

Eye that space up: Does a word affect memory about visual location?

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Introduction

Previous research showed that task-irrelevant spatial information could affect content in the visuospatial working memory, if the irrelevant information is salient enough, for example it represents visually salient distractor/object (Cowan, 1999). The visual distractor is supposed to activate part of the space that influences another piece of spatial information that is not visually available but stored in the internal spatial map created by rehearsal (Van der Stigchel et al., 2007). Another line of studies revealed that word meaning that conveys spatial information (e. g. words 'up', 'down', 'left', 'right') is able to activate part of the space and 'interact' with the word physical position (a spatial Stroop effect) (Lu & Proctor, 1995).

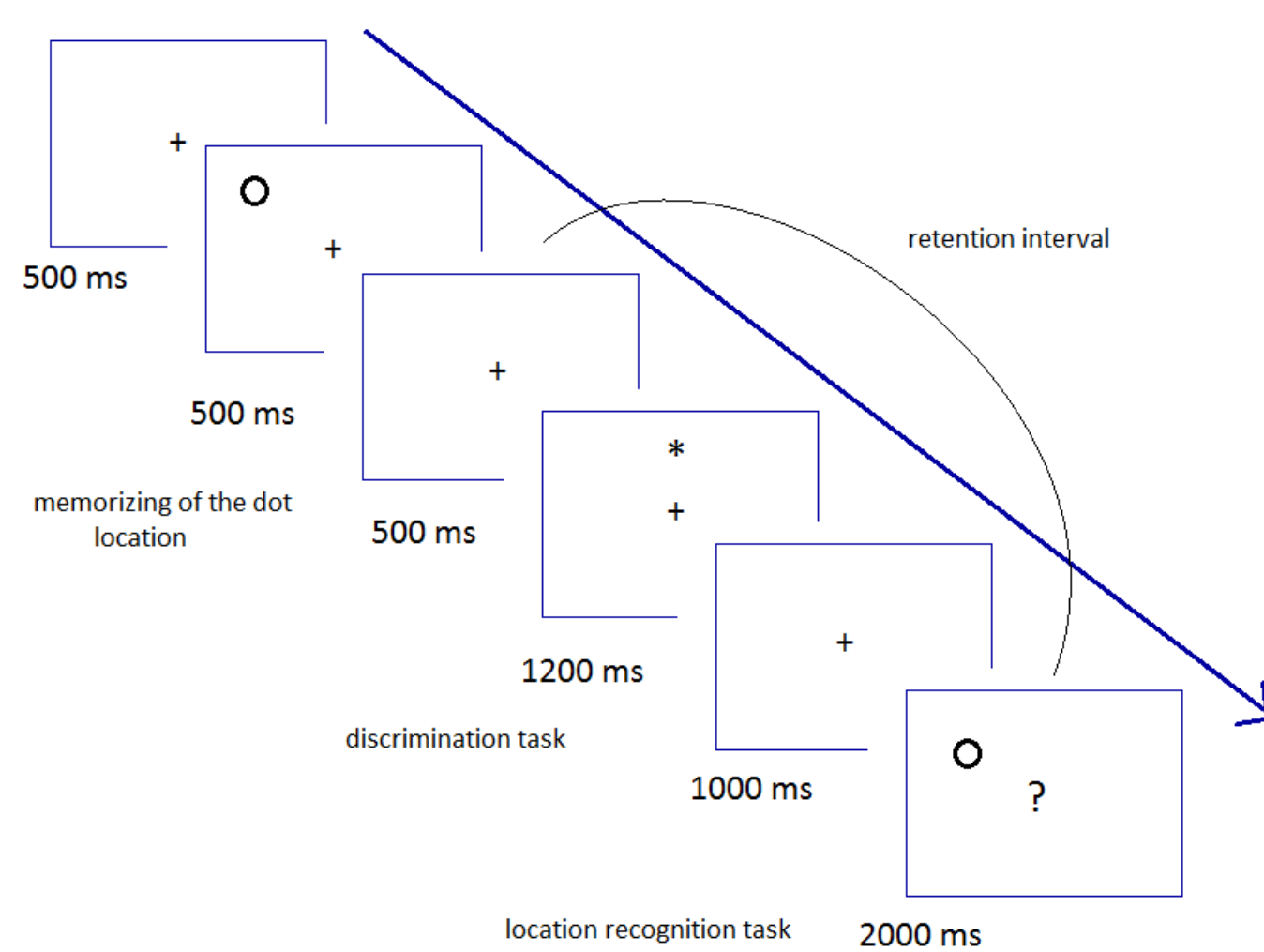
Current study was aimed to combine two fields of research and investigate whether spatial information caused by linguistic stimuli would affect two stages of visuospatial working memory: location maintenance and location recognition, even if word meaning is task-irrelevant.

Two experiments were conducted to test this effect. The Experiment 1 was carried out without semantic content, and Experiment 2 was conducted with semantic content.

Experiment 1, without words

Method

Procedure



Design

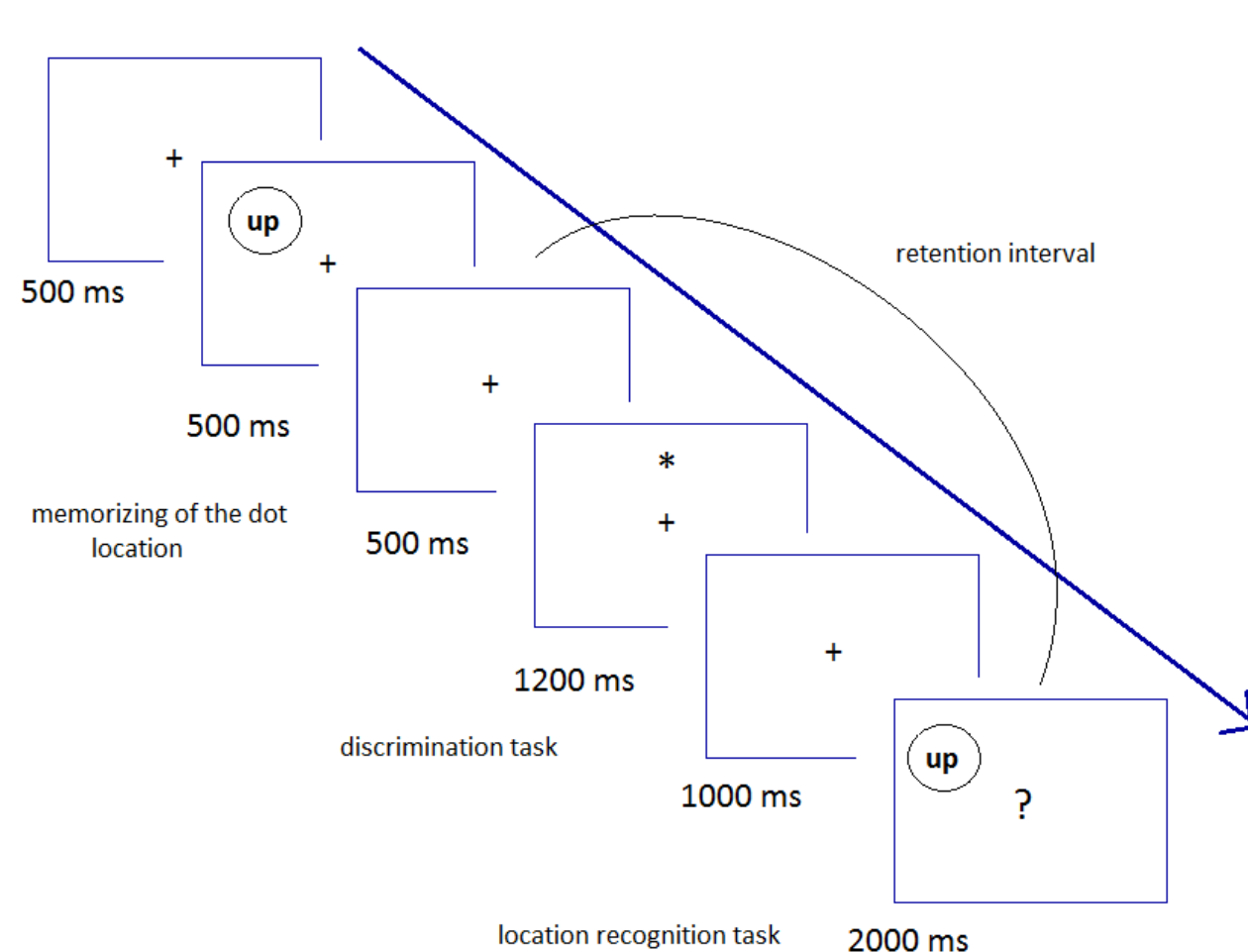
IV: dot location (up vs. down) x probe position (up vs. down)

DV: RT, accuracy

Experiment 2, with words

Method

Procedure

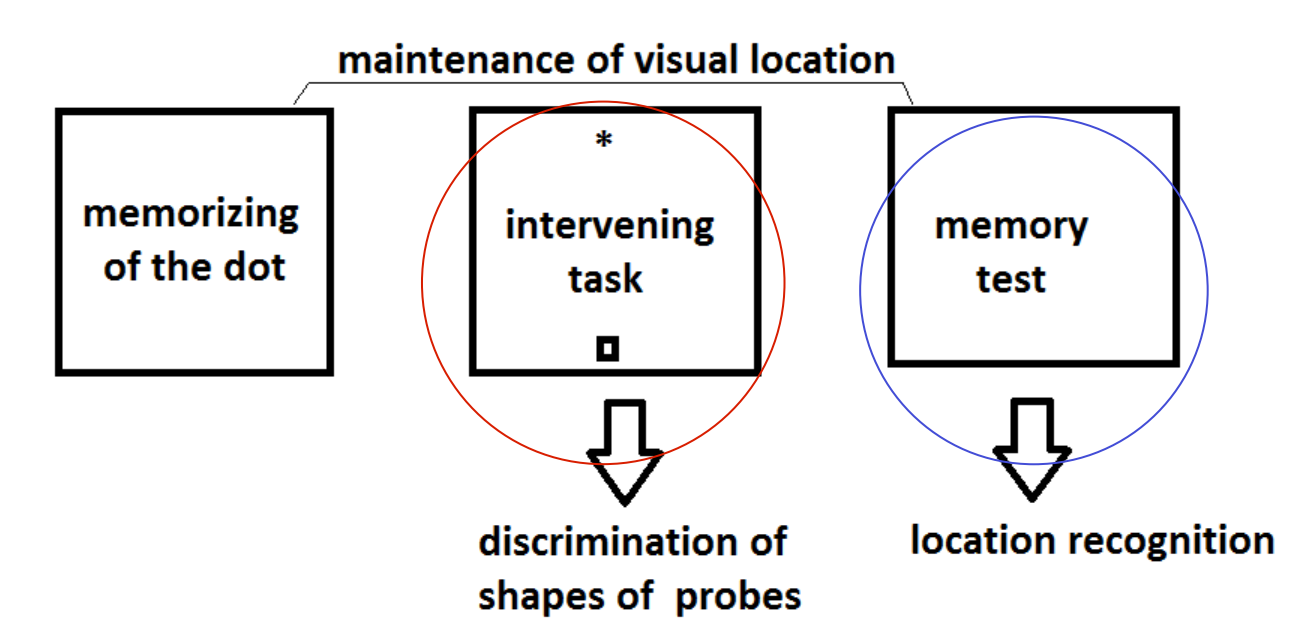


Design

IV: word (up vs. down vs. symbols) x dot location (up vs. down) x probe position (up vs. down)

DV: RT, accuracy

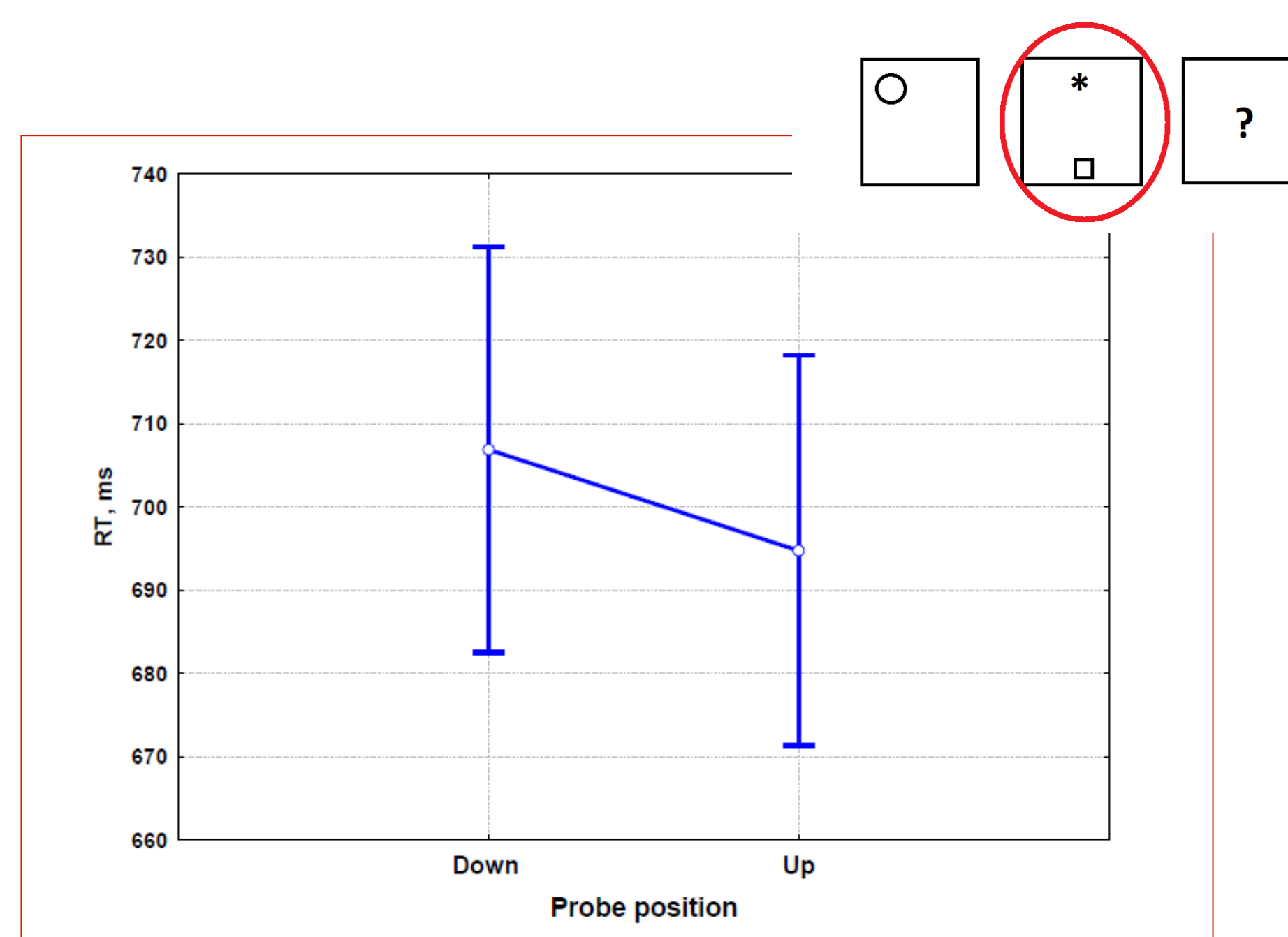
Experimental setup
Dual task:
discrimination of shapes of probes
location recognition



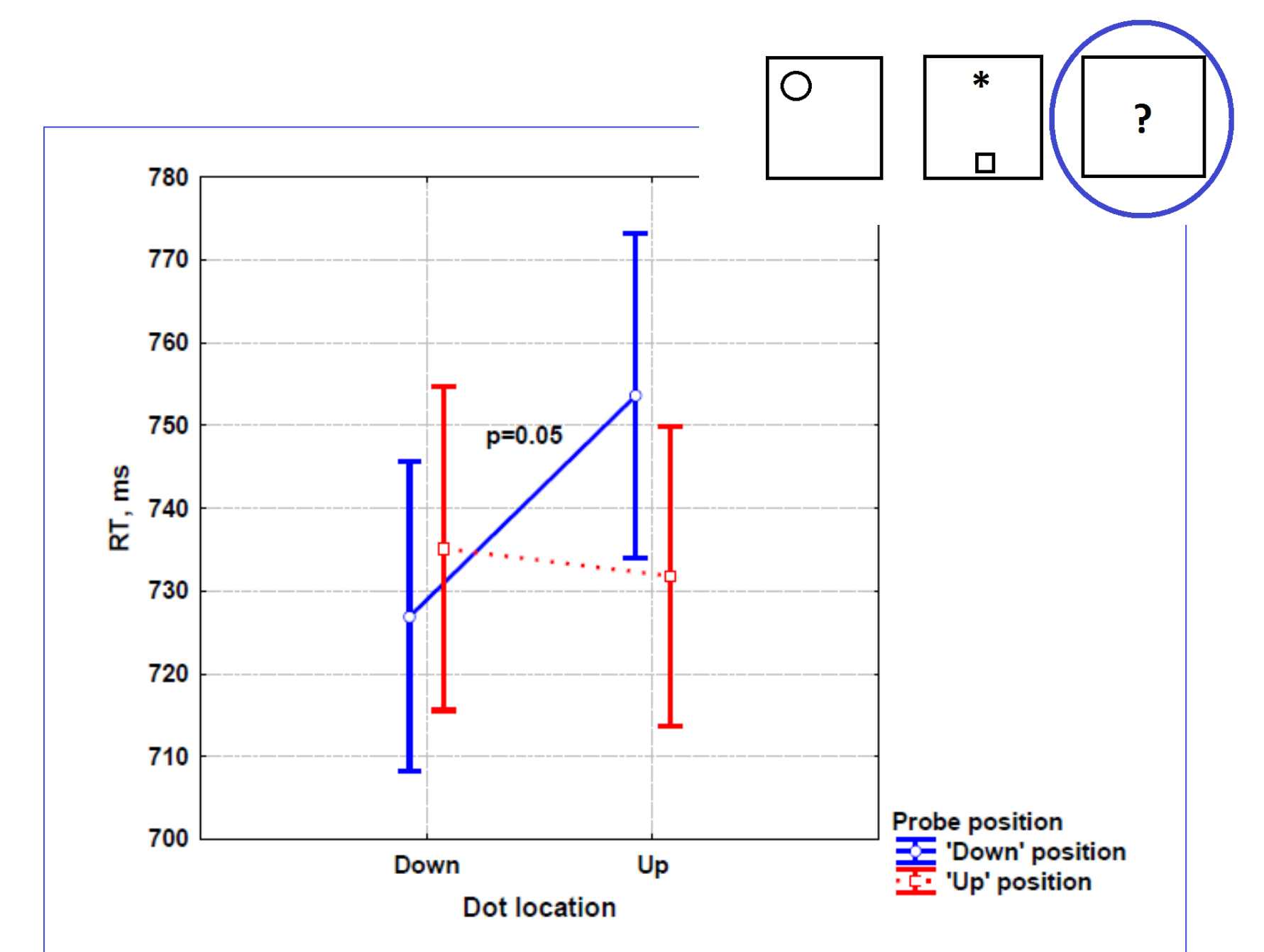
Results

Experiment 1

$F(1, 28)=4.95, p=0.034; \eta_p^2=0.15$

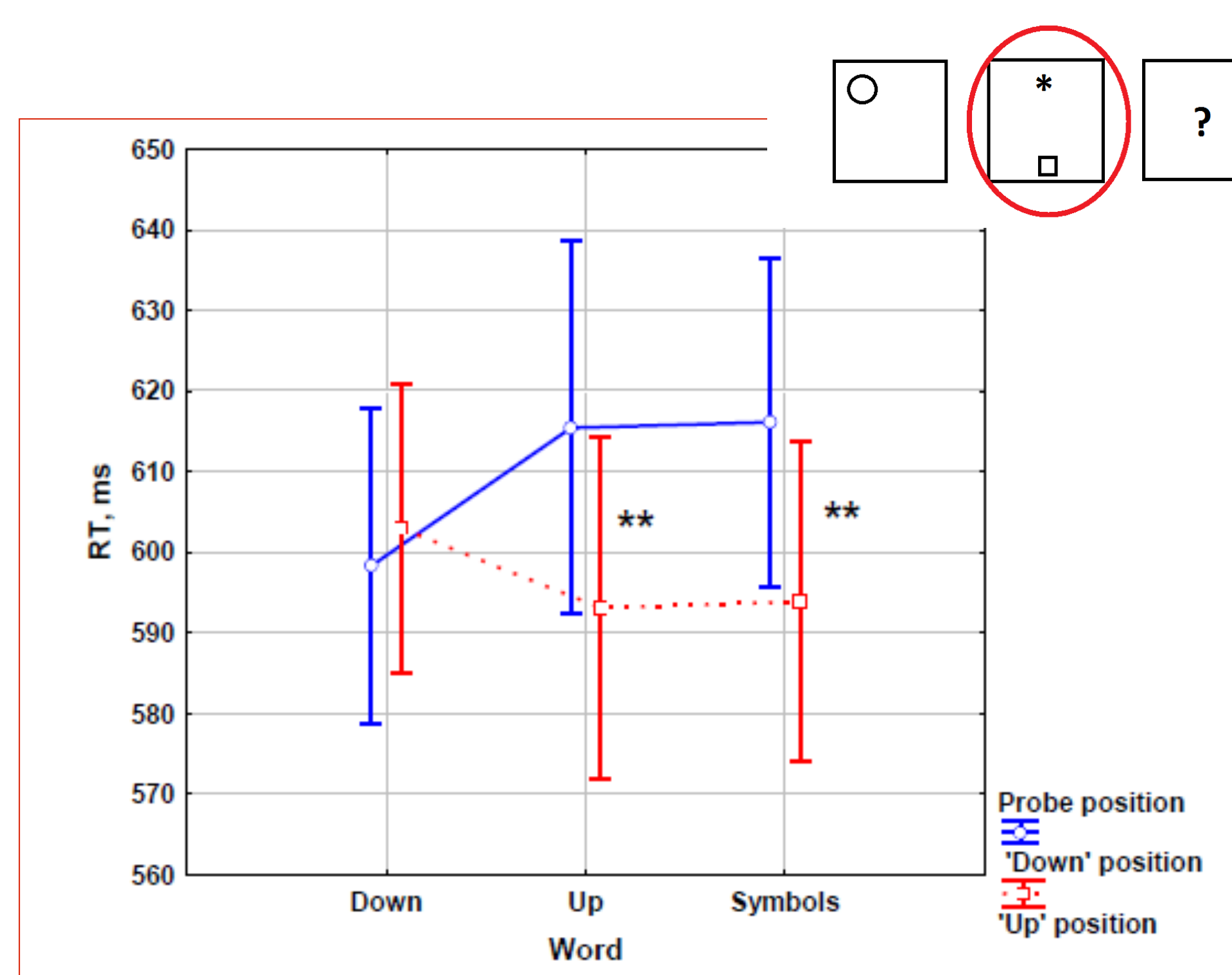


$F(1, 28)=5.09, p=0.032; \eta_p^2=0.15$

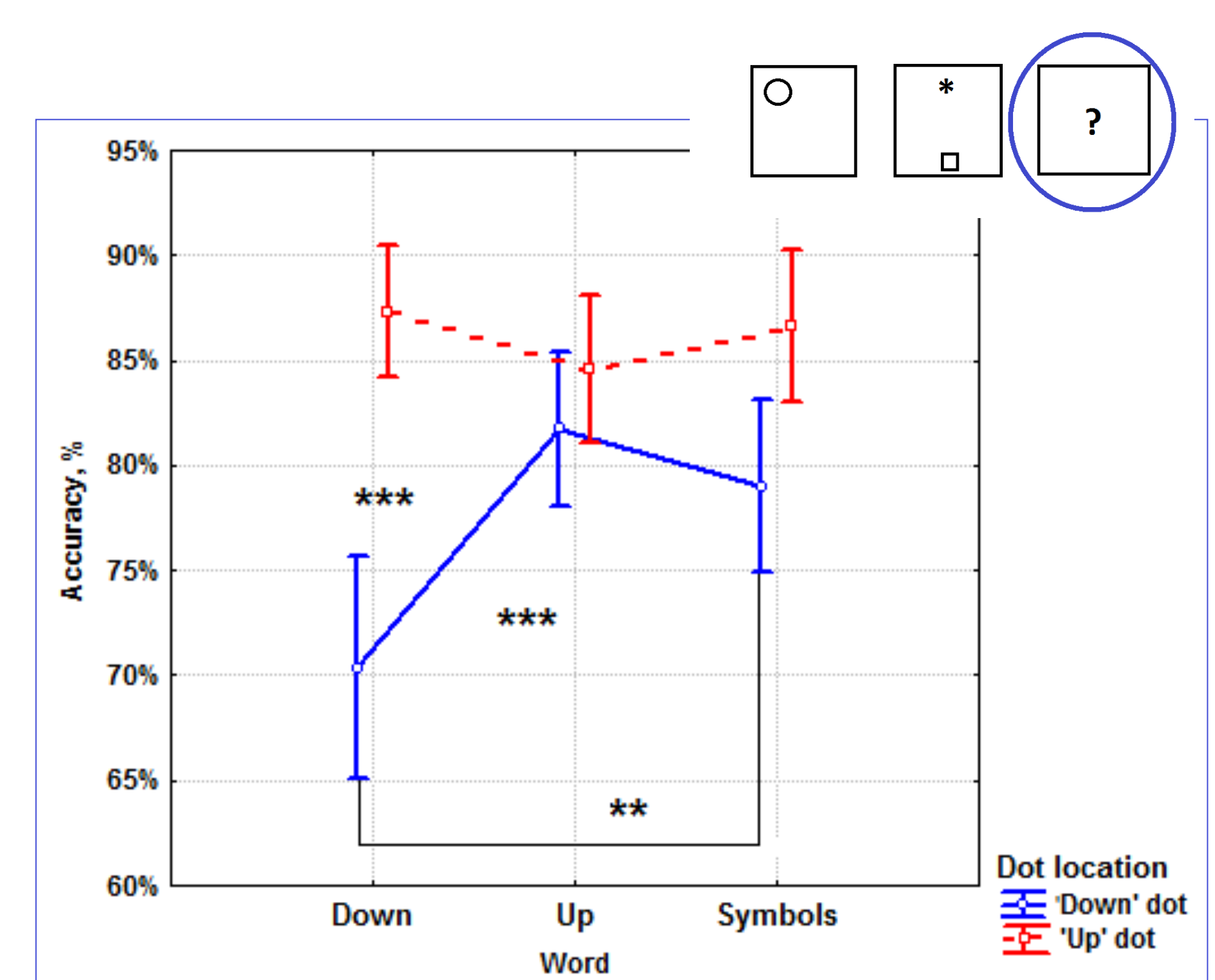


Experiment 2

$F(2, 58)=7.14, p=0.002; \eta_p^2=0.15$



$F(2, 58)=10.3, p=0.000; \eta_p^2=0.26$



Conclusion

- task irrelevant space-related word meaning could not be ignored
- part of space activated by word meaning sometimes was even stronger than space activated by visual object (dot)
- 'down' word eliminated privilege of upper field for object categorization
- word was able to make a visual object more tangible in the space
- word made visual field asymmetry is more pronounced

References

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- Lu, C. H., & Proctor, R. W. (1995). The influence of irrelevant location information on performance: A review of the Simon and spatial Stroop effects. *Psychonomic Bulletin & Review*, 2(2), 174-207.
- Van der Stigchel, S., Merten, H., Meeter, M., & Theeuwes, J. (2007). The effects of a task-irrelevant visual event on spatial working memory. *Psychonomic Bulletin & Review*, 14(6), 1066-1071.

Acknowledgements

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