Compression and Decompression in Cognition

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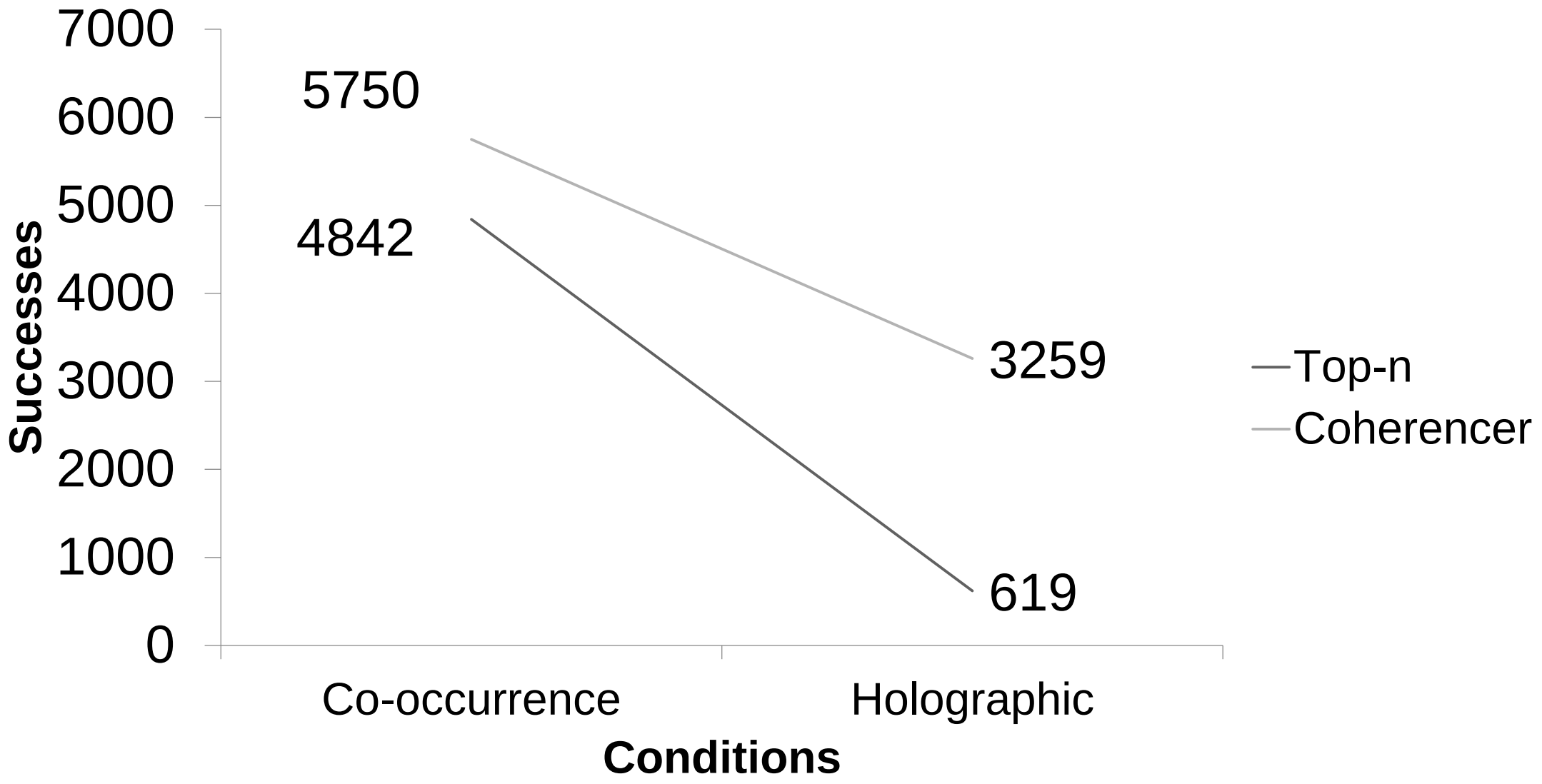
Introduction

- Compression of signals from the environment is critical to an organism's success
- Decompression plays an equally critical role
- We demonstrate this point by comparing two compression representations and two decompression procedures
  - Co-occurrence probabilities and holographic vectors
  - Top-*n* model and Coherencer model
- Problem
  - Given a single object label and a compressed representation of a database of labeled images, select four other object labels that occur in a single image


7000
6000
5000
4000
3000
2000
1000
0
Successes
5750
4842
3259
619
Co-occurrence
Holographic
Conditions
Top-n
Coherencer

Conclusions

- This is a preliminary, empirical demonstration that the exclusion of either side of the compression-decompression dyad in domains that do not explicitly represent key information gives an incomplete description of the process