Do different languages train our brain in different ways?
The discussion of *typological distance* and its influence in the *bilingual brain*

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Focal Message

There is reason to hypothesize that **different languages, with different linguistic designs, may stimulate the brain in different ways.** With this hypothesis, **theoretical foundations in language, cognition, and neuroscience are needed** to further investigate the role of L1-L2 typological distance in the bilingual brain.

'It is unlikely that there will be a single effect of bilingualism'
-Kroll & Chiarello, 2016, p. 347

- Age of Acquisition
- L2 Switching Frequency
- L2 Proficiency
- Linguistic Distance & Skill Engagement? ?

Language

'L1-L2 Typological Distance' is not well-defined in bilingualism scholarship

This definition is crucial because languages can differ exponentially in various linguistic dimensions. The processing of these dimensions can take up different levels of effort, depending on the individual's background languages and perceived L1-L2 distance (i.e., psychotypology).

Neuroimaging research thus far gives insight into how linguistic the specific designs of a language may activate different parts of the brain. This has implications for processing across various dimensions of typological distance:

Dimensions of Typological Distance

- Complexity of grammatical forms — De Martino et al., 2020
- Lexical status/ orthographic similarity — Baeck et al., 2015
- Tonality — Chien et al., 2020
- Orthographic transparency — Meschyan & Hernandez, 2006
- Logographic vs. alphabetic scripts — Coderre et al., 2008

Skill Engagement

Under the umbrella of typological distance, the type of **skill(s)** that a bilingual uses in their L2 may have an influence on cognitive demand

Imagine **the different levels of inhibitory control** needed in these scenarios:
Reading in a typologically similar L1-L2 pair (e.g., Spanish-Portuguese) vs. *Producing* in a typologically similar L1-L2 pair

Or, imagine **the different types of memory** needed for the following scenarios:
Recognizing the logographic characters of a distant L2 (e.g., Mandarin characters) vs. *writing them out* by memory

Neuroscience

The fundamental connection between bilingual neural activity and neurostructural changes is not yet strongly confirmed

Scientists are still unsure whether repeated engagement with a brain function in bilingual activity necessarily leads to neuroanatomical changes. This foundation is key for further investigations into the impact of L1-L2 typological distance in the bilingual brain.