alzheimer's
- multiple vascular + vascular dementia

non-amnestic

frontotemporal dementia Pick's
Lewy body dementia
Primary progressive aphasia Alzheimer's disease

• precursor of dementia. But might deposit, subtype may change
early onset genetically driven

MCI → AD criteria:

- clinical: applied without the need of highly specialized tests
- research: biomarkers (investigational studies, clinical trials):
 - AB deposition - increased A_B 42 in CSF, positive on PET
 - neuronal injury. increased total t or phosphorylated tau in CSF non-specific to AD but increase likelihood: atrophy, loss of hippocampal + Medial Temporal Lobe

Deficits:

Short term memory → long term
episodic → semantic → procedural

Recall is more affected than cognition

Learning is very low, learning curve is not curvilinear
interference in recognition

+ executive functions, visuospatial, attentional control, language

Phonemic fluency: spared in MCI

Semantics: much more impaired. 9 years before dementia

Naming: unstable in MCI

Word-finding - more difficult in AD

PPTT: declined in AD and MCI

Primary Progressive Aphasia

Frontotemporal dementia → behavioral issues or language trail

language is the primary affected feature
nonfluent, semantic, logopenic variants

Language: atrophy starts in different areas

RAVLT

CVLT

LM I-II

Boston Naming Test

Clinical Linguistics

- some "developmental" can be acquired
- Acquired - loss of previously acquired skill. Primary disorder.
- local lesion, diffuse injury. Neural trauma & disease
- Aphasia required language disorder due to local brain injury
- non-degenerative
- 1/4 patients recover after 3 months
- decrease from then on
- after 6 months 1/4 severely affected, recovering less likely

Classification: Fluency & comprehension

fluent *Broca	VS	non-fluent *Wernicke
content, lexical, ...		speech full but incomprehensible
anterior	posterior	plasticity

Childhood aphasia: more unclear, can happen at any age. ^{infective,} ^{bleeding} injury, epilepsy-aphasia

Introduction to Neuroimaging

- location & timing
- slow
- blood + electricity - direct & immediate
- EEG & MEG
- MMN - 200s, mismatch physically PET, fMRI
- P400 - semantic incongruity contextual integration expectation
- P300 - oddball effect
- P600 - syntactic anomalies lack of the head syntactic reanalysis
- MEG \rightarrow EEG temporal, spatial
superimposed w/ the anatomical view
- M170 left - letter string reading 400-500ms interlexical competition
- M250 - phonological stimulus N400m - lexical and post - S
- M350 - lexical activation

dyslexia vs alexia
dysgraphia vs agraphia

PTSD & Broca's aphasia

17.04.2025

- increased reevaluation vs. care of re-experiencing trauma
"transient aphasia"

, PTSD → reduced WM capacity

Morphological processing in OCD

storage: unified or separated

- OCD: procedural memory impairments

written vs derivations

Broca's aphasia • slower speech

+ telegraphic

• shorter utterances

• paragrammatism

+ less syntax

→ strategies to reduce cognitive load

Adapting to signlanguage trends

Concreteness; hand shape, orientation, location, movement, facial expression

Aphasia → maps to signs around

Phonological Component Analysis

Language-brain co-evolution: Arthur & striatum

behav. + linguistic rigidity ← enhanced striatum activity

evolution: recent development in humans in Broca's / basal ganglia connectivity

replacing reactive aggression with verbal aggression

Emergent morphological sensitivity in children

morphological differences are recognized

cluster permutation analysis

Challenges & choices of working with aphasic multilinguals

linguistic & cultural bias

experiment driven debrief vs normative

anglocentric bias

Bilingual Aphasia Test

Comprehensive Aphasia Test