Does Grosjean's Language Mode require Variable Language Activation?

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The Wellsprings of Linguistic Diversity

In this talk …

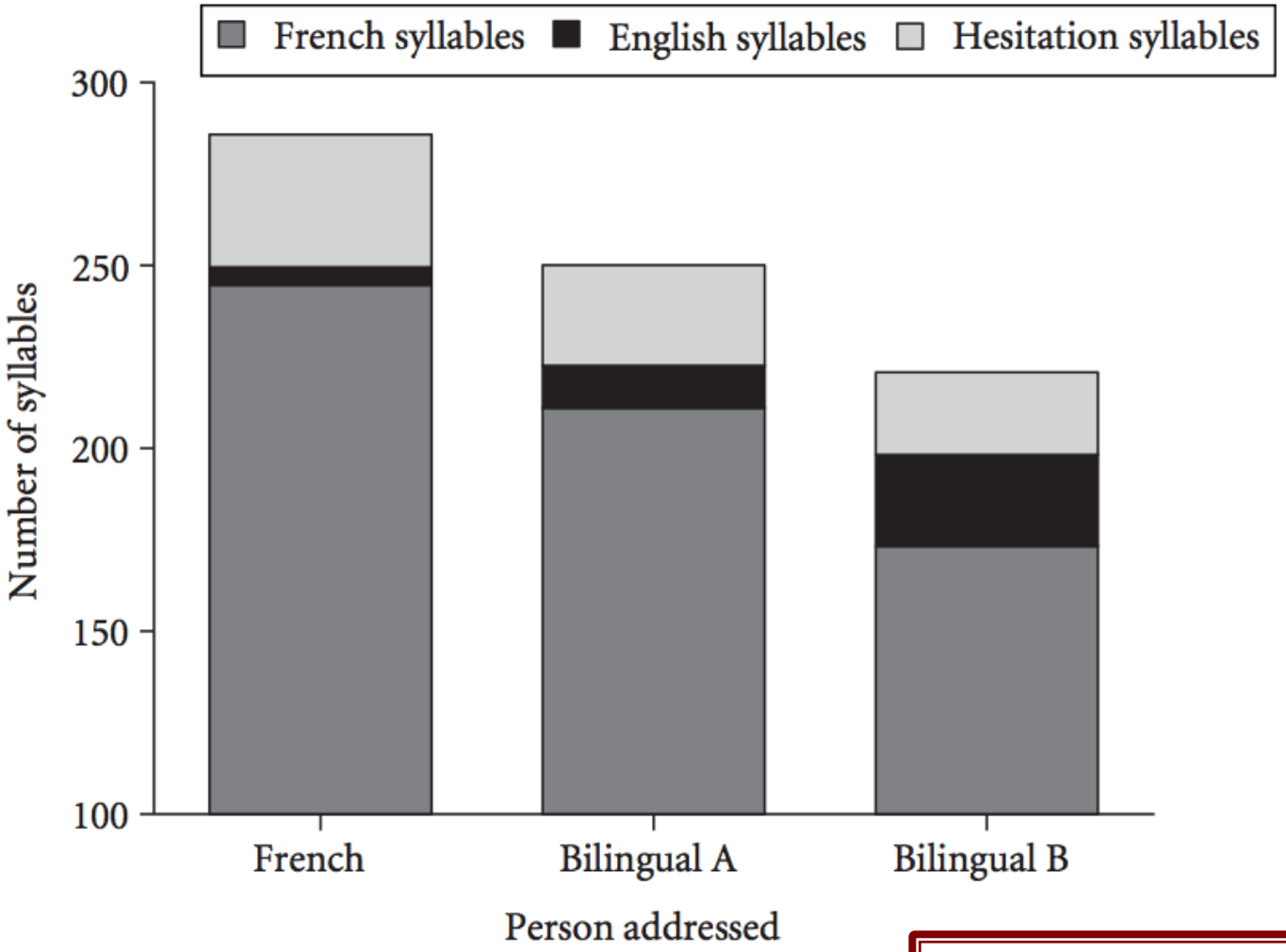
- Grosjean's language mode
- Control by variable activation
- Control by monitoring
- They are indistinguishable …
- No they're not
- But both are needed

Grosjean's Language Mode

- Lexical mixing
  - Chicken-em jesteś i tyle! — You're chicken and nothing else.
  - Nie mam driver license-u. — I don't have a driver's licence.
  - Ja bym nie wierzył customer-owi. — I wouldn't believe a customer.
  - Góry Perthskie. — The Perth hills.
- how do bilinguals avoid making more lexical intrusions?

Ulatowska (2013)

Grosjean's Experiment



Grosjean (1997,2008)

The Variable Activation Model

of bilingual control

- **activation** – readiness to use lexemes from a partcular language
- **base language** – functionally dominant language
- **variable language activation** – languages have varying levels of readiness for production
  - a.k.a. *language mode*

Grosjean (1997, 2008)

Grosjean's Activation Model

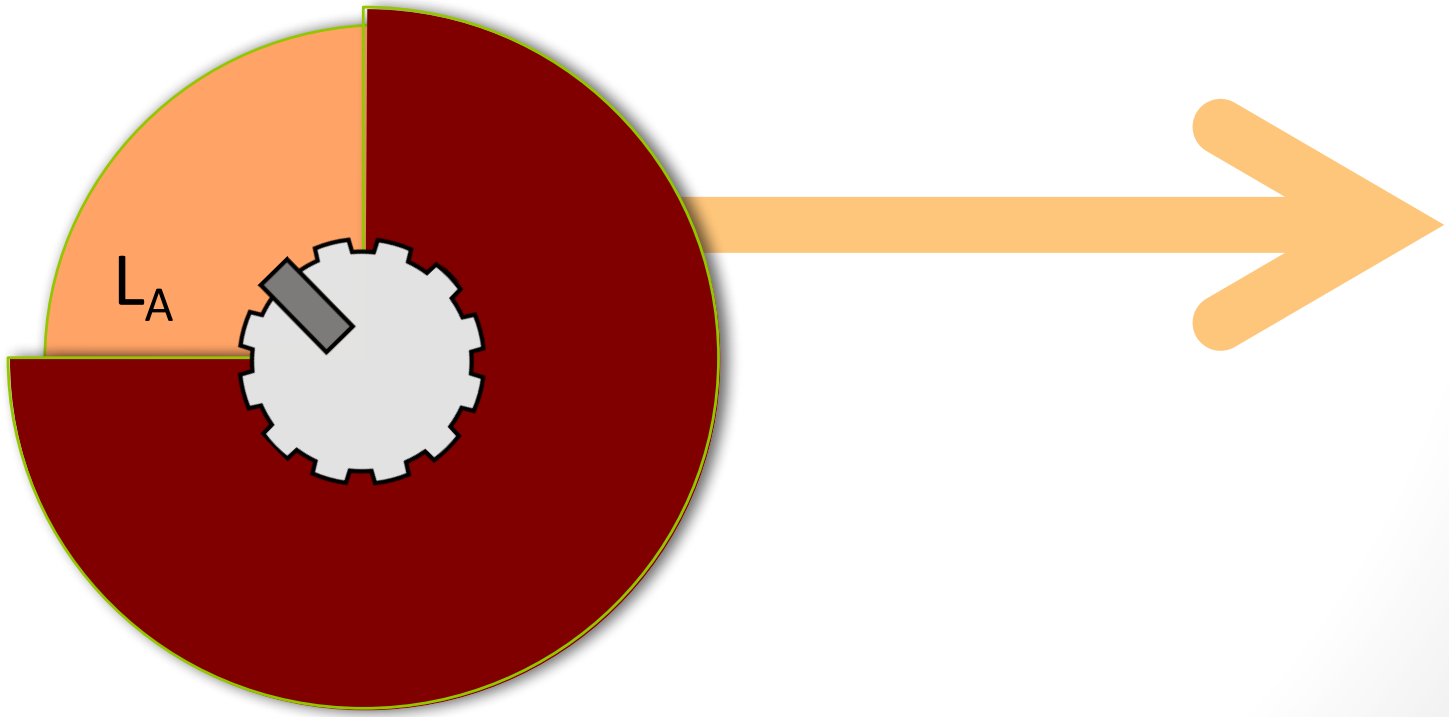
of bilingual control

base language: L_A

language mode: monolingual

$P(w \in L_A) = 1.0$

$P(w \in L_B) = 0.0$



Grosjean's Activation Model

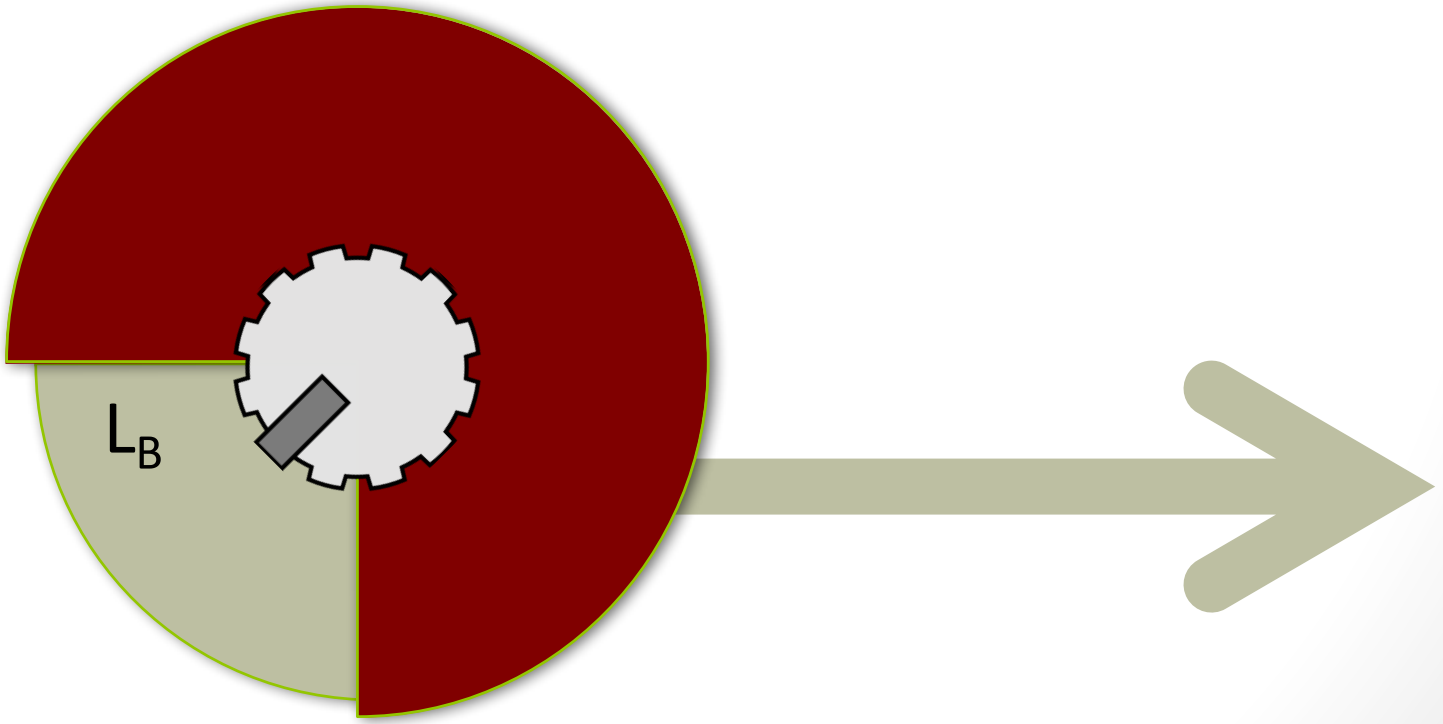
of bilingual control

base language: L_B

language mode: monolingual

$P(w \in L_A) = 0.0$

$P(w \in L_B) = 1.0$



Grosjean's Activation Model

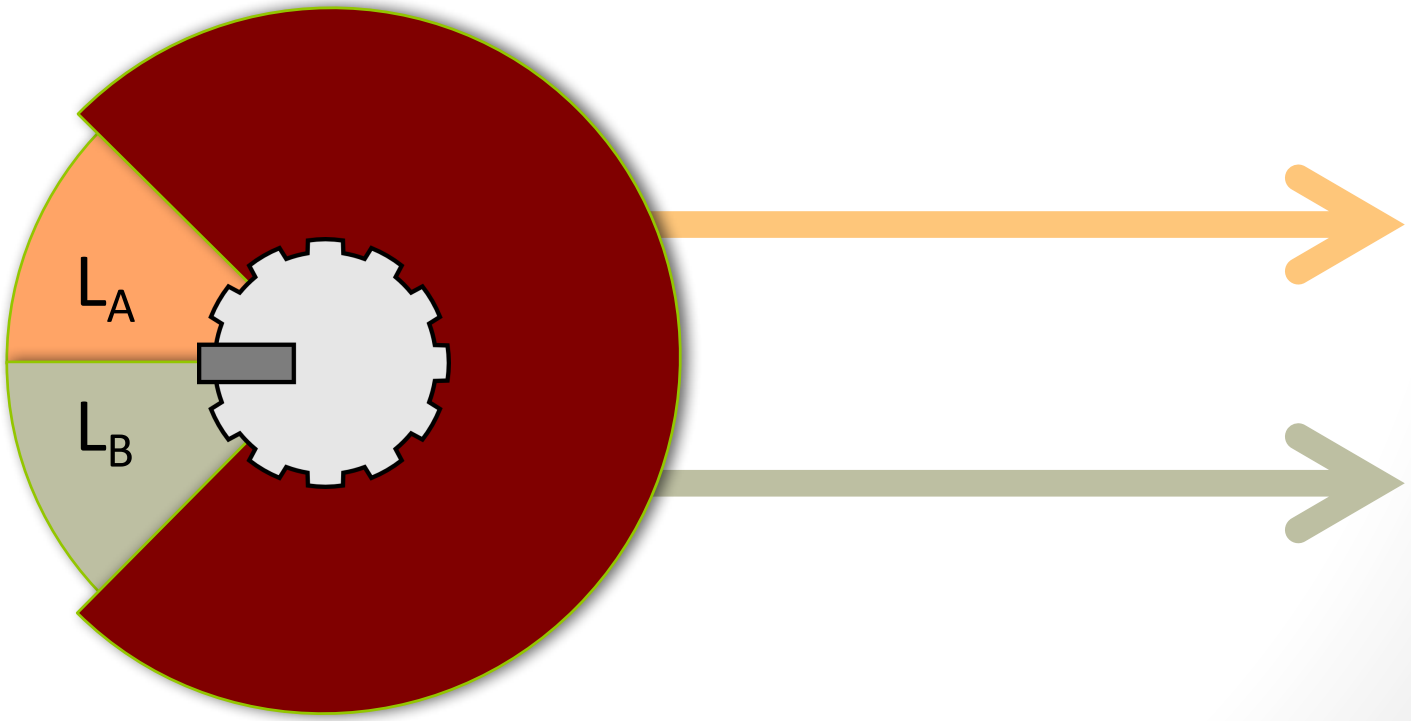
of bilingual control

base language: either L_A or L_B

language mode: 100% bilingual

$P(w \in L_A) = 0.5$

$P(w \in L_B) = 0.5$



Grosjean's Activation Model

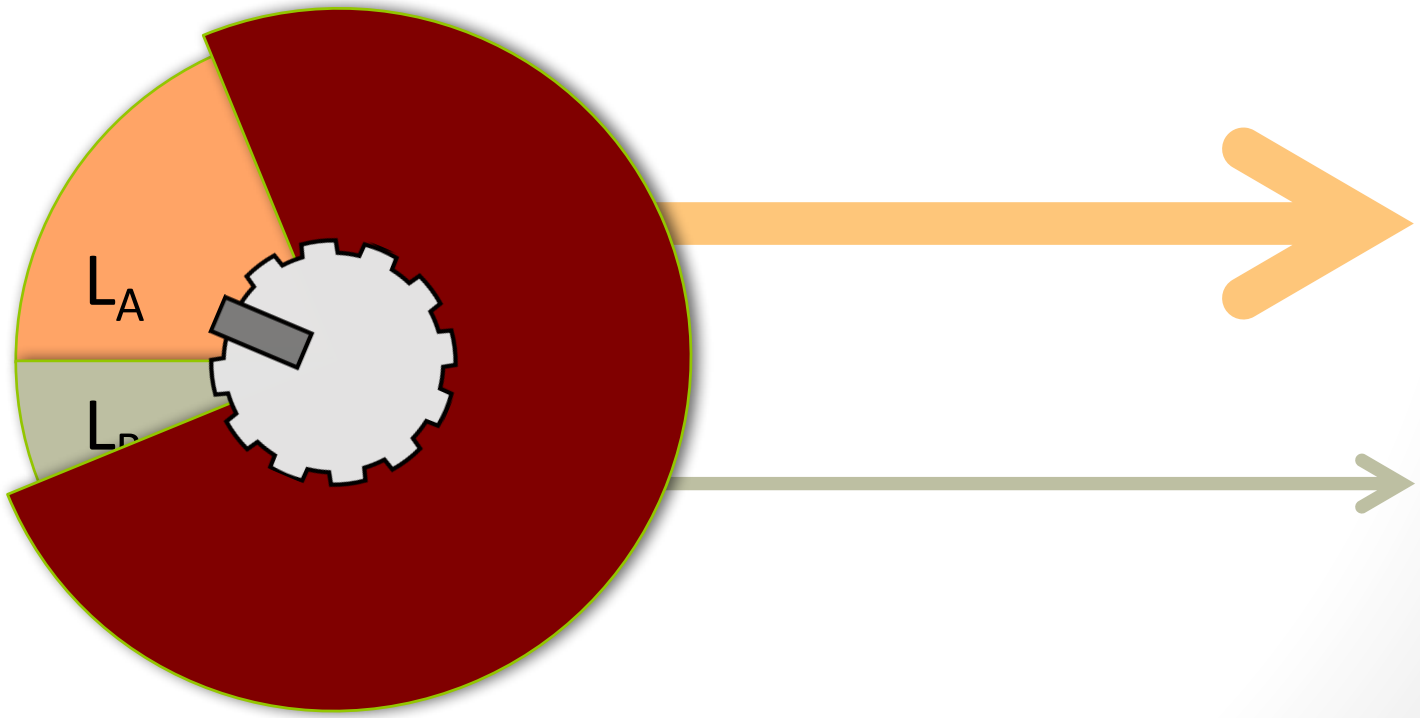
of bilingual control

base language: L_A

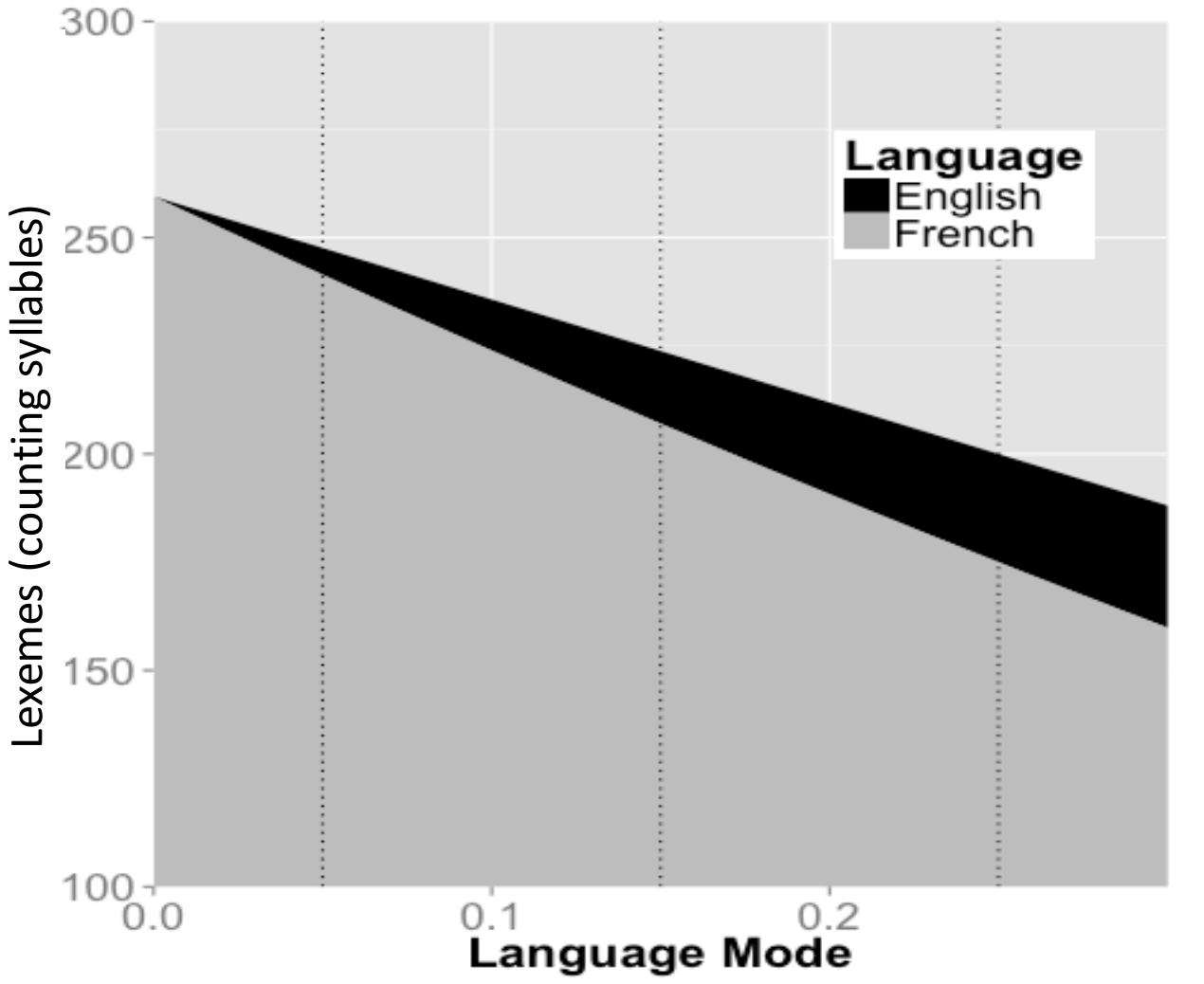
language mode: 50% bilingual

$P(w \in L_A) = 0.75$

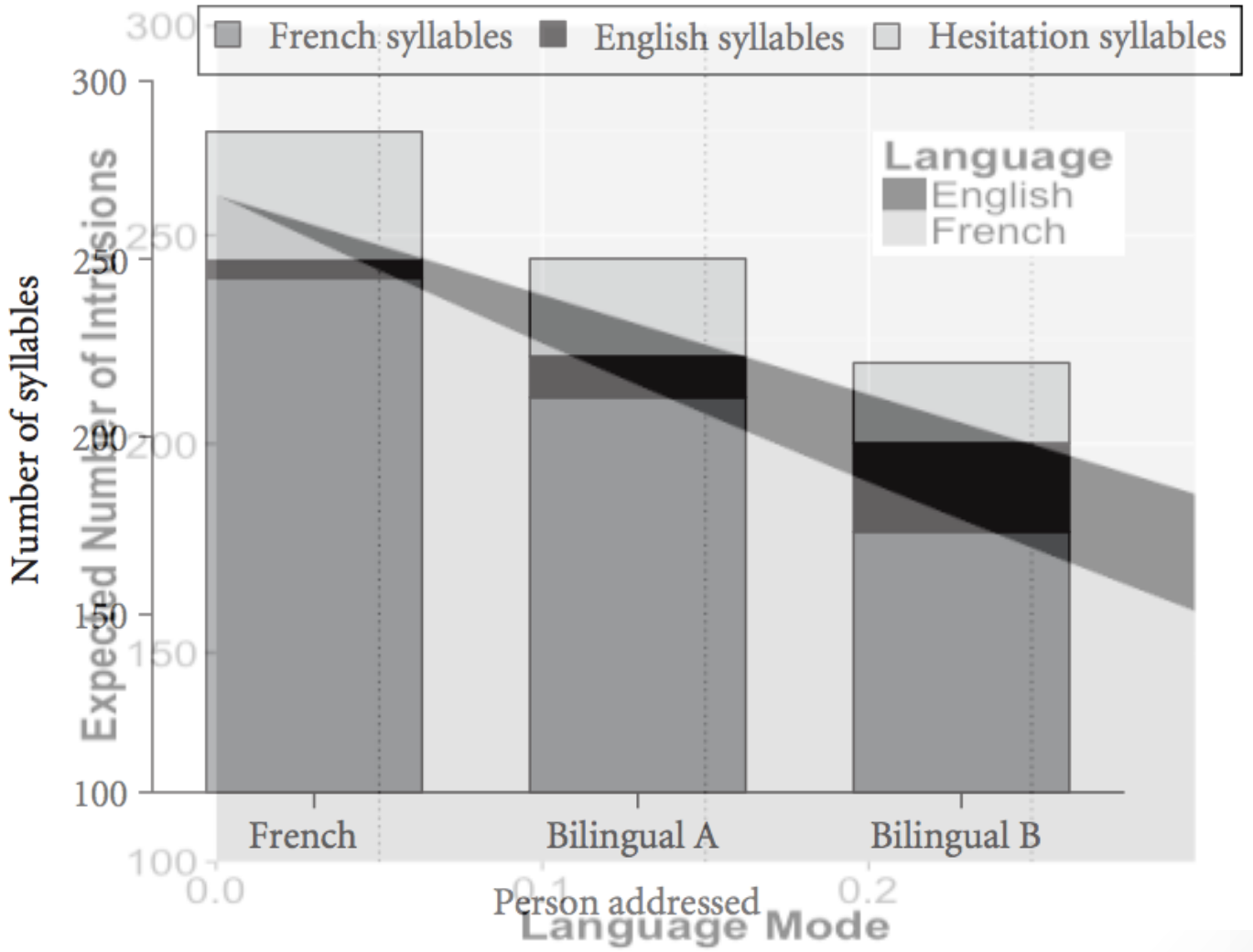
$P(w \in L_B) = 0.25$



Accounting for the Experiment



Grosjean's Experiment



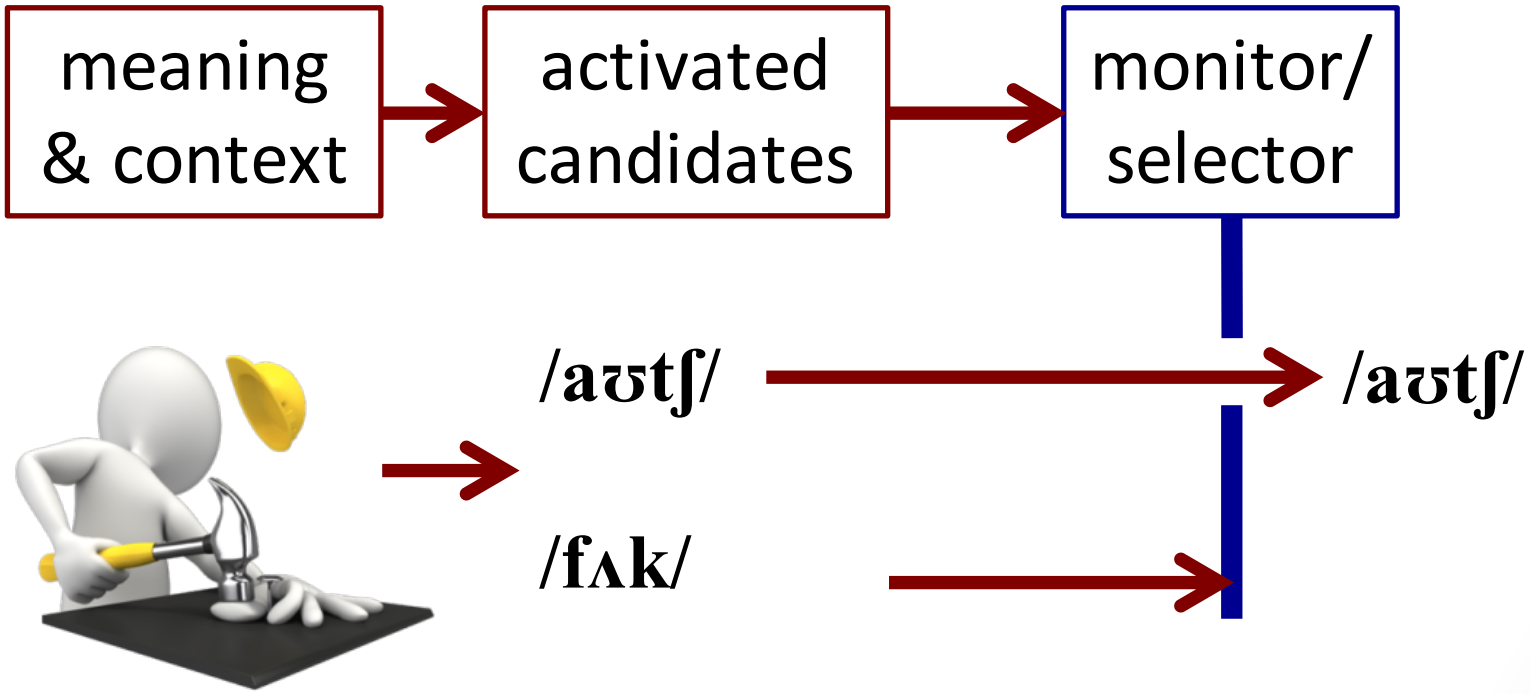
Variable Activation Summary

- The more *activated* a language, the more ready it is to be used
- Behavioural *language mode* combines activation levels across available languages
- The relative frequency of different language items is a good estimator of their relative activation

The Monitor in Production

- Levelt (1989) envisaged an error-detection/correction stage in production, guarding against:
  - slips of the tongue
  - lexical choice errors
  - taboo words

Monolingual Use of Monitor



Language Selection by Monitor

- Is monitoring used to enforce language selection?
- Festman & Münte (2012):
  - divide bilingual participants into two groups by level of intrusions
  - test groups on 4 cognitive control tasks
- Non-switchers better at all four tasks

Festman & Münte (2012)

Language Selection by Monitor

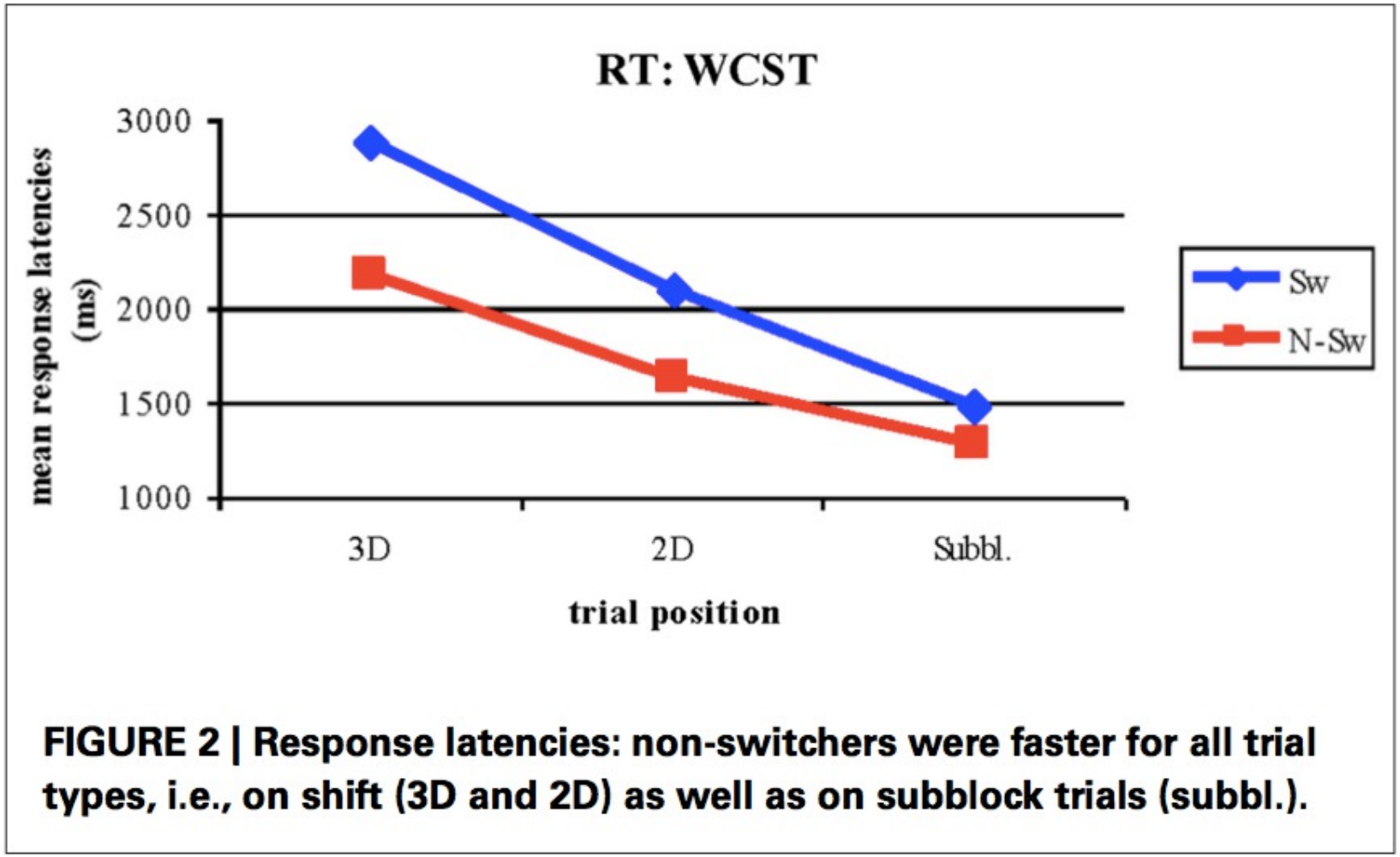
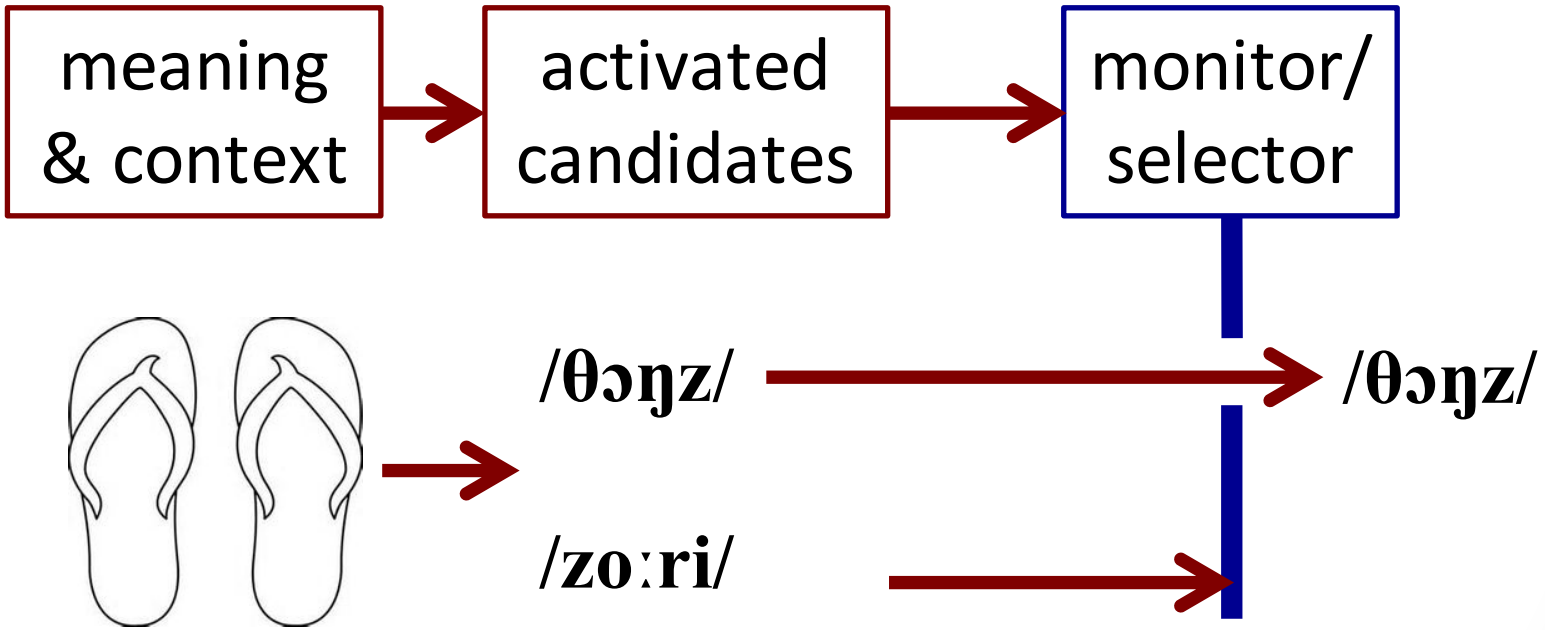


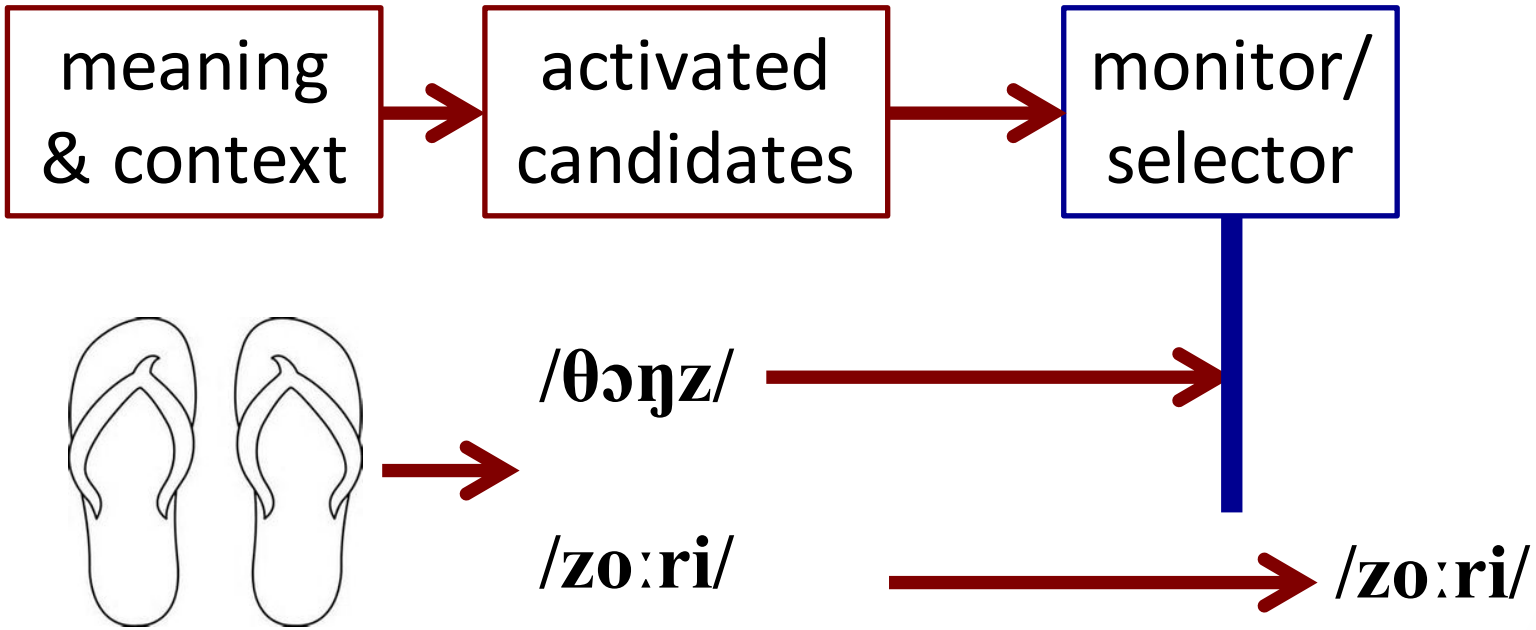
FIGURE 2 | Response latencies: non-switchers were faster for all trial types, i.e., on shift (3D and 2D) as well as on subblock trials (subbl.).

Festman & Münte (2012)

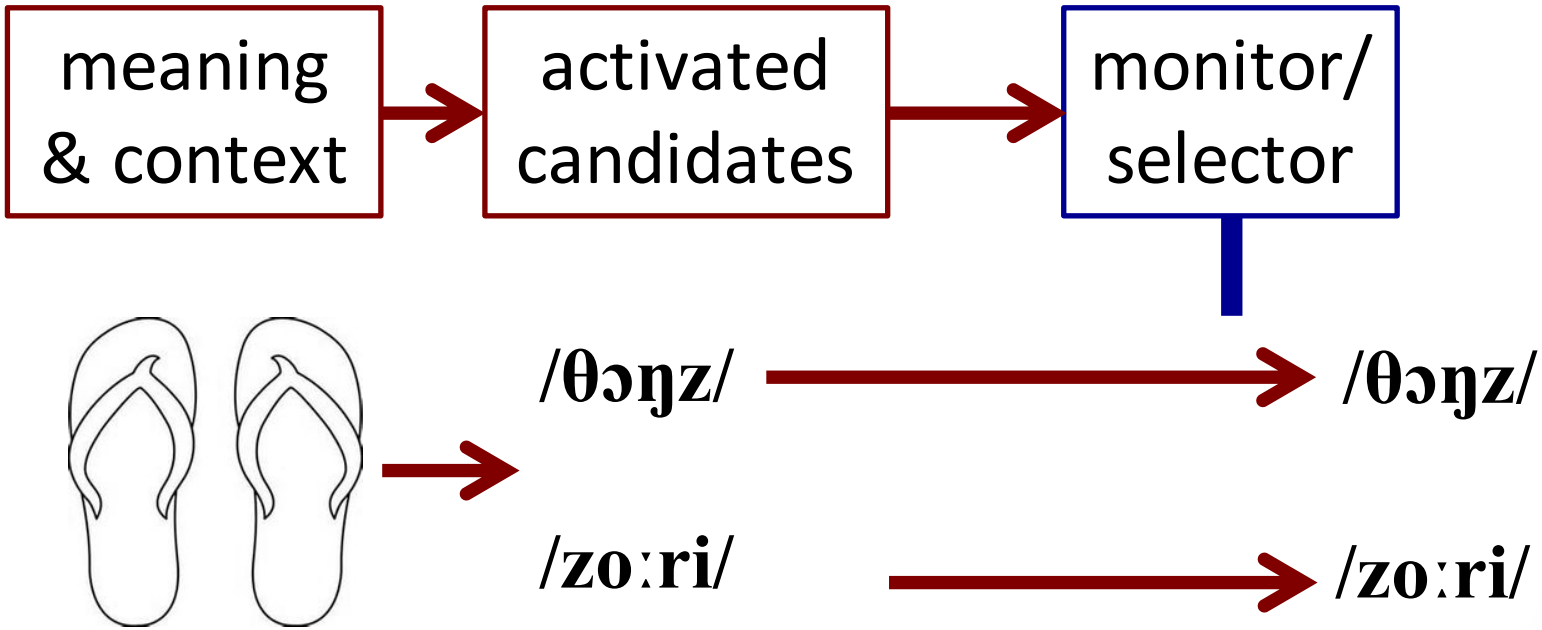
Language Selection by Monitor



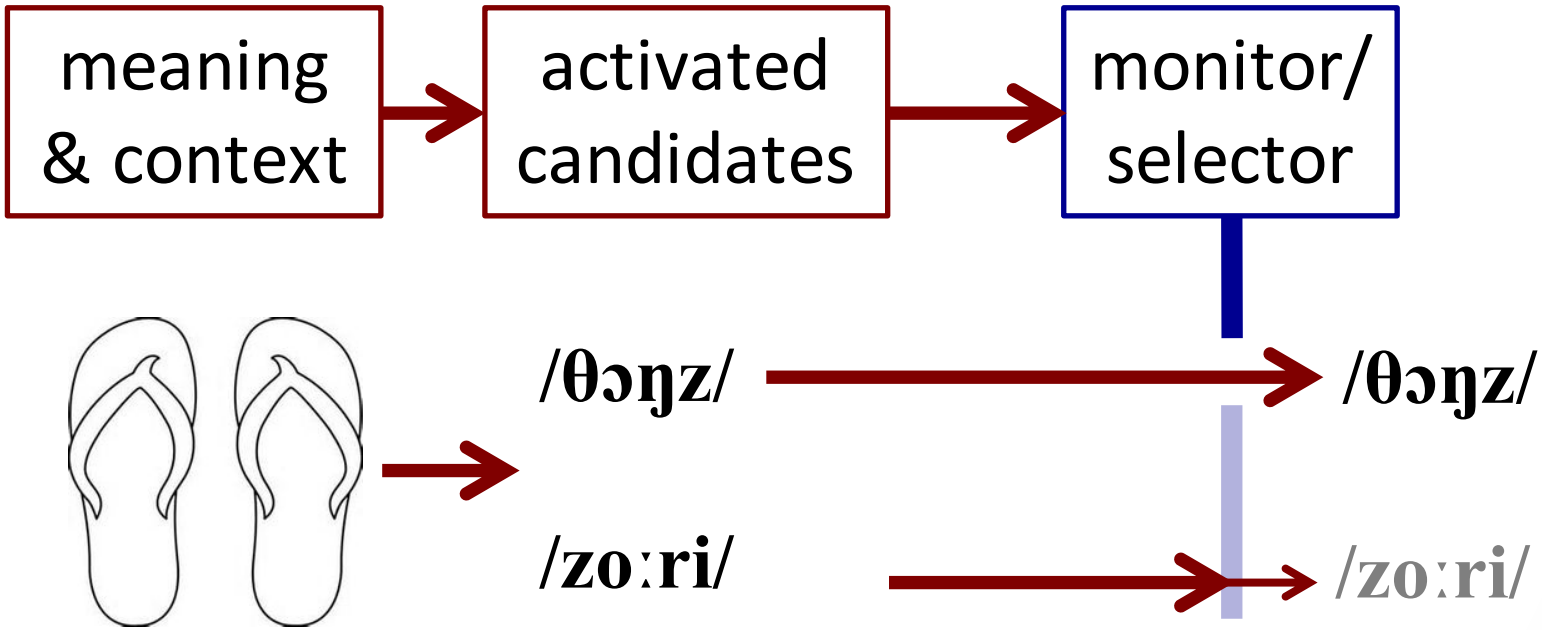
Language Selection by Monitor



Language Selection by Monitor



Language Selection by Monitor



weak but present monitoring

They're Indistinguishable …

- De Groot (2011:293, drawing on Dewaele 2001) argues that:

  it remains to be seen whether … adaptability concerns fluctuations in the degree of activation of the bilingual's two language subsets or fluctuations in the attentiveness of a mental monitor that watches over the output of the language system

No They're Not (I)

- ERP evidence
  - ERN is a variation in potential, associated with ACC
  - marks conflict between incompatible outputs
  - ERN bigger in bilinguals using L2 than using L1
  - So more competitor conflict using L2 than L1
  - So variable levels of activation of competitors

Monitoring and ERP

- event-related potentials
- error-related negativity (ERN) Gehring et al., 1993
  - internal monitoring as its too fast
- related to response conflict Swick and Turken, 2002
- implicated region *Anterior Cingulate Cortex*

The Anterior Cingulate Cortex

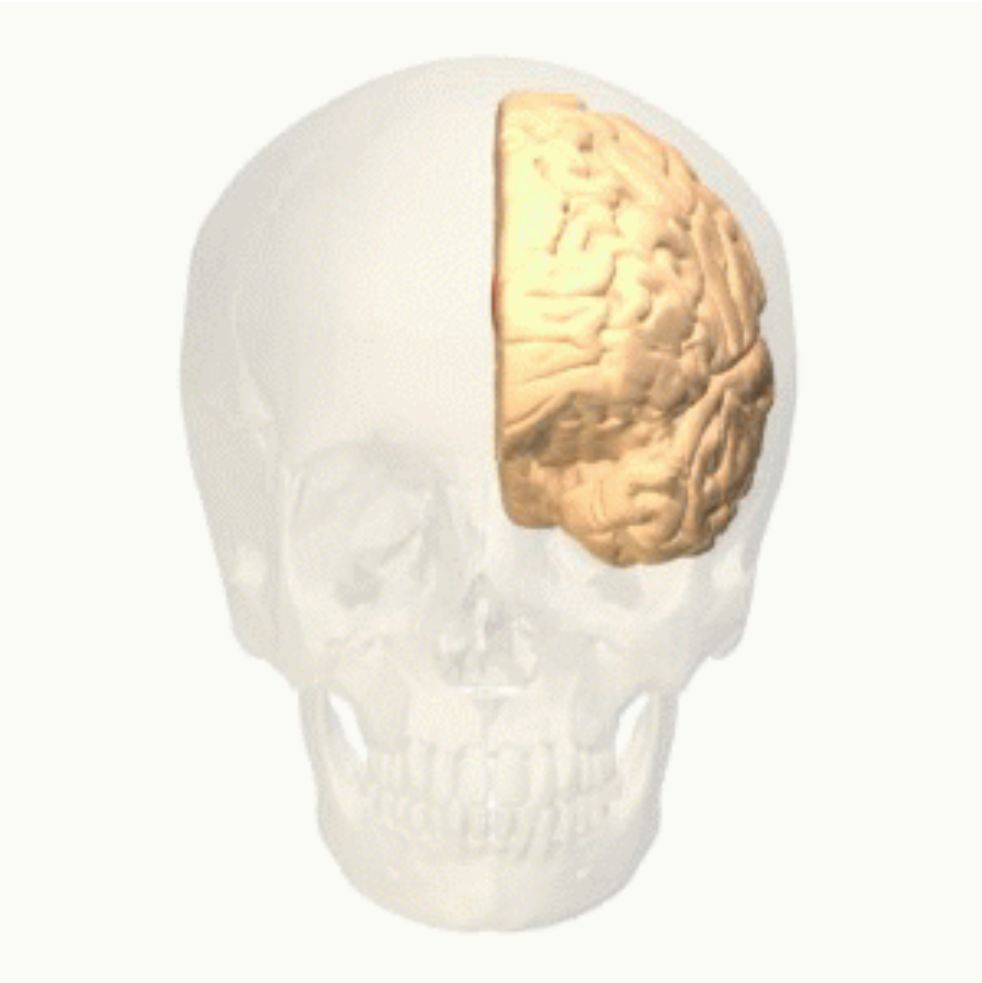
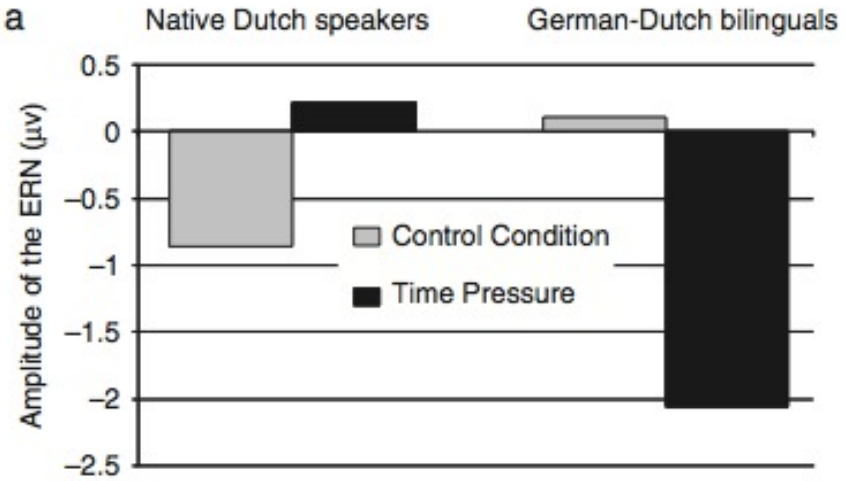


Image: https://en.wikipedia.org/wiki/Anterior_cingulate_cortex#/media/File:Anterior_cingulate_gyrus_animation.gif

Monitoring and ERP

- ERN marks conflict between incompatible alternatives Botvinick et al. (2001,2004)
- phoneme monitoring task under time pressure, ERN is smaller in L1 than L2 speakers Ganushchak & Schiller (2009)



Monitoring and ERP

- ERN marks conflict between incompatible alternatives Botvinick et al. (2001,2004)
- phoneme monitoring task under time pressure, ERN is smaller in L1 than L2 speakers Ganushchak & Schiller (2009)
- so less conflict when using dominant language
- so fewer competing candidates activated?

No They're Not (I)

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  - marks conflict between incompatible outputs
  - ERN bigger in bilinguals using L2 than using L1
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No They're Not (II)

- Eye-tracking of distraction
  - teach monolinguals and bilinguals a new *language*
  - bilinguals less prone to distraction
  - no monitoring involved (because perception)
  - bilinguals have better control over language-level activation

Bartolotti & Marian (2012)

Both are Needed

- Evidence for monitoring in bilingual production
- Evidence for variable activation
  - variable levels of ERN depending on context
  - variable levels of distraction in perception tasks
- Both are needed
- Both happen

Summary and Conclusions

- Grosjean argues for a differential activation explanation of variable mixing
- De Groot suggests a monitoring explanation
- Bilingual monitor more in production in L2 than L1
- This doesn't fit with a purely monitoring explanation
- Perception does not involve production monitoring but does involve activation
- Bilinguals less prone to distraction than monolinguals
  - i.e. they control activation levels
- Bilingual flexibility can only result from situation-sensitive shifts in language activation
- Production combines variable activation and monitoring

Thank you for your attention!

Luisa Miceli