

Cognition in Context: Pathways and Compound Risk

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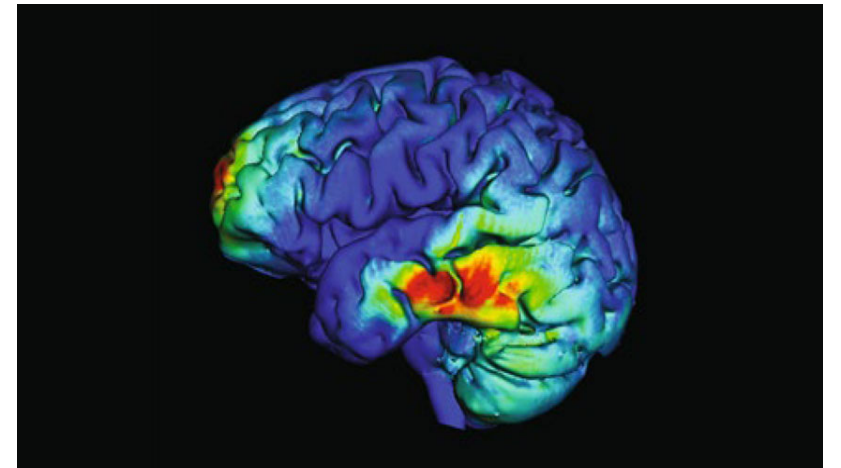
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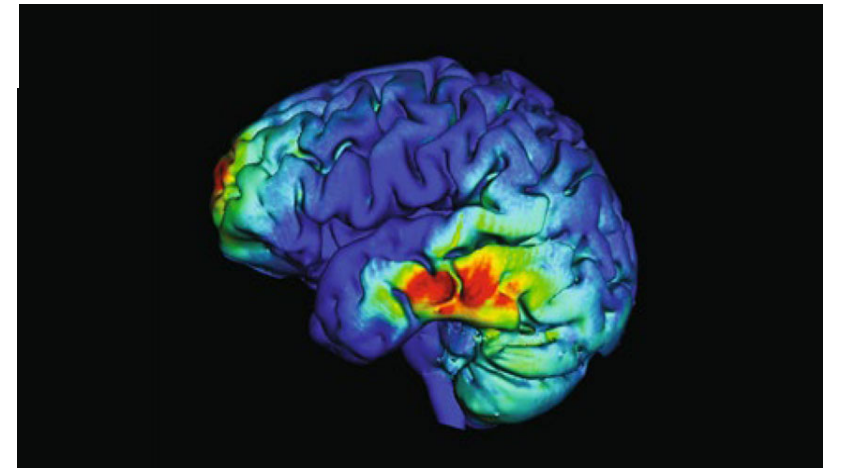
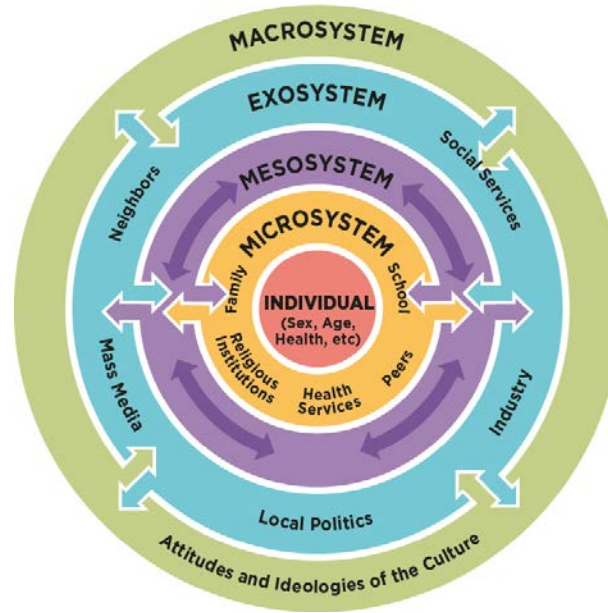


Genes, Brain, and Cognition

- Genetic basis for cognition
 - See Kovas & Plomin, 2006
- Mechanisms for the genotype-phenotype association are unclear
 - Konopka, 2017



Genes, Brain, and Cognition: Pathways?



Bronfenbrenner, 1994



Explaining the genotype-phenotype association:

Individual socioeconomic trajectories and sorting into neighborhoods

Sources of Data

Health and Retirement Study

- Genotype: 2006/2008 genetic data
 - HRS polygenic score for cognitive performance for non-Hispanic whites
 - Ware, Schmidt, Gard, et al. (2018)
- Phenotype: 2014 cognitive performance
 - Serial 7s, Backward counting, Immediate recall, Delayed recall
 - Thresholds for the 0-27 score:
 - 0-6 = Demented, 7-11 = CIND, 12-27 = normal
- Mediator 1: Years of schooling

American Community Survey

- Mediator 2: Census tract poverty
 - 2008-2012 five-year estimate of the proportion of households in poverty

Results???

Weighted multinomial regressions predicting cognitive status in 2014

Cognitive PGS	Model 1	Model 2	Model 3	Model 4
CIND	-0.161*** (0.048)	-0.123** (0.050)	-0.104 (0.055)	-0.065 (0.058)
Demented	-0.159* (0.076)	-0.148 (0.080)	-0.063 (0.092)	-0.063 (0.095)
Individual Education				
CIND		-0.224*** (0.021)		-0.240*** (0.021)
Demented		-0.301*** (0.078)		-0.325*** (0.040)
Household Poverty				
CIND		1.198*** (0.168)		0.898*** (0.235)
Demented		1.424*** (0.266)		0.789** (0.310)
Census Tract Poverty				
CIND			2.166*** (0.512)	1.440** (0.515)
Demented			2.496*** (0.750)	1.600* (0.819)

Note. Models adjusted for age, sex, and principle components, with normal as referent group
 CIND = cognitively impaired, not demented

Take Away...

- Carrying genetic risk for poorer cognition sets people on a trajectory toward lower SES, including lower future education attainment
- Moreover, this genetic risk potentially sorts people into higher poverty areas that are 'risky' for cognition



Thank you!

Questions?

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...and come see me during the poster session!