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Exam 1:	Tuesday February 17	100pts
Exam 2:	Tuesday March 31 st	100pts
Exam 3:	TBD	200pts

Discussion section 75pts

Discussion participation and attendance	20pts
Debates, 2	25pts
Pop Activities	30pts

Extra-credit: Up to 5 points for lecture and out-of-class

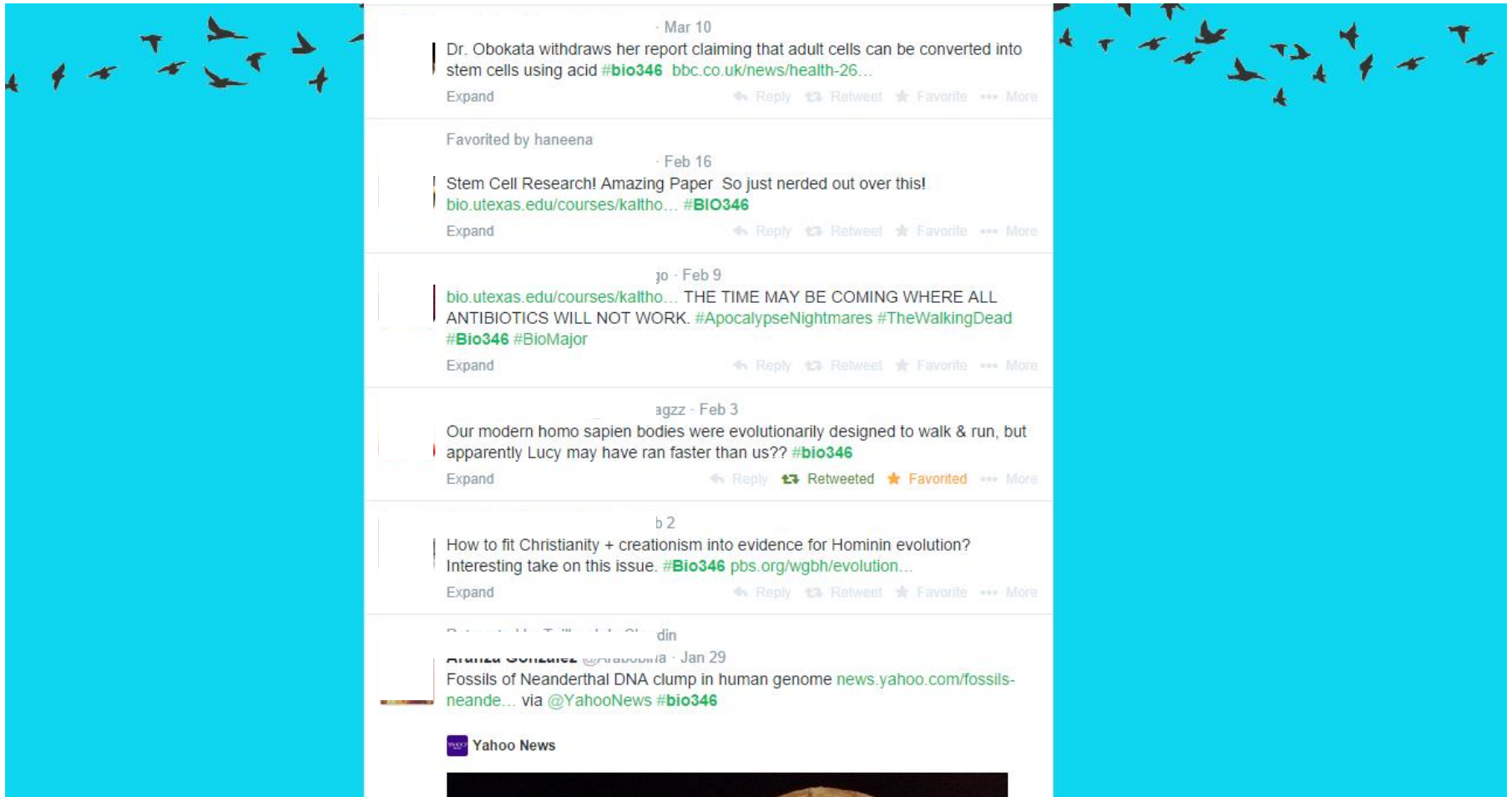
Twitter participation

Total 475pts



How to tweet in Human Biology?

1. Complete the survey
2. Use #BIO346
3. Share your knowledge, news and thoughts!



Steps to fail Human Bio

1. Not reading for discussion



2. Texting in lecture/discussion



3. Online shopping



4. To go unnoticed



Research Article

SOCIOECONOMIC STATUS MODIFIES HERITABILITY OF IQ IN YOUNG CHILDREN

Eric Turkheimer, Andreana Haley, Mary Waldron, Brian D’Onofrio,
and Irving I. Gottesman

University of Virginia



What is the hypothesis on this paper?

SES is an environmental factor that affects heritability of IQ in young children

How was the methodology to test the hypothesis?

- 48,197 american mothers
- 59,397 children followed from birth until age 7

623 were twin births but 319 pairs were studied

- 114 were monozygotic
- 205 were dizygotic

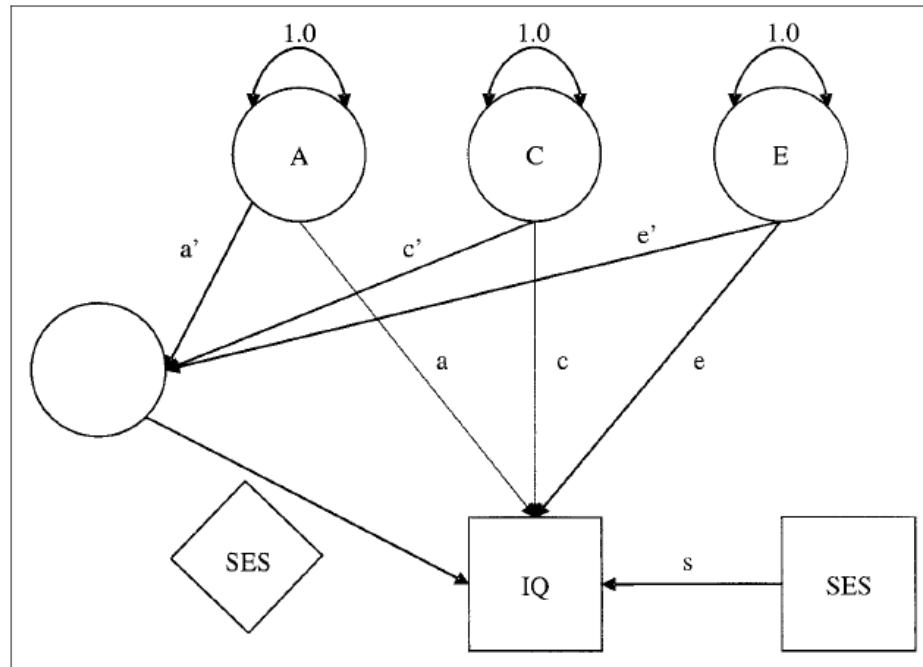
Twins were 43% White, 54% Black, and 3% “other.”

The Wechsler Intelligence Scale for Children (WISC) @ 7

- Verbal IQ (VIQ)
- Performance IQ (PIQ),
- Full-Scale IQ (FSIQ)

Socioeconomic scores were obtained at mother’s registration in the study and at the 7-year evaluation: Median family income was \$22,100 in 1997

Their goal was to fit a model in which the magnitude of the variance components themselves varied as a continuous function of SES.



$$IQ = sSES + (a + a'SES)A + (c + c'SES)C + (e + e'SES)E,$$

The model was fit using the Mx **maximum likelihood** modeling program. A recent addition to Mx allows the user to place the value of an observed variable on a path, as indicated by the diamond denoting SES.

Results

Table 1. Results of model fitting, showing path coefficients (rows labeled A, C, E, A', C', E')

Factor	Main-effects-model parameter	Interaction-model parameter	95% CI	
			Lower	Upper
FSIQ				
A	10.41	2.33	-7.28	9.67
C	11.66	16.83	11.43	21.87
E	9.14	13.32	10.92	15.68
SES	0.36	0.36	0.28	0.44
A'		0.16	0.05	0.29
C'		-0.12	-0.26	-0.01
E'		-0.1	-0.13	-0.05
VIQ				
A	7.16	2.69	-5.06	7.98
C	8.56	12.03	7.48	16.32
E	6.97	7.42	5.66	9.32
SES	0.26	0.26	0.2	0.31
A'		0.1	-0.01	0.19
C'		-0.09	-0.22	0.02
E'		-0.01	-0.04	0.03
PIQ				
A	-5.23	-2.26	-11.37	6.72
C	9.41	11.97	7.69	15.89
E	9.48	12.11	10.21	14.04
SES	0.22	0.22	0.16	0.28
A'		0.16	0.01	0.27
C'		-0.07	-0.19	0.03
E'		-0.06	-0.1	-0.02

Note. Additive variation in genotype, shared environment, and nonshared environment is denoted by A, C, and E, respectively. Their interactions with socioeconomic status (SES) are denoted by A', C', and E'. FSIQ = Full-Scale IQ; VIQ = Verbal IQ; PIQ = Performance IQ; CI = confidence interval.

How did they assess the role of sampling error in the results?

Table 2. Chi-square fits of the main-effects and interaction models and tests of the difference between the models

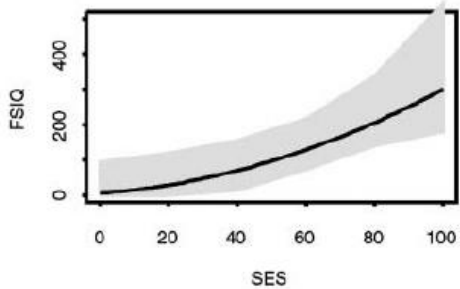
Test	Fit		Comparison	
	Main-effects model	Interaction model	χ^2 difference	<i>p</i>
Full-Scale IQ	8,236.4	8,220.6	15.8	.001
Verbal IQ	7,841.2	7,837.5	3.7	.3
Performance IQ	8,014.5	8,005.8	8.7	.034

These suggest that the interactions jointly contribute a significant improvement in fit for FSIQ and PIQ, but not for VIQ.

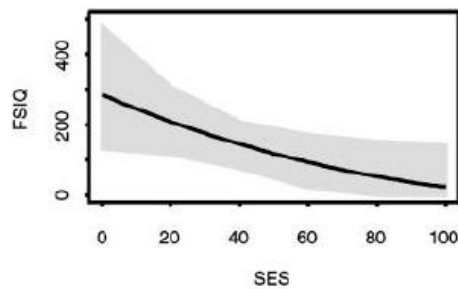


But McKayla is not still impressed...

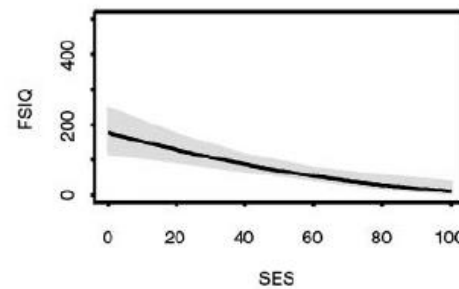
Magnitude of the variance components A, C, and plotted as a function of observed socioeconomic status (SES). Shading indicates 95% confidence intervals.



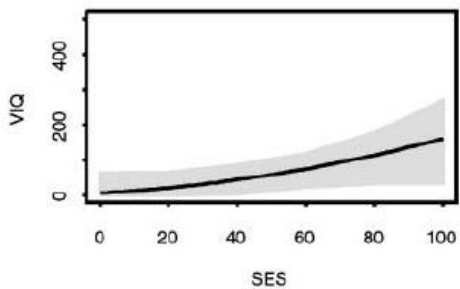
A



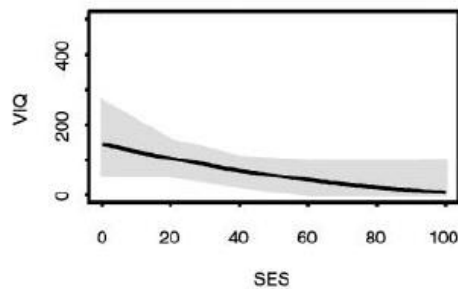
C



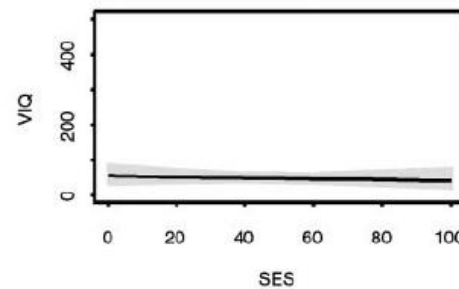
E



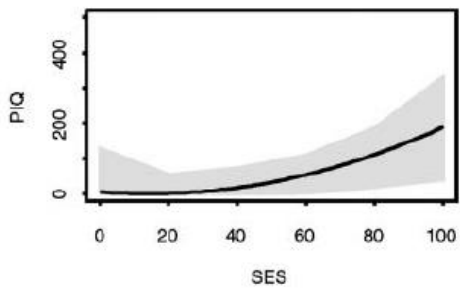
A



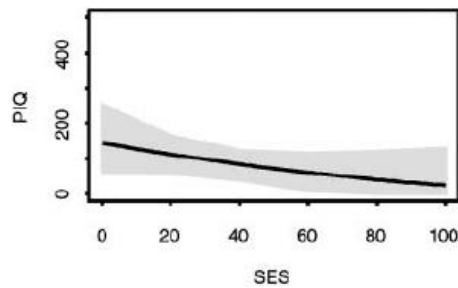
C



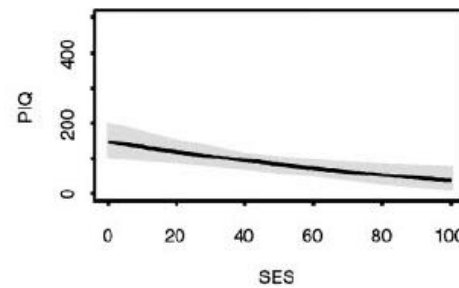
E



SES

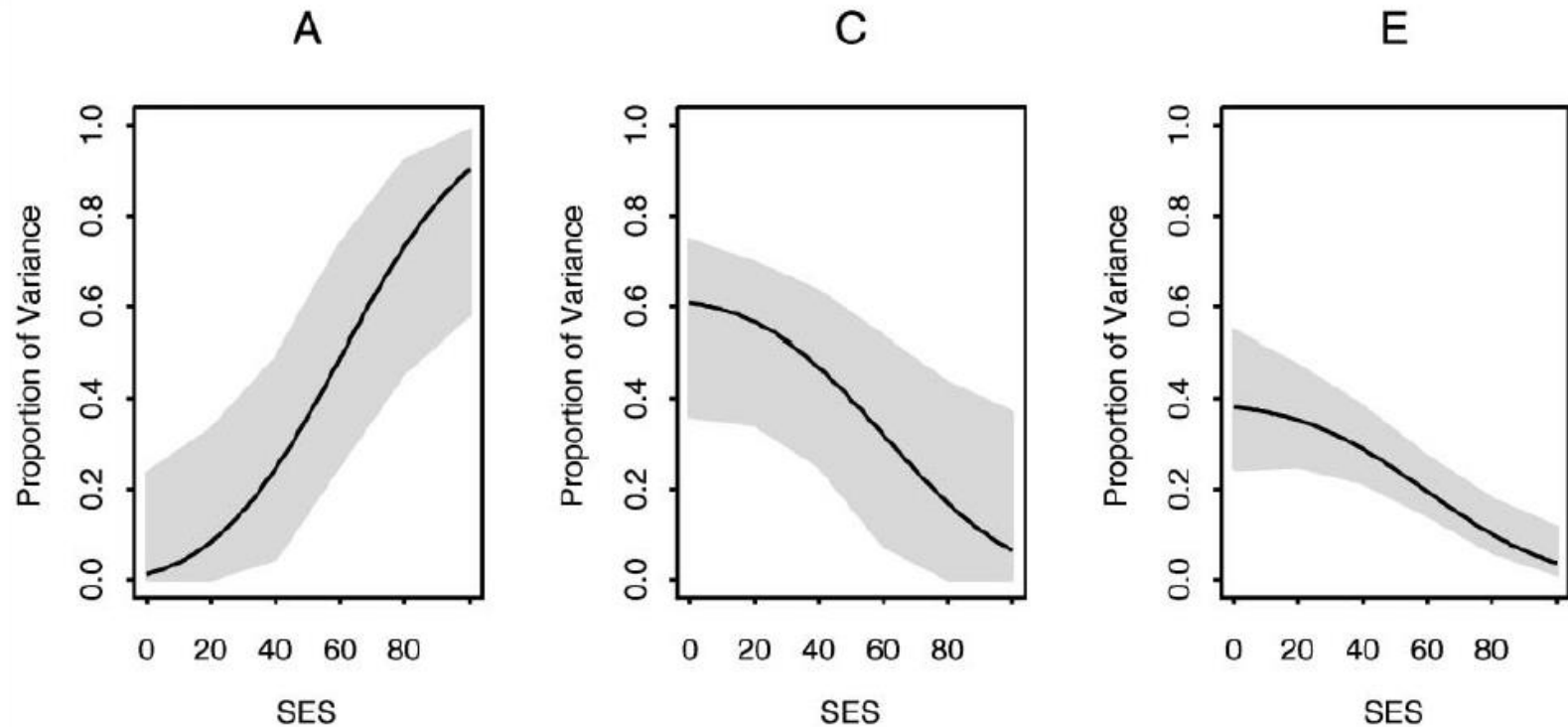


SES



SES

Proportion of total Full-Scale IQ variance accounted for by A, C, and E plotted as a function of observed socioeconomic status (SES). Shading indicates 95% confidence intervals.



Results demonstrate that the proportions of IQ variance attributable to genes and environment vary nonlinearly with SES. The models suggest that in impoverished families, **60% of the variance in IQ is accounted for by the shared environment**, and the contribution of **genes is close to zero**; in affluent families, the result is almost exactly the reverse.

The models we employed in this study do not allow us to determine which aspect of SES is responsible for the interactions we observed.

