

# **Spatial biases in mental arithmetic are independent of reading habits: Evidence from French and Arabic speakers**

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The representation of number magnitude appears linked to space, with small- vs. large-magnitude numbers being respectively related to the left vs. right side of space in Western cultures. These Spatial-Numerical Associations (SNAs) in number processing is commonly attributed to the reading/writing direction. SNAs have also been reported in Western participants solving arithmetic problems, with subtraction/addition inducing leftward/rightward biases. Here, we tested whether SNAs in arithmetic stem from reading direction by using a temporal order judgement task in participants with opposing reading directions. French/Arabic speakers solved subtraction and addition problems while determining which of a left or right target appeared first on screen. Both groups favoured the right target more often when solving addition than when solving subtraction problems. These results indicate that SNAs in arithmetic are not related to reading direction. We call for a reconsideration of current models and suggest a pervasive role of biological factors in human adults.