

Semantic associations across development

Adults are thought to have well-established, efficient semantic networks₁. Ironically, this can result in memory distortion (e.g., DRM paradigm)₂. Young children are less susceptible to these distortions₂. This may point to differences in underlying network structure & content, but it is unknown how concept organization differs across development

Research Questions

How are concepts organized differently in adults and children?

- Structure:** Is the adult network better organized around important concepts (i.e., more centralized)? Are children more idiosyncratic?
- Content:** Are the networks centralized around different concepts? Do adult networks more accurately reflect co-occurrences in the environment?

Free association task

100 nouns from category norming study with 3-5 year old Canadians₃
 4 words per category
 25 words per participant (1 per category)
 100 **adults** (native English speakers)
 100 **children** (4-5yo; native English speakers)



“As fast as you can, what’s the first word you think of when I say the word PIZZA?”

“If someone asked me, I might say PEPPERONI, because that goes on top of pizza”

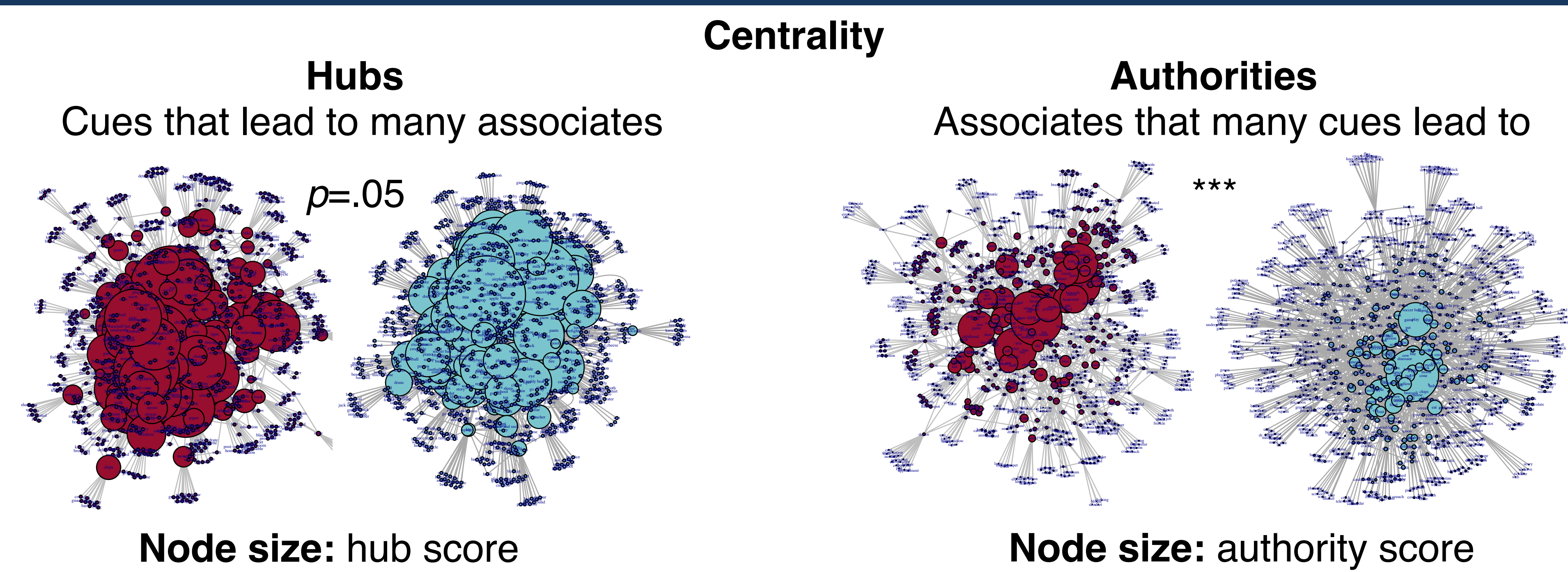
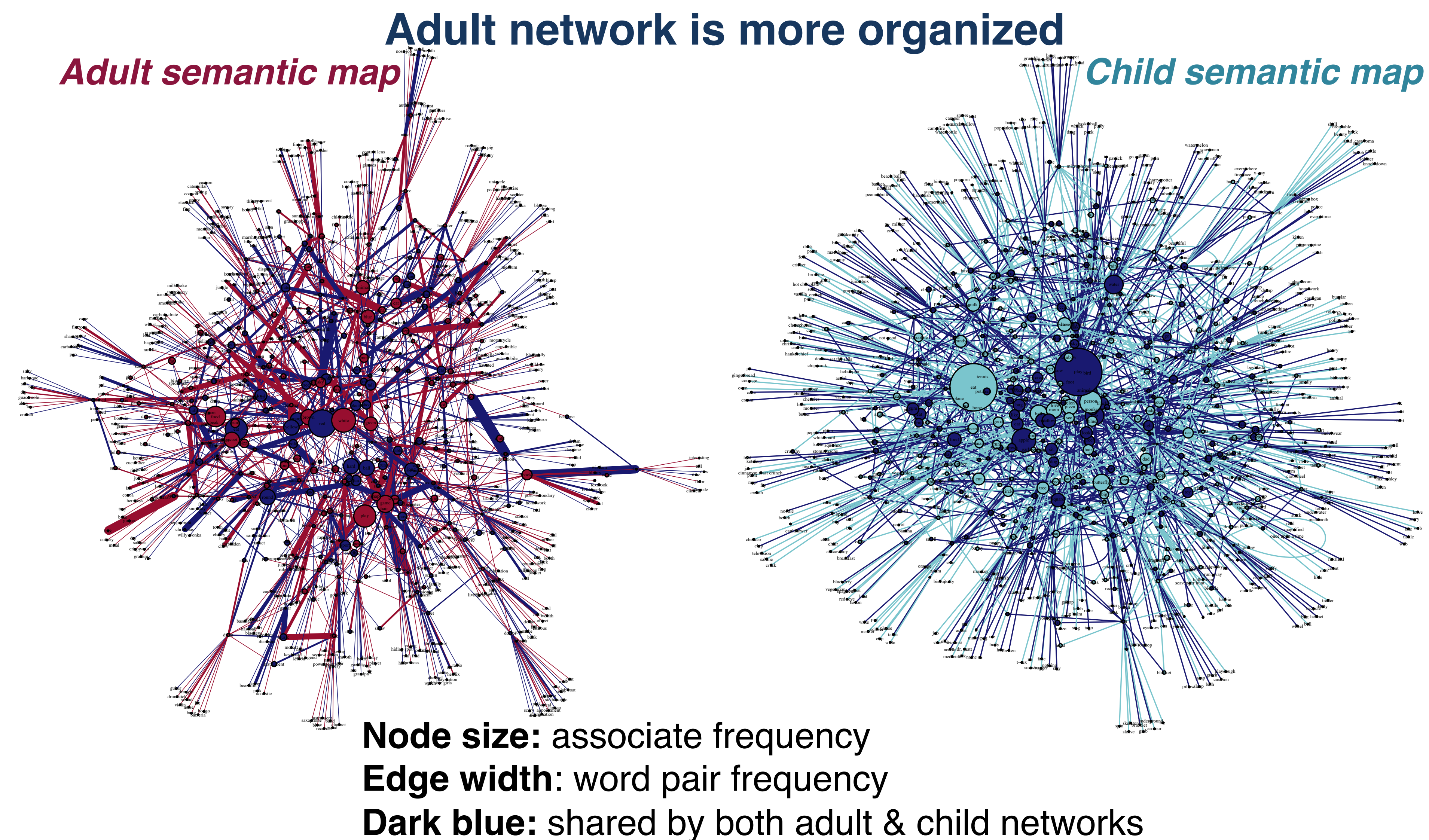
Study Outline

Structure

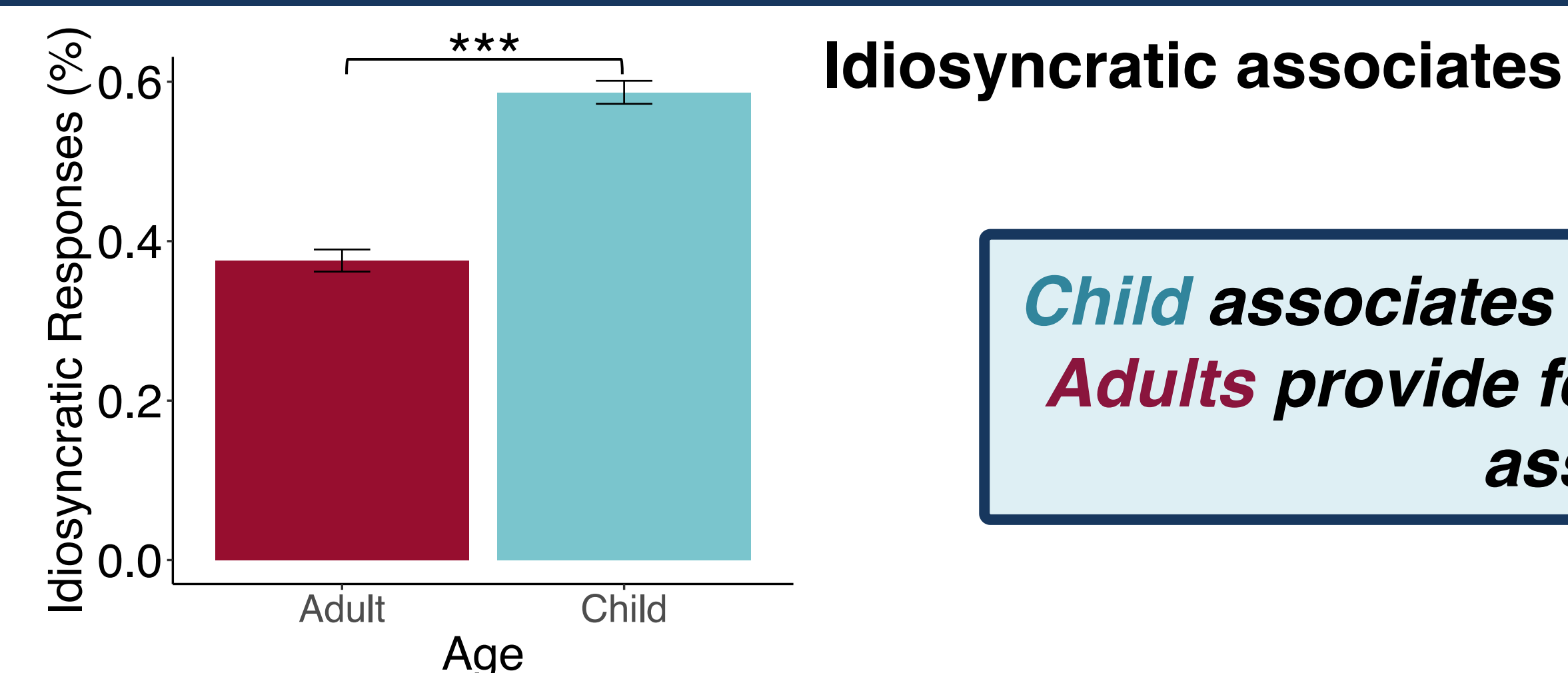
Semantic maps: Global structure of networks
 Centrality: How are the networks organized around specific concepts?
 Idiosyncratic associates: What % of responses are unique to one participant?

Content

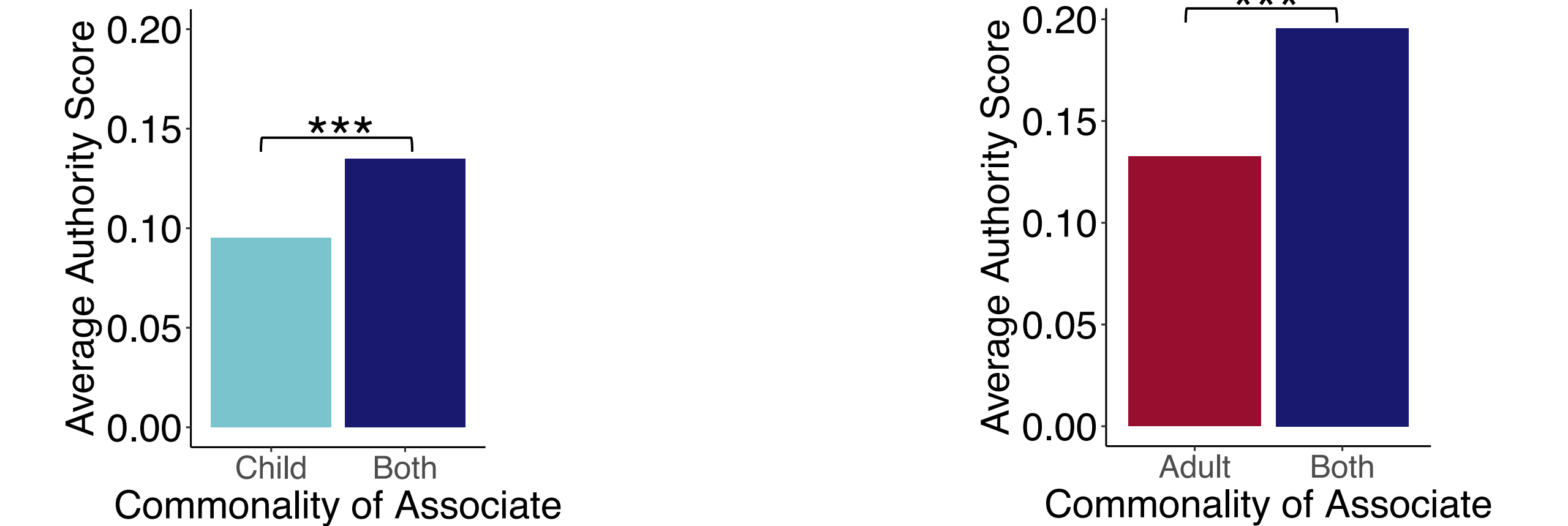
Centrality of shared associates: Are the networks organized around the same concepts?
 Real-world co-occurrence & word pair frequency: Do the networks accurately reflect the environment?
 Real-world co-occurrence between networks: Do adults more accurately reflect the environment?
 Real-world co-occurrence & shared pairs: Do pairs from both networks more accurately reflect the environment?



Cues in children lead to more associates
Associates in adults are consistent and more central in the network

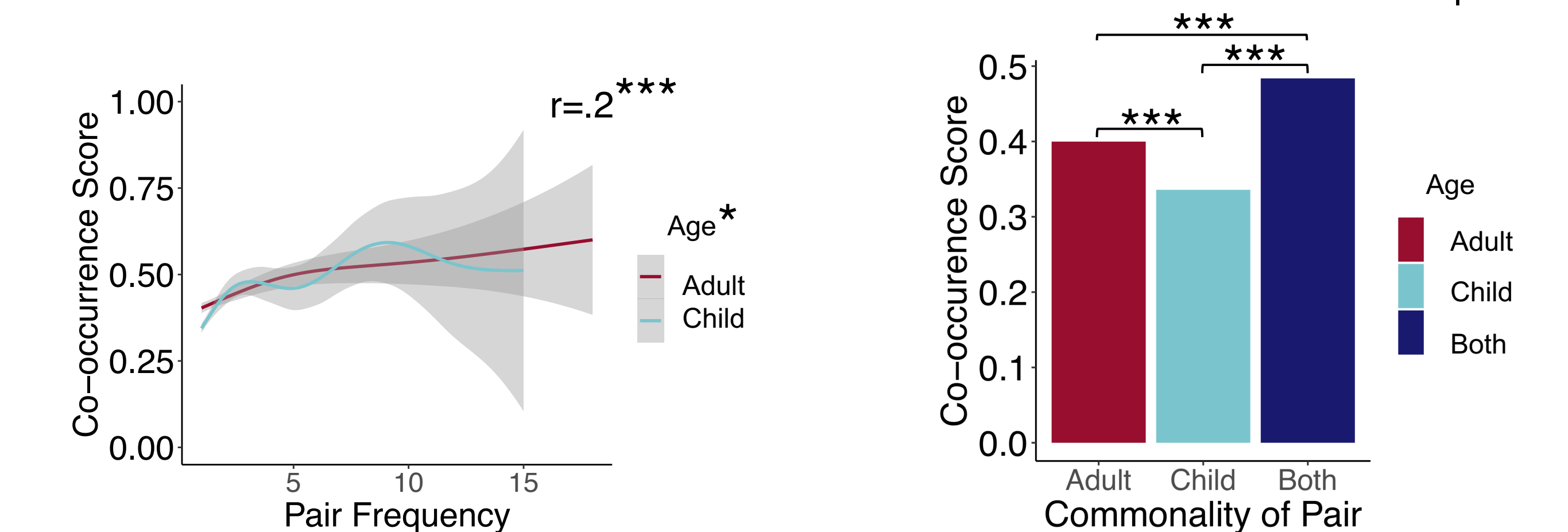


Both networks organize around the same concepts



Adult & shared pairs reflect real world co-occurrences

Co-occurrence: rate of word-word co-occurrence from GloVe₄ dataset



Conclusions

The **adult** network is more centralized and uniform, while the **child** network is more distributed and idiosyncratic
Both networks organize around the same concepts
Adult, frequent, and **shared** pairs better reflect real life co-occurrences
 Adults’ better organization & use of real world co-occurrences may explain adult susceptibility & child resistance to memory distortion
 The beginning of an adult-like network may be present by 4-5 years
 →Differences due more to structure than content?
Future directions: Child networks may be shaped by poor generalization₅ & good retention of verbatim information₆

References

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