

Early Childhood Health and School Readiness

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Background

- Children born pre-term or low birth weight face a myriad of problems that might be linked to poor school readiness skills.
- Suboptimal maternal prenatal health, single parenthood, and social economic disadvantage may exacerbate these risks.

Objective

- To examine the relationship between early indicators of health and school readiness.
- Health indicators: Prematurity and birth weight
- School readiness includes children's physical, cognitive, and socio-emotional development.
- School readiness indicators:
 - Cognitive Skills: PPVT and WAI.
 - Prosocial and externalizing behaviors: SDQ.

Hypothesis

- Children born premature and/or low birth weight will have cognitive and socioemotional delays.
- Prenatal exposures to alcohol or tobacco, diabetes or high blood pressure in pregnancy, or multiple birth will impact this relationship.
- Family characteristics such as single parent, low SES, immigrant status, or non-English speaking background will also be important.

Method

- Data: both cohorts of the Longitudinal Study of Australian Children (LSAC).
- We related prematurity and low birth weight status to children's cognitive and behavioral school readiness at ages 4 or 5 Years.

Method

- OLS regressions, controlling for child and family background characteristics.
- Test interactions:SES, child gender, immigrant status, single parent
- We will explore the role of out of home child care in children's experiences, but this analysis is currently in process.

Longitudinal Study of Australian Children (N = 6821)

Birth Weight	Percentage
> 2.5 kg	94.2%
1.5-2.49 kg	5%
< 1.5 kg	0.8%

Longitudinal Study of Australian Children (N = 6821)

Gestational Age	Percentage
> 36 wks	93.1%
32-36 wks	5.5%
< 32 wks	1.4%

Prenatal Maternal Risks

Prenatal alcohol exposure	33.1%
Prenatal tobacco exposure	18.6%
Diabetes during pregnancy	5.5%
Hypertension during pregnancy	8.0%
Multiples	3.0%

Birth weight and School Readiness

	PPVT	WAI	Prosocial	Externalizing
Moderate low birth weight	-.14*	-.25***	.03	.03
Very low birth weight	-.47**	-.67***	-.13	.21
Prenatal alcohol	.08**	.01	-.04	.05
Prenatal smoking	-.08*	-.09*	-.07	.18***
SES	.25**	.18***	.07***	-.14***

*p<.05;**p<.01;***p<.001. PPVT=Peabody Picture Vocabulary Test; WAI=Who Am I ; SES=Socioeconomic Status

Prematurity and School Readiness

	PPVT	WAI	Prosocial	Externalizing
Moderately early	-.03	-.11*	.06	-.03
Very early	-.24*	-.59***	-.08	.09
Prenatal alcohol	.08**	.01	-.04	.05
Prenatal smoking	-.08*	-.09**	-.07	.18***
SES	.25**	.18***	.07***	-.14***

*p<.05;**p<.01;***p<.001. PPVT=Peabody Picture Vocabulary Test; WAI=Who Am I ; SES=Socioeconomic Status

Birth Weight, Prematurity and School Readiness

	PPVT	WAI	Prosocial	Externalizing
Birth weight	.07*	.11***	.01	-.01
Moderately early	-.03	-.02	.07	-.04
Very early	-.15	-.44***	-.07	.08
Prenatal alcohol	.08**	.01	-.04	.05
Prenatal smoking	-.07*	-.08*	-.07	.18***
SES	.25**	.18***	.07***	-.14***

*p<.05;**p<.01;***p<.001. PPVT=Peabody Picture Vocabulary Test;
WAI=Who Am I; SES=Socioeconomic Status

Results

- Low birth weight and prematurity are associated with lower cognitive measures of school readiness.
- Once birth weight is accounted for, gestational age is only important for those <32 weeks for the WAI
- Low birth weight and prematurity are not associated with prosocial or externalizing behaviors.
- No interactions by subgroups (sex, SES, immigrant status) on school readiness.
- Prosocial behaviors are predicted by being female and higher SES.

Implications and Future Directions

- Results suggest that birth weight is most important for cognitive school readiness.
- Intervening with children early could moderate the risks of poor health at birth
- Home visiting programs and quality early child education might be an important avenue for intervention
- Future research will explore the potential moderating role of formal child care.

ECLS-B Cohort

- Data were from 7308 singleton and 1463 multiple births in the Early Childhood Longitudinal Study-Birth Cohort (ECLS-B), a nationally representative cohort of children born in the USA in 2001
- Multiple logistic regression analyses examined associations between sociodemographic characteristics and low cognitive functioning at 9 and 24 months, and tested whether gestational and birth-related factors mediate these associations.

Hillemeier et al Paediatr Perinat Epidemiol. 2009 23(3):186.

Early Childhood Longitudinal Study-Birth Cohort (ECLS-B) Birth Weight Characteristics

- Normal birth weight 92.8%
- Moderately low birth weight 6.0%
- Very low birth weight 1.2%

Hillemeier et al Paediatr Perinat Epidemiol.
2009 23(3):186.

Child Characteristics: ECLS-B

- Non-Hispanic White 54.6%
- Non-Hispanic Black 14.1%
- Hispanic 24.2%
- Other 7.1%

Hillemeier et al Paediatr Perinat Epidemiol. 2009
23(3):186.

Household characteristics

- \leq \$US20,000 25.1%
 - \$US20,001-\$40,000 29.6%
 - \$US40,001-\$75000 24.7%
 - \$US75,001-\$100,000 10.1%
 - \geq \$US100,001 10.4%
-
- Hillemeier et al Paediatr Perinat Epidemiol. 2009 23(3):186.

Maternal Characteristics:ECLS-B

- Age 27.3 Y
- Married at birth 68.0%
- <high school diploma 26.2%
- High school / voc-tech program 27.1%
- ≥Bachelors degree 24.7%

- Hillemeier et al Paediatr Perinat Epidemiol. 2009 23(3):186.

Maternal Health Conditions: ECLS-B

- Smoked in last trimester of pregnancy 11.2 %
- Drank alcohol in last trimester of pregnancy 33.3%
- Adequacy of prenatal care utilization:
 - Inadequate 9.9%
 - Intermediate 14.2%
 - Adequate 44.2%
 - Adequate plus 31.7%
- Presence of pregnancy risk factors 30.6%
- Presence of labor and delivery complications 32.4%
- Gestation 38.7 wks
- Hillemeier et al Paediatr Perinat Epidemiol. 2009 23(3): 186.

Birthweight and Prematurity and Early Cognition: ECLS-B

- At 9 months on Bayley Cognition:
 - VLBW OR = 55.0 [95% CI 28.3, 107.9]
 - MoLBW OR = 3.6 [95% CI 2.6, 5.1]
 - Very preterm OR = 3.6 [95% CI 2.0, 6.7]
 - Mod preterm OR = 2.4 [95% CI 1.7, 3.5]
 - At 24 months on Bayley Cognition :
 - VLBW: OR 3.7 [95% CI 2.3, 5.9]
 - MoLBW: OR 1.8 [95% CI 1.4, 2.3];
 - VP: OR 1.8 [95% CI 1.1, 2.9]
 - MoPT: OR 0.9 [95% CI 0.7, 1.3]).
 - Results for multiple births were similar
- Hillemeier et al. Paediatr Perinat Epidemiol. 2009 May;23(3):186-98.

Conclusion

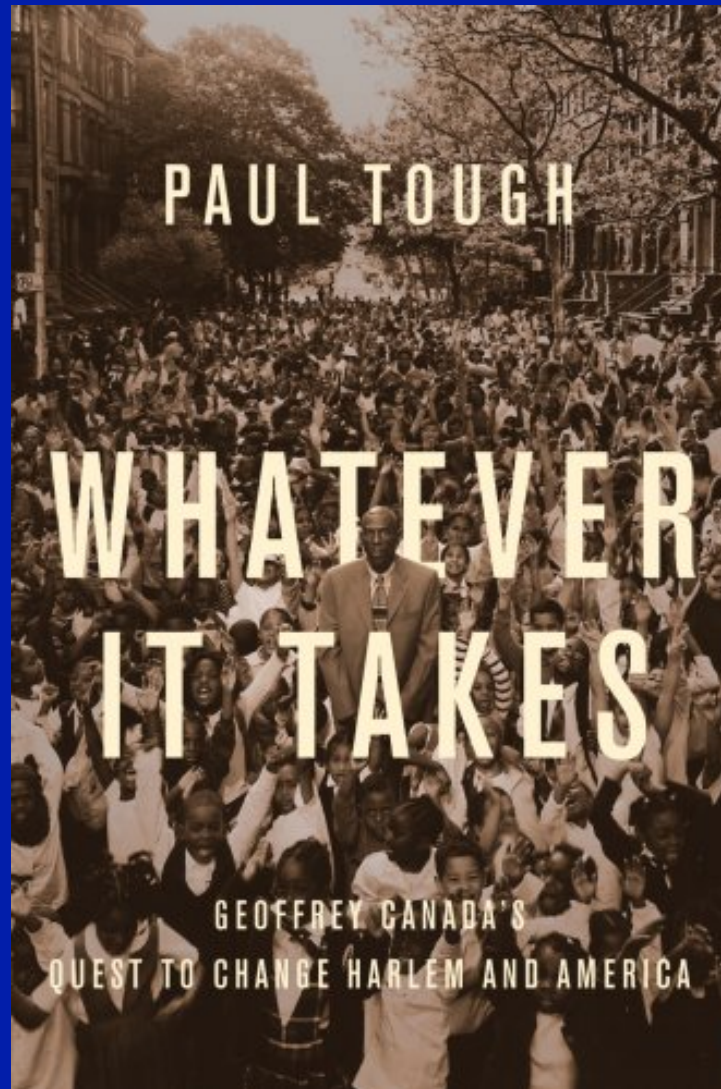
- Sociodemographic disparities in poor cognitive functioning emerged by 24 months of age.
- In the ECLS-B, these outcomes were not mediated by gestational or birth characteristics once ses was taken into account.
- Further investigation of processes whereby social disadvantage adversely affects development prior to 24 months is needed.

Hillemeier MM, Farkas G, Morgan PL, Martin MA, Maczuga SA. Paediatr Perinat Epidemiol. 2009 May;23(3):186-98.

DBP Chicago Model

Examine sequential outcomes after implementing translational science and community interventions so that disability is prevented, function optimized, and families supported as we create systems of care that apply the best of science to eliminate health care disparities for vulnerable children.

Implication



Opportunity



Acknowledgements

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