



Annotated Bibliography: Income and Children Outcomes

By Annie McEwen and Jennifer Stewart

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This annotated bibliography was prepared in support of the synthesis entitled, "The Relationship Between Income and Children's Outcomes: A Synthesis of Canadian Evidence", *CRDCN Synthesis Series*, April 2014.

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Canadian studies

Baker, Michael. 2011. "Innis Lecture: Universal early childhood interventions: what is the evidence base?" *Canadian Journal of Economics-Revue canadienne d'économique* 44(4): 1069-1105.

Summary: This article examines the evidence base for universal early childhood programs with an analysis of the developmental trajectories of children by SES and income.

Data set: National Longitudinal Study of Children and Youth (NLSCY), Cycles 1-8.

Target: Children age 0-19 year.

Method: Regressions, with sibling fixed effects.

Results: Baker finds lower SES children are more likely to have poor cognitive, developmental and behavioural outcomes in the early years (ages 0-5). Over 48 percent of the children in the bottom cognitive quintile are from the bottom two quintiles of SES. Further, children from lower SES families have significantly less likelihood of improving low cognitive and behavioural outcome measures between the early years and adolescence than children from higher SES families. Early outcomes are significant predictors of human capital accumulation (grade repetition and high school completion), particularly for lower SES children.

Boyle, Michael H., Katholiki Georgiades, Yvonne Racine, and Cameron Mustard. 2007. "Neighborhood and Family Influences on Educational Attainment: Results from the Ontario Child Health Study Follow-Up 2001." *Child Development* 78(1): 168-189.

Summary: This study examines the effect of neighbourhood on children's long-run educational attainment. Using the OCHS and multi-level modeling, the study attributes variation in years of education in 2001 to neighbourhood, family and individual (child) level-variables measured in 1983.

Data set: Ontario Child Health Study (OCHS) and follow-up

Ages: 4-16 in 1983 and ages 22-34 at follow-up in 2001

Method: Multi-level longitudinal model, nesting children within families within neighbourhoods.

Results: Their model explains a third of the variation in 2001 education levels: approximately 7 percent was explained by neighbourhood, 21 percent by family, and 6 percent by child level measures. The study indicates that the educational benefits to most children living in affluent areas do not extend to those children coming from economically disadvantaged families.

Bradbury, Bruce, Miles Corak, Jane Waldfogel, and Elizabeth Washbrook. 2012. "Inequality in Early Childhood Outcomes." in *From Parents to Children: The intergenerational transmission of advantage*, edited by J. Ermisch, M. Jänti, and T.M. Smeeding: Russell Sage Foundation.

Summary: This study compares the correlation between socioeconomic status (parent education and family income) and early childhood hyperactivity, conduct problems and cognitive outcomes between the United States, United Kingdom, Canada, and Australia.

Data set: National Longitudinal Survey of Children and Youth, Cycles 0-5, and various data sets for US, UK and Australia.

Ages: 0-5

Method: Correlation

Results: The study finds the lowest level of correlation in Canada, close to Australia, but significantly lower than in the US and UK. They find a stronger association between cognitive outcomes and income, particularly in the United States.

Burton, Peter and Shelley Phipps. 2008. "Economic Resources, Relative Socioeconomic Position and Social Relationships: Correlates of the Happiness of Young Canadian Teens." *Child Indicators Research* 1(4):350-371.

Summary: This study examines the relationship between income and self-reported happiness of teens age 12-15.

Data set: NLSCY Cycles 1-6

Ages: 12-15 for analysis, but using data spanning all 6 cycles

Method: Probit models

Results: The authors find that while family income increases likelihood of not reporting low levels of happiness, family income is not a robust predictor of being at the very top of the happiness distribution. The study also looks at relative income effects, comparing family income to neighbourhood averages. Here they find relative income position matters for those at the top of the happiness distribution, but absolute income matters more when looking at avoiding the lowest levels of happiness.

Burton, Peter, Shelley Phipps, and Lihui Zhang. 2012. "From Parent to Child: Emerging Inequality in Outcomes for Children in Canada and the U.S." *Child Indicators Research*: 6(2)1-38.

Summary: This study compares the effect of income earlier in childhood on adolescent and early adulthood outcomes including: educational aspirations, math scores, and educational attainment.

Data set: NLSCY Cycles 1-8, for the U.S. the National Longitudinal Survey of Youth 79, Child-Young Adult supplement

Ages: 11-22

Method: Regression

Results: The authors find that the gap in outcomes between children of different incomes is larger in the United States than in Canada, and the particular success of very high-income American children and different income distributions may in part explain this difference. When the study introduces more covariates than income into models, the relationship between income and high school drop-out decreases to non-significance in Canada whereas it remains significant and larger in the United States.

Cardin, Jean-François and H el ene Desrosiers. 2012. " volution des habilet es psychosociales de 17 mois   6 ans selon le sexe et le milieu socio conomique." in *Documents de travail de l' tude longitudinale du d veloppement des enfants du Qu bec ( LDEQ)*, edited by Institut de la statistique du Qu bec.

Summary: This study looked at the evolution in children's psychosocial development from infancy to six years of age in Quebec. Specifically, Cardin and Desrosiers examined how initial psycho-social measures and outcomes at age six are related to socio-economic background.

Data set: L' tude longitudinale du d veloppement des enfants du Qu bec

Ages: 17 months-6 years

Method: Generalized Linear Models, SES disadvantage measured by binary low-income measure (<\$35,000) and maternal education

Results: They find that their measure of socio-economic disadvantage is predictive of worse outcomes for certain psychosocial skills. Over early childhood, disadvantaged children are less likely to see their negative outcomes improve, leading to a widening of the gap between children. The study also identifies different psycho-social difficulties are of different types for boys and girls.

Caro, Daniel, James T. McDonald, and Douglas J. Willms. 2009. "Socio-economic status and academic achievement trajectories from childhood to adolescence." *Canadian Journal of Education* 32(3):558-590.

Summary: This paper examines the socio-economic gradient and gap in academic achievement over the course of childhood.

Data set: NLSCY cycles 1-4

Ages: 7-15

Method: Hierarchical linear models and panel data models, with 4 longitudinal points

Results: The study shows that socio-economic disparities start early and that the gap between children of different backgrounds persists. Most importantly, while the SES gap remains stable from ages 7 to 11 (elementary school), it widens at an increasing rate from age 11 to 15 (middle school).

Contoyannis, Paul and Martin Dooley. 2010. "The role of child health and economic status in educational, health, and labour market outcomes in young adulthood." *Canadian Journal of Economics/Revue canadienne d'économique* 43(1): 323-346.

Summary: This analysis uses follow-up data from the OCHS to look at whether socioeconomic status and parental health during childhood affects both child health outcomes and adult socioeconomic status and health.

Data set: Ontario Child Health Study (OCHS) 1983 and 2000 follow-up

Ages: 4-16 to 21-33

Method: Logistic regression, sibling fixed effects, tests OLS vs. fixed-effects

Results: The study finds that while parental health is strongly related to child health, there is a great degree of intergenerational mobility.

Corak, Miles. 2001. "Are the Kids All Right? Intergenerational Mobility and Child Well-being in Canada." *Statistics Canada*.

Summary: This review looks at longitudinal evidence on intergenerational mobility in Canada, using correlation/intergenerational elasticity measures.

Data set: Various administrative data

Ages: Adult-child correlation with parent

Method: Correlation

Results: Corak finds that, relative to other countries, there is a good degree of mobility in Canada with parental income responsible for only about a fifth to a quarter of the relative income difference between parents and their children.

Corak, Miles, Lori Curtis, and Shelley Phipps. 2011. "Economic Mobility, Family Background, and the Well-Being of Children in the United States and Canada." in *Persistence, Privilege, and Parenting*, edited by T.M. Smeeding, R. Erikson, and M. Jänti: Russell Sage Foundation.

Summary: This chapter gives a comparison of intergenerational mobility in Canada and the USA.

Method: Correlation

Results: In Canada estimates range from .16 to .21, three times as great as that in the USA. Intergenerational mobility is lower at the top and bottom of the income distribution in the US. This is important to contextualizing the comparison; American disadvantaged children are even more disadvantaged than the child at the mean. Without transfers, both countries would have similar child poverty rates - in Canada virtually all families receive some transfer.

Curtis, Lori and Shelley Phipps. 2000. "Economic Resources and Children's Health and Success at School: An Analysis Using the NLSCY." Human Resources Development Canada.

Summary: This paper examines the impact of 'economic resources' measured not only by current household income. The study uses the first two cycles of the NLSCY to look at the effect of various measures of economic resources and parental time on subjective measures of child health and school success.

Data set: NLSCY cycles 1&2

Ages: 5 to 13

Method: Ordered Probit regression

Results: The authors find that housing quality is a significant predictor of child health and school success. Parental time available significantly improves school success but is not associated with health outcomes.

Desrosiers, H  l  ne, Karine T  treault, and Michel Boivin. 2012. "Caract  ristiques d  mographiques, socio  conomiques et r  sidentielles des enfants vuln  rables    l'entr  e    l'  cole." in Series   tude longitudinale du d  veloppement des enfants du Qu  bec: Institut de la statistique du Qu  bec.

Summary: This study looked at the extent of school readiness (using the Early Childhood Development Instrument, EDI) among children in Quebec based on socioeconomic background, and the effect on later academic achievement.

Data set: L'  tude longitudinale du d  veloppement des enfants du Qu  bec

Ages: 4/5-8/9

Method: Descriptive and correlation, socioeconomic status rather than income

Results: Children living with 'socioeconomic disadvantage', measured by employment, mother's level of education, and sufficiency of income (subjective), are more likely to be vulnerable at school entry. They find that approximately 25 percent of children would be vulnerable on at least one area of school readiness. School readiness EDI measures are also found to be predictive of Grade 4 abilities, with 46 percent of vulnerable children having below-average academic measures at Grade 4.

Dooley, Martin and Jennifer M. Stewart. 2004. "Family income and child outcomes in Canada." *Canadian Journal of Economics* 37(4):898-917.

Summary: This paper looks at the question of whether we can expect to improve children's cognitive outcomes (measured by standardized testing) substantially by increasing cash transfers to low-income families.

Data set: NLSCY cycles 1, 2, 3

Ages: 4-13

Method: Multivariate Regression and fixed effects panel regression (family and child).

Authors use five strategies to get at unobserved heterogeneity and isolate the effect of income: fixed effects, income before and after outcome, consumption activities (housing and child activities), welfare income vs. earned income, adoption.

Results: The findings indicate that the income's effect on cognitive outcomes is smaller than traditional estimates when taking methodological steps to control for unobserved factors correlated with income. The authors find between 15-22 percent of a standard deviation increase in cognitive score for each increase in a unit log of income. They also find that effect of income is not linear, and flattens out at \$60,000 household income.

Dooley, Martin and Jennifer M. Stewart. 2007. "Family income, parenting styles and child behavioural-emotional outcomes." *Health Economics* 16(2):145-162.

Summary: This paper uses a series of novel techniques to try to more accurately observe the effect of income itself on behavioural-emotional outcomes rather than the effect of income-associated factors. The paper also looks at the role of parenting style as one theorized pathway of income's effect on children.

Data set: NLSCY cycles 1, 2, 3

Ages: 0 to 11 and 4-13

Method: Multivariate Regression and panel fixed effects. Attempt to control for heterogeneity by: fixed effects, income before and after outcome, consumption activities, welfare income vs. earned income

Results: They find little evidence of an effect of income on behavioural-emotional scores specifically via parenting. The exclusion of parenting style from the models was found to not bias the estimated income effect, but parenting style itself was found to have a consistent impact on child outcomes.

Dooley, Martin and Jennifer M. Stewart, and Ellen Lipman. 2005. "Exploring the good mother hypothesis: Do child outcomes vary with the mother's share of income?" *Canadian Public Policy* 31(2):123-144.

Summary: This study examines "the good mother hypothesis" that child expenditures increase and outcomes improve with mother's share of income.

Data set: NLSCY cycles 1, 2, 3

Ages: 4-13

Method: Fixed effects models child and family specific

Results: The authors find limited indication that child outcomes (cognitive and behavioural) improve with mother's share of income. The evidence of whether there is a differential impact of income based on which parent earns income is an important consideration for policies that either transfer income or attempt to focus on increasing earnings of parents.

Gagné, Lynda and Ana Ferrer. 2006. "Housing, neighbourhoods and development outcomes of children in Canada." *Canadian Public Policy* 32(3):275 - 300.

Summary: This paper looks at the effect of housing on child outcomes. While not focused on income per se, housing tenure is often used as a proxy for wealth.

Data set: NLSCY cycles 1, 2, 3

Ages: 4 to 11

Method: Panel data longitudinal models

Results: The analysis finds very little direct effect of housing quality or tenure (rented or owned) or neighbourhood quality perception on child cognitive or behavioural-emotional outcomes. Housing ownership is associated with better outcomes for girls. Girls seem more effected by poor neighbourhood quality than boys, while boys are more negatively effected by housing instability.

Hoddinott, John, Lynn Lethbridge, and Shelley Phipps. 2002. "Is History Destiny? Resources, Transitions and Child Education Attainments in Canada." *Ottawa: Human Resources Development Canada.*

Summary: This paper looks at persistence and change in child outcomes over time. The analysis examines the effect of income and parental characteristics on cognitive outcomes for four "cohorts" of different aged children. They also examine the predictive power of past outcomes and whether key events, like parental divorce alter childhood trajectories.

Data set: NLSCY cycles 1&3

Ages: Four ages of sample/cohorts: 1) ages 0-2 until 4-6, 2) ages 4-5 until 8-9, 3) ages 7-9 until 11-12, 4) ages 11 to 15

Method: Multivariate regression, weighted least squares.

Results: The authors find that lower initial attainment is a strong predictor of lower later attainment. Key parent characteristics have most influence in earliest cohort. None of the observed 'transition events' such as marital status change of parents have a substantive effect on cognitive outcomes. While the effect of income is small, the authors caution that cumulative effect of bundles of household characteristics related to income which often occur together is large.

Jones, Charles, Linn Clark, Joan Grusec, Randle Hart, Gabriele Plickert, and Lorne Tepperman. 2002. "Poverty, Social Capital, Parenting and Child Outcomes in Canada." Applied Research Branch Strategic Policy Human Resources Development Canada.

Summary: This study averages family income over the first three cycles of the NLSCY to look at the effect of long-term (6-year) poverty on child health, hyperactivity/inattention and math scores. The study also examines the "family stress model" of the relationship between income and child outcomes.

Data set: NLSCY cycles 1-3

Ages: 4 to 15

Method: Longitudinal linear models, multi-level models (household) and nested multiple regression (mediation models), examines duration of low-income

Results: Their testing of "family stress" models, finds that this relationship is partly explained by long-term low-income causing family "burn-out", increasing family dysfunction and depression among family members.

Lefebvre, Pierre and Philip Merrigan. 2010. "The Impact of Family Background, Cognitive and Non-Cognitive Ability in Childhood on Post-Secondary Education Attendance: Evidence from the NLSCY." in Pursuing Higher Education in Canada: McGill and Queen's University Press.

Summary: This paper explores the post-secondary education choices of Canadian youth aged 18 to 21 in 2005.

Data set: NLSCY cycles 1-6

Ages: 8-11 (cycle one) and 18-21 (cycle 6) at outcome

Method: Multinomial logistic regression model and sequential logistic model, with methods to assess selection bias.

Results: The authors find that while several characteristics of low-income families (e.g. single-parenthood, low-educated mother, lower perceived health) are important for educational attainment, household income itself is not a significant predictor of PSE choices. They find some family background characteristics have significantly different magnitudes of effect for females and males.

Lefebvre, Pierre, Philip Merrigan, and Francis Roy-Desrosiers. 2011. "Quebec's Childcare Universal Low Fees Policy 10 Years After: Effects, Costs and Benefits." Centre Interuniversitaire sur le Risque, les Politiques Economiques et l'Emploi (CIRPEE) Working Paper. Accessed 15 June 2013.

<http://ideas.repec.org/p/lvl/lacir/1101.html>

Summary: This paper uses difference-in-differences estimation to explore the effect on children of subsidized child care in Quebec introduced in 1997. The new policy amounted to a major increase to in-kind transfers to families with children.

Data set: NLSCY cycles 1-7

Ages: 0-4

Method: Double difference estimation technique, where treatment groups are Québec's children and children of the same age in the Rest of Canada are the control groups over several years.

Results: The analysis found that the policy did not reduce socio-economic gaps in school readiness. The policy significantly increased both mother's hours of work and children's hours of daycare. They find there is considerable difference of the effects of daycare across age groups of the children and across the education levels of the mother.

Lipman, Ellen L., David R. Offord, and Michael H. Boyle. 1994. "Relation between economic disadvantage and psychosocial morbidity in children." *Canadian Medical Association Journal* 151(4):431-437.

Summary: Using the OCHS and OCHS follow-up this study looked at the association between poverty and prevalence rates of psychiatric disorders, poor school performance and social impairment.

Data set: Ontario Child Health Study (OCHS) 1983 and 1987

Ages: 4-16 (1983) and 8-20 (1987)

Method: Correlation, multinomial logistic regression

Results: In cross-sectional correlation analysis, there existed a relationship between income and psychosocial morbidity, though it flattened at a threshold of \$10,000 (1984 dollars). Analysis found independent effects of low income and noneconomic factors related to poverty (low maternal education and family dysfunction) In the longitudinal analysis (follow-up) the study found no significant relationship between earlier poverty and psychological distress.

Lloyd, Jennifer E.V. and Clyde Hertzman. 2009. "From Kindergarten readiness to fourth-grade assessment: Longitudinal analysis with linked population data." *Social Science & Medicine* 68(1):111-123.

Summary: This paper constructs a Community Index of Child Development (CICD) that assesses the ability of regions to help children develop successfully between school entry and grade four.

Data set: Early Development Instrument (EDI) and British Columbia Ministry of Education's Foundation Skills Assessment (FSA)

Ages: 5-6 (kindergarten) and 10-11 (grade 4)

Method: Descriptive and correlation. The authors link individual level measures of school readiness taken during kindergarten with academic ability at grade four (age 9-10) to look at child development trajectories in different regions.

Results: In some areas, children from high vulnerability neighbourhoods tend to catch up between Kindergarten and Grade 4 whereas in other areas they tend to fall further behind. Communities that register higher on the CICD (those with relatively high ratio of positive to negative deflections) are generally found in neighbourhoods with the lowest risk of vulnerability initially and those that are the richest socioeconomically.

Manitoba Centre for Health Policy. 2012. "How are Manitoba's Children Doing?" Winnipeg: University of Manitoba.

Summary: This report examines various measures of inequality for Manitoban children drawn from longitudinally linked administrative and population data.

Data set: Administrative data from the Province of Manitoba: 'early screen', Early Development Instrument (EDI) at Kindergarten, standardized tests at grade 3/4

Ages: Prenatal to 7/8

Method: Descriptive and correlation, structural equation modeling and logistic regression for determinants of educational success

Results: The study finds children's developmental trajectories are set early and are influenced by factors including: prenatal health, health at birth, individual and family factors in the preschool period, and socioeconomic factors at all stages of development. It also finds that there is significant room for improvement in during childhood, and many children "deflect" from early vulnerability to later success.

Milligan, Kevin and Mark Stabile. 2009. "Child Benefits, Maternal Employment, and Children's Health: Evidence from Canadian Child Benefit Expansions." *American Economic Review* 99(2):128.

Summary: Milligan and Stabile use changes in child benefit policy in Manitoba (as compared to the rest-of-Canada) to examine the effects of higher benefit levels on child outcomes.

Data set: NLSCY cycles 3-6

Ages: 0-5

Method: Difference-in-differences models exploiting Manitoba policy change (versus rest-of-Canada) on National Child Benefit

Results: They find slight improvements in child and maternal well-being, though different effects for boys and girls. The analysis provides some support for the "family process" theory of income's effect on children, and conclude that the extra income provided by child benefits may improve long-run outcomes for children receiving higher benefit

Milligan, Kevin and Mark Stabile. 2011. "Do Child Tax Benefits Affect the Wellbeing of Children? Evidence from Canadian Child Benefit Expansions." *American Economic Journal: Economic Policy* 3(3): 175-205.

Summary: This paper uses changes in child benefit across time, provinces and family type as an opportunity to explore the relationship between exogenous income changes (benefits) and child outcomes.

Data set: NLSCY cycles 1-6 and Survey of Labour and Income Dynamics (SLID)

Ages: 0-10

Method: Difference-in-differences models (family type, province, time) exploiting National Child Benefit and provincial child benefit policy change.

Results: They find statistically significant, though small, effects on child cognitive, physical and mental health outcomes at the \$1000 benefit change level, particularly for low-education families (who are also likely to be low-income). Importantly, they find these effects vary by child gender. They also find positive effects of higher benefits for mothers' outcomes.

Morris, Pamela and Charles Michalopoulos. 2000. "The Self-Sufficiency Project at 36 Months: Effects on Children of a Program that Increased Parental Employment and Income." *Social Research and Demonstration Corporation*.

Summary: The Self Sufficiency Project (SSP) was a welfare-to-work demonstration project that offered significant income supplement for single parents who found full-time employment. This follow-up study looks at the effect that the SSP may have had on family functioning and on the cognitive development of the children.

Data set: Self-Sufficiency Project experimental data, 36 month follow-up

Ages: 3-5, 6-11, 12-18

Method: Experimental data - comparison of treatment and control groups

Results: SSP had few effects, none on the pre-school children and those that were observed on older children were quite small. There were small positive effects on children's cognitive and school outcomes for those of elementary school age, though for adolescent children, the SSP may have produced small negative effects.

Phipps, Shelley and Lynn Lethbridge. 2006. "Income and the Outcomes of Children." in *Analytical Studies Branch Research Paper Series*, edited by S. Canada. Ottawa: Statistics Canada.

Summary: This report investigates the impact of income (by various measures) on child cognitive, emotional, health and behavioural outcomes at different ages. Specifically it evaluates how different measures of income relate differently to child outcomes, including 'permanent' income, linear, and logarithmic transformations.

Data set: NLSCY cycles 1-3

Ages: Three spans: 0-7, 4-11 and 8-15

Method: Regression and evaluation of different specifications for income

Results: They find higher income is almost always associated with better outcomes for children, regardless of the measure of income employed, but the size of the association between income and child outcomes at best varies with developmental domain. The functional form of income changes as children age, with the relationship of association moving from linear to logarithmic.

Roberts, Paul, Peter Smith, and Holly Nason. 2001. "Children and Familial Economic Welfare: The Effect of Income on Child Development." edited by Applied Research Branch Strategic Policy Human Resources Development Canada. Ottawa.

Summary: This paper examines the effect of family income on children's cognitive and behavioural outcomes from ages zero to 13.

Data set: NLSCY cycles 1 & 2

Ages: 0-11 to 2-13

Method: Reduced-form Ordinary Least Squares (OLS) regression

Results: The analysis find very small income effects; raising household incomes by \$10,000 would result in an increase, on average, of 1.2 points in children's scores on the PPVT scale, or about 25 per cent of a standard deviation. The authors also look at how *change* in income affects outcomes. In general they found a fair degree in change in income and family composition, but high persistence of outcomes over the two cycles of data collection (2-year span). The findings suggest short-term income fluctuations may not have an immediate and simple effect on children's outcomes.

Romano, Elisa, Lyzon Babchishin, Linda Pagani, and Dafna Kohen. 2010. "School readiness and later achievement: Replication and extension using a nationwide Canadian Survey." *Developmental Psychology* 46(5): 995-1007.

Summary: This study using the NLSCY and MLEPS to replicates an international study on the importance of school readiness in predicting later school success.

Data set: NLSCY cycles 1-6, and Montreal Longitudinal-Experimental Preschool Study (MLEPS)

Ages: 4/5 to 6/8

Method: OLS regressions, controlling for factors including income.

Results: The authors concur with international findings, that early measures of cognitive ability and socioemotional behaviours are predictors of later school success: "better developed kindergarten math, reading, and attention skills significantly predicted better third-grade math and reading achievement, but kindergarten socioemotional behaviors

generally were insignificant predictors." The find kindergarten math significantly predicted socioemotional behaviors, giving support for the importance of socioemotional behaviors as indicators of school success and predictors of later school success.

Santos, Rob, Marni Brownell, Okechukwu Ekuma, Teresa Mayer, and Ruth-Ann Soodeen. 2012. "The Early Development Instrument (EDI) in Manitoba: Linking Socioeconomic Adversity and Biological Vulnerability at Birth to Children's Outcomes at Age 5." edited by Manitoba Centre for Health Policy. Winnipeg, MB.

Summary: This report uses population data on children in kindergarten, Early Childhood Development Instrument (EDI) linked to administrative data to examine the effects of socio-economic adversity.

Data set: Early Development Instrument (EDI) and administrative data

Ages: Prenatal to 6

Method: Structural Equation Modeling

Results: The authors find that children at the bottom of the SES distribution are disproportionately exposed to multiple adverse conditions. For low SES children, early life predicts EDI outcomes at age five. Larger proportions of low and very low birth weight babies go on to be vulnerable at age five, compared to babies born with normal (and high) birth weight.

Thomas, Eleanor. 2006. "Readiness to Learn at School Among Five-year-old Children in Canada." in *Children and Youth Researcher Series*. Ottawa: Statistics Canada.

Summary: This report describes the "readiness to learn at school" of Canadian children who were 5 years old in 2002/2003, using a range of cognitive, behavioural and social measures. It describes home environment factors that may be linked to measures of readiness to learn, including income.

Data set: NLSCY cycles 5 & 6

Ages: 0-5

Method: Regression and correlation coefficients

Results: The report finds that differences in receptive vocabulary between children from low income households and those from more affluent households may be partly accounted for by differences in how often children were read to. Differences in communication skills between lower and higher income children were partly accounted for by positive parent-child interaction and by participation in organized sports and physical activities. These communication differences between children of different income parents at age 5 were already apparent at age 3.

Wilk, Piotr, Michael H. Boyle, Martin Dooley, and Ellen L. Lipman. 2006. "The Effect of the Self-Sufficiency Project on Children." edited by Social Research and Demonstration Corporation: SRDC Working Paper.

Summary: This study examines the effect of the Self-Sufficiency Project, a welfare-to-work income supplement demonstration project, on children.

Data set: Self-Sufficiency Project data (72 month follow-up)

Ages: 6-18

Method: Experimental data - comparison of treatment and control groups

Results: The study shows no statistically significant differences in emotional, cognitive or behavioural outcomes between children of parents receiving the supplement or not. While higher income benefits could be offset by negative impact of hours of work, causal pathways of effect were not examined.

Williamson, Deanna L. and Fiona Salkie. 2005. "Welfare reforms in Canada: Implications for the well-being of pre-school children in poverty." *Journal of Children & Poverty* 11(1):55-76.

Summary: The paper looks at child cognitive scores (PPVT-R) at school entry before and after the implementation of mandatory welfare-to-work initiatives in Canada in the late 1990s.

Data set: NLSCY cycles 1 & 3

Ages: 5-6

Method: Comparison of groups pre- and post- welfare reforms in Canada. ANOVAs and correlation coefficients

Results: The paper finds no evidence of change in well-being of children after introduction of welfare reforms. Income is treated categorically and with reference to work status. They do find, controlling for income, all children did better if their parents worked rather than received social assistance.

International studies

Blau, David. 1999. "The effect of income on child development." *Review of Economics and Statistics* 81(2):261-276.

Summary: This study examines the effect of parental income on children's cognitive, social, and emotional development.

Data set: Matched mother-child data from the National Longitudinal Survey of Youth (NLSY)

Ages: 0-6

Method: OLS, Fixed and random-effects, examines different specifications of income.

Results: The study finds that the effect of current income is small, especially when income is treated as endogenous. The effect of "permanent" income is substantially larger, but relatively small when compared to the size of most policy-induced changes to income. The study finds family background characteristics play a more important role than income in determining child outcomes. Blau concludes: "policies that affect family income will have little direct impact on child development unless they result in very large and permanent changes in income."

Duncan, Greg J. and Jeanne Brooks-Gunn (eds.). 1997. *Consequences of growing up poor*. New York: Russell Sage Foundation.

Summary: This volume is a collection of 12 studies on the effects of poverty on children.

Data set: Various

Ages: Various

Method: Various

Results: The studies found family income has selective but, in some instances, substantial effects on child development and well-being. Income is usually a stronger predictor of ability and achievement outcomes than are measures of parental schooling or family structure. Income appears to be more strongly related to children's cognitive ability and academic achievement than to emotional outcomes. Children who live in extreme poverty or who live in poverty for multiple years appear to suffer the worst outcomes. The timing of poverty also is found to be important for certain outcomes; poverty in early and middle childhood appear to be far more important for shaping ability and achievement than they do during adolescence.

Gershoff, Elizabeth T., J. Laurence Aber, Cybele C. Raver, and Marie Claire Lennon. 2007. "Income is not enough: Incorporating material hardship into models of income associations with parenting and child development." *Child Development* 78(1): 70-95.

Summary: This study examines dual components of family income and material hardship along with parent mediators of stress, positive parenting, and investment as predictors of 6-year-old children's cognitive skills and social-emotional competence.

Data set: The Early Childhood Longitudinal Study

Ages: 6

Method: Structural Equation Modeling (SEM), multi-group analysis

Results: Support was found for a model that identified unique parent-mediated paths from income to cognitive skills and from income and material hardship to social-emotional competence. The association of income with child cognitive skills appears to be mostly mediated by the level of parent investment in children.

Guo, Guang and Kathleen Mullan Harris. 2000. "The Mechanisms Mediating the Effects of Poverty on Children's Intellectual Development." *Demography* 37(4): 431-447.

Summary: This study looks for the mechanisms by which income affects child outcomes. Five latent factors are examined as mediating pathways: cognitive stimulation, parenting style, physical environment, child ill health at birth, and ill health in childhood.

Data set: National Longitudinal Survey of Youth - parents with children after 1986

Ages: 3-10

Method: Structural Equation Modeling (SEM)

Results: The study finds that the influence of family poverty is entirely mediated by intervening factors, with non-significant direct effects remaining in the model. Cognitive stimulation in the home, physical home environment and health at birth as well as parenting style are the strongest mediators for intellectual development.

Heckman, James J. 2000. "Policies to foster human capital." *Research in Economics* 54(1): 3-56.

Summary: This article summarizes the available evidence on the importance of early childhood cognitive and non-cognitive skills in producing later social and economic success. The article highlights the importance of early investment and argues that non-cognitive skills have been undervalued in understanding the childhood determinants of later outcomes.

Data set: Various

Ages: Various

Method: Various

Heckman, James J. 2006. "Skill Formation and the Economics of Investing in Disadvantaged Children." *Science* 312(5782): 1900-1902.

Summary: This short article provides a summary of Heckman's work on the economics of "investing in disadvantaged children". The article explains the idea of cumulative advantage and the diminishing returns expected by investing later during childhood. Heckman argues that current approaches to child policy overinvest in the later years and under-invest in the early years.

Data set: Various

Ages: Various

Method: Various

Mayer, Susan E. 1997. *What money can't buy: family income and children's life chances*. Cambridge: Harvard University Press.

Summary: This American study tries to differentiate between the effect of money versus socioeconomic status on children's development.

Data set: Panel Study of Income Dynamics and National Longitudinal Survey of Youth

Ages: 5-7 (NLSY) and 13-17 onward (PSID)

Method: Regression with five strategies of controlling for unobserved heterogeneity: 1) Income from different sources (wages vs. welfare) 2) Parental income before an outcome with effect after outcome 3) Child expenditures 4) Trends over eras 5) Exogenous sources of variation in income that are uncorrelated with parental characteristics (policy changes)

Results: Mayer finds that once children's basic needs are met, characteristics of parents become more important to how children 'turn out' than anything additional money can buy. Additionally, parents' education, age when their children are born, and race account for up to half of the observed correlation between children's outcomes and parental income.

Morris, Pamela, Greg J. Duncan, and Elizabeth Clark-Kauffman. 2005. "Child Well-Being in an Era of Welfare Reform: The Sensitivity of Transitions in Development to Policy Change." *Developmental Psychology* 41(6): 919-932.

Summary: This study examined the importance of timing of income changes to child outcomes.

Data set: Evaluation data from seven anti-poverty and welfare experiments (randomized)

Ages: Various age groups

Method: Meta-analysis

Results: This study finds that times of developmental transition during childhood are the only periods sensitive to the changes in families brought about by income policies. Specifically, small positive effects of policies were found for children transitioning into middle childhood, and small negative effects of these same policies were found for children transitioning from middle childhood into early adolescence.

Yeung, W. Jean, Miriam R. Linver, and Jeanne Brooks-Gunn. 2002. "How money matters for young children's development: Parental investment and family processes." *Child Development* 73(6): 1861-1879.

Summary: This study examines how two measures of income (stability and level) are associated with preschool children's developmental outcomes. Two sets of mediating factors that reflect two dominating theories of income mediation in the literature are examined: (1) the investment perspective, and (2) the family process perspective.

Data set: The Panel Study of Income Dynamics and its 1997 Child Development Supplement

Ages: 3-5

Method: Structural Equation Modeling (SEM)

Results: The study found that distinct mediating mechanisms operate on the association between income and different child outcomes. Much of the association between income and cognitive scores was mediated by the family's investment in providing a stimulating learning environment. In contrast, family income was associated with children's behavioral scores primarily through maternal emotional distress and parenting practices.