Session 1:
Poverty at the Beginning of Life

Comments by

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The session

• Elysia Davis “Prenatal Programming of Child Health and Development”
• Erin Kinnally, “Early Life Stress and Epigenetic Development”
• Jon Guryan “The Effect of Poor Neonatal Health on Cognitive Development: Evidence from a Large New Population of Twins”
The papers

• Elysia Davis: Effects of stress signals (natural and synthetic) on fetal and child development and regulation.

• Erin Kinnally: Effects of early life stress on epigenetic regulation and behavioral disinhibition; stress can change how genes work.

• Jon Guryan: Impact of birth weight on cognitive outcomes using test scores through grade 8. Can school quality remediate disadvantage?
We know there exist strong correlations between family and environmental factors and adult outcomes.

- Maternal health
- Family environment, POVERTY
- External environment

Childhood and adult outcomes
Consider one important pathway: POVERTY
Risk of adverse outcome for poor / nonpoor children

Income inequalities are increasing (in education)

The papers in this session deal with the fetal development and early life period.

- Maternal health
- Family environment, POVERTY
- External environment

Fetal and early life development

Childhood and adult outcomes
Why study the fetal development channel?

- “The fetal period in the life cycle is unmatched by any other in growth and development, and it is the period in the human lifespan that is the most vulnerable to both organizing and disorganizing influences.”

Why study the fetal development channel?

• It is perhaps also easier to study because of the limited time period and fewer external factors at play (maybe)
What kinds of outcomes?

- Regulation, behavior
- Mental health
- Mortality
- Health - metabolic syndrome
- Cognitive measures (test scores in childhood)
- Educational attainment
- Wages and incomes
What kinds of outcomes?

- An intermediate outcome is the birth outcome
- Birth weight
- Gestational age
- Weight for gestational age

Example: Guryan (and coauthors) examine relationship between birth weight and cognitive outcomes
Measures of maternal health

- First generation of work focused on nutrition (famine, Dutch winter)
- Much work now on stress
External environment

- Pollution
- Smoking
- Weather
- Public policies
- Schools
Some observations on this literature, with attention on:

- *Connections between economics and psychology*
- *Common reference point – interest in informing sound public policy*
1. When does pre-natal period end?

- A tremendous amount of the (human) work focuses on the pre-natal period.
- This is especially true for the economics studies.
- What about the post-natal period?
  - My own work shows that exposure to food stamps through age 3-5 leads to reductions in metabolic syndrome in adulthood.
- Optimal public policy responses will be different depending on what we learn.
2. Can we apply the results from “extreme events” to more modest ones?

- Much of the work examines relatively extreme influences on the fetal environment
- Examples: famine, severe maltreatment
3. The role of *interaction effects*

- The work by Erin Kinnally on epigenetics is an example of this
- Gene x environmental interactions
- An example (thanks Ross Thompson): maternal care in rodents (Meany)
  - “nurture”: maternal licking and grooming (LG)
  - High LG leads to better outcomes in pups (less stress)
  - High LG offspring in LOW stress environments do well
  - Low LG offspring in HIGH stress environments do well
4. The importance of stress

- Elysia Davis’ work examines the effects of stress hormones in the pre-natal period; effects on infant and child development and regulation
- Economics has focused more on nutrition. Stress has received less attention:
  - Prenatal maternal cortisol negatively affects the health, cognition, and education of children (Aizer, Stroud and Buka 2012 using the National Collaborative Perinatal Project)
5. The role of *mediating behaviors* and interventions

• In poorer families, shocks lead to more adverse long run outcomes. Why?
• Parental mediation effects – how do investments in the child react to the infant health outcome?
• Guryan – can good schools remediate? What about parents? Do they adjust their behavior to the twin that weighs more (or less)?
• When interventions are implemented, do parents support or withdraw behavior?
• Can post-natal interventions be effective in changing the life course?
6. Public policy and *interventions*

- Nurse visitation program [can be justified by pre-natal and post-natal development]
- Food and nutrition programs [if results for famine extend to more modest deficits]
- Income maintenance programs [does money matter?]
  - Conditional cash transfers (Oportunidades in rural Mexico) lead to reduction in cortisol among children 2-6 (Fernald and Gunnar 2009)
  - Negative rainfall shocks lead to higher cortisol in Kenya (Haushofer et al 2012)
  - Expansion of in-work benefits (EITC) lowers risky biomarkers in mothers (Evans and Garthwaite 2011)

- We have much to learn about how government policies can affect these outcomes.
Conclusions

• The literature is much more advanced than my crude flowchart

• Yet we have much more to learn about the permanence of these deficits and how public policy / interventions can help

• A constant challenge of the human literature is the observational nature of the work. Establishing causality is difficult.