

Visuospatial Processing for Education in Health and Natural Sciences

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Juan C. Castro-Alonso *Editor*

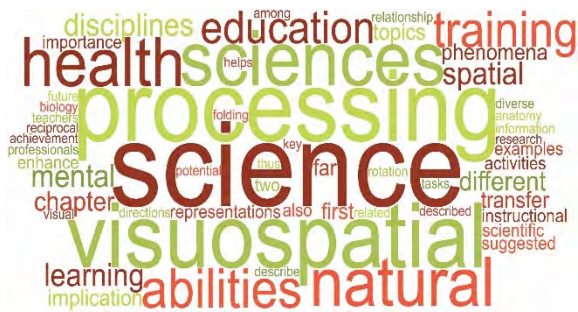
Visuospatial Processing for Education in Health and Natural Sciences

 Springer

Castro-Alonso, J. C. (Ed.). (2019). *Visuospatial processing for education in health and natural sciences*. Springer.
<https://doi.org/10.1007/978-3-030-20969-8>

Chapter 1

Overview of Visuospatial Processing for Education in Health and Natural Sciences



Castro-Alonso, J. C. (2019). Overview of visuospatial processing for education in health and natural sciences. In J. C. Castro-Alonso (Ed.), *Visuospatial processing for education in health and natural sciences* (pp. 1-21). Springer. https://doi.org/10.1007/978-3-030-20969-8_1

Chapter 2

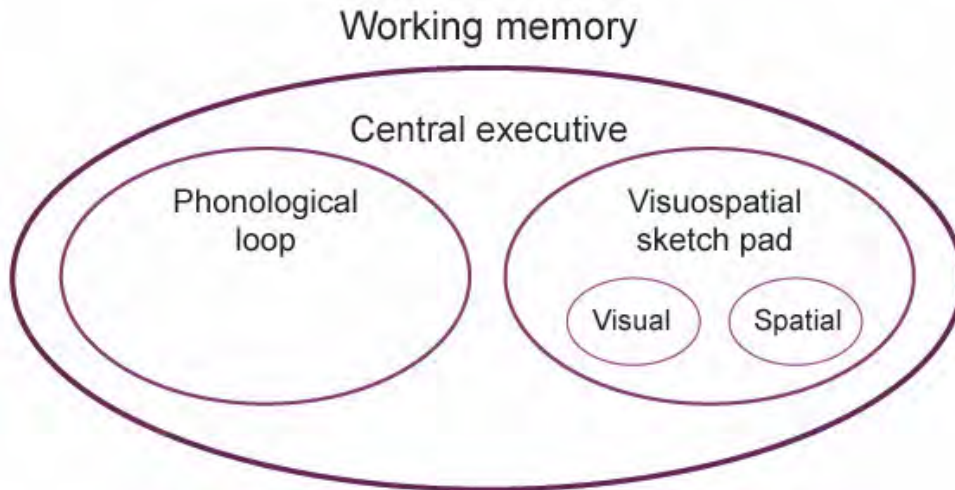
Different Abilities Controlled by Visuospatial Processing



Castro-Alonso, J. C., & Atit, K. (2019). Different abilities controlled by visuospatial processing. In J. C. Castro-Alonso (Ed.), *Visuospatial processing for education in health and natural sciences* (pp. 23-51). Springer.
https://doi.org/10.1007/978-3-030-20969-8_2

Chapter 2

Visuospatial Processing by Working Memory



Castro-Alonso, J. C., & Atit, K. (2019). Different abilities controlled by visuospatial processing. In J. C. Castro-Alonso (Ed.), *Visuospatial processing for education in health and natural sciences* (pp. 23-51). Springer.
https://doi.org/10.1007/978-3-030-20969-8_2

Chapter 3

Science Education and Visuospatial Processing



Castro-Alonso, J. C., & Uttal, D. H. (2019). Science education and visuospatial processing. In J. C. Castro-Alonso (Ed.), *Visuospatial processing for education in health and natural sciences* (pp. 53-79). Springer.
https://doi.org/10.1007/978-3-030-20969-8_3

Chapter 4

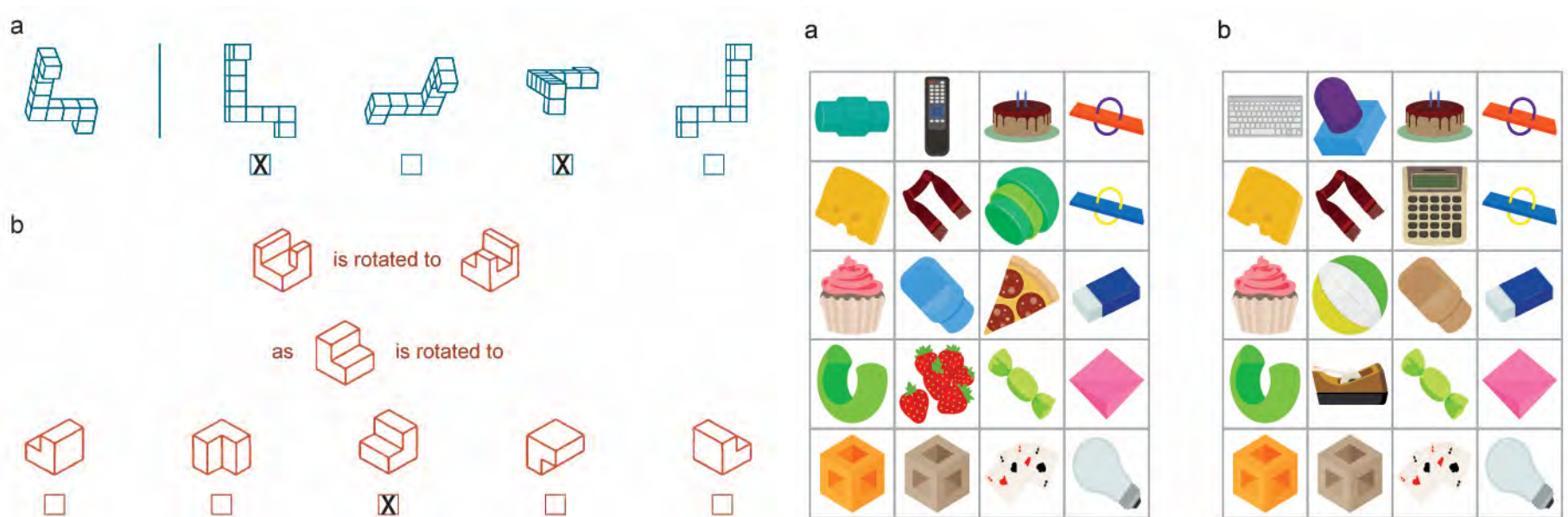
Sex Differences in Visuospatial Processing



Castro-Alonso, J. C., & Jansen, P. (2019). Sex differences in visuospatial processing. In J. C. Castro-Alonso (Ed.), *Visuospatial processing for education in health and natural sciences* (pp. 81-110). Springer. https://doi.org/10.1007/978-3-030-20969-8_4

Chapter 4

Sex Differences in Different Visuospatial Processing Abilities



Sociocultural and Biological Explanations

Castro-Alonso, J. C., & Jansen, P. (2019). Sex differences in visuospatial processing. In J. C. Castro-Alonso (Ed.), *Visuospatial processing for education in health and natural sciences* (pp. 81-110). Springer.
https://doi.org/10.1007/978-3-030-20969-8_4

Chapter 5

Instructional Visualizations, Cognitive Load Theory, and Visuospatial Processing



Castro-Alonso, J. C., Ayres, P., & Sweller, J. (2019). Instructional visualizations, cognitive load theory, and visuospatial processing. In J. C. Castro-Alonso (Ed.), *Visuospatial processing for education in health and natural sciences* (pp. 111-143). Springer. https://doi.org/10.1007/978-3-030-20969-8_5

Chapter 5

Limited Working Memory

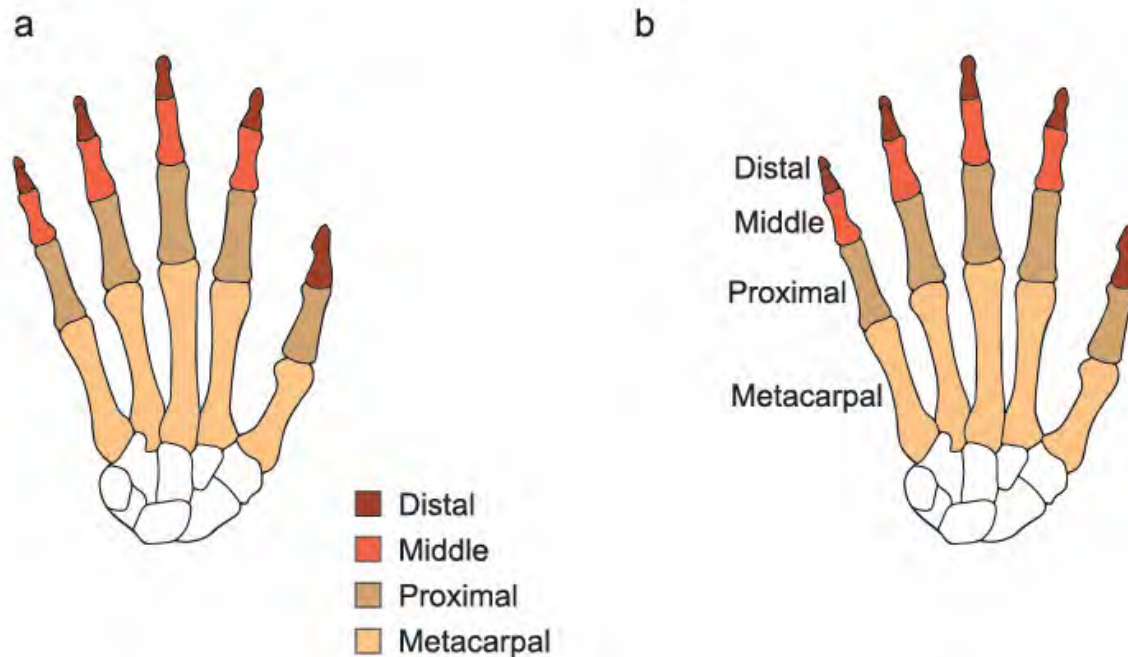


Castro-Alonso, J. C., Ayres, P., & Sweller, J. (2019). Instructional visualizations, cognitive load theory, and visuospatial processing. In J. C. Castro-Alonso (Ed.), *Visuospatial processing for education in health and natural sciences* (pp. 111-143). Springer. https://doi.org/10.1007/978-3-030-20969-8_5

Chapter 5

Cognitive Load Theory

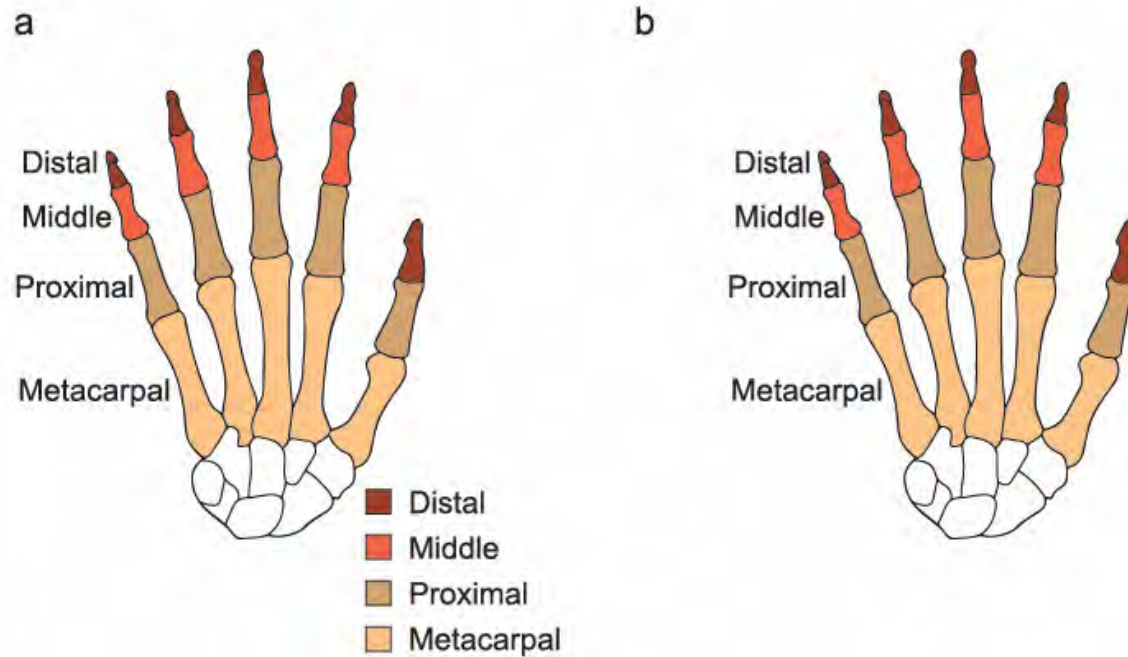
Split-Attention



Castro-Alonso, J. C., Ayres, P., & Sweller, J. (2019). Instructional visualizations, cognitive load theory, and visuospatial processing. In J. C. Castro-Alonso (Ed.), *Visuospatial processing for education in health and natural sciences* (pp. 111-143). Springer. https://doi.org/10.1007/978-3-030-20969-8_5

Chapter 5

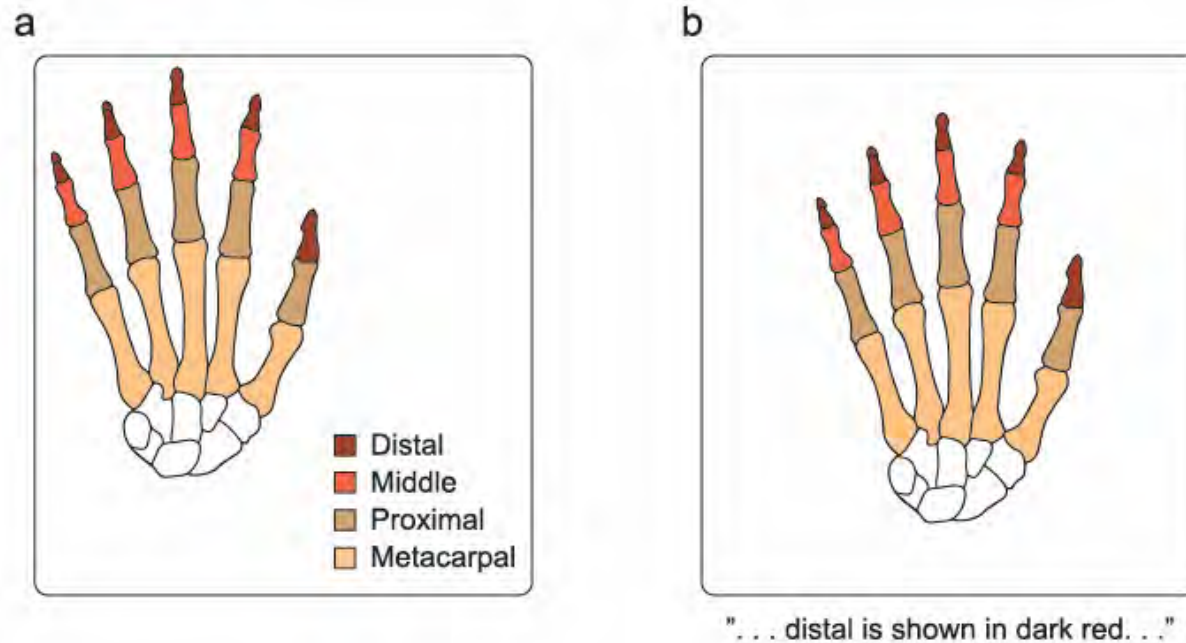
Redundancy



Castro-Alonso, J. C., Ayres, P., & Sweller, J. (2019). Instructional visualizations, cognitive load theory, and visuospatial processing. In J. C. Castro-Alonso (Ed.), *Visuospatial processing for education in health and natural sciences* (pp. 111-143). Springer. https://doi.org/10.1007/978-3-030-20969-8_5

Chapter 5

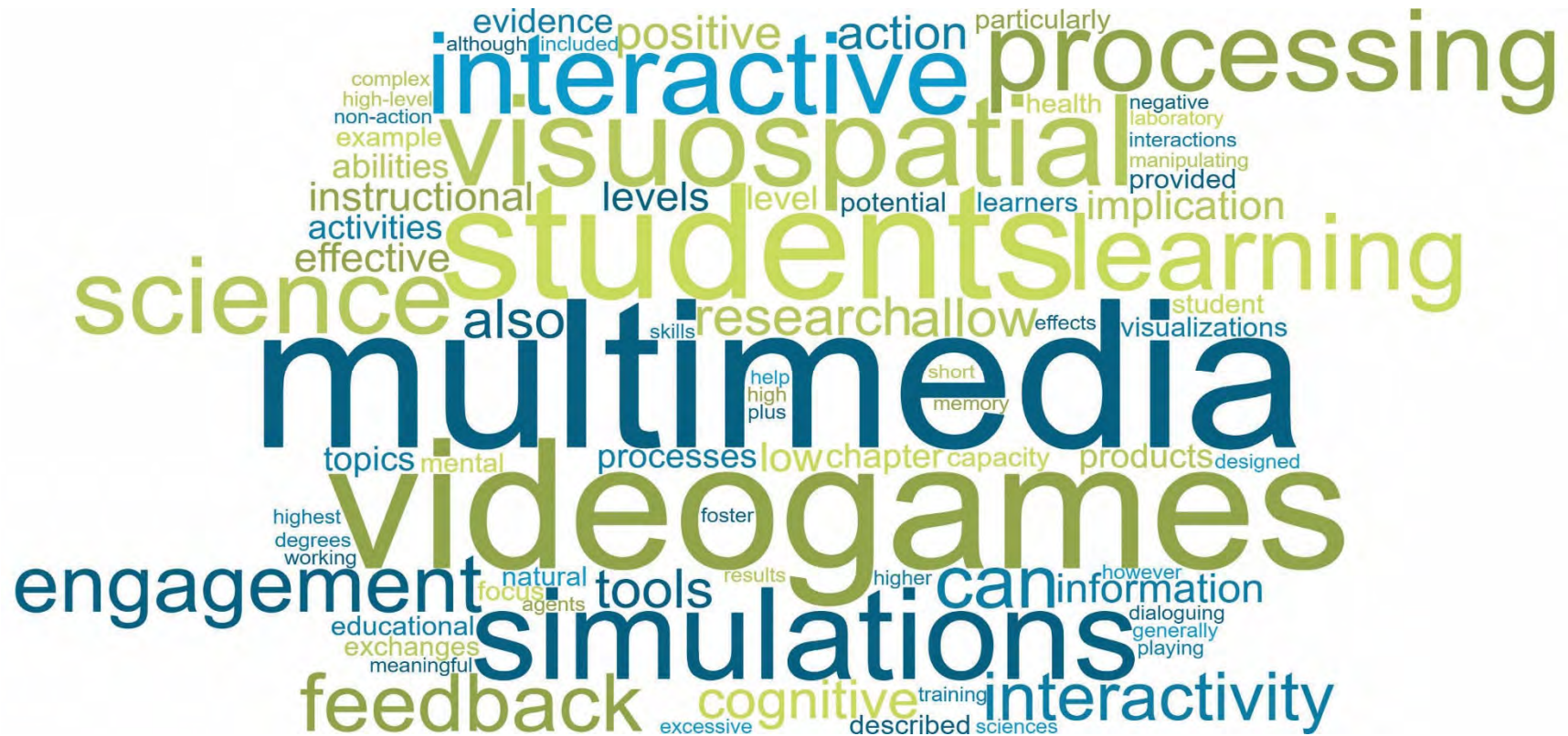
Modality



Castro-Alonso, J. C., Ayres, P., & Sweller, J. (2019). Instructional visualizations, cognitive load theory, and visuospatial processing. In J. C. Castro-Alonso (Ed.), *Visuospatial processing for education in health and natural sciences* (pp. 111-143). Springer. https://doi.org/10.1007/978-3-030-20969-8_5

Chapter 6

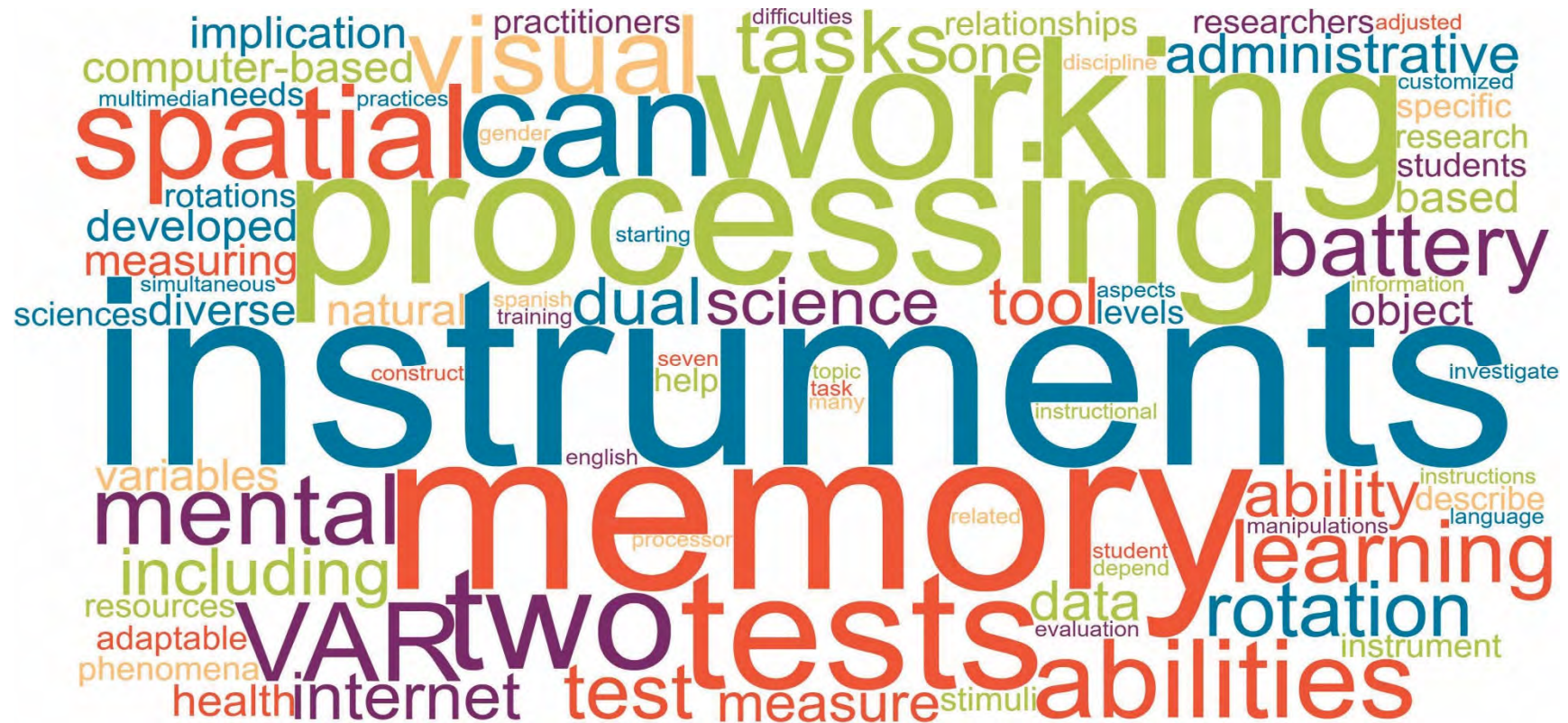
Interactive Science Multimedia and Visuospatial Processing



Castro-Alonso, J. C., & Fiorella, L. (2019). Interactive science multimedia and visuospatial processing. In J. C. Castro-Alonso (Ed.), *Visuospatial processing for education in health and natural sciences* (pp. 145-173). Springer.
https://doi.org/10.1007/978-3-030-20969-8_6

Chapter 8

VAR: A Battery of Computer-Based Instruments to Measure Visuospatial Processing

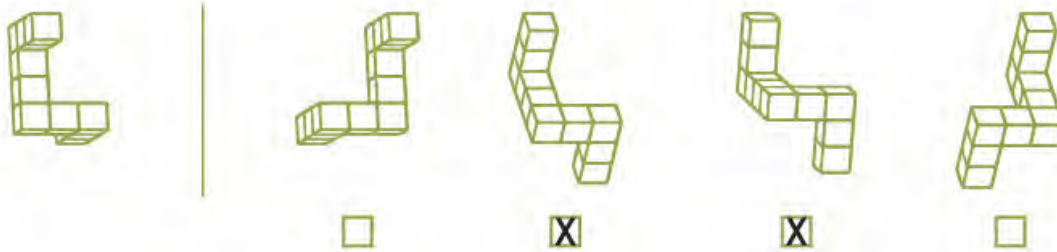


Castro-Alonso, J. C., Ayres, P., & Paas, F. (2019). VAR: A battery of computer-based instruments to measure visuospatial processing. In J. C. Castro-Alonso (Ed.), *Visuospatial processing for education in health and natural sciences* (pp. 207-229). Springer. https://doi.org/10.1007/978-3-030-20969-8_8

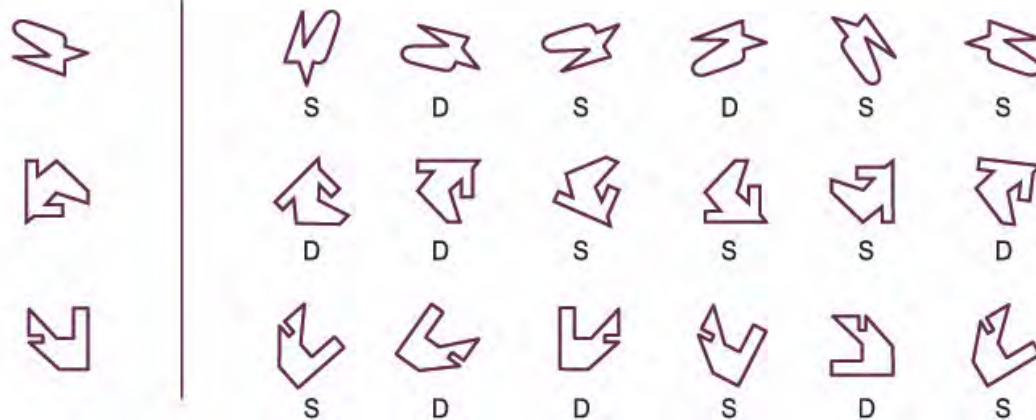
Chapter 8

Mental Rotation Instruments

a



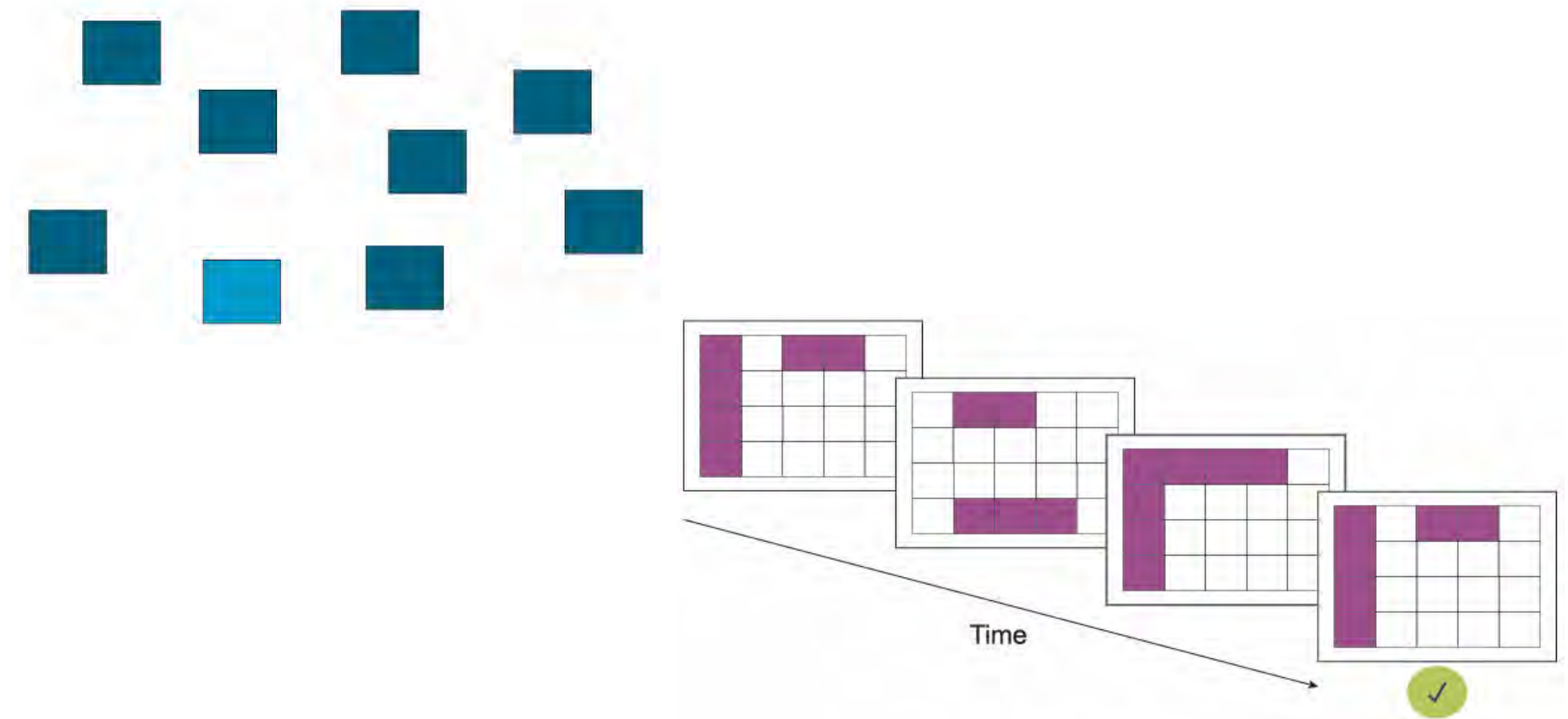
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Castro-Alonso, J. C., Ayres, P., & Paas, F. (2019). VAR: A battery of computer-based instruments to measure visuospatial processing. In J. C. Castro-Alonso (Ed.), *Visuospatial processing for education in health and natural sciences* (pp. 207-229). Springer. https://doi.org/10.1007/978-3-030-20969-8_8

Chapter 8

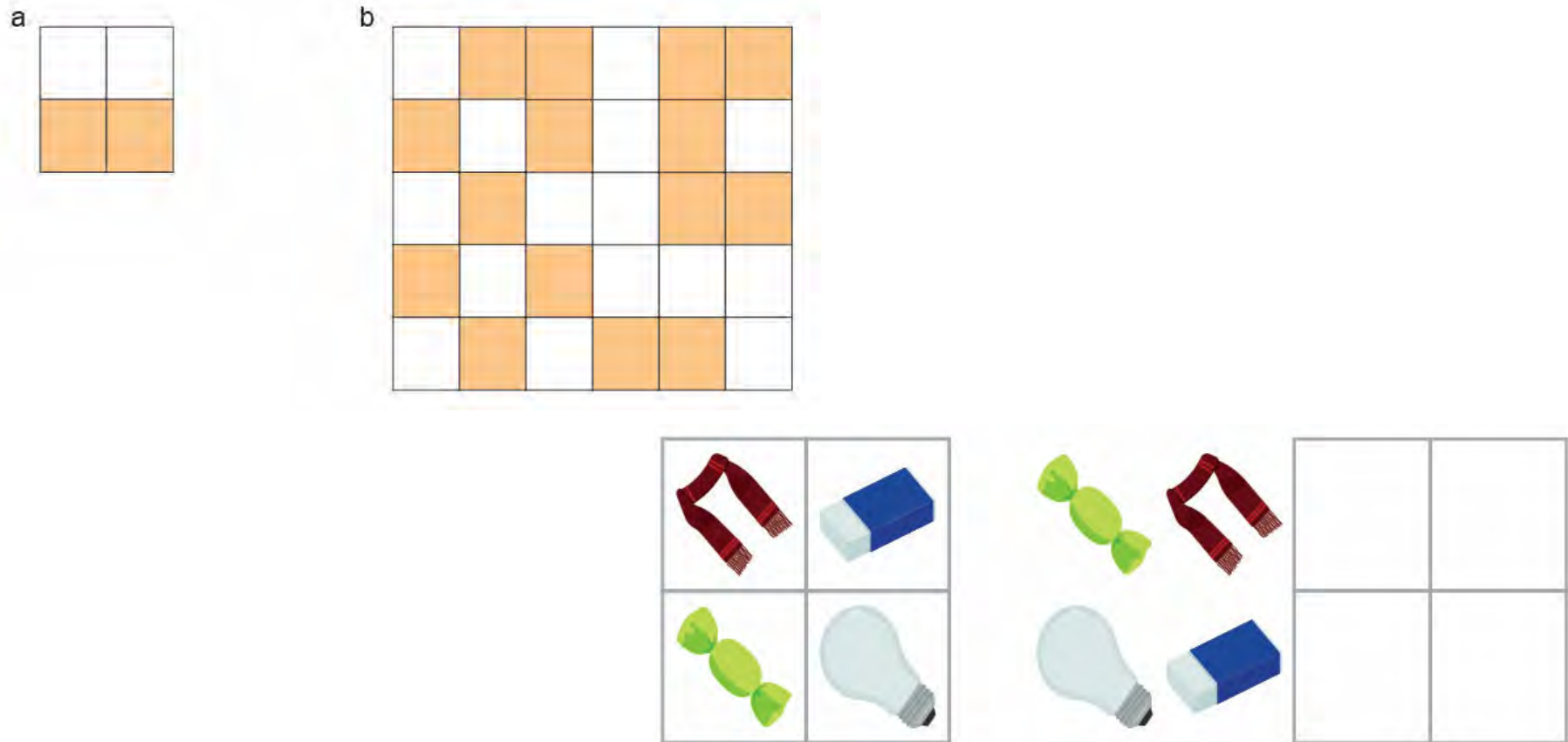
Spatial Working Memory Instruments



Castro-Alonso, J. C., Ayres, P., & Paas, F. (2019). VAR: A battery of computer-based instruments to measure visuospatial processing. In J. C. Castro-Alonso (Ed.), *Visuospatial processing for education in health and natural sciences* (pp. 207-229). Springer. https://doi.org/10.1007/978-3-030-20969-8_8

Chapter 8

Visual Working Memory Instruments



Castro-Alonso, J. C., Ayres, P., & Paas, F. (2019). VAR: A battery of computer-based instruments to measure visuospatial processing. In J. C. Castro-Alonso (Ed.), *Visuospatial processing for education in health and natural sciences* (pp. 207-229). Springer. https://doi.org/10.1007/978-3-030-20969-8_8

Instructional Implications

Visuospatial processing:

Is key for learning about health and natural sciences

Is more efficient in men than women

Is limited, as working memory

Can be managed by instructional strategies (cognitive load theory)

Needs awareness and research

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