Nature Precedings : doi:10.1038/npre.2008.2654.1 : Posted 13 Dec

The Undertheorized Environment

Sociological Insights for Behavioral Genetics

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May 9, 2008

e Precedings : doi:10.1038/npre.2008.2654.1 : Posted 13 Dec

Acknowledgements

- Hedwig Lee
- Guang Guo
- Michael Shanahan

Nature Precedings : doi:10.1038/npre.2008.2654.1 : Posted 13 Dec

"I feel so at home here.... I went in search of my roots and had my DNA tested, and I am Zulu... I'm crazy about the South African accent; I wish I had been born here."

–Oprah Winfrey
Johannesburg, June, 2005

Ontology

/On*tol"o*gy/, n. That department of the science of metaphysics which investigates and explains the nature and essential properties and relations of all beings, as such, or the principles and causes of being.

—Webster's Revised Unabridged Dictionary

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Theoretical Question

How should social scientists understand and evaluate claims for genetic origins of behavioral traits?

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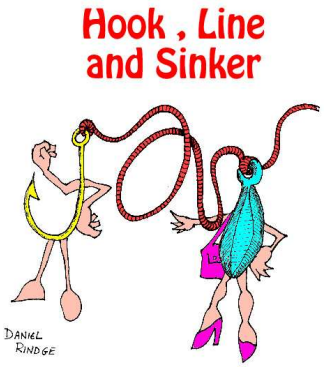
Two Main Approaches



1. Dismissal on epistemological or ideological grounds
2. Uncritical incorporation of genetic logic in social science

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Theorizing Genetic Effects

Five Criteria

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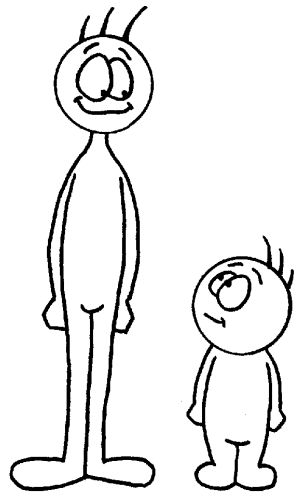
The Undertheorized Environment: Criterion 1

Environment should be conceptualized as potentially *enabling* as well as *constraining* outcomes.



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The Undertheorized Environment: Criterion 2

The Paradox of Reform

Decreased social control in one domain may induce increased social control in other domains.

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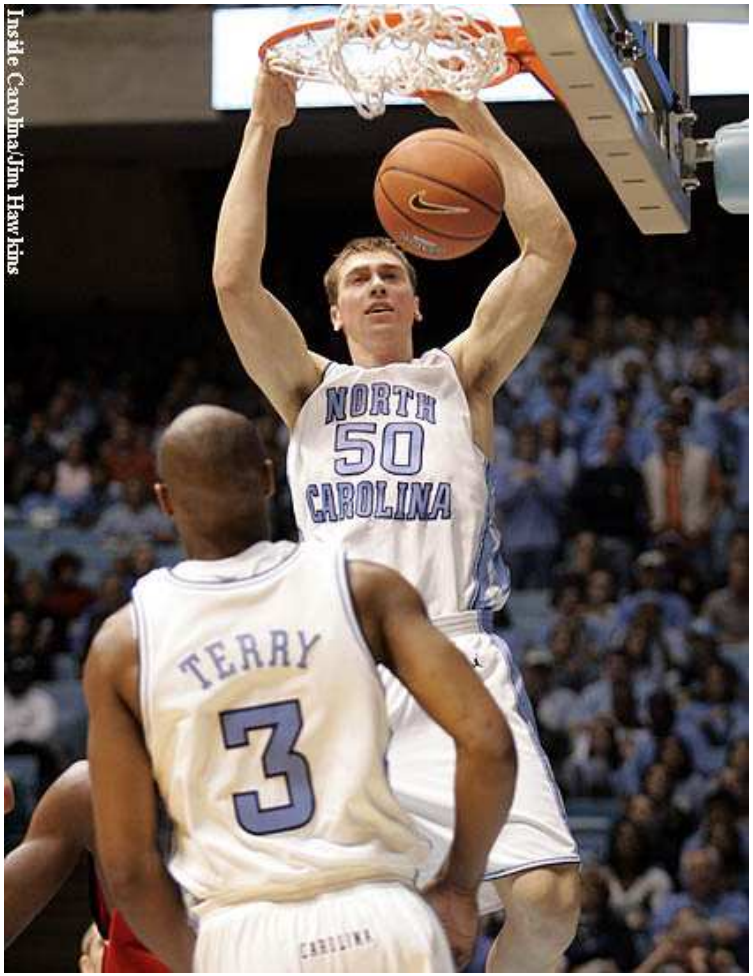
The Undertheorized Environment: Criterion 3

Both environments and genetic potentials must be understood as nested and cross-cutting in potentially complex ways.



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The Undertheorized Environment: Criterion 4

Because genetic and environmental influences may iterate over time, **small differences may matter**. Small and even unmeasurable environmental influences may have substantial influences on outcomes, particularly over time.

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The Undertheorized Environment: Criterion 5

Because evolutionary time is very slow, change observed within historical time must be (mostly) the result of environmental change.

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The Implicit Ontology of Behavioral Genetics

- Buzzword: "Basic Processes"
- Biology is more real than sociality
- Environmental effects are residual

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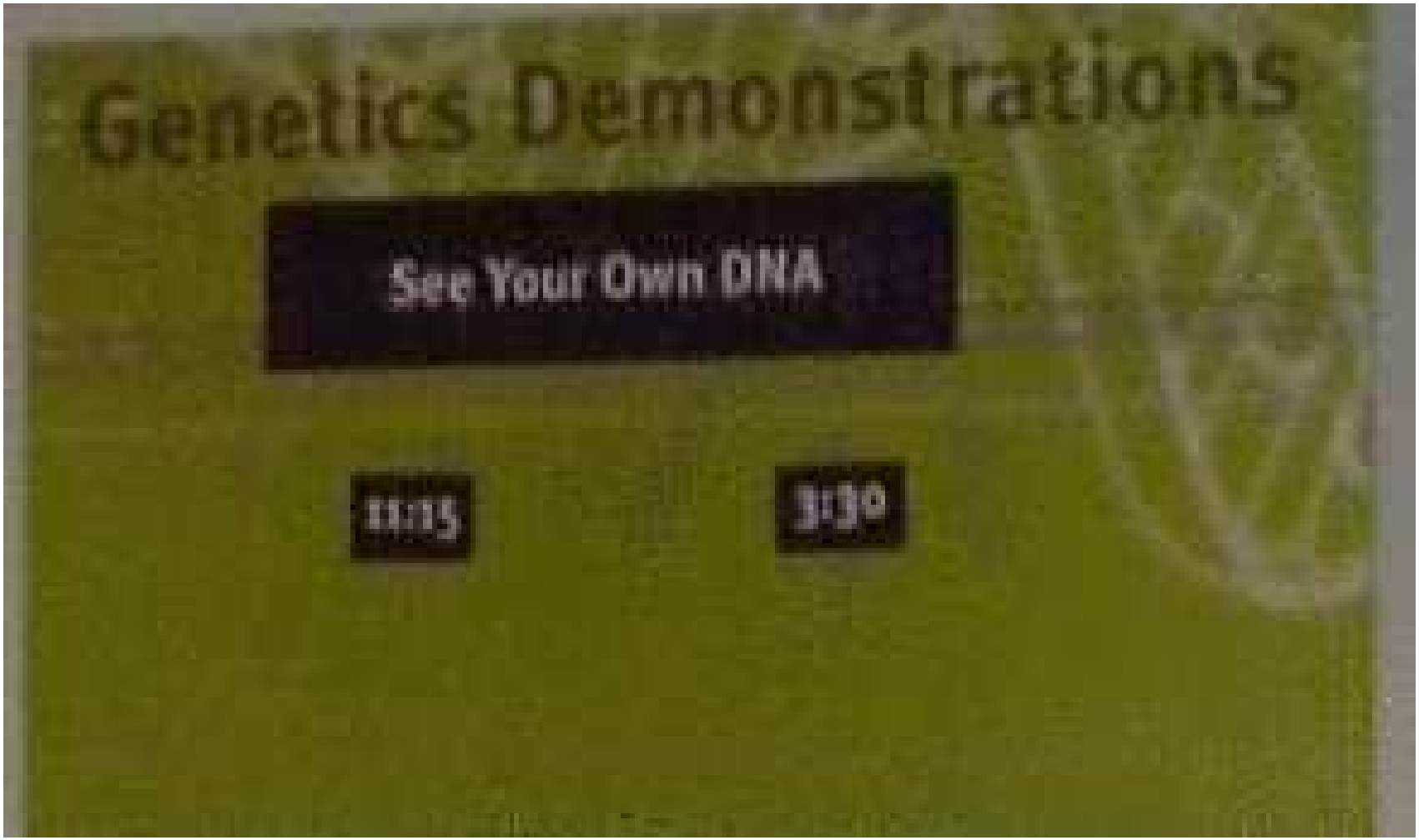

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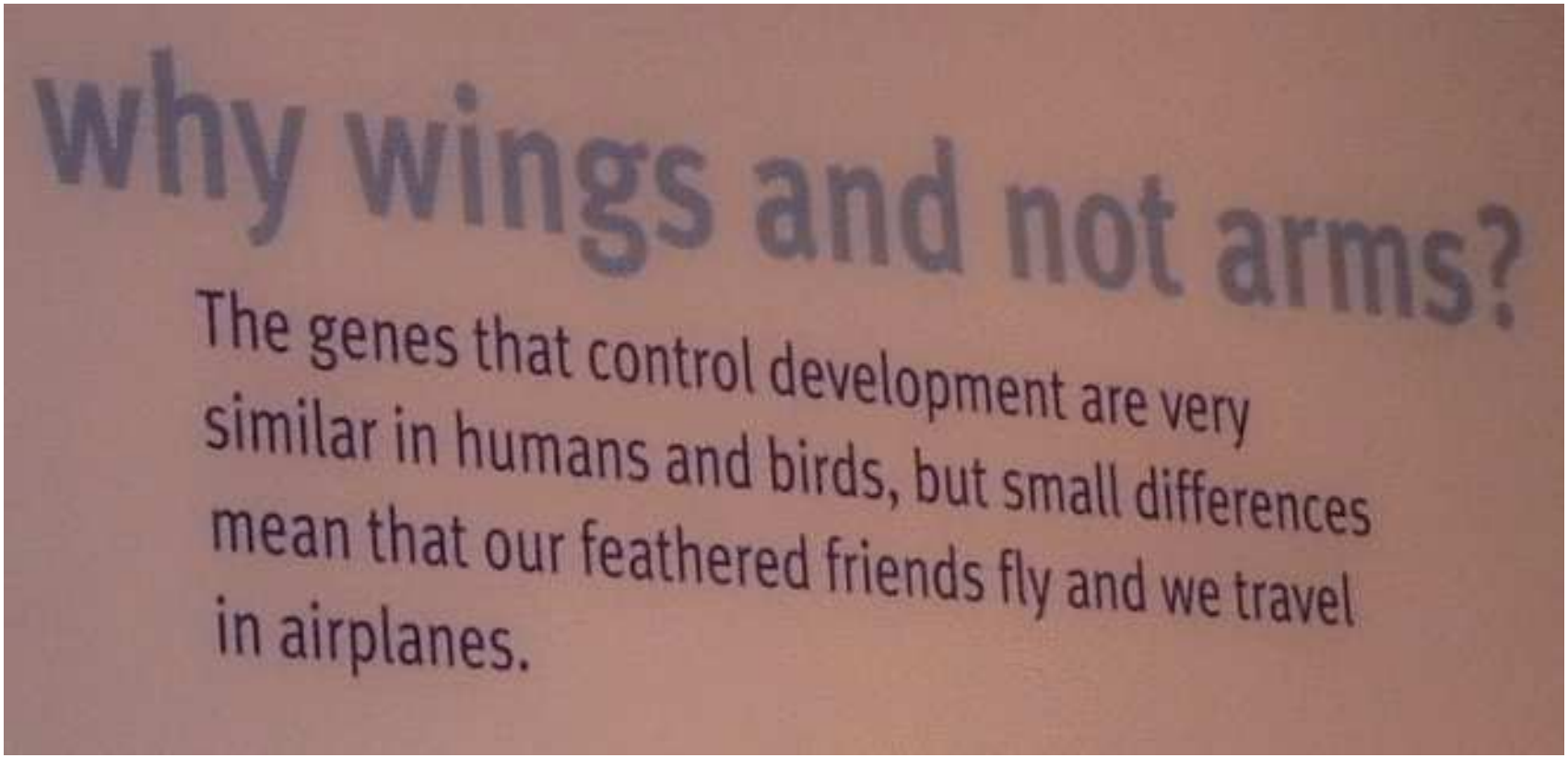

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Looking Forward

- Epistemological humility
- Embracing causal complexity
- Gene-Environment Interaction Chains:
  - Genes and environmental factors condition one another's effects
  - Chains may be of indeterminate length

Additional Slides Follow

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Behavioral Genetics: Conceptual Schemata

1. Partition variation in outcomes into heritable, shared environment, and nonshared environment ("Genetic" and "Environmental" factors)
2. Model gene-environment (GE) interactions
3. Consider GG and EE interactions as well

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Twin Studies

- Substantial estimations of h^2 (0.2–0.7)
- Assumptions:
  - Equal environments
  - No Gene-Environment covariation
- No specific cause
- No mechanism

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Biomarkers

- Small effects
- Specific causes
- Statistical power is a problem:
  - 3,000,000,000 base pairs
  - 0.1% functional polymorphisms (SNPs)
  - $\approx 3,000,000$ independent variables
- Enter theory
  - ...as mechanism
  - ...as categorization scheme