

Using What's Available— And There's Lots!

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Going for the Gold*

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Explore multilevel modeling as a particularly appropriate statistical tool for population-based information-rich environments.

- a) Information at two or more levels (neighborhood and individual, with family available in some jurisdictions).
- b) Large cohorts avoid issues associated with 'small N'
- c) Family data allow sibling controls for unmeasured factors

Issues

- 1) Put together multiple files to measure family income
- 2) Construct family structure histories to assess the effects of critical family events-parental divorce or death-at different stages of childhood
- 3) Build on longitudinal information on place of residence
- 4) Link information from parental health histories to child health histories to assess the contribution of such conditions as maternal depression
- 5) Expand the literature on the socioeconomic gradient

Common Issues

- Just have ecological data to measure income
- Just have test scores for those in school

Methodological Problem

- Representing populations with multifile data

Ecological (Neighborhood) Approach

- 1) Income Data from whole population
- 2) Census Dissemination Area (about 400 households in Winnipeg)
- 3) Data from Canadian Community Health Survey
Show: Correlation between mean neighborhood HH income and individual HH income of 0.57 in Winnipeg and 0.30 outside Winnipeg (N of about 400)

Individual Approach

- 1) Income Data from part of population
- 2) Sample: Using 5 year birth cohort data from Winnipeg
 - a) about 40% from Pharmacare benefits program (DPIN)
 - b) about 8% from Social Assistance program (SAMIN) (Lowest income families)

Combining Income Information from 2 data bases

- 1) Individuals only in DPIN database
- 2) Those in both DPIN and SAMIN databases
(had at least one spell of social assistance)
- 3) Those only in SAMIN database (lowest
income)

DPIN data-Most Analysis Done here (so far)

- 1) Use mean of each family's income categories (codes are from 1 to 11) over up to 11 years in which benefits were received. Median family filed 4 times.

<Averaged over as many years as possible-averages usually predict better>

2) Simple comparisons (for children) show:

a) Children in families having DPIN data generally representative of children in all Winnipeg families

<Higher pharmaceutical use among parents?>

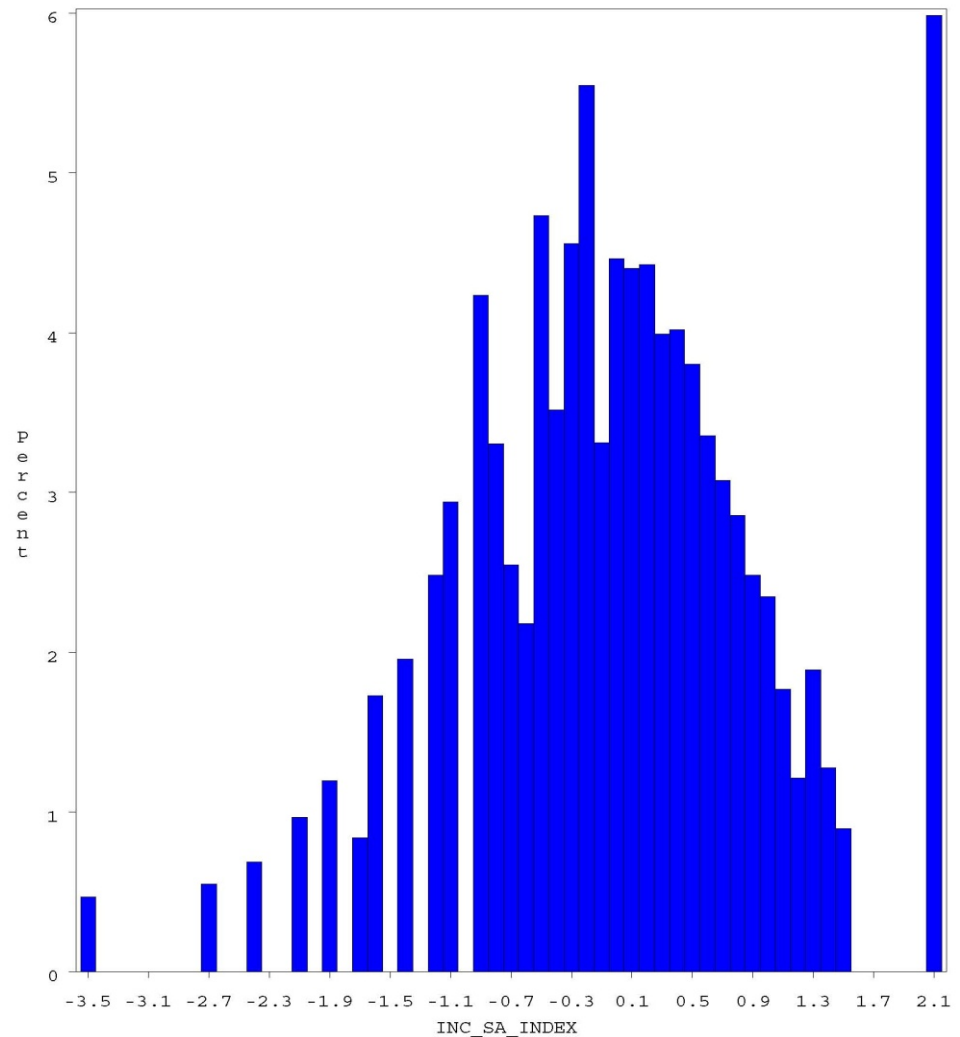
b) Children in families having DPIN data tend to score slightly higher (with a smaller standard deviation) on Educational Achievement measure

Technique (Mosteller & Tukey, Willms)

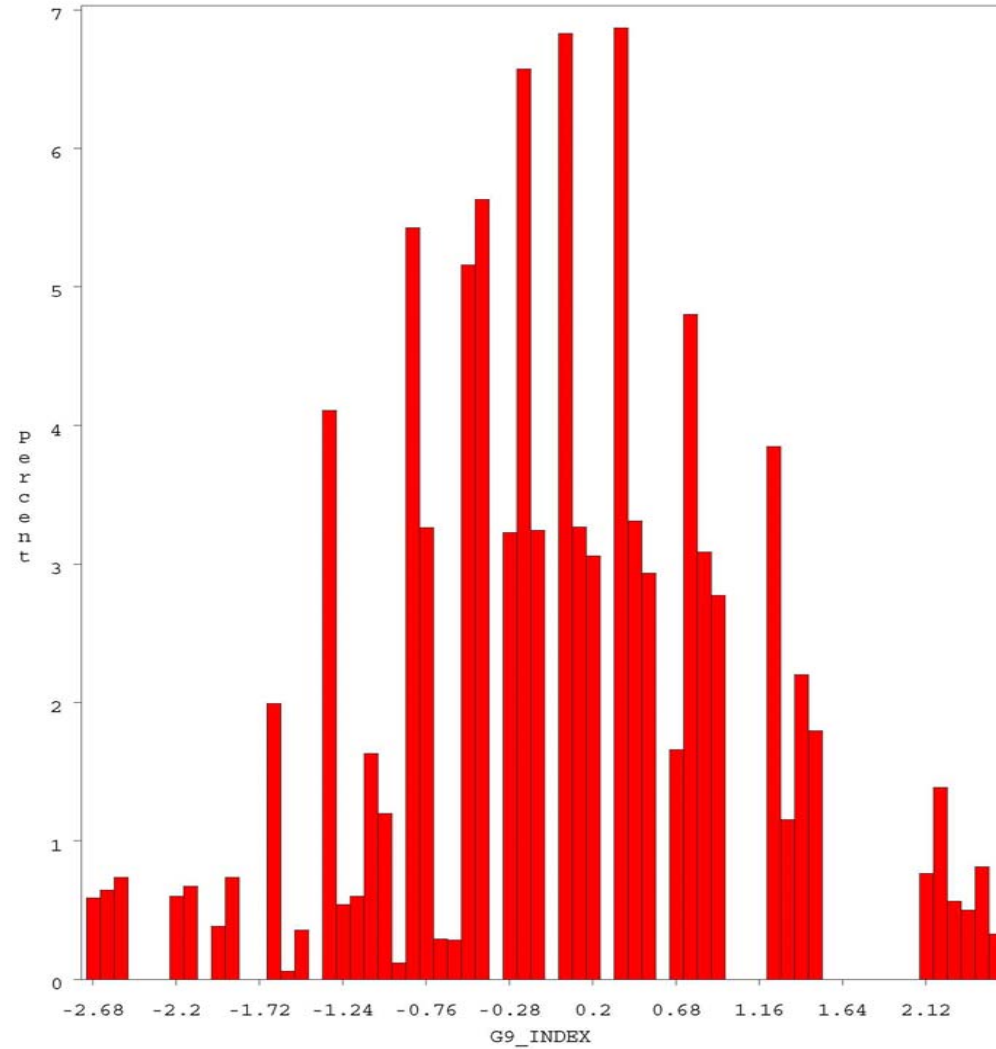
- For multiple files
- Using rank data to 'normalize'
- Underlying logit distribution divided into pieces according to percentage of population or sample included
- Also used to build educational indices

Income distribution for Families of Birth Cohorts

Income Distribution for Families of MB Birth Cohorts



Grade 9 Index Distribution: 1981–1989 MB Birth Cohorts



\$!d: /project/child ses/broo/phonosackm/sibcorr 2009/Measures/mb8189 a9 checks.sas

March 3, 2010 phonosackm \$

Multilevel Model of Educational Achievement Scores

~Variance to be explained~

Models Using

	Null Model	Neighborhood HH	Family HH
Neighborhood (Level 3)	.123	.028	.034
Family (Level 2)	.314	.266	.252
Individual (Level 1)	.572	.529	.525

- It doesn't matter much!
- Ecological approach vindicated
- Can combine Neighborhood and Family in same model and do slightly better.

Issue

- 1) Repeated movements of parents and their partners in and out of a child's household may produce short-term crises that reduce a child's capacity for normal development
- 2) Only one transition (i.e. divorce alone) versus to construct a family structure history that charts experiences over the entirety of childhood

Longitudinal Information on Place of Residence

- 1) Identify the number of residential moves (changes in 6 digit postal codes) and the number of school moves
- 2) Hypothesis that residential mobility is an important pathway through which family instability influences early school leaving, labour force participation, teenage childbearing and young adult health

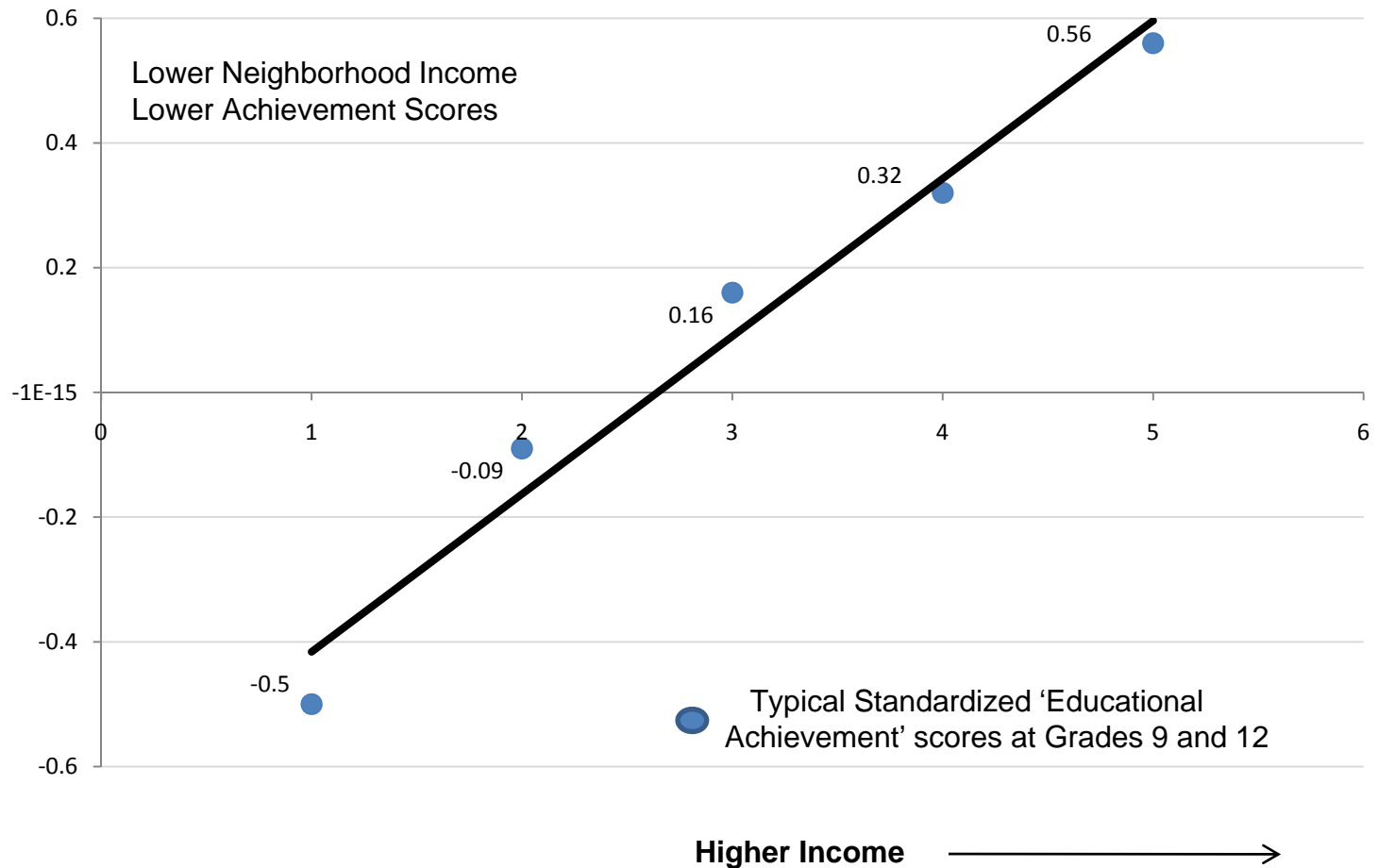
Child and Parental Health

- 1) Health conditions for both children and parents can be measured
- 2) Measurement of maternal health will concentrate on mental health. Age of each child at the time of onset of the particular mental health condition of the mother (anxiety, depression, etc.) will be recorded for each condition

Expanding the Literature on the Gradient

- 1) From early childhood through adolescence and into adulthood, the socioeconomic gradient may remain constant, weaken with age, or strengthen with age
- 2) Rich array of outcomes (health, education, social assistance) can be studied
- 3) Analysis of sibling correlations in health status over the developmental process (with circumstances differing for each family) should open another window on how the gradient develops

How important is income?



How similar are children in the same family?

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