

Current Topics in Behavioral Neurosciences

Volume 41

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Processes of Visuospatial Attention and Working Memory

 Springer

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Visuospatial Integration and Hand-Tool Interaction in Cognitive Archaeology



Emiliano Bruner, Annapaola Fedato, María Silva-Gago, Rodrigo Alonso-Alcalde, Marcos Terradillos-Bernal, María Ángeles Fernández-Durantes, and Elena Martín-Guerra

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Abstract Testing cognitive hypotheses in extinct species can be challenging, but it can be done through the integration of independent sources of information (e.g., anatomy, archaeology, neurobiology, psychology), and validated with quantitative and experimental approaches. The parietal cortex has undergone changes and specializations in humans, probably in regions involved in visuospatial integration. Visual imagery and hand-eye coordination are crucial for a species with a remarkable technological and symbolic capacity. Hand-tool relationships are not only a

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- Zelditch M, Swiderski D, Sheets DH, Fink W (2004) Geometric morphometrics for biologists: a primer. Elsevier Academic Press, Waltham
- Zhang S, Li CSR (2012) Functional networks for cognitive control in a stop signal task: independent component analysis. *Hum Brain Mapp* 33:89–104
- Zilles K, Amunts K (2010) Centenary of Brodmann's map – conception and fate. *Nat Rev Neurosci* 11:139–145
- Zlatkina V, Petrides M (2014) Morphological patterns of the intraparietal sulcus and the anterior intermediate parietal sulcus of Jensen in the human brain. *Proc Soc Biol* 281:20141493