A Systems Based Model For Smart Kids

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Food for the Brain

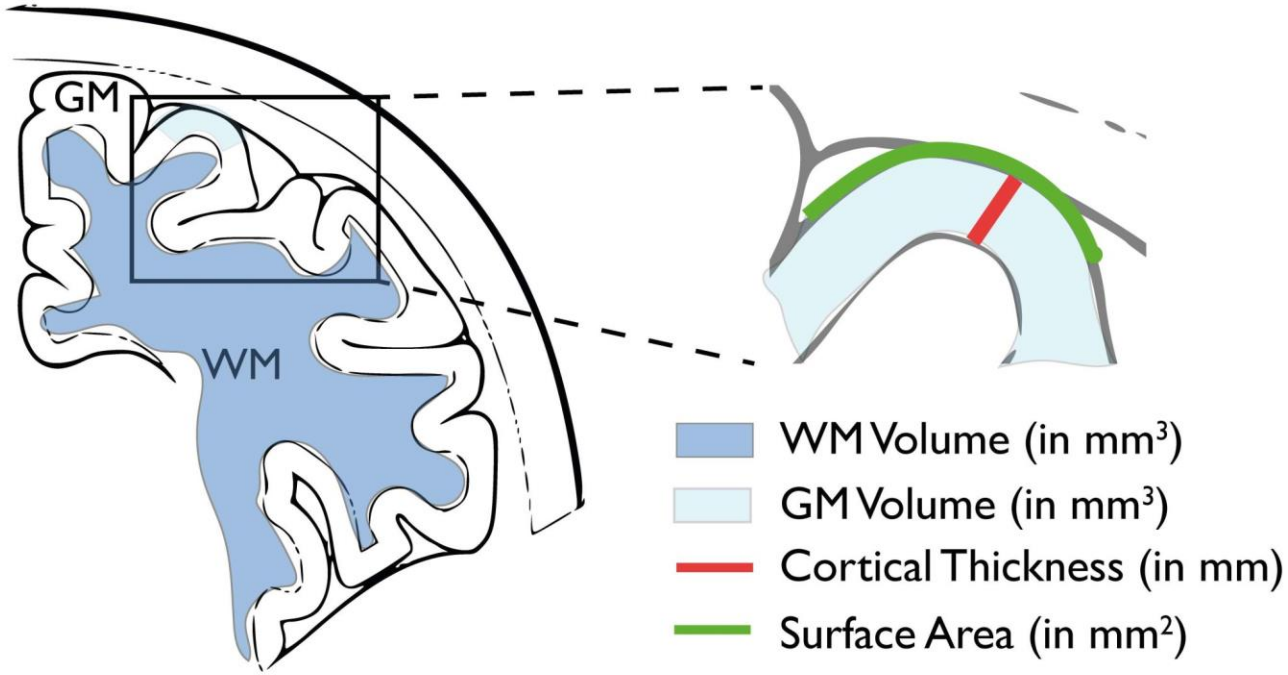
Overview

- Trajectories of brain development
- Factors that influence neurodevelopment
- Models to think about how the pieces fit together
  - A systems-based approach

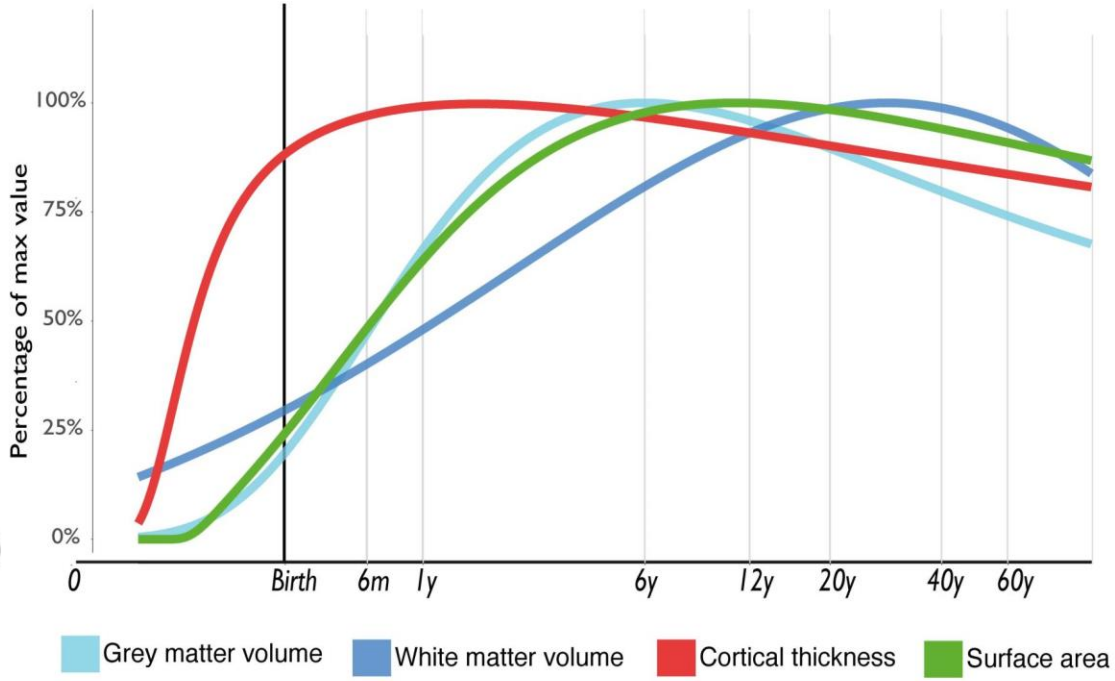
The brain takes ~30 years to develop

- Starts months before birth and is most rapid in the first few years
- Ends in early-mid adulthood

Morphological properties

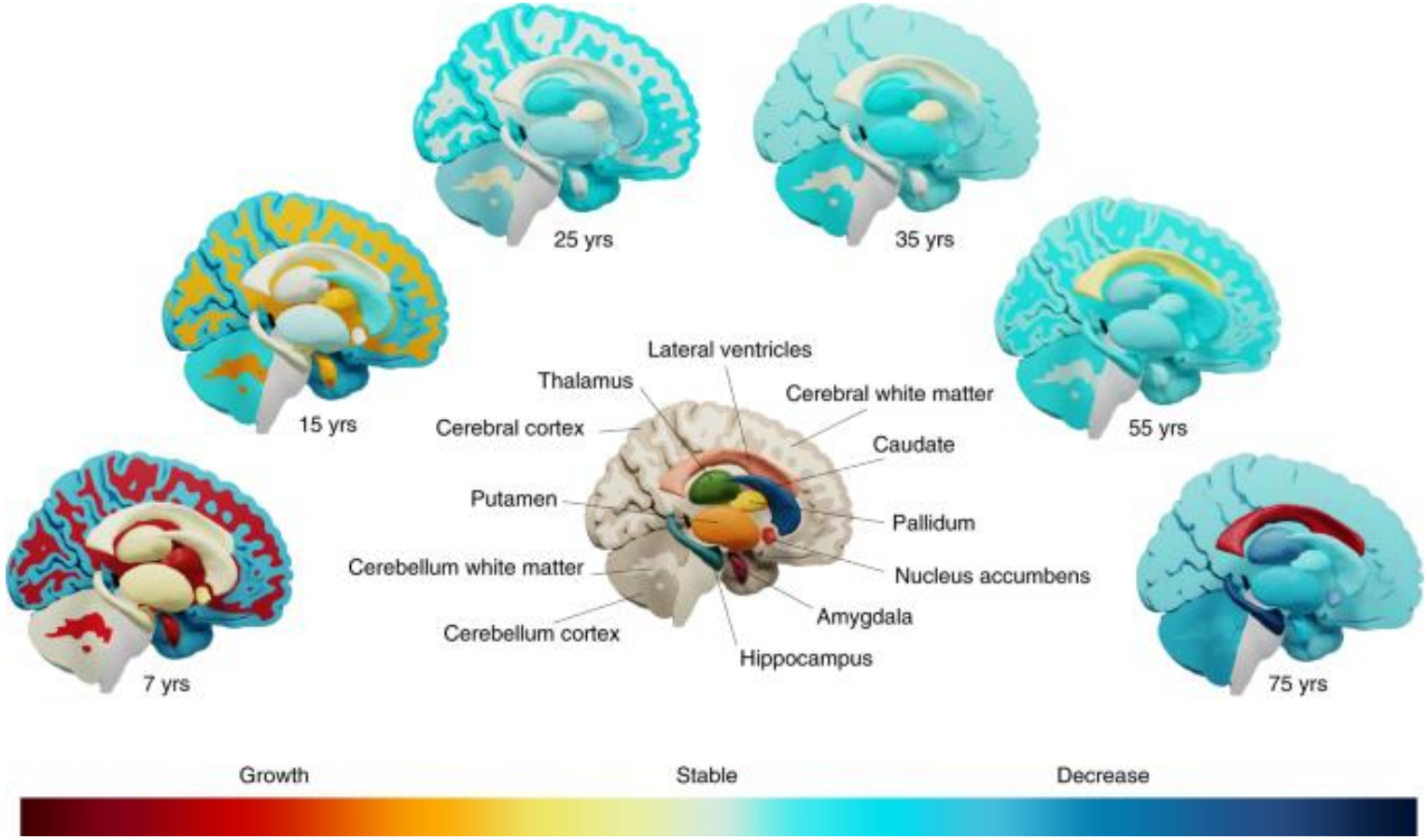


Whole brain changes



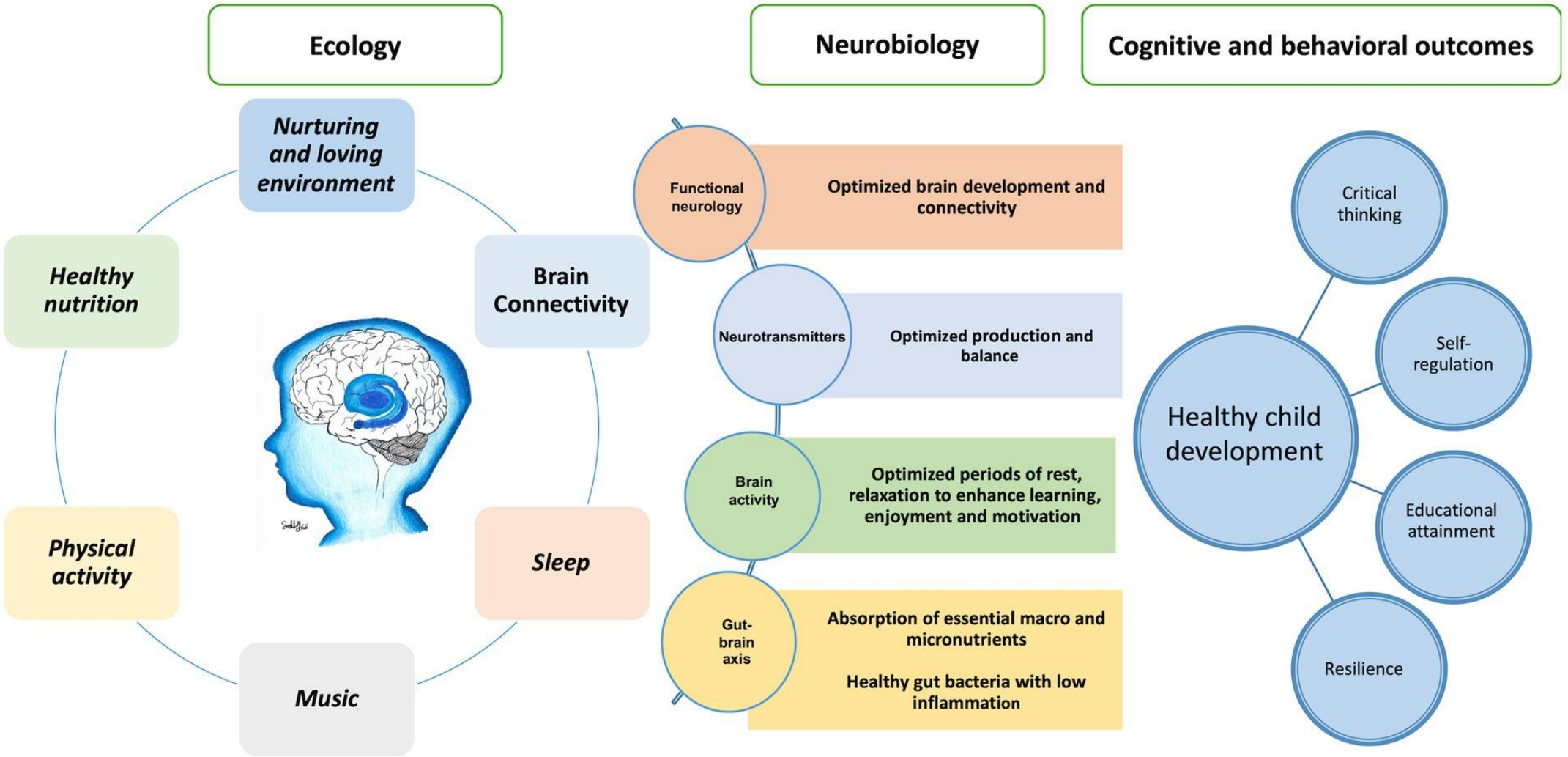
The brain takes ~30 years to develop

- The brain is dynamic and responsive across the entire lifespan
- Possible to intervene regardless of age



Brouwer et al. Nature Neuroscience 2022

Several factors influence brain development



Mualem et al. Front Public Health 2024

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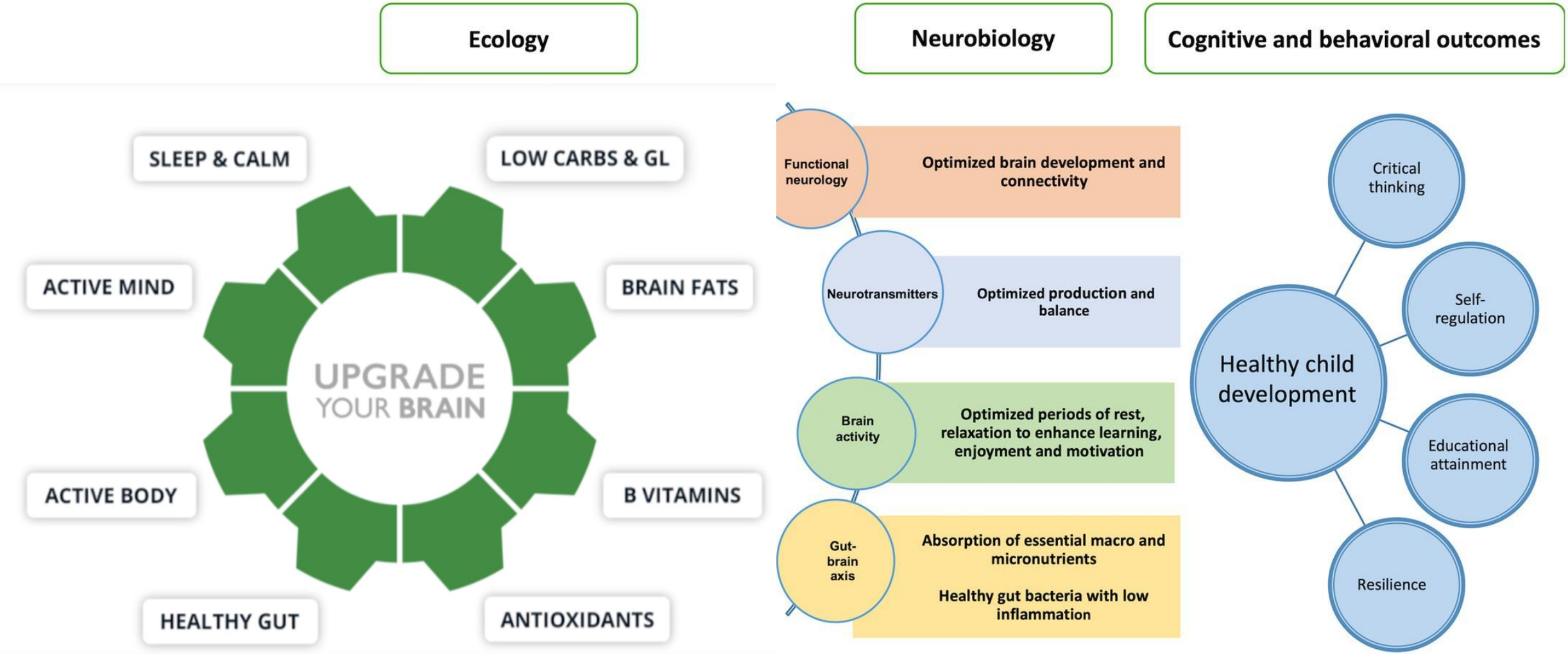
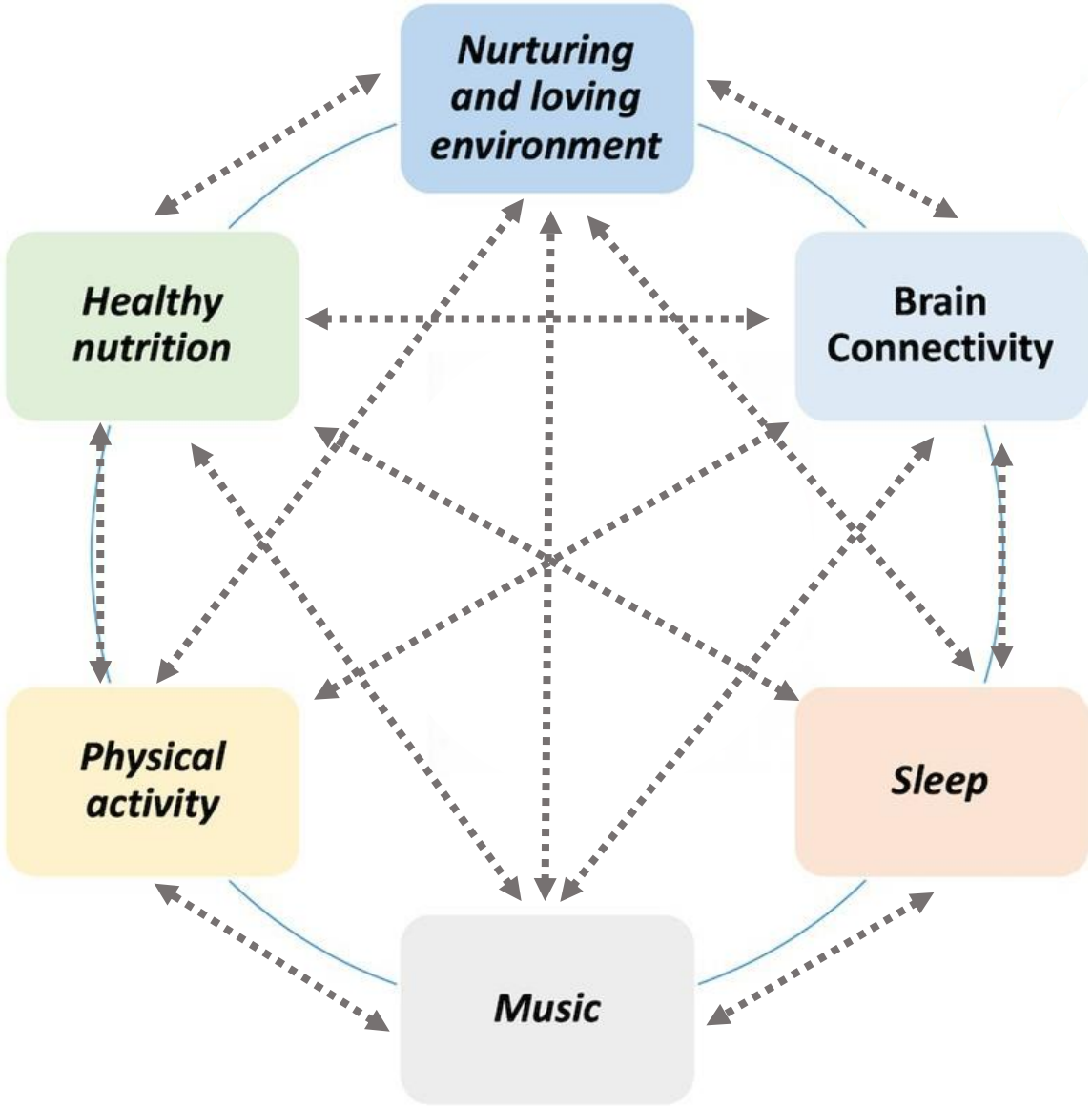


Brain health factors are a system not a list



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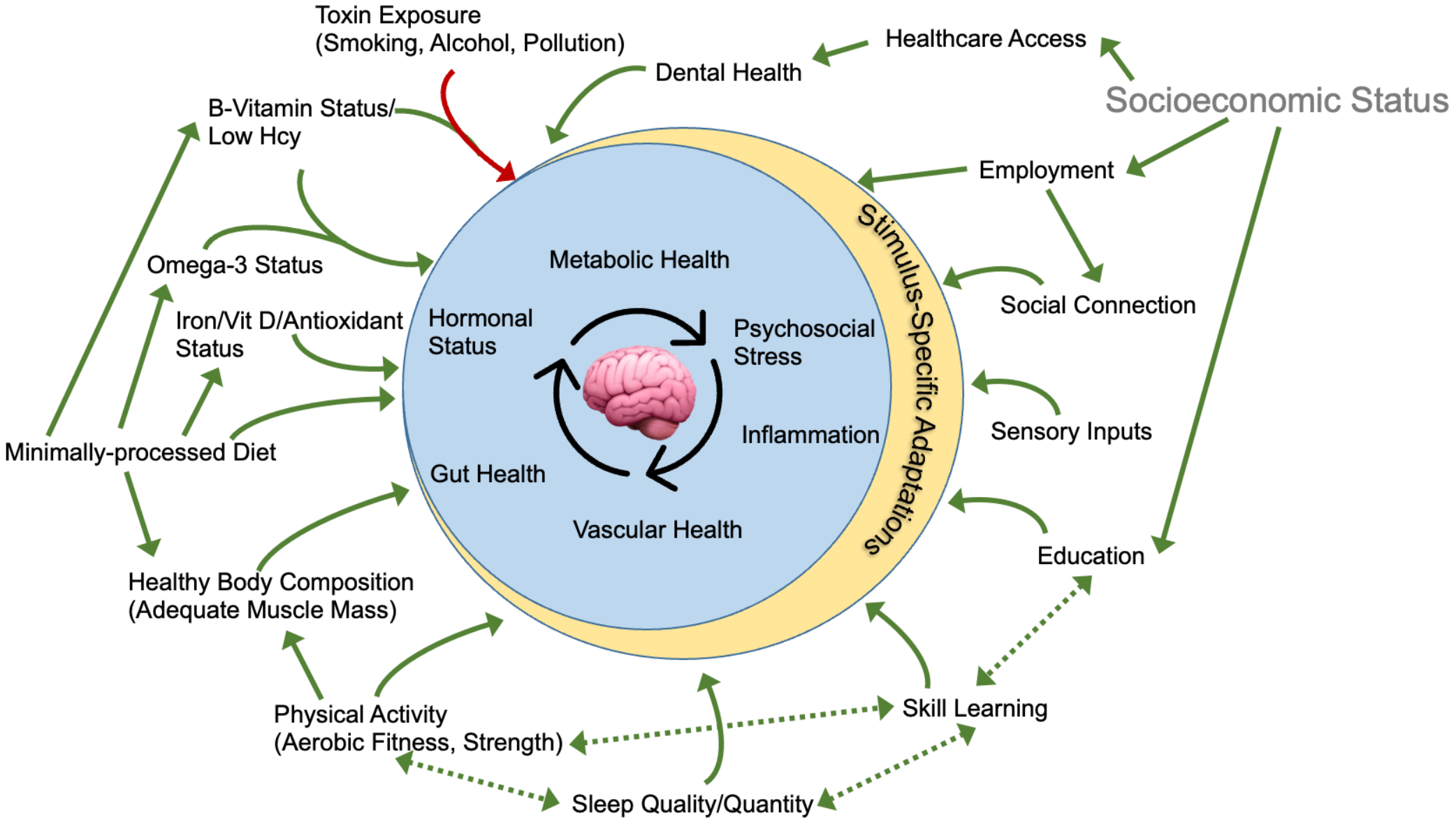
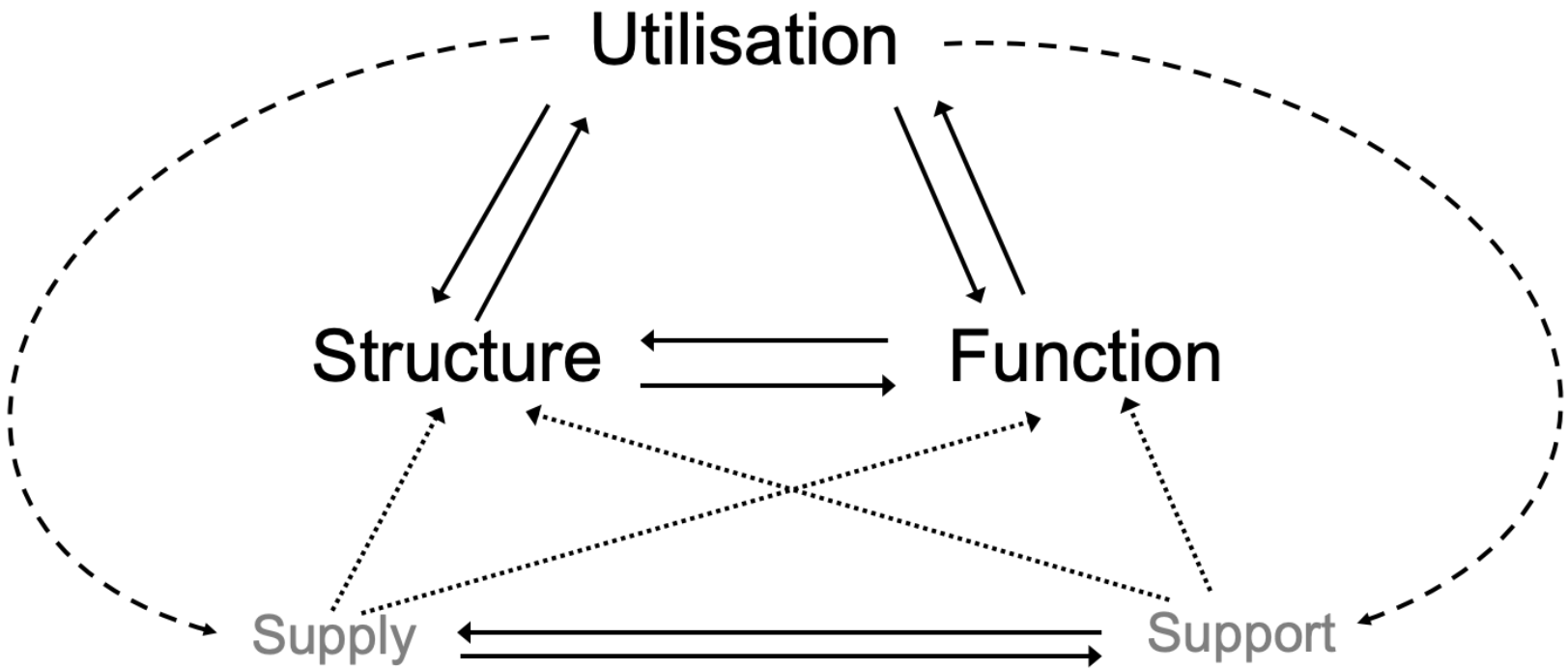


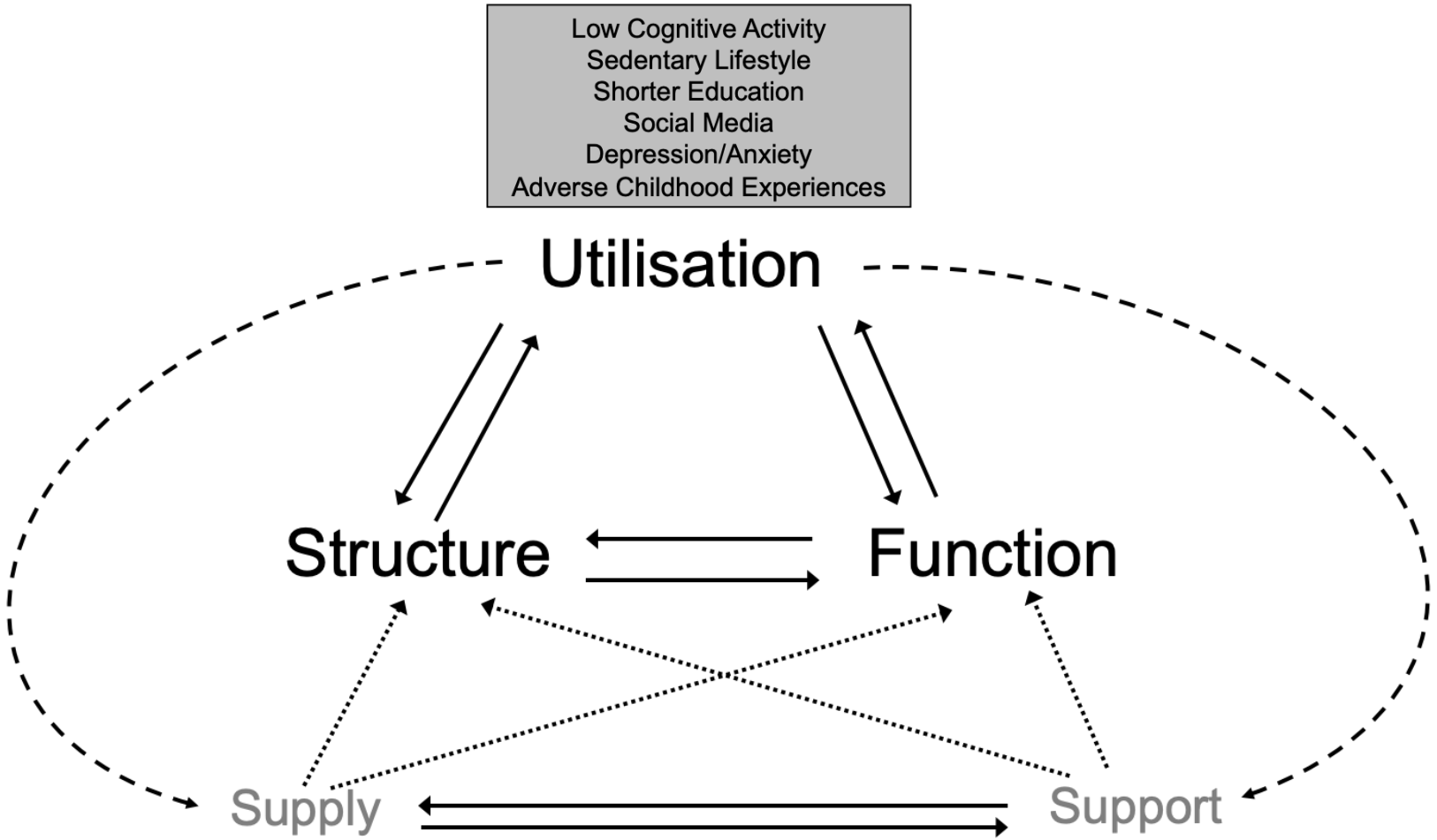
Wood et al. *In Preparation*

A system for brain health

- How the brain is used
- How the brain's structure is developed
- How the brain works
- The processes that support them



A system for brain health



Summary

- The brain develops most rapidly for the few years after birth
  - A very large window for intervention even after that
- Brain health as an interconnected system
  - How the brain is used
  - The factors that provide the necessary inputs and support
  - How those all together improve brain structure and function
- The system is synergistic
  - Don’t think about it as a list where everything has to be perfect
  - Small changes in a few areas can have a big overall impact

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