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Goal bias in using spatial language to describe changing quantities

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Abstract

Numbers and space are associated in the mind, and in language. We investigate 6,400 instances of verbs indicating vertical movement (e.g., rise, fall, decline) or size-based changes (e.g., contract, grow, extend) in four corpora, showing that 60% of all uses occur in quantitative contexts (e.g., ‘prices rose’). For concrete spatial language, it has been found that movement goals are more likely encoded than sources (e.g., Lakusta & Landau 2005, Stefanowitsch, 2018). We demonstrate that this asymmetry carries over to spatial-numerical language, which more often encodes goals (e.g., ‘revenue went up to 48 million’) than sources (e.g., ‘share prices rose from \$7.13’). In line with their path-related meaning, vertical verbs showed a much higher propensity to encode endpoints (20%) than size-based verbs (10%), a large effect (Cohen’s $d = 2.0$). These results show that the goal bias attested for spatial language carries over to abstract conceptual domains.