MAIN QUESTION
What cognitive mechanisms allow bilinguals to quickly switch from speaking in a dominant language to speaking in a non-dominant language?

BACKGROUND

• Bilinguals are very good at preventing accidental language intrusions (Gollan et al., 2011; Pollock & Bongaerts, 1994).
• How? One common proposal: They use inhibition

Hallmark of Inhibition = Asymmetrical Switch Costs

• How does inhibition work? At what processing level(s) is it applied?
• Several possibilities (Green, 1998):
  • Language-wide: Applies equally to all words in a language
  • Reactive: Words inhibited in proportion to their activation levels

• Major source of evidence for inhibition: switch cost asymmetry (Allport et al., 1994; Meuter & Allport, 1999; but see Koch et al., 2010; Verhoef et al., 2009)
  • Switch costs: A result in which switching into a language is more difficult than staying in that language
  • Often interpreted as a measure of how much inhibition is needed
• Switch cost asymmetry: Greater switch costs for the dominant language than the non-dominant language
• Logic: More inhibition of dominant language needed to speak non-dominant language than vice-versa

Present Research: Use word frequency to determine locus of inhibition

• If the switch cost asymmetry is due to language-wide inhibition:
  • All words within a language affected equally
  • Low-frequency (LF) and high-frequency (HF) words should show equal asymmetries

• If the switch cost asymmetry is due to reactive inhibition:
  • Inhibition should be greatest for words that are highly active
  • Larger asymmetry for HF than LF words

• Alternatively, maybe inhibition is greatest for a word that has a much higher activation level than its translation equivalent
  • Greater difference in activation between translation equivalents for LF than HF words (Duyck et al., 2008; Gollan et al., 2008)

• Most inhibition for dominant LF words (octopus)
• Least inhibition (if any) for non-dominant LF words (pulpo)
• Moderate inhibition for all HF words (hand, mano)
• Larger asymmetry for LF than HF words

METHODS

Participants: 68 Spanish-English bilinguals

Materials and Design: 192 pictures (only 64 named by each subject)
• 96 LF pictures (mean lemma frequency = 9/million; SD = 6)
• 96 HF pictures (mean lemma frequency = 114/million; SD = 129)
• Median lemma frequency = 20/million
• Cued switching block included in a counterbalancing order with other blocks (always preceded by English-only and Spanish-only blocks, and sometimes by a voluntary switching block) (Gollan, Kleinman, & Wierenga, in press)

RESULTS

• Significant switch cost asymmetry for LF words (181 ms; p < .01)
• No asymmetry for HF words (18 ms; p = .62)
• Significant 3-way interaction between asymmetry and log frequency
• Larger asymmetry for LF than HF words (p < .05)
• Largest switch costs for dominant LF words (174 ms)
• No switch costs for non-dominant LF words (<1 ms; not sig.)
• Intermediary switch costs for dominant HF words (117 ms) and non-dominant HF words (103 ms)

CONCLUSIONS

• Language-wide inhibition cannot explain why asymmetry is there for LF targets and not for HF targets
• Suggests that the degree to which a word is inhibited depends on its activation level relative to its translation equivalent's
• Invites an account in which translation equivalents directly compete for production
• Alternative non-inhibitory account: Non-dominant LF words at RT ceiling
• Used so rarely, they may require additional retrieval mechanisms
  • Could explain lack of switch costs without assuming inhibition

REFERENCES


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Contact email: dkleinman@ucsd.edu
http://sites.google.com/site/kleinman/