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Ordinality trumps cardinality: What we spatialize when we spatialize numbers

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Abstract

People implicitly map numbers onto space, but what aspect of numbers do people spatialize? When cardinality (i.e. magnitude; 5 objects) is pitted against ordinality (i.e., sequential position; the 5th object), people show an implicit ordinality mapping, at least in lateral space. We hypothesized that if people spatialize numerical magnitude at all, they should do so on the vertical axis, according to the way they talk about numbers (i.e. low, high). Participants memorized sequences of randomized numbers (e.g. 85913) and then classified them (as small or large) using two response keys, oriented either laterally or vertically. Participants showed reliable ordinality mappings on both axes; they were faster to press the left/upper key for numbers earlier in the memorized sequence and the right/bottom key for later numbers, regardless of numbers magnitudes. People map exact numbers onto both lateral and vertical space according to their ordinality.