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The Semantic Coexistence of Heart and Brain in Cantonese: Computational Evidence from 3.4 Billion Tokens

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Abstract

Cultural concepts of mind vary dramatically across societies. In Chinese thought, 心 (*xīn*, “heart-mind”) historically served as the seat of cognition and emotion, while 脑 (*nǎo*, “brain”) played minimal role. Modern neuroscience introduced brain-centered models, raising questions about whether scientific concepts replace or coexist with folk theories. How does scientific knowledge reshape traditional mental vocabulary in non-Western contexts? Here we show, through distributional semantic analysis of 3.4 billion Chinese tokens from classical texts to social media, that *xīn* and *nǎo* function as parallel rather than competing concepts. Contrary to eliminative materialism, *xīn* maintains its integrated multi-dimensional structure as a living folk concept, while *nǎo* enters as specialized medical terminology. This coexistence varies systematically: encyclopedic texts show convergence in biomedical contexts, while vernacular preserves traditional differentiation. These patterns suggest that folk and scientific frameworks operate as contextually deployed parallel systems rather than successive evolutionary stages. Our approach demonstrates how computational linguistics reveals mechanisms of cultural-cognitive modernization.

Keywords: computational sociolinguistics; psychology; Chinese thought