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Does Language Shape Numbers? Cross-Linguistic Insights from Vector-Space Models

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Recent evidence suggest that linguistic estimates can predict behavioural performance in number comparison tasks, supporting the idea that data extracted from vector-space models are informative about the mental representation of numbers. The current study investigates whether this phenomenon is specifically related to one's native language and whether it can be replicated in multiple populations. Across two experiments (one based on an Italian sample and the second one based on a Slovenian sample), we extracted vector representations of number words from participants' native language and from other languages, to test whether native-language-based models better predict performance in symbolic and non-symbolic number comparison tasks. In the first experiment, the Italian-based vector model outperformed the ones based on other languages across symbolic and non-symbolic tasks. Similarly, the second experiment showed that in the Slovenian population, non-symbolic tasks yielded consistent results, and performance in symbolic tasks was closely aligned with the native-language model. Together, these findings support the idea that native language experience plays a key role in shaping numerical representation of both symbolic and non-symbolic information. Further research could explore whether this pattern extends to other linguistic and cultural contexts.

If you're submitting a symposium talk, what's the symposium title?

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