

Emphasizing the horizontal meridian eliminates the object-based attention shift direction anisotropy

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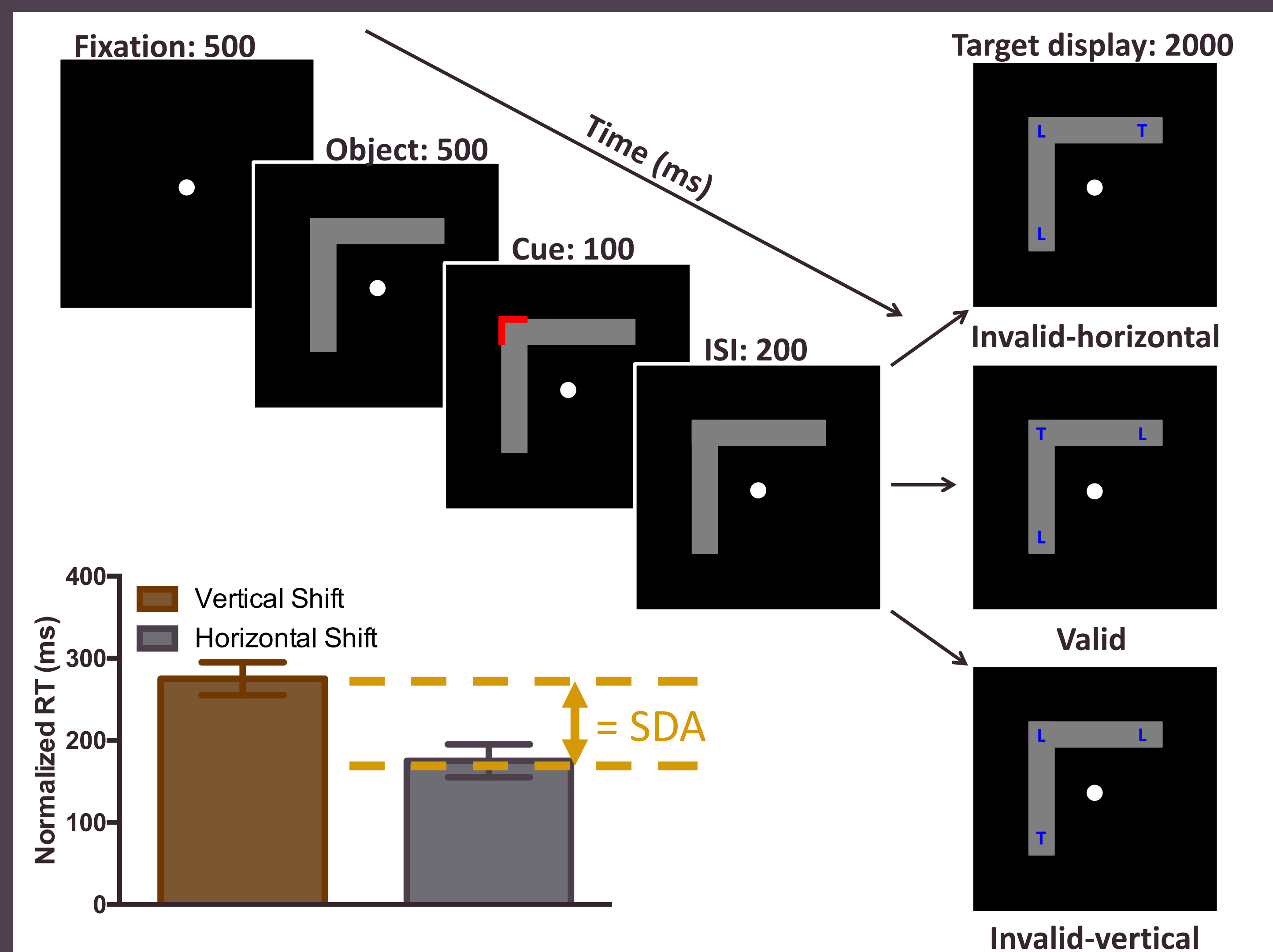
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Introduction

- Object-based attention (OBA) prioritizes visual information within attended vs. unattended objects^{1,2}
- Significant object-based effects for horizontal objects vs. vertical objects³; orientation effects disappear when controlling for attention shifts across visual field meridians⁴
- Reallocating OBA across meridians results in horizontal advantage (shift direction anisotropy, SDA), suggesting modulatory role of meridians for OBA⁵

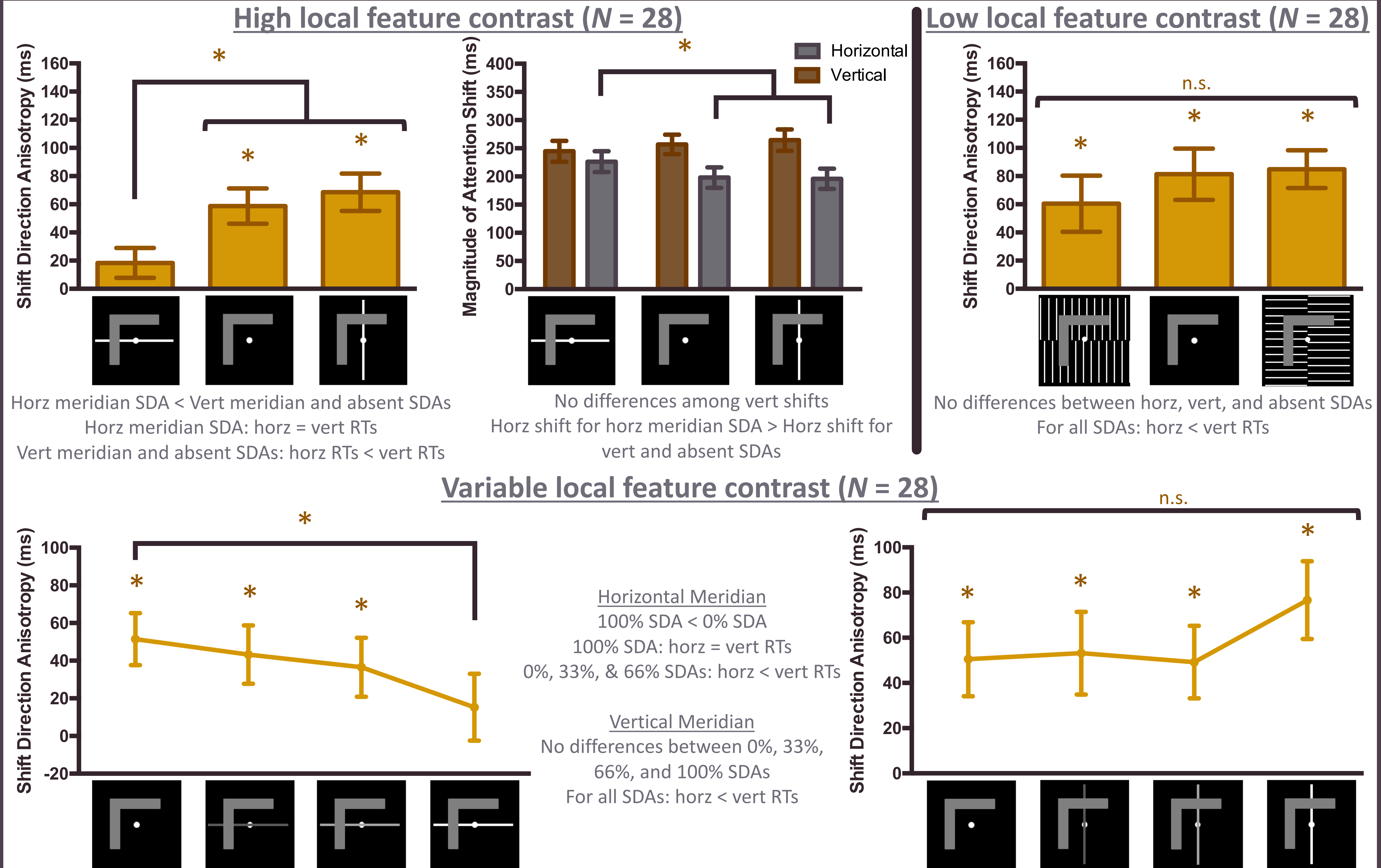
Does manipulating the local feature contrast of the meridians modulate SDA magnitude?

Method



Experiment 1: High local feature contrast = White visible lines
Experiment 2: Low local feature contrast = Illusory contours
Experiment 3: Variable local feature contrast = Varying contrast of visible lines (0%, 33%, 66%, 100%)
60% valid trials • 20% invalid trials • 20% catch trials

Results



Discussion & Conclusion

SDA sensitive to high local feature contrasts (100%, visible), but not low ones (illusory or reduced) of horizontal meridian

- Emphasizing vertical meridian had little affect because of anatomical segregation (interhemispheric boundary) separating left and right cerebral hemispheres
- Visible horizontal meridian established artificial intrahemispheric boundary, further subdividing and sequestering attentional resources into four distinct pools

References

- Duncan, J. (1984). *JEP: General*
- Egley, R., Driver, J., Rafal, R. D. (1994). *JEP: General*
- Pilz, K. S., Roggeveen, A. B., Creighton, S. E., Bennett, P. J., & Sekuler, A. B. (2012). *PLoS One*
- Greenberg, A. S., Hayes, D., Roggeveen, A., Creighton, S., Bennett, P., Sekuler, A., & Pilz, K. (2014). *Journal of Vision*
- Barnas, A. J., & Greenberg, A. S. (2016). *AP&P*

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