Upside down: Task demands and stimulus characteristics reverse inverse effectiveness

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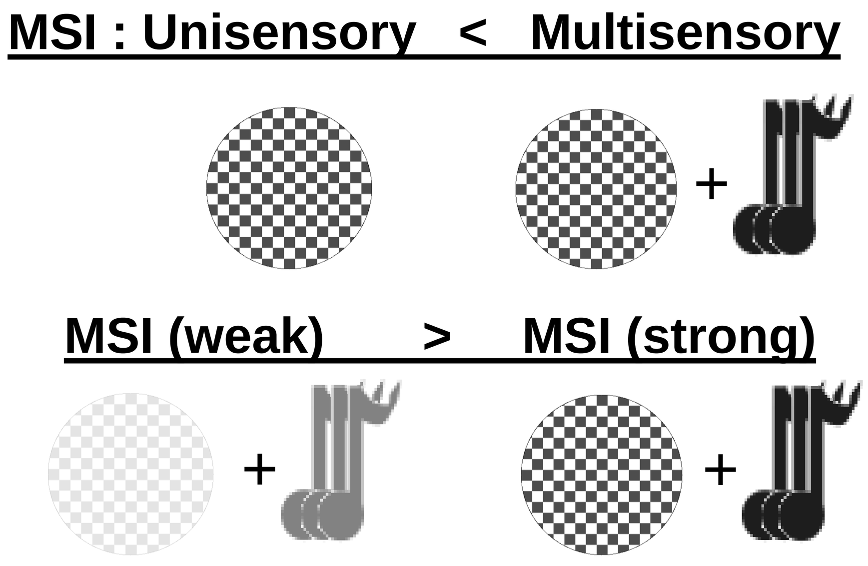
Background

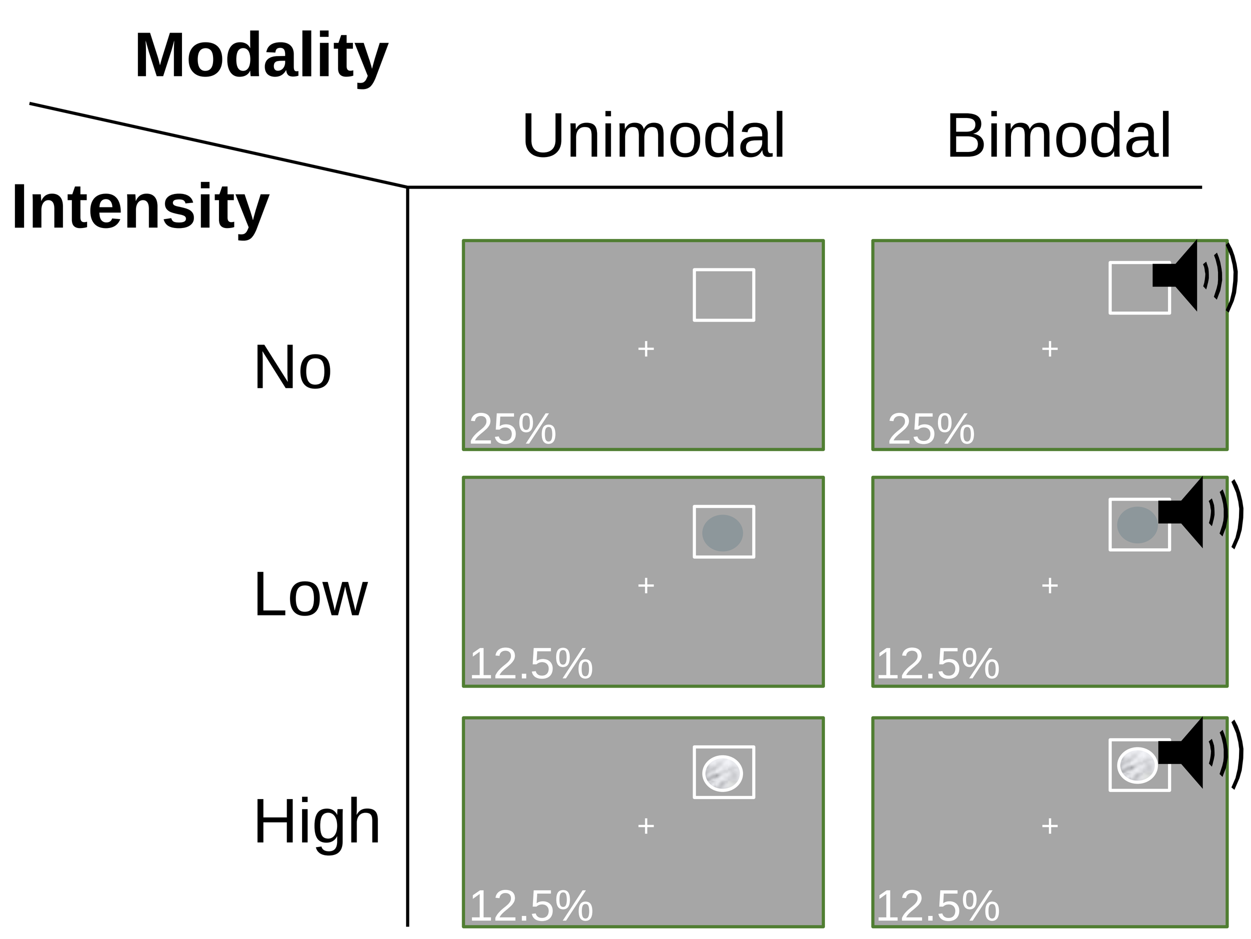
- There are 3 major rules for multisensory interactions
- Multisensory interplay is largest if stimuli
  - are presented close in space (spatial rule)[1,2]
  - are presented close in time (temporal rule)[2,3]
  - **have weak individual unisensory responses (principle of inverse effectiveness, PIE)[4,5]**



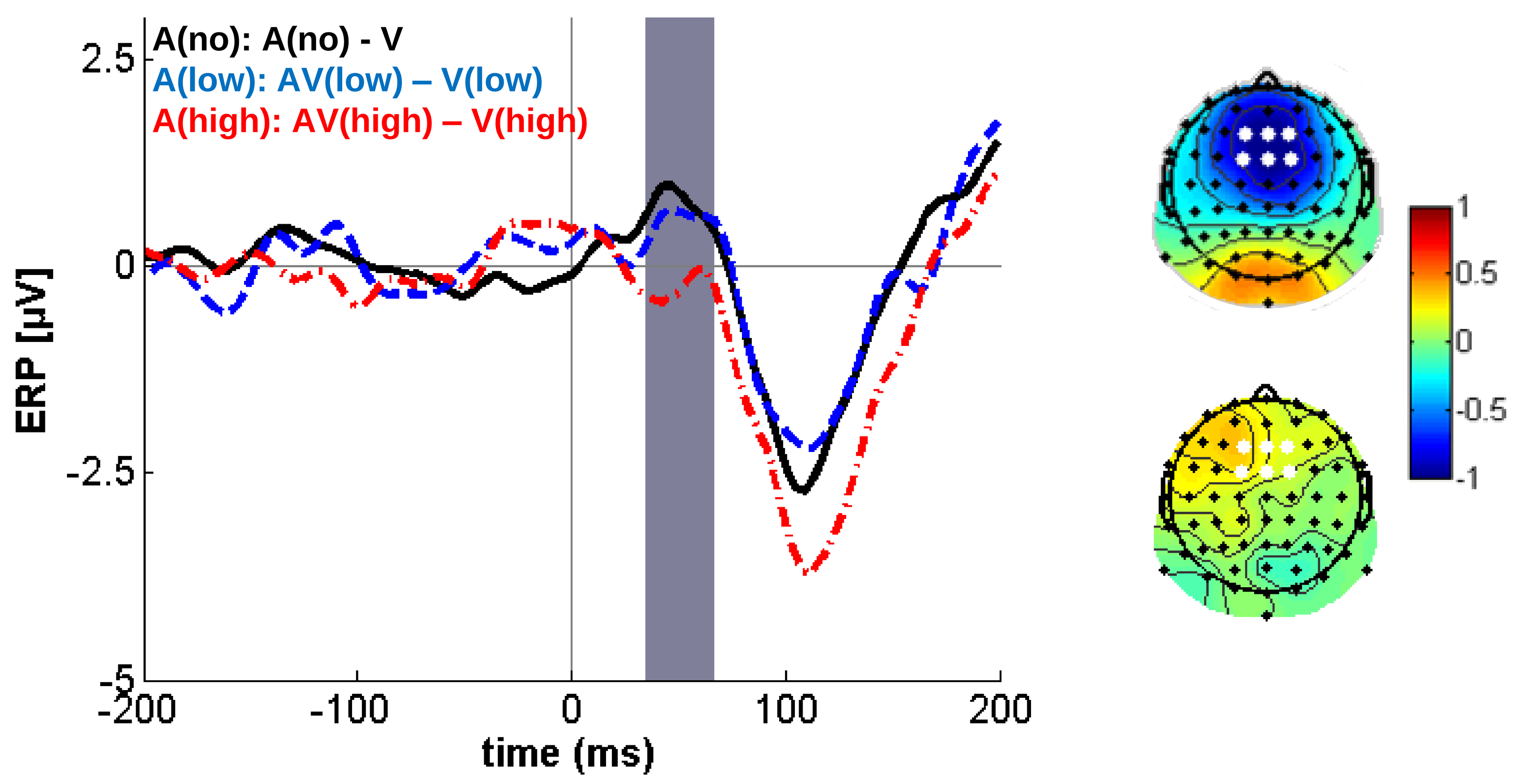
- **multisensory interactions occur automatically and at very low latencies** (presumably via direct crosstalk between sensory-specific areas)[6,7]

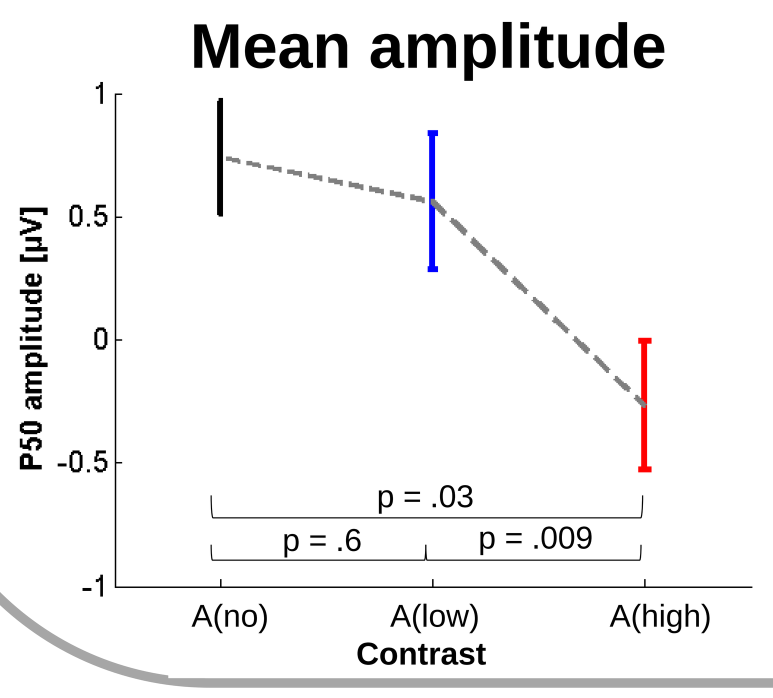
Experiment 1: Design & Results

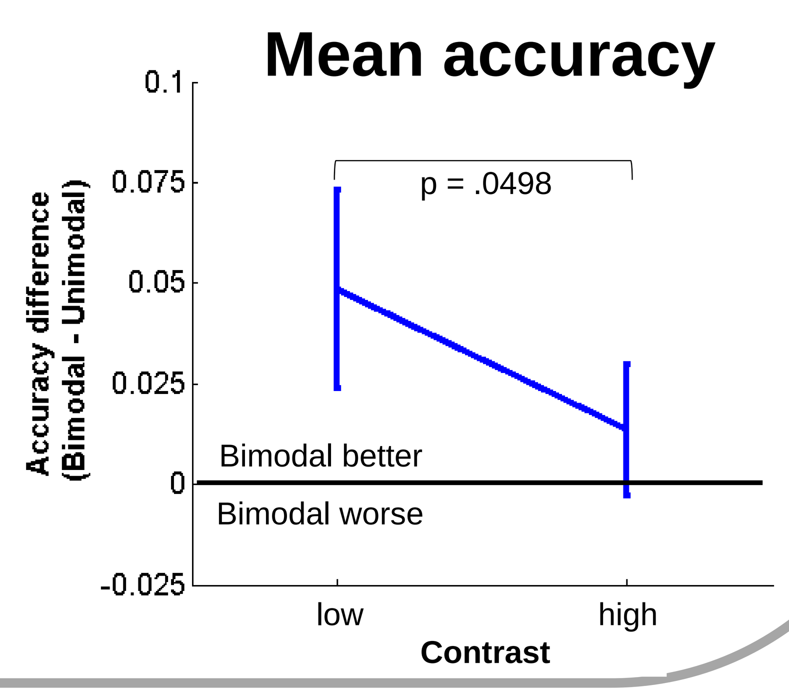
Design:



Results: Analysis of P50 (n=13)

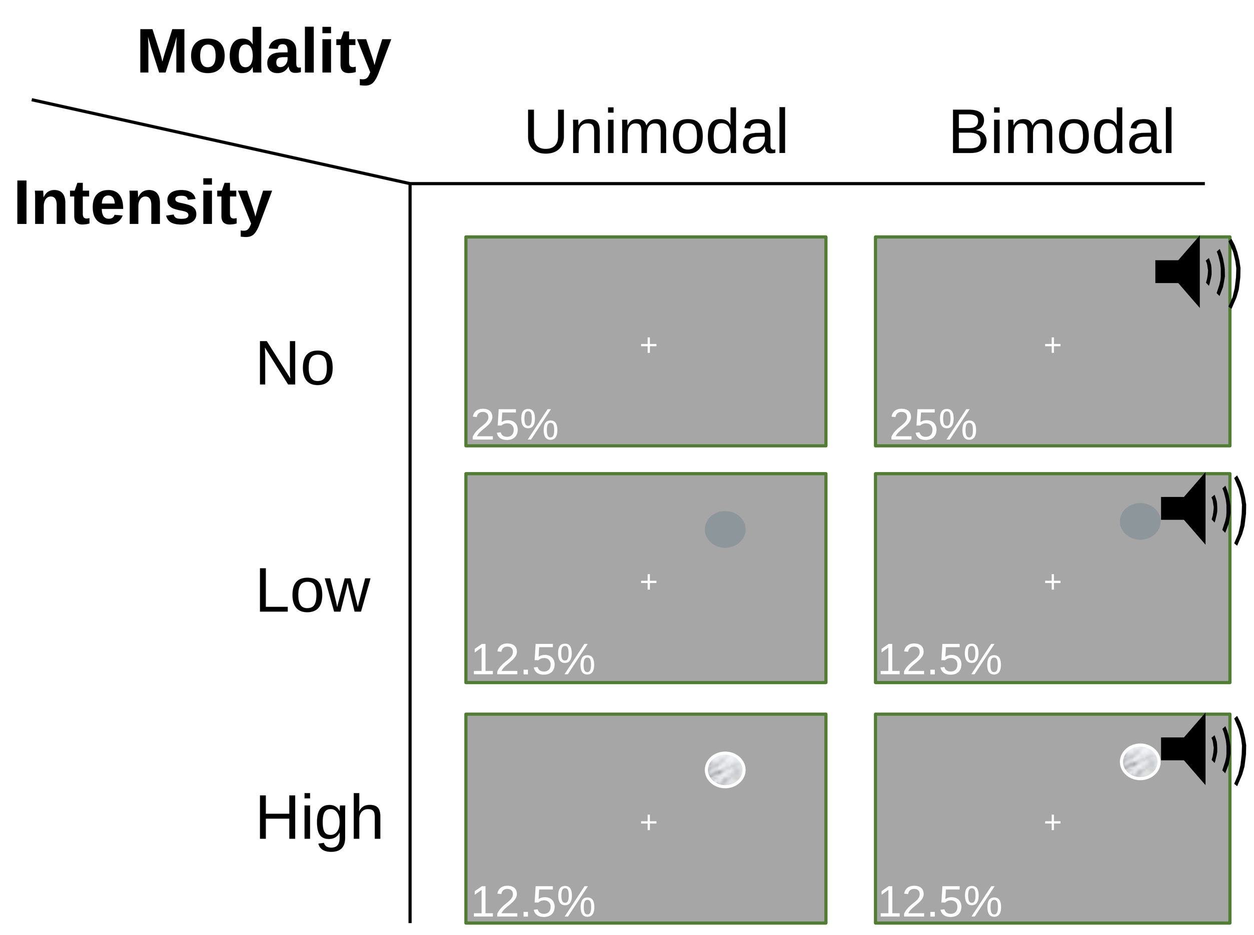




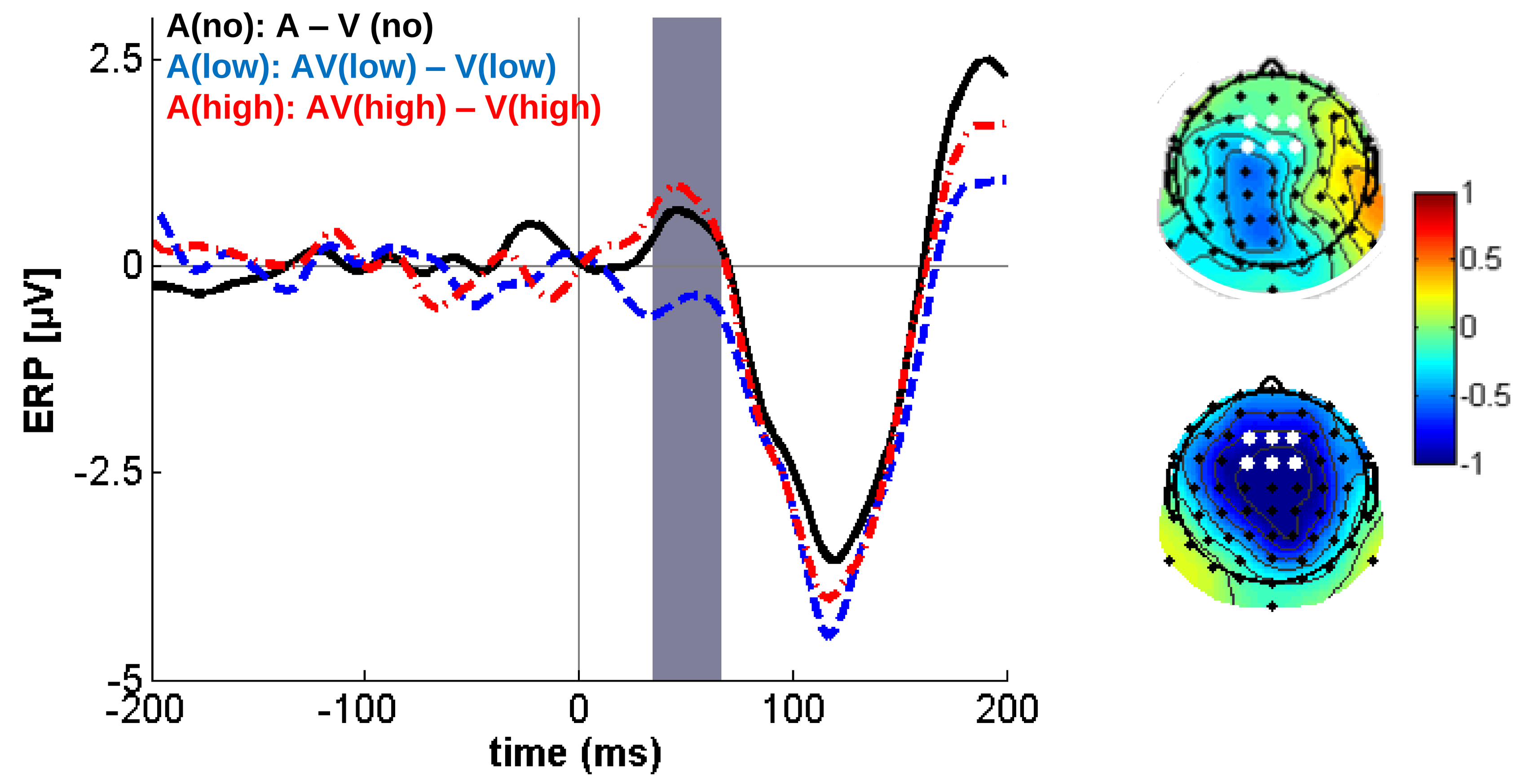


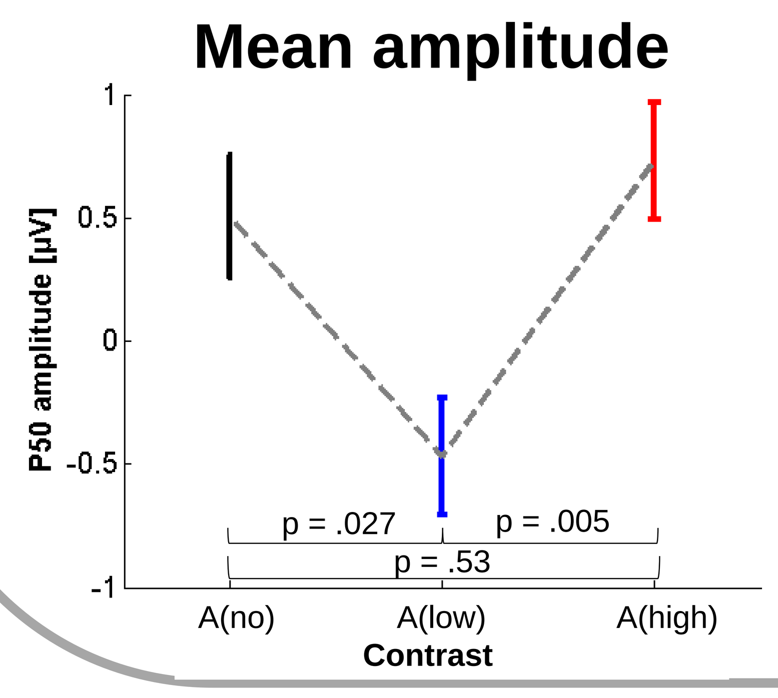
Experiment 2: Design & Results

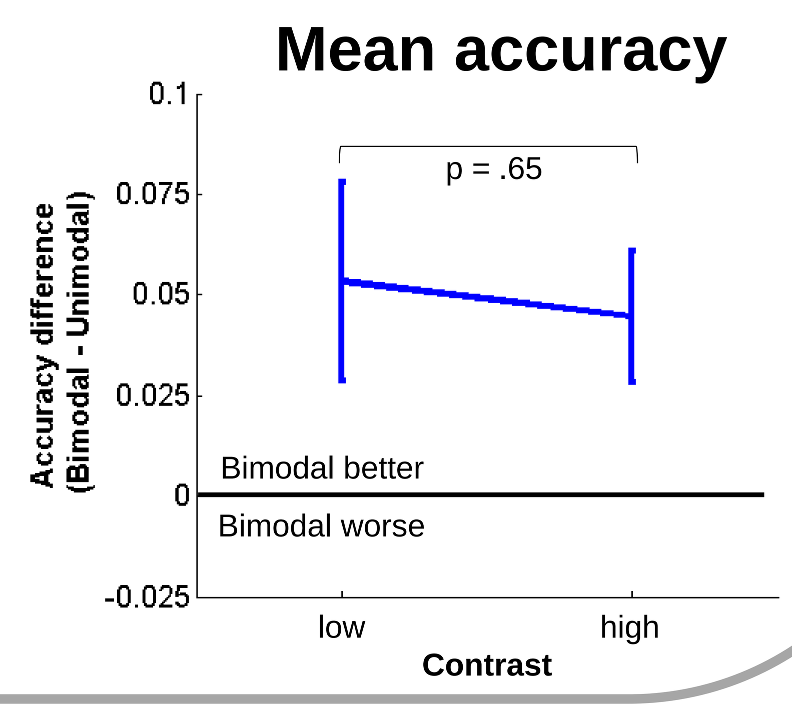
Design:



Results: Analysis of P50 (n=13)







Summary & Conclusion

- *Experiment 1 (with frame): Low contrast P50 > High contrast P50*
- *Experiment 2 (without frame): Low contrast P50 < High contrast P50*
- *Similar behavioural benefits across experiments (low > high contrast)*

This pattern of results calls into question the relevance of low-latency effects for multisensory integration and the generality of PiE; and strongly suggest that low-latency interactions and inverse effectiveness depend upon task demands and visual stimulus characteristics.

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