

Bilingual vs Monolingual Processing of “Untranslatable” Concepts (2023–2025)

Introduction

“Untranslatable” concepts are words or ideas that exist in one language/culture with no direct equivalent in another. Bilingual individuals, who navigate two linguistic worldviews, offer a natural experiment in how language shapes thought. Recent research (2023–2025) in psychology and neuroscience has begun to unravel how bilinguals process such culturally-specific concepts differently from monolinguals. These studies span behavioral experiments – examining decision-making, emotion, and cultural cognition – and neuroimaging investigations (fMRI, EEG) that probe the brain’s handling of language-specific meanings. Below, we summarize key findings, methodologies, and implications from peer-reviewed studies in this period.

Behavioral Studies: Decision-Making and Cultural Cognition

Foreign Language Effect on Decision-Making: A robust finding is that the language context can systematically alter decisions. Bilinguals often exhibit the *Foreign Language Effect (FLE)* – making more utilitarian, less emotionally biased choices when using their second language (L2) compared to their native tongue ¹ ². For instance, a 2023 eye-tracking experiment by Brouwer *et al.* had Dutch–English bilinguals consider moral dilemmas (e.g. “would you kill one to save five?”) in either L1 or L2 ³. Bilinguals using their foreign language were more willing to take utilitarian actions, replicating the FLE in moral decisions ². Eye movements suggested a difference in focus: in L1, participants fixated more on victims they *wouldn’t* sacrifice (perhaps feeling greater guilt/empathy), whereas in L2 they looked more at those sacrificed ⁴. This implies reduced emotional aversion in L2, making decisions more outcome-focused. Consistently, a recent meta-analysis confirms the FLE is reliable across studies, independent of age of acquisition or task format ⁵ ⁶. In practical terms, thinking in a foreign language tends to “*nudge*” people toward more analytical, risk-tolerant choices ¹ ⁷.

Emotion and Cognition in L1 vs L2: Language also modulates emotional processing and memory. Bilinguals generally report that their native language (L1) carries more emotional weight, whereas L2 provides emotional distance ⁸ ⁹. For example, recalling a traumatic childhood memory in an L2 triggers less distress than doing so in one’s L1 ¹⁰. Likewise, **Keysar et al. (2023)** found that using a foreign language can even reduce cognitive biases like false memories. In their study, bilingual participants did memory tasks (recalling word lists and witnessing film clips) in L1 vs L2; those using L2 were significantly less prone to false recalls and misinformation effects ¹¹ ¹². The authors suggest that operating in L2 encourages more deliberate, systematic processing (“monitoring” one’s memory) which guards against intuitive errors ¹³. This aligns with evidence that L2 attenuates automatic emotional reactions – a recent systematic review noted a consistent “*L1 advantage*” in emotional intensity and an “*L2 advantage*” in emotional regulation ¹⁴ ¹⁵. In other words, the native language elicits stronger automatic emotion (faster amygdala engagement, vivid memories), while the second language blunts emotional resonance, helping bilinguals stay more rational and calm under emotional circumstances ¹⁶ ¹⁷. This emotion dampening in

L2 can lead to more **rational decision-making and reduced emotional bias in tasks** ¹⁷ – bilinguals using L2 show lower skin conductance and arousal to emotional stimuli and can more easily discuss upsetting topics without anxiety ¹⁸ ¹⁵ .

Cultural Cognition and “Frame Switching”: Bilinguals often experience shifts in mindset or “personality” between languages, reflecting internalized cultural concepts. Studies have found that bilinguals answer personality inventories differently depending on the language, suggesting that each language context activates distinct cultural norms and self-concepts ¹⁹ ²⁰ . For example, Chinese–English biculturals in the U.S. reported feeling freer to express emotions in English (their L2, due to Western norms encouraging openness) but felt emotions more intensely when speaking Mandarin (L1) ²¹ . Such *cultural frame switching* means a bilingual might be more assertive or individualistic in one language and more modest or interdependent in the other, mirroring the untranslatable cultural values embedded in each tongue ²² ²³ . Furthermore, *tolerance of ambiguity* – comfort with uncertainty and new experiences – appears higher when bilinguals use their L2. **Purpuri et al. (2023)** primed Italian–English bilinguals to think in either language and measured this trait, finding that participants scored significantly higher in ambiguity tolerance in their second language ²⁴ ²⁵ . This suggests that the cognitive flexibility of using a non-native language might open one’s mindset to novel possibilities. Across these behavioral studies, the overarching theme is that **bilingual minds do not process concepts in a vacuum**: the language in use can tilt cognitive processes, whether it’s moral reasoning, risk evaluation, emotional recall, or self-perception. By straddling two semantic and cultural systems, bilinguals demonstrate how language-specific concepts (including so-called “untranslatable” ones) can subtly but powerfully influence thought and behavior.

Neuroimaging Studies: Neural Mechanisms in Bilingual Concept Processing

Neuroscience research from 2023–2025 has leveraged fMRI, EEG, and other measures to uncover how bilingual brains represent and manage concepts from different languages. **One line of work examines semantic organization in the bilingual brain.** An fMRI study by **Mei et al. (2023)** used representational similarity analysis to compare brain activity patterns in Chinese–English bilinguals performing tasks in each language ²⁶ ²⁷ . Participants named words (shallow processing) or made semantic judgments (deep processing) in L1 vs L2. Strikingly, during deep semantic processing, bilinguals showed **high cross-language pattern similarity in key semantic regions**, indicating that engaging meaning deeply leads to *language-independent conceptual representations* ²⁸ ²⁹ . In other words, thinking about the concept itself (not just the word) activated overlapping neural circuits regardless of language ³⁰ ³¹ . This suggests that at a conceptual level, bilingual brains can merge information from both languages, which may help them navigate “untranslatable” ideas by accessing an underlying meaning network that transcends linguistic labels.

Neural Responses to Emotional Language: Complementing the behavioral findings on emotion, neuroimaging shows clear divergences in how L1 vs L2 emotional content is processed. **Del Maschio et al. (2024)** conducted an fMRI *emotional Stroop* task with Italian–English bilinguals, where participants named the color of emotional vs neutral words ³² ³³ . They found **stronger brain activation in emotion-related regions (e.g. medial temporal lobe, including the posterior cingulate/precuneus)** when processing negative words in the native language compared to the second language ³³ . Notably, even though bilinguals’ reaction times didn’t differ between languages, their brains were more “emotionally engaged” for L1 words, consistent with a richer affective resonance in one’s mother tongue ³⁴ . In EEG research,

bilinguals likewise show attenuated responses to emotional stimuli in L2. **Jankowiak and colleagues (2023)** observed that Polish–English bilinguals had significantly smaller N400 brainwave amplitudes to negative words in English (L2) than in Polish, indicating reduced semantic/emotional processing effort for L2 emotional content ³⁵ ³⁶. This reduced N400 and other ERP differences disappeared when an emotional context was provided, suggesting that context can modulate the L2 emotional blunting ³⁷ ³⁸. Overall, these neural findings support a model where *L1 has a built-in emotional “boost” in the brain, while L2 is processed in a more detached manner*, aligning with the idea that some emotion-laden concepts do not fully “translate” in a bilingual’s neural response ³⁴ ¹⁴.

Conceptual Network Integration and Cognitive Control: Beyond specific task responses, bilingualism induces broader neuroplastic changes that affect concept processing efficiency. A large-scale resting-state fMRI study published in 2024 (151 participants, varying second-language acquisition ages) reported that **bilinguals’ brains have higher global network efficiency than monolinguals’** ³⁹. Graph-theoretic analysis showed greater functional integration across brain regions in bilingual individuals, meaning their neural networks communicate more efficiently on the whole ³⁹. Interestingly, this effect was strongest in early bilinguals – the younger one’s age of L2 acquisition, the more pronounced the increase in inter-network connectivity (especially between language association areas and the cerebellum) ⁴⁰. Such enhanced connectivity might underlie bilinguals’ ability to juggle multiple linguistic frameworks, facilitating quicker access to concepts in either language. It also provides a neural basis for cognitive control advantages often noted in bilinguals: a more integrated brain network could support the switching and inhibition processes required when selecting between languages or concepts. Indeed, other studies using fMRI have found bilinguals engage frontal executive regions more efficiently during language switching or interference tasks, reflecting **neurocognitive mechanisms that help manage cross-language competition** ⁴¹ ⁴². Notably, bilinguals seem to recruit “language control” networks even when processing one language, potentially as a carryover of managing two lexicons ⁴¹. This constant exercise may confer a protective effect – for example, lifelong bilingualism has been associated with cognitive reserve and resilience against brain aging ⁴³.

To summarize the neural evidence: *bilingual brains adapt structurally and functionally to accommodate multiple languages*. They often show **distinct activation patterns for language-specific content (especially emotional or culturally-loaded stimuli)**, yet also exhibit **convergent representations and stronger connectivity that bridge their two languages**. This dual pattern – separate channels for language-unique elements and integrated networks for shared meaning – illustrates the dynamic way bilingual minds handle “untranslatable” concepts.

Implications and Conclusion

The convergence of behavioral and neuroimaging findings yields a clearer picture of how bilinguals navigate untranslatable concepts. **Cognitively**, bilingual individuals demonstrate greater flexibility in interpreting and reacting to concepts, depending on the language context. They can shift into a more analytical, less emotionally biased mode when using a second language, which can be advantageous in decision-making (e.g. making less biased financial or moral choices) ¹ ². Culturally, bilinguals effectively carry two conceptual toolkits – allowing them to understand culture-bound concepts (like unique emotion terms or values) from an insider perspective in L1 and with an outsider’s detachment in L2. This *bicultural cognitive frame* might enhance creativity and empathy, but it also means that translation is not just linguistic but conceptual: bilinguals often realize that certain ideas “feel different” in each language. **Neurally**, the bilingual brain’s enhanced connectivity and adapted activation patterns highlight an efficient handling of

concepts: increased network integration may enable quicker code-switching and the merging of conceptual associations across languages ⁴⁴ ³⁹ . At the same time, language-specific emotional circuits ensure that some culturally laden concepts retain their unique impact in the native tongue ³⁴ .

These insights have practical implications. In education and communication, recognizing that bilinguals might *think differently* in each language can inform teaching strategies (e.g. introducing difficult topics in a second language to reduce emotional barriers, or conversely, leveraging L1 for personal expression). In therapy and counseling, patients might prefer discussing trauma in their L2 to gain emotional distance ¹⁰ , or use untranslatable L1 words to convey feelings that English lacks. In multicultural teams and policymaking, using a lingua franca could inadvertently shift group decisions toward more utilitarian outcomes ¹ . Finally, this research underscores the principle of linguistic relativity with a new twist: rather than a fixed effect of one language on thought, bilinguals show that **the mind can flexibly toggle between worldviews**. Continued studies (e.g. using EEG decoding or fMRI multivariate analyses) are probing how deeply these differences go for various concept domains (time, space, self, etc.) and how early bilingual exposure can sculpt the brain. As we advance into 2025 and beyond, bilingualism research is moving “beyond the advantage vs. no-advantage” debate ⁴⁵ to a more nuanced exploration of how language-specific concepts live in the mind. The emerging evidence paints a compelling picture: bilingual brains are uniquely equipped to reconcile the untranslatable, illuminating the profound interplay between language, culture, and cognition ⁴⁶ ¹⁷ .

Sources: Recent peer-reviewed studies and reviews on bilingual cognition and neurology (2023–2025), including *Frontiers in Language Sciences*, *Bilingualism: Language and Cognition*, *Human Brain Mapping*, *Communications Biology*, and others ² ³⁹ . All cited works are listed above in context.

¹ ⁷ ¹⁰ ¹¹ ¹² ¹³ ²⁴ ²⁵ 'I couldn't believe the data': how thinking in a foreign language improves decision-making | Language | The Guardian

<https://www.theguardian.com/science/2023/sep/17/how-learning-thinking-in-a-foreign-language-improves-decision-making>

² ³ ⁴ Frontiers | The time course of moral decision making in bilinguals' native and foreign language
<https://www.frontiersin.org/journals/language-sciences/articles/10.3389/flang.2023.1239490/full>

⁵ ⁶ Decision-making depends on language: A meta-analysis of the Foreign Language Effect | Bilingualism: Language and Cognition | Cambridge Core

<https://www.cambridge.org/core/journals/bilingualism-language-and-cognition/article/decisionmaking-depends-on-language-a-metaanalysis-of-the-foreign-language-effect/357CDDF948DB7FC3C101534F1EA3442A>

⁸ ⁹ ²⁰ ²¹ ²³ Your personality changes when you speak another language, but that's not always a bad thing

<https://phys.org/news/2024-12-personality-language-bad.html>

¹⁴ ¹⁵ ¹⁶ ¹⁷ ¹⁸ ⁴² Emotional processing in bilinguals: a systematic review aimed at identifying future trends in neurolinguistics | Humanities and Social Sciences Communications

[https://www.nature.com/articles/s41599-023-01926-1?](https://www.nature.com/articles/s41599-023-01926-1?error=cookies_not_supported&code=b5c46096-8c68-47fc-9b64-9aee1d346750)

[error=cookies_not_supported&code=b5c46096-8c68-47fc-9b64-9aee1d346750](https://www.nature.com/articles/s41599-023-01926-1?error=cookies_not_supported&code=b5c46096-8c68-47fc-9b64-9aee1d346750)

¹⁹ The effect of language and cultural context on the BIG-5 personality ...

<https://www.tandfonline.com/doi/full/10.1080/01434632.2023.2186414>

22 How speaking different languages affects your personality

<https://olgakhazan.substack.com/p/how-speaking-different-languages>

26 27 28 29 30 31 44 The depth of semantic processing modulates cross-language pattern similarity in Chinese-English bilinguals - PMC

<https://pmc.ncbi.nlm.nih.gov/articles/PMC9980893/>

32 33 34 Neurocognitive mechanisms of emotional interference in native and foreign languages: evidence from proficient bilinguals - PMC

<https://pmc.ncbi.nlm.nih.gov/articles/PMC11337870/>

35 36 37 38 Brain potentials reveal reduced sensitivity to negative content during second language production | Bilingualism: Language and Cognition | Cambridge Core

<https://www.cambridge.org/core/journals/bilingualism-language-and-cognition/article/brain-potentials-reveal-reduced-sensitivity-to-negative-content-during-second-language-production/14F0523D9AA77E696EDAEB5FF1DF7256>

39 40 Enhanced efficiency in the bilingual brain through the inter-hemispheric cortico-cerebellar pathway in early second language acquisition | Communications Biology

https://www.nature.com/articles/s42003-024-06965-1?error=cookies_not_supported&code=f577eca1-7e79-4ded-8fa7-cdf2c2f78710

41 The impact of bilingualism in within-language conflict resolution

<https://www.frontiersin.org/journals/psychology/articles/10.3389/fpsyg.2023.1173486/full>

43 A neural mechanism of cognitive reserve: The case of bilingualism

<https://www.sciencedirect.com/science/article/pii/S1053811923005165>

45 New Approaches To How Bilingualism Shapes Cognition And The ...

<https://www.frontiersin.org/research-topics/17276/new-approaches-to-how-bilingualism-shapes-cognition-and-the-brain-across-the-lifespan-beyond-the-false-dichotomy-of-advantage-versus-no-advantage/magazine>

46 On language and thought: Bilingual experience influences semantic associations | CoLab

<https://colab.ws/articles/10.1016%2Fj.jneuroling.2020.100932>